COLLABORATIVE ENVIRONMENTS WORK: A CASE STUDY OF TEACHER TRAINING

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In recent years, many research projects related to cooperative and collaborative learning, as well as to learning communities based on these practices, have appeared. Numerous authors have recognised the innovative potential of collaborative networked learning, thus allowing for the growth of research in the field of collaboration connected with education and distance learning. In this paper, through a case study in the context of teacher training, we intend to show that collaborative environments actually work.

1. INTRODUCTION

Collaboration in virtual environments is becoming an increasingly frequent phenomenon and can be looked at as a pedagogical strategy, as well as a philosophy or a lifestyle (Henri & Pudelko, 2003). In the same line, Gros (2004) states that, in the specialised literature, studies on collaborative learning multiply day by day: *Las investigaciones sobre experiencias, condiciones de uso, tipos de interacción, no solo son elevadas (en términos cuantitativos) sino que apuntan e inciden en aspectos muy fundamentales del proceso educativo, por lo que están ante un ámbito de investigación y desarrollo de gran interés* (Gros, 2004, p. 2).

In fact, we can note a predominance of empirical studies related to the creation of virtual environments focusing on collaboration, seen as a learning paradigm *per se* (Develotte & Mangenotte, 2003).

Aiming to collaborate in this process, we conducted an experiment of distance training for teachers trying to better grasp the way training can be developed and the importance collaborative environments can have. We believe that the information to be extracted could be highly relevant in solving some of the problems encountered in teacher training (nowadays so problematic) and in its implementation on a large scale, and in overcoming some space-time contingencies that impose such great limitations on teacher training throughout teachers' lives.

Building on the emergence of the collaborative discourse, we describe briefly the environment that supported the intervention. The findings achieved through the evaluation of all data, are also presented.

2. THE EMERGENCE OF THE COLLABORATIVE DISCOURSE

As Henri & Pudelko (2002) highlight: *en effet, la fascination suscitée par les nouvelles formes des collectifs qui son en train d'être inventés autour de l'Internet et du web est grand* (p. 13). In addition, Harasim (2000) also emphasises the importance of collaboration for networked learning: *the principle of collaborative learning may be the simple most important concept for online networked learning, since this principle addresses the strong socio-affective and cognitive of learning in the web* (p. 53).

It is this growing recognition that leads a considerable number of authors to refer to a paradigm change, which has to do with a collaborative paradigm, such as that which is mentioned by Harasim (2000): *The convergence of the computer network revolution with profound social and economic changes has lead to a transformation of education at all levels. The new paradigm of collaborative networked learning is evident in the new modes of course delivery being offered, in the educational principles that frame the educational offerings, the new attributes that shape both the pedagogies and the environments that support them and that yield new educational processes and outcomes* (p. 59).

This new research field is mainly connected with collaborative learning (Henri & Lundgren-Cayrol, 2001) and with the development of virtual communities and all the issues raised by these communities (Henri & Pudelko, 2002). In pedagogical terms, collaboration and virtual communities are concepts that are not easily adjusted to school practices, though they pressupose and inspire the creation of new educational approaches (Dillenbourg *et al.*, 2003). The reason why they are not adjusted to school practices is that the nature, procedures and working style of organisations is insufficient or even contradictory to the demands of new education, social and cultural realities that these new learning environments bring about. In a similar way, Levan (2004) stresses that the practice of collaborative work is still difficult because conditions for the development of this way of working are far from present in the current organisational forms.

The focus on learning, the strengthening of the teacher-student and student-student interactions, the inclusion of collaborative work strategies and learning based on autonomy and reflection: these are the chief aspects that some authors associate with the change in the pedagogical paradigm. At the same time, they provide a suitable background for some of the more conscious approaches to the use of learning environments which meet the current needs for continuing training.

