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A Tool for the Effective Use of Forum in Collaborative Processes: Towards New "Circles of Culture"?

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ABSTRACT

This article describes the experience of a didactics course for university teachers which attempted to generate learning materials useful for the learning process. Such materials originated from the human interaction occurring within a forum of online discussion in a Virtual Learning Environment (VLE). The rather promising results point towards new possibilities of learning in collaborative interactive processes, taking into account aspects that influence the interactions, such as culture, power, and teacher identity.

INTRODUCTION

Mattos (2002) describes the first experience with online courses for teachers of Universidade de Fortaleza using a VLE called CadiNET. The evaluation of this experiment indicated that the processes of collaborative and interactive learning in courses used within CadiNET were not completely successful, especially in those cases with longer duration (months). On such occasions, it was observed that, after a few weeks of intense online discussion, processes tended to be spaced out. Some specific methods1 and techniques were used, but their results did not last long. One of the resources used was the method of case studies in online environments (Suchman, 1987), combined with tools that facilitate processes of communication via Internet, especially those related to collaborative practice in forums. In all the courses, great emphasis was placed upon problem definition and discussion, always having the experience of the student-teachers (teachers who are students in the course) as a starting point. The contents and the basic materials suggested for the discussions were the same for all the groups, though each group presented different characteristics. Several mechanisms were used by the teacher in charge to stimulate the online discussion, such as messages and short, polemic texts, suggestions of collaborative activities, and others. At the end of each course, it was perceived that the reports on the student-teachers'experience provided during the discussions were never revisited in the courses which followed. And yet, such reports might have helped to enrich the basic learning material, which might have been adapted to the peculiarities of each group.

In a Learning course for teachers that took place from September to November 2002, a different methodology was experimented. The planning of the course was still strongly indebted to previous courses: there was a schedule predetermined by the teacher in charge; the practice of face-to-face meetings was maintained, as was also the use of the method of case studies. This time, however, the methodology was expanded, drawing inspiration from the method of the development of critical consciousness, by Paulo Freire (Freire, 1967; 1980). Besides, a new computation tool was devised to treat the interactions of the online community, using techniques of Artificial Intelligence (AI), in order to develop learning material both useful and adaptable to learners. This new methodology and its tool will be described below.

EXPERIMENTING WITH THE "CIRCLES OF CULTURE"

The methodology described in this paper is based on the "circles of culture", which are Freire's idea to replace the traditional "classroom", and on the author's methodological process of the development of critical consciousness. Some modifications in Freire's methodology were necessary, however, due to the characteristics of the internet and of the tool being proposed. Such modifications abided by the principles of participation, problem definition and utilization of the elements of the culture of teaching. Nevertheless, the movement of construction and reconstruction of knowledge, for example, characterized by the movement from concrete to abstract and back to the concrete problem, is similar in both methodologies. Before going on to explain the methodology proposed here, it is necessary to describe Freire's methodology, which is composed by three stages:

1. Investigating stage
   - Research of the vocabulary and thematic universe, in order to detect the *generating words*2;
   - Systematizing and discussion of the research material;
   - Preparation of the team and of the circle of culture animators, aiming at a proper use of the methodology and the specific material.
2. Theme definition stage
   - Encoding of the learning material transformed into *symbols of use* in the circle of culture.

Table 1 – Relationship among the methodologies.

Freire's Methodology	Methodology of the Course	Mode
Investigating	• Forming the online community • Evaluation and diagnosis	Face-to-face Face-to-face and virtual
Theme definition	• Presenting and debating the cases • Systematizing and encoding the learning material	Face-to-face and virtual Face-to-face
Problem definition	• Presenting and debating the cases • Evaluation and diagnosis	Face-to-face and virtual Face-to-face and virtual

3. Problem definition stage
- Discovery of the concrete existential limits and possibilities raised in stage one (Gadotti, 1989);
- Search for concrete actions to overcome them.

