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## Web-Based Educational Discussion Forums in a College Undergraduate Program Setting: the Case of *Alfamat*

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**Abstract:** In this paper we talk about a particular Web-based learning environment, *alfamat*, which was used as a mediator in educational discussion forums that took place in college undergraduate program settings. We will focus on a group of Portuguese prospective mathematics teachers' perspectives about some of *alfamat*'s characteristics as well as on its usage and consequent implications for their learning. Some special features stand out: interaction as a mediator of students' reflection and sharing of ideas about subject matters; interaction as a catalyst of students' performance; interaction as a means for rethinking and reformulating individual ideas based upon others' ideas and experiences.

### Introduction

In our academic settings, sharing and collaboration are still done, almost exclusively, through traditional office and face-to-face meetings. Although discussion forums on the Web present themselves as potential contributions for promoting and supporting learning, it is still a challenge to involve students in its usage in teaching and learning settings. In previous experiences within our own teaching we found that students would only participate with a great effort from the instructor's part (Almeida, Dias, Morais, & Miranda, 2001). The instructors' role seems thus to be essential to promote communication through Web forums and to make them effective for learning (Allan, 2004). There is evidence that asynchronous learning can be effective (Twig, 2004). However, as Oliver and Shaw (2003) put it, technology on its own is insufficient and the instructors' enthusiasm and competence are of critical importance in stimulating the students' participation in asynchronous discussion. It is up to the instructor to plan teaching through appropriate tasks that take into account the fact that students learn better in socially organized tasks than they do in isolation (Bussi, 1998). Web forums bring instructors yet another responsibility as they are required to lead a new mode of communication that is Web forums unique contribution: the communication of *many-to-many*. Other concerns for the e-instructor, besides "facilitating discourse" is to "develop a sense of trust and safety within the electronic community" (Anderson, 2004, p. 278).

We believe that Web-based learning environments make possible to provide resources that favor each individual student's work style so that each one can progress at own pace (Almeida, Dias, Morais, & Miranda, 2001; Allan, 2004), while group work is also possible. In such environments individuals can learn to relate to others and to interact with them. This way, while benefiting from others' contributions, each one can also share knowledge and experience that might be useful for the other members of the community. That is, sharing and collaboration work both ways establishing a net of active participants. As knowledge is a human construction, it is reasonable to expect that it will emerge from such interaction with sharing and collaboration. Therefore, appropriately structured interaction and sharing of knowledge in discussion forums may be relevant factors for the construction of meaningful learning (Aviv, Erlich, Ravid, & Geva, 2004).

Another important feature is that in a Web forum, contrary to the situation of a traditional classroom, the participants' contributions and interactions remain available and can be accessed anytime afterward by any participant, including the instructor. This is another relevant feature of Web forums since the discussion can be revisited and commented anytime (Markel, 2001). Web forums do, in reality, extend the class in space and time so that the discussion and reflection can still go on afterward. However, as Milliron (2004) put it, what is important is to connect with the learner to be able to connect the learner to learning. That is, we should use technology as a means to achieve this, but not let it use us.

## The *Alfamat* Site as Support of Communities of Learning

*Alfamat*, developed by instructors from the Polytechnic Institute of Bragança, is a site especially conceived to provide discussion *forums* and chat to be used as interaction means by instructors and students in course work contexts. It was designed having in mind that it should be an interface as friendly as possible so that even non-technology oriented participants would find it easy to use.

*Alfamat* has been used as support of students' interactions and activities within courses of mathematics and science teachers pre- and in-service programs at Escola Superior de Educação (The Polytechnic Institute's School of Education). On the interface of access to the *alfamat* community (Fig. 1) there is a list of courses that are part of the Mathematics and Natural Sciences elementary teacher education program. A number of communities co-exist in *alfamat*, (now hosted at <http://www.estig.ipb.pt/alfamat/>) each one integrating the instructor and the students within each of the different courses.

