

Abstract #: 011-0109

**DISTANCE LEARNING: THE IMPORTANCE OF THE VIRTUAL CONTACT OF THE INSTRUCTOR WITH
PUPILS IN OPERATIONS MANAGEMENT COURSES OVER THE WEB**

Track: Educational Issues in Operations Management

Karin Sylvia Graeml

Pontifical Catholic University of Parana – Brazil (collaborating instructor)

Rua Ricardo Lemos, 454 apt. 501 – Curitiba – PR 80540-030 Brazil

karin.graeml@netpar.com.br

Alexandre Reis Graeml

Positivo University/Federal Technological Univ. of Parana – Brazil (associate professor)

Rua Ricardo Lemos, 454 apt. 501 – Curitiba – PR 80540-030 Brazil

graeml@fulbrightweb.org

POMS 20th Annual Conference

Orlando, Florida U.S.A.

May 1 to May 4, 2009

ABSTRACT

Distance learning has become an important teaching/training tool, used by universities and corporations alike. This paper reports the results of a study that consisted on analyzing the sharing of ideas and thoughts in discussion forums by students and educators that were participating in Operations Management courses over the web. Part of the classes and assignments took place in a virtual learning environment provided by the university, where students could communicate among themselves and with the instructor, to share their ideas and reflections about the subject and clear eventual doubts. This interaction was monitored for four modules belonging to two extension courses. Results show that those courses whose instructors involved themselves largely in the discussions that were taking place in the virtual environments were also the ones that had greater student participation. Instructors did not even have to write a lot, they just needed to interfere with quick guidance tips to keep the students going.

Key-words: distance learning, forums, interaction

INTRODUCTION

The evolution of technologies has always interfered with human life, changing habits and the way of doing things. It could not be any different with education. New technologies demand the traditional way of teaching to be reviewed, because they can improve efficiency or allow completely new ways of interacting with students. There is a huge selection of technologies, based on computers and the connectivity provided by electronic networks, which gives a new push to distance education, an education mode that has long been around.

Distance education was created and developed, according to Mansur (2001), as a response to the accumulation of educational needs that were not properly addressed by conventional education. Since its early days, when paper and ink were used in correspondence courses in Russia and England, early in the XIXth century, distance education already represented an alternative to usual educational schemes that demanded students and educator to share the same physical room, at the same time (BELLONI, 1999).

The classical uses of distance education were magician training, sewing, and radio assembling and fixing. Those courses called people's attention and curiosity but also made them very cautious; because distance learning did not follow the paradigm of space/time sharing that had characterized the learning process along the time.

After the correspondence courses, and with the appearance of new technologies, such as radio, television and computer tools, more sophisticated virtual learning environments (VLE) could start being developed.

Although technology is an important part of distance education these days, it is important to remember that the focus should be kept on the educational needs of the students and not the technology itself (MORAN, 1997). This seems to be an important recommendation, because in a very technologically oriented society there is always the risk of overvaluing technology, assigning to it a mistaken central position in the lives of people and, more specifically with respect to the objective of this paper, the learning process.

The new educational paradigm of distance education demands a new attitude from the educator and the student, considering that physical interaction is replaced by other communication and

interaction means between those involved. The use of interaction tools in virtual learning environments, by the educator and the students, is essential for the construction of a trust relationship between the parties, without which the learning process does not evolve (MORAN, 1997a; BELLONI, 1999).

The Internet is a new communication means, which can help revise, broaden and change current ways of teaching and learning. For Moran (2006), teaching using the new medias may represent a revolution in education, specially if the conventional paradigms of the learning process are overcome, which keep students and educators apart, even when they share the same physical environment.

Researching distance education can be justified because of the importance it may have (and already has) as a complement or replacement to other forms of learning processes used until our days. Although it is not conceptually new, considering that it has been used for a long time, at least through the mail, distance education's importance becomes much greater now that it is leveraged by the technological possibilities brought by the computer and its connectivity in networks. This demands researchers to study the area, attempting to understand the real reach and consequences of its use in a more generalized way.