Hence, as Henri & Pudelko (2002) point out: *Les recherches qui s'y rattachent, présentent toutes les caractéristiques d'une paradigme en émergence, à savoir: tentatives de définir les principaux concepts, de délimiter des frontières de l'objet étudié, de circonscrire le domaine par rapport aux camps disciplinaires, de trouver des méthodologies appropriés* (p. 20).

The creation of these learning environments demands theoretical and practical knowledge that will provide them with a suitable background and will justify and provide limits for them. Moreover, there are various research projects that prefer one learning theory to another, though some authors take several theories into account to substantiate their collaborative practices. Notwithstanding the contribution given by a variety of theories, collaborative learning feeds on constructivist values, such as

autonomy, reflection and active entrepreneurship, and is based on constructivist theories to explain learning mechanisms. According to Coll (2004), since collaborative learning is centred on individual learning, it is rather obvious the importance of theories that establish learning in an environment of mutual help and in the activity of the subject (constructivism), just as are the theories that set up learning on the basis of social interaction (social constructivism).

Collaboration calls on a theoretical underpinning, found in the theory of cognitive flexibility, in the concept of distributed cognition and in andragogy, which permits the establishment of the basic principles of collaborative learning (Depover & Marchand, 2002).

The difference between cooperation and collaboration was well elaborated on by Henri & Lundgren-Cayol (2001), using control and autonomy, the aim to achieve, the task and interdependence as the main aspects to distinguish both.

The first distinctive aspect is the degree of *autonomy* of trainees/learners and the level of *control* of the trainer/teacher. We can then confirm that, in cooperation, there is higher control on the part of the trainer and lower autonomy on the part of the trainee. On the other hand, in collaborative tasks, more autonomy is necessary and, thus, higher cognitive maturity than in cooperation. As a result, the activities in which the trainees possess less maturity should be more structured and contextualised, giving the trainer more control over the learning process. The less developed are the learning strategies for the learner, the more control should there be over the learning process. This control should be carried out in a clear way, in order to gradually develop trainees' autonomy and collaborative capacities: *Collaborative online interaction is best developed with maximum autonomy, without excessive teacher intervention and control* (…) (Tu, 2004, p.14). Consequently, at first sight, collaboration seems to be destined for people with the ability to self-regulate their learning.

Another feature that distinguishes these two concepts is *the aim to achieve*. Cooperation is based on the distribution of tasks and responsibilities among the members of a team to reach a certain objective, whereas, in collaboration, interaction is negotiated and oriented so as to accomplish a common purpose by means of a consensus. Objectives are expected to be collectively defined and each member is to be individually responsible for attaining the group's objective and not merely his own. In the collaborative process, sharing means "to participate" in order to achieve a common goal, but without the distribution of tasks and responsibilities within the group. As Harassim (2000) mentions, *collaboration or co-laboring means working together to accomplish shared goals; individuals seek outcomes beneficial to themselves and to the other members of the group*.

As far as *the completion of the task* is concerned, and contrary to collaboration, cooperation proposes a task which is distributed among the various members of a working group. In cooperation, emphasis is placed on the completion of the task by the group, based on the sub-tasks for each trainee. Collaborative work does not equal the sum or the juxtaposition of different individual works, rather it is necessary a greater involvement of the group, the establishment of common goals and the coordination of the activity.

Interdependence is a characteristic of both concepts. In cooperation, interdependence must exist, because the contribution of some is not complete without the contribution of others: there is reciprocal interdependence which is necessary for the complementation of the task. On the other hand, in collaboration,

interdependence requires a new relational involvement, essential for mutual support and the creation of a common identity. Collaboration is thus found within the interactions of a group, where discoveries are shared and the meaning to be given to work is negotiated, as well as in the validation of new constructed knowledge.

Several authors share the opinion that, instead of separating these two concepts, they should be considered as two ends of a *continuum*: cooperation would represent a highly organised learning process, while collaboration would be a learning process carried out under the responsibility of the trainee. Between one end and another, a range of intermediate situations of group work could emerge depending on the trainee's autonomy, the trainer's degree of intervention and the skills already developed by the trainees. The term 'group' is used in the sense of comprehending the learning processes that include cooperation, collaboration or both in different moments.