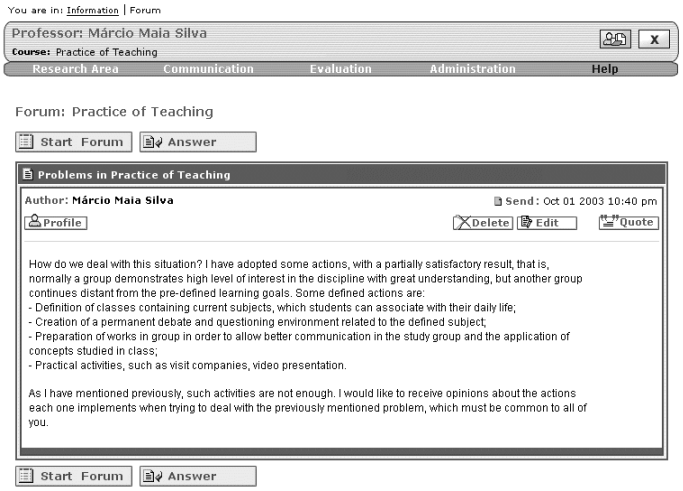
During the Learning course, the stages in Freire's methodology were turned into moments of interaction3, so as to adapt to the use of asynchronous discussion, both in the face-to-face and the internet environments.

The table 1 shows the relationship between Freire's methodology and the one adopted in the course.

The moments of interaction are the following:

1. Forming the online community that was to meet in an asynchro nous virtual environment. It is necessary that participants be aware of the time demand for the collective experience. There is a rather generalized belief concerning virtual learning that this mode of learning would be less time demanding. This is not true. Virtual learning requires, among other things, regularity in the online meetings. Participants must have this information before hand, so as to have a better idea of what they are about to experience. It is also important that the online community have a common objective to be fulfilled. Otherwise, each individual will try to use the online environment for the fulfillment of immediate objectives only. For example: if a student-teacher enrolls for the course in the hope that his/her learning efforts will be restricted to using the VLE in order to search for preexistent learning material, and to meeting with the teacher in charge, every now and then, to clarify his/her doubts, then the method ology proposed will not work, because collaborative construction of knowledge will not take place.
2. Evaluation and diagnosis through dialogue, where the written word is of fundamental importance. This is the moment when the contexts of the culture of work are revealed, and when partici pants learn to *raise problems*, rather than merely seek the solution for their own problems. The aim here is to attempt to understand the contexts that permeate the teaching practice. This universe of the culture of work constitutes, in itself, a *generating moment* – a moment when the preparation for deeper probing takes place. It is within this experience that the *gener ating themes* emerge – themes that will provide the guidelines of the dialogue. Consciousness, in its turn, built in the course of the experience with the online community, will only become effective in organized action.
3. Presentation, in an online environment, of those cases that constitute a problem for each student-teacher (see, in fig. 1, an example of a student-teacher reporting a case). These problem-cases are discussed by the other student-teachers, who propose solutions. This is an important space to reflect on the identity of the student-teacher as a paramount element of his/her knowl edge. The teacher in charge also places himself/herself as subject of this process, reflecting and proposing, along with the partici pants, and presenting his/her own doubts in the practice of the profession. This is a crucial moment in the process of (re)construction of a student-teacher's knowledge. It is at this moment that the generating themes, the collective reflection and the practice of problem solving emerge in a more intense fashion.
4. Systematizing at face-to-face moments. On such occasions, a synthesis is attempted of all that was discussed in the online environment, at the same time that the themes that have been established since the beginning of the course are interrelated. Here, the difference between the two environments is clearly perceived. In a synchronous, face-to-face environment, empha sis is placed upon learning processes characterized by the frequent deconstruction/construction of principles, norms, concepts and paradigms. Such moments require ability on the part of the teacher in charge in order to promote, within a few hours, the exploration of the thesis-antithesis-synthesis movement. He/ she must be careful to keep in mind the learning objectives of the online community, linking them to the VLE. On the other hand, the interactions in an online forum are characterized by the encouragement of members to participate, by the emphasis on the written word and on the contribution of each participant, and by the possibility of documentation of the dialogue, since it is recorded.
5. Encoding the learning material in a two-way fashion: face-to-face, through defining and presenting slides based on the online discussion that have taken place in the forum environment. Within the forum environment, the basis will be the dialogues and generating themes obtained in the face-to-face interactions. Encoding of the online discussion was made possible by a tool developed for the systematizing of learning material. This tool will be described below.

Figure 1 - An example of a student-teacher reporting a case in forum



A COMPUTATIONAL TOOL TO SUPPORT THE INTERACTIVE AND COLLABORATIVE PROCESS OF SYSTEMATIZING WORKING MATERIAL

The interactive and collaborative systematizing process consisted of elaborating problem-cases and analysis-cases reported by the users (student-teachers) in the discussion forums, and organizing them as material to be re-used by the online community. This was made possible by a computational tool called FEMDI (Tool for the Elaboration of Interactive Learning Material). Figure 2 illustrates the architecture of FEMDI as integrated into the CadiNET environment.