Contributing to that, the objective of this paper is to check if the constant presence of the educator in an electronic discussion forum in a distance education course motivates students to increase the level of participation and interaction in the virtual learning environment. This is done based on the analysis of the interaction that took place in discussion forums for modules of a semi-presential extension course offered by a traditional catholic university in Brazil, in which

educators adopted very distinct behaviors: one of them entered the forum at least twice a day, while the other only visited the site once a week.

The focus of this study is specifically on electronic forums. This is justified by the importance of such tools in the composition of a balanced set of techniques, resources and practices that make distance education more dynamic and interactive. This will become clear after the reader gets to section “The electronic forum as an asynchronous tool for active interaction in distance learning”, ahead.

After this brief introduction, the next section presents the literature review, discussing the issue of the interaction among students and educators in distance education. Then, the electronic forum tool is presented, which allows for asynchronous interaction in a virtual learning environment and was chosen as the object of the empirical study reported here. After that, the methodological procedures used to collect and analyze the data are presented, followed by the analysis of the collected data. At last, some final considerations are made about the results of the study, also indicating possible future studies.

THE INTERACTION BETWEEN STUDENTS AND EDUCATOR IN DISTANCE EDUCATION

In traditional education, the educator has many different ways of interacting with the students at his/her disposal. Even if empathy does not happen immediately between educator and students, it is possible to reverse the situation by means of conversation, looks, smiles etc. It is easy to "feel" the students with a simple talk at the beginning of the first class, which makes the work easier, afterwards.

In a virtual environment, these very simple actions in formal education are no longer possible. Students and educator are physically apart, many times in different cities, states or even countries. Thus, the use of technological interaction tools available today in virtual learning environments is pedagogically important for the success of distance education. Those tools are the ones that allow students and educators to connect to each other, even when they are physically separated and/or not synchronized in time (MORAN, 2007).

In that respect, Palloff and Pratt (2002) highlight the fact that an on-line learning community that is created by students and educators is much more than just an interaction tool. They argue that a virtual space is created where students and educator participate in the formation of important social interactions for the learning process to happen. In such a space, participants feel united, even when they are physically apart, sharing and generating new knowledge.

The participation and interaction provided by distance learning may vary according to the method that is used. Synchronous methods demand simultaneous participation of all those involved (students and educator), having as its main characteristic the fact that interaction happens in real time. Asynchronous methods do not demand simultaneity, releasing the individuals from time constraints (PARKER, 1999; McISAAC and GUNAWARDENA, 1996).

Chats, real time video-classes and teleconferences are examples of synchronous tools, while forums, electronic mail, video on demand and bulletin boards represent asynchronous tools. McIsaac and Gunawardena (1996) warn us to the importance of selecting the most suitable tool, depending on the teaching objectives. For some activities and objectives, time synchrony is important. In other instances, however, providing time disconnection may be useful to allow each

individual to do his/her tasks at the most convenient time, and also so that the student becomes the manager of his/her own learning pace (PARKER, 1999).

The decision about the activities that should be synchronously or asynchronously performed is an important step of the educational planning, as the effectiveness of the learning process will depend on that (McISAAC and GUNAWARDENA, 1996). Even when asynchronous tools are used in order to give students more freedom to choose when to access the content and interact, it is important to define the frequency with which the educator will be involved in the interaction. After all, there is a dilemma involving asynchronous tools that needs to be addressed: although it eliminates the need to participate in predetermined times, if the educator is not present and does not answer students' questions diligently, many of them will feel discouraged to continue interacting and participation in the virtual learning environment will decrease (BULLEN, 1998).