Therefore, as an alternative to considering these approaches as dichotomies, one should understand them as part of the above-mentioned *continuum* that helps trainees to place themselves in the learning process, since collaboration is not a learning procedure that can be achieved immediately, but that previously requires the development of cooperation skills.

3. ENVIRONMENT

On the basis of what was presented above, two training sessions on b-learning mode were chosen, in which the distance component was based on the creation of a platform using a LCMS and a Groupware. The collaborative learning environment was then established on the ATutor and ACollab platforms, installed in integration, which worked from the same database in an Apache server. These platforms are OpenSource tools with a GPL (General Public License) developed by the University of Toronto (http://www.ATutor.ca).

ATutor is a Learning Content Management System (LCMS) that uses SCORM for content development, which in our case was the function we attributed it. On the other hand, ACollab is a collaborative environment (Groupware), i.e. a multi-group Web-based collaborative work environment. It shows a considerably open and flexible structure in the creation and management of groups and in the organisation of collaborative activities, using forums, inboxes, information zones, event scheduling, chats and the joint construction of documents with comments on the work under development. Apart from this, it also includes a library where finished work is made available.

To sum up, we could state that, in this study, ACollab allowed us to form a general group, with all the members of the training, and four smaller groups of four people each, in which some activities were to be completed by the general group and others by the more specific groups.

We chose the b-learning approach with a distance component equal to 2/3 of face-to-face attendances.

The choice for b-learning was due to the fact that:
- its is highly advisable for users with little experience in the use of computers;
- it is more sensible for users with little experience in distance training;

- it takes advantage of the best in face-to-face training and in distance training;
- it allows for the development of the necessary skills for total distance training.

We cannot neglect the fact that, for those who are not familiar with this type of training and technology, participation in these activities brings about a cognitive overload. b-learning may function as a transition mode for total distance training, while training skills are developed and technologies and distance communication processes are explored.

4. INTERVENTION

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.

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 and necessarily in following these new processes (Hargreaves, 2005).

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.

5. EVALUATION

The platform turned out to be quite useful for distance collaborative work. This statement is based in the analysis of data collected from electronic records of the platform, individual interviews (E), group feedback and a research diary (D), extracts of which we are using to illustrate a number of findings about the environments an the intervention described (in the quotes below, A1 stands for training 1 and A2 for training 2). The limitations in working collaboratively were not due to the collaborative environment generated by the platform, but rather to a set of conditions independent of the platform and sometimes inherent to the trainees. Thus, the platform *possesses good conditions to establish collaboration, but it was not fully developed* (A2_E6).

I think that [the limitation] were we teachers, because many had a really basic knowledge of computers (A2_E7). Because if I had explored it more, dedicated myself more, it would have been easier to me. I believe it was a bit my fault (A2_E5).

(…) I consider it has potential, but it's just that thing we have already mentioned in our training: we need to change the way people think and teachers must have more training in this area. And this is not happening, because when we come to choose a training session, we realise that very often there is only one session to be offered in the area of the Internet or Informatics (A2_E7).

The use of the platform ATutor-ACollab was straightforward and intuitive. The characteristics of the communication system were satisfactorily adjusted to the work developed and showed potential for collaborative work: *(…) it is easy to work with, it is, let's say, functional. Yesterday or the day before, when I was uploading those activities, I was there for 40 minutes and completely forgot to have lunch, because it was being functional and I was verifying a few things* (A1_E1).