In order to facilitate the modeling of the tool, whereas aiming at ensuring its usability, all the possibilities of interaction for the construction of learning material were defined in a task model. Figure 3 shows the tasks that may be carried out by the user and/or automatically, through FEMDI. According to the model (Gamboa et al., 1997), a task is made up of sub-tasks that, on their turn, are composed of elementary actions situated at the lowest hierarchical level. The sub-tasks within

a task suffer structural restrictions, which specify how many sub-tasks can be executed (all or not, as the alternative tasks), as well as time restrictions, which determine the order of their execution (for example: if they follow a sequence, or not, as the parallel tasks).

Figure 3. Task model of FEMDI

According model shows figure 3, in order to have systematizing process it ´s necessary *classify the messages* obtained in collaboration tools. It consists in *looking for themes* that were more discussed. For this, some modules of FEMDI are started when users begin the discussions. The teacher in charge is responsible for creating an ontology of initial concepts which he considers that have more probability to be used in the discussions. An ontology explicitly defines any set of concepts, relationships, and attributes that need to be manipulated in a particular situation, including teaching situations (Gruber, 1993). The ontology notion comes from the Artificial Intelligence context where it is identified as the set of formal terms with one represents knowledge, since the representation completely determines what "exists" for the domain of a course. The idea is, during the discussions, the teacher in charge could add and modify this initial ontology. It can be also modified by the student-teachers of a course.

When messages are sent to VLE, they are submitted for an indexing process. Keywords are identified through mining strategies of information in texts, as for instance, the technique of creation of lightweight ontology (Ding, 2001).

Taking into account the dynamic characteristics of a discussion, some criteria are used to make easier to index a message, and to optimize and refine the automatic process of retrieving keywords. These criteria are the following:

§ Messages concerning a same subject suggest to be related to a same theme or set of themes.

§ Expressions, which are very repetitive when describing a certain subject, suggest keywords.

§ Messages, which are frequently referenced by others participants when describing a certain subject suggests *generating themes*.

In the next moment, the found keywords are submitted to a *clustering* process. They are classified taking into account the associated concepts through approximation and semantic relationships. The next step, as represented in the task model (figure 3), is to *show messages* to the user. A set of words shown to the user is grouped and has coefficients, which show the probability, that each set of words has to belong to a certain subject. The idea is to help the teacher responsible by the task to associate the words to the *generating themes*. Having many keywords and *generating themes* it is possible to suggest automatically: *generating themes* of a new set of messages; that a specific subject could be composed by many subject, if it treats different themes and; different subjects be jointed, because, at the end, they are related to the same theme.

These procedures help to improve the search mechanism of messages based on keywords and themes. In *look for theme* task, FEMDI tool uses this information to retrieve messages that better represent a discussion about a certain theme. Then it shows to the user (*show messages* task), the messages which had a great number of keywords. When visualizing messages, the user performs the *select message* task, which he/she has two options:

Selecting messages with better expression and clarity of ideas and, among them, selecting texts that can compose the support material. In order to facilitate this task, the tool visually presents, in the recovered text, key expressions found in previous processes, suggesting that this text indicates excerpts that better summarize the discussed ideas. At this moment, the user selects these text fragments, and the tool, through the task g*enerate document*, helps in creating a summary with a logical chaining of ideas in the selected excerpts. The task *treat document* allows the user to edit the document and add comments, illustrations, links, and other resources that could enhance the document.

The last step of this process, which is not obligatory, is recording the document and making it available to other users.

4. DESCRIPTION OF THE COMMUNITY EXPERIENCE

The first meeting of the community took place in the environment of a computer laboratory. Two activities were then developed. The first one was a tutorial about the CadiNET environment for online teaching/learning, which was to be used throughout the course for the meetings via Internet. The second activity was yet another tutorial about searching in the Internet, a subject that, from the experience of previous courses, was known to be of great interest for many teachers.

On the initial days of the course, which took place in an online environment, there was little participation on the part of the student-teachers. At that moment, the intervention of some of the student-teachers, along with the teacher in charge, in the sense of stimulating colleagues to participate, was of the utmost importance. Slowly, and especially after the first face-to-face meeting, the online community intensified the discussion. It was only when greater participation was established, and one could sense that the participants all felt at their ease in the online environment, that they were required to report their cases.