Moore (1989), McIsaac and Gunawardena (1996), Northrup (2002) and Biocca *et al.* (2003), among others, consider that the interaction is essential to any distance education program. The pedagogical issue of interactivity is very important because learning happens, according to these authors, when communication takes place, for the construction, reconstruction and reconciling of information and knowledge. Therefore, opportunities should not be wasted of stimulating the participation of students in a virtual learning environment.

There are three types of interaction using a virtual learning environment, according to Moore (1989)¹: student-student interaction, student-educator interaction and student-content interaction. Northrup (2002) adds a fourth type of interaction to this set: the interaction between the students and the content that is collectively built in the virtual learning environment. In that case, the educator's feedback becomes essential to guide the discussion and validate generated knowledge.

Reaffirming Northrup's (2002) concern with respect to the need of feedback by the educator to the students, after their intervention in the virtual learning environment, Cinelli (2006), also based on several other studies (BERGE, 1999; LIAW, 2000; WELLER, 1988), warns us to the fact that students do not feel comfortable about going on with the interaction in the virtual learning environment until they receive feedback from the educator to their contributions. After having studied the process of critical thinking of students participating in electronic interactions with educators, Bullen (1998, p. 1) found out that even when the educator interacted regularly, some students still needed more educator involvement, in order to keep interested in the virtual learning experience. They needed the educator to be present (at least once a day) to continue motivated to participate. Muirhead (2000) also had similar findings: he noticed that interactivity, which he described as communication, participation and feedback, is only effective when students and the educator actively take part in an academic discussion. That means that the educator has to be "present" in the virtual interaction process for the students to feel motivated and have their efforts directed to relevant objectives. The ability of a educator to influence his/her students in distance learning is significantly greater when there is interaction with the students, compared to the possibility of the students only interacting with the content made available in the virtual learning environment (MOORE, 1989).

Moore (1989, p. 1) considers that the lack of feedback mechanisms for the relationship between those involved in the learning process "makes these teaching procedures highly generalized, not individual, leaving ultimate responsibility for maintaining motivation, for interacting with the presentation, for analyzing the success of application, and for diagnosing the difficulty on the learners themselves, requiring a high degree of learner autonomy".

Biocca *et al.* (2003) remind us that the social motivations of the individuals, their social cognition, interpersonal communication and other elements of the social theory need to be taken into consideration, because they contribute to the success or not of the learning process in distance education. Students even need individualized affective care (MOORE, 1989), which can only be provided if there are mechanisms to support a more contact between the students and the educator.

Northrup (2002) warns, however, that the interaction does not happen on its own. It needs to be intentional and planned by the educator, and should be as intensive as possible. Belloni (2001) confirms this, highlighting the fact that, for the interaction to take place, two or more actors should be willing to interact. Many times, an on-line course presents negative results because of the lack of interaction willingness and not due to a poor technology setting.

THE ELECTRONIC FORUM AS AN ASYNCHRONOUS TOOL FOR ACTIVE INTERACTION IN DISTANCE LEARNING

Etymologically, the word *forum* means a meeting for discussion. It can be public or private, depending on its purpose. In computer mediated electronic environments, this idea of a place where discussion happens was replicated in virtual interaction environments. The first time networked computer resources were used as the means for an organized discussion was, according to Harasim *et al.* (1997), when Murray Turoff involved twenty specialists in a specific topic that were dispersed in the USA, in an interactive process of answering questionnaires and analyzing aggregate responses, comparing them to their own (Delphi methodology). This happened in 1970.

In virtual discussion spaces such as electronic forums, the physical and time barriers imposed by distance in case of traditional meetings (everyone has to be in the same place and at the same time) are eliminated, allowing for the disconnection of space and time, as argued by Levi (1996). The learning process is possible 24 hours a day and seven days a week, providing convenience to those involved that can choose the most suitable time to interact, without having to move.