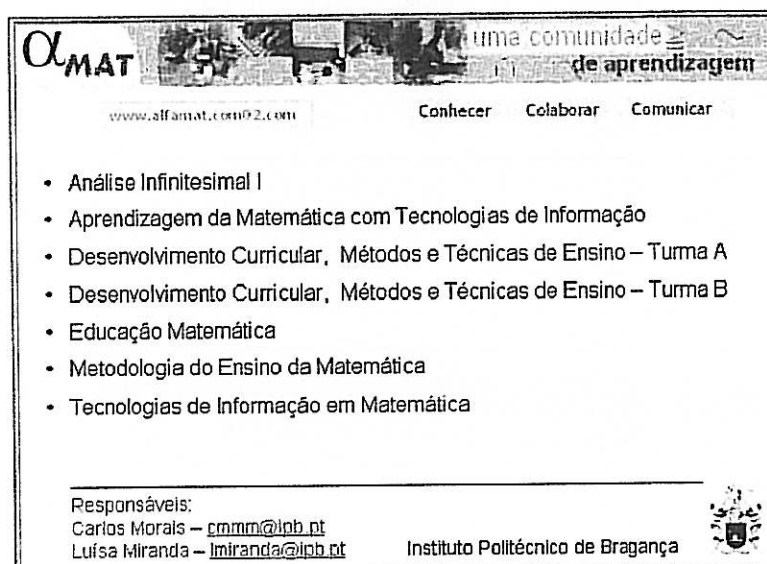


Figure 1. Interface of *alfamat* community

Each community is accessed just by a click on the name of the course and the introduction of a login and a password. Besides synchronous and asynchronous communication, *alfamat* provides information and links of interest for each community. Fig. 2 shows a typical example of a discussion on the topic *What is it to be a teacher? (O que é ser professor?)*. This discussion took place during a teaching and learning session within the *Curriculum Development, Methods and Teaching Technics* course.

The *forums* were to give learners the opportunity to construct their own learning in a space open to interaction, to sharing of knowledge and of experiences, constituting a community that includes instructors who can contribute with their expertise. Discussions about the subject matter and sharing of matters of interest took place in each community. Any member of any community could interact or collaborate both with other community members and with members from other communities. Among other characteristics, the *alfamat* site provides each community the opportunity to interact asynchronously, using the discussion *forums*, and synchronously, through the *chat*.

To validate the feasibility of *alfamat* and to assess its effects on the students learning within courses taught by the authors themselves were two of their concerns. An ongoing doctoral research project at University of Minho investigates the *alfamat's* usage in the context of a specific course from the mathematics and science teacher undergraduate program at the Polytechnic Institute of Bragança.

In this paper we reflect on the potentialities of *alfamat* as a mediator in educational discussion *forums* by looking into the perspectives of prospective elementary teachers of mathematics who used it within their course work at the Polytechnic Institute undergraduate mathematics education program. We focus on their perspectives about

some of *alfamat*'s characteristics, as far as the forums asynchronous communication is concerned, as well as on its usage and consequent implications for their learning.

**alfamat** uma comunidade de aprendizagem

Fóruns de Discussão Desenvolvimento Curricular e Métodos e Técnicas de Ensino O Professor - Agente Educativo

Chat

ID	Autor	Assunto
499	A6	Ser professor e acima de tudo gostar daquilo que faz, só assim é que será um bom profissional. A profissão em causa pressupõe transmitir conhecimentos, experiências aos alunos mas também aprender com estes (os alunos). O professor nunca pode estagnar, tem de ir sempre à procura de novos meios e técnicas de ensino...ser professor é ser inovador, prático e activo.
500	A21	Ser professor é ser amigo, compreensivo, flexível,..., mas nunca deixando de impor o respeito necessário perante os seus alunos. Ser professor não é só ensinar!

Links

Textos de Apoio

Questionário

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Figure 2. Sample of a discussion in one of *alfamat* communities

### The Context of Our Study

From all the participants in *alfamat* in the year of 2001/2002 we opted for inquiring 32 second year students that were enrolled in the *Curriculum Development, Methods and Teaching Technics* course. This decision had to do, on one hand, with the fact that this was one of the courses with the highest enrolment. On the other hand, it was taken into account the availability of these participants considering the schedule set for the study. In our sample, 27 females and 5 males, the ages ranged from 18 to 24 years, with mean 20.6 and mode 20. Our study was designed to investigate these students' interactions as participants of discussion *forums* within nets of asynchronous communication as well as their opinions about this means of communication.

The students' teaching and learning activities were in accordance with the course pre-defined syllabus. The course instructor and the researcher jointly planned seven two-hour teaching and learning sessions, which took place during two months in the 2001/2002 academic year. Because of limited informatics resources and to make sure that they would have the greatest support possible, the students were organized in two distinct groups.

During all seven 2-hour sessions that all 32 students attended, the researcher supervised students concerning the functionality of the informatics resources, and the course instructor supervised them concerning their participation in the *alfamat* activities. Texts about the topics in the syllabus were available in the *alfamat*. Questions and issues were raised for the students to reflect on and debate using the discussion forum and 395 messages were published and made available by and to all students in the context of the discussion forums.