After some four weeks of classes, when participation in the forum had become intense, tasks were initiated that required a collaborative performance. Indeed, only a central topic, selected from among recurrent questions, was established, and student-teachers were asked to relate their experience on that topic. On describing their teaching experience, student-teachers in fact transformed it into yet a new case for discussion and reflection by the online community (analysis-case). Such reflections were later on systematized, encoded, and presented by the teacher for discussion at face-to-face meetings.

It was also decided that a few subjective aspects of the teaching/learning process should be emphasized, such as:

· Identification of the student-teachers with more effective participation in the forum environment. The exchange of open messages between these and their colleagues was then stimulated.

· Highlighting of the student-teachers'contribution in the VLE. During the face-to-face meetings (every fortnight) these were presented in slides, to be discussed by all. In a very informal way, student-teachers were invited to expand their participation in the forums.

· Identification of clever comments in the VLE. These witty comments, which normally gave origin to new comments, were turned into catchwords that proved very useful in prompting the spontaneous participation of the student-teachers.

5. CONCLUSIONS AND RECOMMENDATIONS

From the experience with this community of student-teachers, it was possible to establish the following conclusions and recommendations about interactive processes:

· The central question for the success of collaborative learning processes for university teachers through Internet does not lie exclusively on the choice of methodology and techniques. It lies, fundamentally, on the understanding of the local and global cultural processes that involve the teaching practice and on the transformation of such processes through a conscious, collective, and organized intervention. In the case of the experiment reported here, such transformation occurred in the individual practice of many a participant.

· The ideal collaborative activities are those characterized by the discussion of theoretical principles or problem definition practical situations. Generalizations and mere presentation of facts, on the other hand, tend not to trigger collaborative processes.

· The interface of the VLE has significant influence on the collaborative processes. However, contrary to what was previously believed (Dilloembourg, 1999; Mattos, 2002), semi-structured inter-

faces made these processes more difficult. The CadiNET environment is now going through changes, especially as concerns the forum , in order to make the possibilities of communication interaction online simpler and more powerful. The interface of the tool FEMDI has not presented any problems of usability, due to the modeling of the tasks previous to its conception, and to the existence of helping options, such as search.

- The constant presence of the teacher in charge is fundamental, not so much to "control" the online community, but to make discussion viable, and to remind the group of their objectives.
- Searching for difference of opinion is indispensable. It is through differences that the online community progresses and goes deeper in the discussions. This is, in fact, one of the basic elements for the establishment of collaborative learning processes. How ever, it is important that productive forms be found for the discussion, since divergence without mediation tends to discour age some participants, causing them to give up debating.

The present experiment lacked two "moments": one initial moment of face-to-face meeting, when the community might elaborate the schedule of the course, instead of leaving it entirely to the discretion of the teacher in charge. Another moment, which has been suggested by all participants, including those of previous courses, would be the continuation of the online discussion, even after the end of the course, in order to keep the mutual ties of support. This was not possible for technical reasons (the need of maintenance and improvement of the CadiNET environment), and also because the end of the school period dispersed most of the participants.

Another request of the participants was a progressive union, snowball fashion, of the groups that take the course of didactics for teachers of the Universidade de Fortaleza.

The setting up of a permanent environment for teacher training, which will not be geared exclusively to courses and/or expert orientation, but rather will be based on a space for research and mutual support, is an objective to be fulfilled on a short term basis.

ENDNOTES

1. In this article, the terms "method" and "methodology" are used with different meanings. "Method" refers to the set of reflections theoretically organized, keeping internal coherence. "Methodology" refers to the set of working techniques used in scientific research. As will be further seen, Paulo Freire elaborated both a method and a methodology, which are mutually coherent.

2. The generating words, used in the process of teaching how to read, are gradually replaced, in the post-literacy phase, by the generating themes. The generating themes are an important element in the present methodology. The teaching contents are not theoretical constructions provided a priori: they are historical and personal constructions, related to each person, to each group. Hence, Paulo Freire's criticism of what he called "banking education", whose contents are not only pre-established, but also alienated from the learner's social context. The generating themes constitute, therefore, a problem definition of an individual's life practice.

3. Moments are different from stages in that the first constitute situations that occur in a simultaneous fashion – in juxtaposition. Stages are characterized by their sequencing.

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