People gain freedom in electronic environments but that does not come without a price. Markel (2001) warns us that electronic forums and other forms of electronic interaction used with educational purposes demand students to be much more active and responsible with respect to the content of the course and the relationship with the educator and peers. As there is the expectation of regular participation of the students in the on-line discussion, virtual interaction tools stimulate the adoption of responsible attitudes towards active learning, as noted by Hopperton (1998). It is not possible to hide in the middle of the crowd and remain anonymous. Participants have an important role in the construction of knowledge by means of their sharing ideas and experiences with the group in collaborative discussions. Markel (2001) believes that this allows knowledge to be broadened, as students' experiences complement the theory that is being presented by the educator.

Another specific advantage of *electronic forums* is that they allow the whole discussion to be recorded and stored for future reference (HARASIM *et al.*, 1997). This way, students have an additional source of reference for their study, which is directly related to the fourth type of interaction possible in distance education highlighted by Northrup (2002), i.e. the possibility of students interacting with content that was collectively built in the virtual learning environment.

All these characteristics make electronic forums an important distance education tool that can be used along with other tools to complement the creation of a balanced virtual education environment, capable of involving and motivating students to participate intensively in the learning process.

METHODOLOGY

This research involved analyzing the interaction in four electronic forums related to four different modules of two distinct extension courses provided in a semi-presential fashion by a university in South Brazil. The two courses had 39 and 28 students each. The purpose of the forums, in addition to representing a space for students to interact and clear doubts, was to allow for the discussion of issues that had previously been presented by the educators in traditional physical meetings and the sharing of experiences among the participants.

The objective of this study, as previously stated, was to check how the educator's attitude and behavior in the interaction in the electronic forum influenced the participation and interaction of students in the virtual learning environment. Based on the experience of other researchers, as presented in the literature review, the authors of this paper believed that different levels of educator participation, involving frequency, responsiveness to students' questions, thoughts and ideas, motivation etc. would lead to different levels of activity by the students in the virtual learning environment, also.

As soon as the researchers had access to the data for the four electronic forums, they realized that it would be wise to isolate a variable that, otherwise, could bias the analysis: the students of one of the two courses had made very little use of the forum. Even with the educators visiting the

forum regularly, the students did not respond as expected. The reason for that would need to be better analyzed, using methodological procedures that were not available now, and could involve issues concerning cognition, motivation or affectiveness, as discussed by Biocca *et al.* (2003) and Moore (1989). It is possible that the group of students lacked some preparation in order to understand the importance and the benefits of actively participating in the non-presential part of the courses they were taking.

For this reason, the two modules concerning the other course were withdrawn from the study, which then focused only on the two forums of the Project Management course. This allowed the researchers to analyze the same 39 students interacting with the educator and colleagues who were also attending the two modules. Considering that the same students attended the two modules and, thus, participated in the two forums (one for each module), the researchers prevented other motivation and social factors of the individuals from determining eventual differences in the pattern of adoption of the electronic forum tool. The main variables that could still interfere in the level of interaction of students in the forum that were not isolated by the procedures were the educator's interest and attitude and the level of interest the students had on the specific topics being taught.

There was no control on the level of interest for the topics of the two modules. However, there is no reason to think that there would be any difference. After all, both modules referred very directly to project management. They should be interesting to students that voluntarily enrolled in a Project Management course. There would be no reason for great differences, except for the educator's own performance. This causes us to focus on one single variable, here, the educator

and his/her efforts to keep students motivated for the interaction that was expected from them in distance education.

PRESENTATION AND ANALYSIS OF THE RESULTS

The analysis of the results, presented in this section, took into consideration the four types of interaction proposed by Moore (1989) and Northrup (2002) and tried to identify differences in the way the educators of the two modules of the Project Management course were able to achieve it.

Analysis of the interaction in module A

In module A, students performed 21 interventions in the electronic forum over the course, while the educator interacted 22 times. These figures may seem far from ideal, in terms of active participation of the students, but one has to consider that this is the first time the university is using distance education tools and there is a paradigm shift that has to be made. In addition to that, there was significant passive participation: the forum was visited 517 times by 35 students and the educator. Only four students did not visit the forum at least one time over the period of the course. The educator was present to the forum very frequently: he entered the virtual learning environment 182 times (35.2% of the overall participation), several times a day.