The teaching and learning activities emphasized the value of collaboration for the joint construction of knowledge, encouraging the students to asynchronously share information in the forums. It was intended to stimulate the students' involvement in an active process not only of sharing ideas but also of discussion and collaboration. All contributions remained archived, organized in folders according to the discussion topics, and available to all the members of the community at all times.

### Our Findings

The researcher grouped the 395 messages made available during the *alfamat* sessions into two categories: *related to the task* and *not related to the task*. A posteriori, a panel of judges validated this categorization. The fact that 98.2% of the 395 messages were judged as *related to the task* was identified as a sign of the students' intent and consequent involvement in the activities in which they could interact with their peers and with the instructor. Furthermore, there should be noted that the students' results in the course were satisfactory.

We then wanted to find out the students' perspectives about their own use of *alfamat*'s asynchronous features. A Likert type 5-item questionnaire was used for that purpose. Its items were statements referring to the potentialities of the forums as a communication tool during the teaching and learning process. Students were asked to indicate through a number from 1 (the least favorable opinion) to 5 (the most favorable opinion) how much they agreed with each of the following statements:

Statement 1 – The *alfamat* community's discussion forums promoted students' interaction during tasks.

Statement 2 – The *alfamat* community's discussion forums promoted interaction between students for the sharing of the joint construction of knowledge.

Statement 3 – The *alfamat* community promoted reflection on the topics that were studied.

Statement 4 – The *alfamat* community promoted the rethinking of individual ideas based on the others' ideas.

Statement 5 – The *alfamat* community favored students' reformulation of their own ideas.

Next we present the results obtained for each of the items in the questionnaire. Table 1 shows, in percentages, the distribution of students' opinions for each of the statements. For analysis purposes the answers were coded into: 1, Not Favorable at all (NF); 2, Little Favorable (LF); 3, Favorable (F); 4, Very Favorable (VF); 5, Extremely Favorable (EF).

Table 1. Students perspectives on forums 's contribution (%) (n=32)

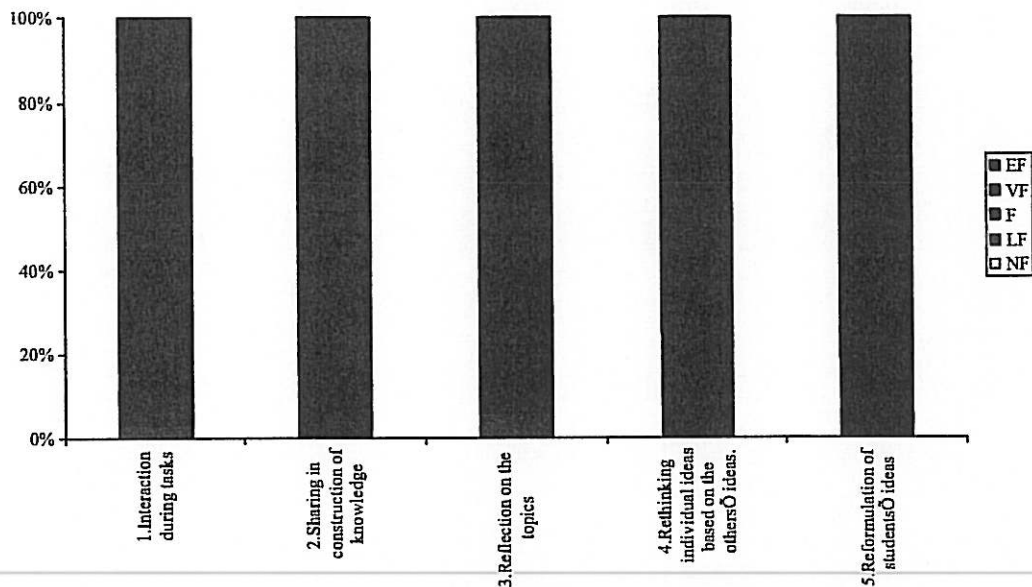
The <i>alfamat</i> discussion forums promoted	NF	LF	F	VF	EF
1. Interaction during tasks	0	3	44	31	22
2. Sharing in construction of knowledge	0	0	28	53	19
3. Reflection on the topics	0	6	25	44	25
4. Rethinking individual ideas based on the others' ideas.	0	0	25	44	31
5. Reformulation of students' ideas	0	0	19	62	19

From these results we may assert that almost all students agree in some degree with the contribution of the *alfamat* discussion forums to interaction during tasks, to sharing in construction of knowledge, to their reflection on the topics of study, to the rethinking and reformulation of their own ideas based on the others' ideas. However, only a limited number of students, ranging from 6 (19%) to 10 (31%), report to strongly agree with the statements. Furthermore, there are a number of students, also ranging from 6 (19%) to 10 (31%), which show just a moderate agreement with the statements.