Two trainees suggested their use in educational contexts: one of them with children from primary education (from 6 to 9), enabling work among schools, not forgetting that the teachers' help is indispensable at this level. The other suggested the creation of portfolios which would support face-to-face activities, at the level of secondary education: *It would be rather important to make an experiment with primary education children and, from this point of view, it would be great, because if we could do it with fourth-year children, it would work very well (A1_E4); I will immediately attempt to apply the knowledge acquired in this distance training to the classroom, with the network creation of folders, similar to portfolios, in which students will work under my guidance. I believe I shall apply this much more deeply as a trainer* (A1_E1).

Some of the trainees also showed interest in using the platform as trainers, for designing and realising distance training themselves: *I got used to the platform and then it was easy. I had never done such work at a distance, but I considered the platform quite reasonable. It was easy to use, though there a few functions that were*

not explored and I would have liked to. I would even enjoy, for example, using it for my own purposes [as a trainer] (A1_E2).

The two trainees that demonstrated interest in using the platform as trainers were given permission to access it as trainers themselves and, after two sessions with them, they started creating their own training courses for other teachers in a collaborative environment.

The training environment in the platform offered a set of instruments or tool for working communication, such as the e-mail, chat rooms, forums and tools for group work. By checking which communication tools were the most relevant for interaction and group work, we found that forums and the drafting room stood out, this being the collaborative work tool: *Forums. Because… I'm going to give a very simple reason for this – I like to talk and discuss things. Documents are secondary for me, because everything is too theoretical* (A1_E3); *That was really good, that is what I prefered [drafting rooms], because each one of us completes, updates or gives suggestions so that the colleges can alter things* (A1_E1).

Forums and drafting rooms were the tools mostly used by the trainees for participation in group activities, both in training session 1 as in training session 2. Therefore, 49% and 6% of the participation was developed on forums, in training session 1 and training 2 respectively. The second most used tool was the drafting room with 21% and 29% in training session 1 and training 2 respectively.

The tools that trainees knew the least of before the beginning of training were forums and drafting rooms, though as new work tools they were more used than any others. Chat rooms were not used at all in training 1 and not used much in training 2, owing to the fact that it is a synchronous tool and it demands little group work, as far as we are led to believe. During face-to-face classes, trainees frequently complained that they did not find colleagues in chat rooms (A1_diary log and A2_diary log), which was maximised by the fact that the group was relatively small and there were fewer possibilities of meeting several people at the same time to talk to.

This idea was also recorded by other sources of information: *Once I was about to find the teacher on the chat room, but then I have no idea of what I did, I left the chat room because someone called me and when I returned, there was no one there* (A1_E2); *I thought it was an imperfection at least for me; I couldn't do it. We were few and not everyone could be there at the same time. In my opinion, this would be one of the most important aspects in the exchange of opinions and learning, even for training itself* (A2_E3).

The conversations led in the chat room of training session 2 were mainly established between trainees and trainer, who was concerned with being online as long as possible. Even if a communication tool was favoured over another one, some trainees highlighted the complementary nature and the importance of integration of these tools for group work: *I thought forums were very motivating. (…) But I am of the opinion that all of them were interesting and important as well* (A2_E6); *I considered them all appealing (…) I mean, the drafting room was awesome; it gave us the opportunity to do what we liked the most. Building things, even the activities of the general group and of the smaller group in which we participated… To be able to communicate and to really work and create was fascinating* (A2_E3); *I don't have any preference, they complemented each other in such a way that there is nothing to say. We can't really say that, that one has no value when compared to another. It may have less weight in terms of work, but it is valuable nonetheless. I*

can use the e-mail fewer times, but it is still there and, whenever I might need it, it is available. This interconnection is of the utmost importance (A2_E4).

These various tools have particular communicative features that make them more or less appropriate to certain communicative processes for interaction and to the work to be developed. Trainees felt that the communication tools were suitable to the tasks being developed, without identifying any limitations that might influence the completion of the tasks in a collaborative work environment.

As a consequence, we can admit that the integration of the ATutor and ACollab platforms generates a "virtual environment" which actually works, providing great potential for communication, interaction and development of distance collaborative work.

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