Analyzing the content of the postings, one notes that the four types of interaction described in the literature review were present there, although the student-educator interaction and educator's feedback prevailed.

The educator's concern with the students' motivation became clear in several of his interactions in the electronic forum, over the course, as shown below:

Dear students,

I am posting a few intriguing questions. Answering them is an optional task for those who have the time [...]

In order to "break the ice", see below an example for question #7: [...]

I wish the draft of a project that I posted above brings you some new ideas for projects in your areas or following the same reasoning of the project in the example.

Please do not hesitate asking me, if you have any further questions.

Other colleagues of yours that read the forum may also have suggestions for projects in your area, look for their contributions.

The educator was conscious of the importance of his presence in the forum for the students to feel assisted and so that they felt that interaction was taking place, stimulating the collective reflection about the content being discussed by all those involved.

The collective construction of an environment for sharing and generating knowledge is acknowledged in this case, when one notes the chronological sequence of the interventions in the forum, showing the interaction between students and the educator and the provision of feedback and guidance by the educator:

On the 27th, at 8:26 p.m., the educator posted the first message in the forum, entitled: "To break the ice...".

Soon afterwards that same day, at 9:30 p.m. a student sent his comments about the educator's text and invited the colleagues that worked in the field to give their opinion. In this case, the student contributed to the inclusion of others and the adoption of an active and participative attitude by everyone.

On the 27th, at 11:00 p.m., the educator responded directly to the student's comment and congratulated him for the intervention.

On the 30th, at 10:25 p.m., noticing that the students were not participating in the forum, in spite of the fact that several of them had accessed the site, the educator included a text with three questions about which the students should reflect and send comments. That same day, 25 minutes later, the first student reacted to the educator's provocation.

On the 1st, at 7:37 p.m., the educator responded to the comments of the students and proposed another question for relection and discussion.

On the 5th, at 6:57 p.m., a student posted a question about a concept. That same day, at 10:15 p.m., the educator answered, giving additional examples to help the students understand the issue.

Another question was posted on the 6th, ate 10:38 p.m., which was answered soon afterwards, on the 7th, at 1:10 a.m.

As discussed before, learning takes place by means of communication, construction, recontruction and reconciling of information and knowledge. In a virtual environment, students also need the frequent presence of the educator, to keep them motivated to study, reflect and participate.

In the case of module A, the educator never left a student without an answer for long in the electronic forum, during the whole duration of the module. The elapsed time between when a question was posted and the educator's answer was never more than 24 hours. This means that, if the student entered the forum once a day, always at the same time, he found new interventions by the educator, answering his own questions and those of the colleagues.

The *interaction between students and the provided content* also happened many times during the whole module, as demonstrated by a few of the students' interventions in the forum to request further explanations, as shown below:

Teacher, could you explain what the definition SOW means and provide real examples?

For me, the text of question 7 is not clear... I did not understand what "requisites and product (or service) acceptance criteria" and "deliveries and project success criteria" mean. Could you explain that, please?

I am facing difficulty to answer the questionnaires. My bachelor's is in Business Administration and during the course I had no contact with the area of projects. I work in a bank and only have access to continuous operations. I have always believed that financial lines/investment were projects, but now I see that they are continuous operations. How can I find examples in my area?

According to the data recorded in the virtual learning environment, the content that was made available by the educator was visited 838 times. That demonstrates that there was intense interaction of students with the content, not just with the educator to obtain feedback, according to the paragraphs above.

It is easily noticed that the educator was concerned in exploring different possibilities of the interaction provided by distance education, as discussed previously in the literature review.