Although the distribution pattern is similar in the five items (Fig. 3), a few observations can be made from the little fluctuation that can be seen. For instance, more students were not so enthusiastic about recognizing the contribution of the forums' interaction for tasks. On the other hand, rethinking their ideas based on others' ideas seem to have earned a high opinion of more students. Item 5, related to reformulation of ideas, has an interesting pattern: besides being the one whose advantage more students recognize, it is also the one, together with item 2, with less strong adepts.

It is not surprising to find these opinions since this was quite a novel situation for these students. First of all, our academic culture is not traditionally for the integration of a community of learning within a course with the purpose of sharing and collaborating. Secondly, Web discussion forums, were, at the time, a real innovation in our school context. It was mainly due to the researcher's and the instructor's efforts that the approach was successful, agreeing with what other authors has previously reported (Almeida, Dias, Morais, & Miranda, 2001; Oliver and Shaw, 2003).

We consider these results positive in the sense that, not yet completely aware of the contribution of the forums, students became involved in their own learning and in the communities of learning. In fact, it could be directly observed that students were involved in steadily growing interaction and collaboration: sharing and interchanging ideas became an active process indicating that the students began to recognize their contribution to learning.



NF - not favorable at all; LF - little favorable; F – favorable; VF - very favorable; EF - extremely favorable. (n=32)

Figure 3: Combined information on students' answers to statements.

It was apparent that students took advantage of the forums' asynchronous characteristic to give their contribution to the discussion in a reflective way. They regularly used the archives to find the community's contributions and to rethink them (including the ones they contributed with) and consequently reconstruct, reformulate and enrich their own.

Some of students' oral statements confirm these observations:

"(...) I have my opinion, I see my colleagues' opinion and sometimes I am wrong ... I say: ah! They are right (...)"

"(...) Sometimes there were messages with which I did not agree, I gave my opinion and then they answered ... there was discussion of ideas, it helped me complete my ideas with my colleagues' ideas ... new ideas coming up, I called my colleagues attention, so there was a discussion ... and that is the objective, I think."

Another characteristic that was taken advantage of by the students was the organization of the archived information. Being able to easily find the contributions on a variety of topics under study was certainly one of the aspects that some students considered useful e efficient. Students' words show that they accepted well the teaching and learning approach, especially concerning aspects related to reflection and reformulation of opinions:

"(...) because one sees others' opinions ... sees that that person was thinking well, and one reformulates own previous answer ... I thought that my answer would have been more complete if I had talked about this or that, and in the forum it is a question of having time to give our opinion without being under pressure..."

"(...) The possibility to sequence, organize our ideas ... we can go back ... we do not have to send our answer right away ... we can change it, we can have some things and think that we should talk about other things, go back, reformulate, organize ... I think that everything becomes more complete ... nobody is waiting for an immediate answer, I think, isn't it...?"

These *go back* and *extending class* features, making the contributions and interactions remain available to be accessed anytime afterward by any participant, were the ones most stressed by the students as having contributed to their learning, as Markel (2001) had noted that they would.

## Conclusions

This was a novel situation for the 32 students who attended these seven 2-hour sessions: they used the discussion forums within both the context of *alfamat* community and of an education course from their regular Mathematics and Science teacher education program. We could observe that the pre-defined goals for those sessions were fulfilled.

Although students, in general, adhered well to the the teaching/learning approach, their views of its advantages were not as enthusiastic as their actual work during the sessions made us expect. In fact, while, for some students, the forum and the learning community concept seemed to have been completely understood, for others, although having recognized some advantages, there might exist some reserve toward some of the forums' features.

Much is still ahead to be done, but *alfamat*, so far, has shown great potential as an example of a learning community. Questions remain to be answered leading the way to more profound research. The students' written contributions provided information about, both their learning of subject matter and the way the students interact and relate with each other and how they do the tasks in the teaching and learning context. The doctoral research being now conducted might give some answers about both the quality of the interactions in the *alfamat* community and factors that affect them.

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