The student-student interaction was not so evident in the module, in spite of the invitations by the educator and even one of the students. In fact, there were only a few isolated attempts of interactions among peers, as shown below:

Due to your experience with IT projects, I would like to ask you a question that is specific to the area. [...]

For large size software projects (teams of more than 30 people), do you consider agile methodologies such as Scrum or XP applicable, instead of the more usual methodologies, such as RUP and Spiral?

[...] I would also enjoy having the opinion of colleagues that work in the area.

Unfortunately, these requests did not receive due attention from the other students, who simply ignored them. The reasons for that cannot be understood based on the analysis tools that were available for this study.

Analysis of the interaction in module B

As for module B, the scenario was completely different. Students carried out only nine interventions and the educator only replied to them in three occasions. Participants logged in to the electronic forum 156 times; of which only nine accesses were the educator's (corresponding

to only 2.5% of the total). The level of participation of the educator in the forum was very low, specially compared to the educator in charge of module A (see details in Table 1).

In this module, the educator did not write any comment in the forum to motivate students to interact using that tool. This attitude may partially be the cause for the students also presenting a low rate of participation. As stated by Northrup (2002), the interaction does not happen on its own. It should be intentional and planned by the educator.

The student-educator interaction happened primarily in one direction: students asking something to the educator. As the educator took very long to answer, the students possibly started feeling insecure about the efficacy of using the forum as an interaction tool, which reduces the interest in it. In fact, when one analyzes the dates of postings, one finds that the majority of the students' interventions happened during the first half of the course. Closer to the end they probably already had noticed that communication through the forum was not very efficient. With respect to that, Belloni (2001) already warned that for the interaction to happen, it is required that at least two actors are willing to participate. Considering that the students in module B were the same as in module A, the same level of internal motivation to participate in the forum was expected. If they participated less in module B, a natural conclusion is that they did so, because they could not find the other actor (the educator) available or he was not providing the right conditions for a higher level of interaction to take place.

Next, a few of the attempts made by the students to interact with the educator are presented, which ended up being aborted due to the silence of the educator at the other side:

Teacher, do you know the site app.liquidplanner.com?

Is it a good tool for project management?

This question was never answered by the educator, in the forum.

Please see my doubts about case III, below. [...]

Two days elapsed since this was posted until the next student (see below) stated that he was also facing difficulties related to the same issue.

I also have the same doubts, and do not know which tools to use.

Another day was needed for the educator to provide his answer to the two students.

Note that the second student was faster than the educator and added this reinforcing question because there was still no answer. This would be acceptable if it had happened just a few minutes after the first message about the issue. However, two days had already elapsed and the educator still needed an additional day to respond.

I have sent you an e-mail message three days ago, about the development of my work. Could you check it, please, and reply? Thanks.

It is clear that three days after trying to contact the educator, there was still no response from him. It is impossible to know if an answer was ever given by e-mail. Even if that was the case, considering that the student posted his request in a public environment, the educator should also have answered publically, so that the others noticed that he had paid attention to the student's request.

The interaction with the educator in charge of module B was clearly very poor. The methodological tools used in this study do not allow us to establish a cause-consequence relationship between that and the fact that the student-content interaction was also poor (at least when compared to what happened in module A) and that the student-student interaction did not happen at all.

In case of module B, it seems that the self-motivation of the students was not enough to ensure at least a high rate of access to the electronically available content. The number of log-ins was only 493, which is 42% lower than the figure obtained for module A.

It should be highlighted that, according to Moore (1989, p. 1), the lack of feedback mechanisms between all those involved in the educational process leads to the use of generic teaching procedures, that assign to the students all the responsibility for their own motivation to learn, demanding great autonomy and maturity (which is usually not the case of extension program students).

Table 1, below, presents comparative information on the intensity of use of the electronic forum for modules A and B of the Project Management course.

Table 1 – Comparative information about the use of the electronic forum for modules A and B of the Project Management course

Access to the module's forum	Module A	Module B
Number of accesses to the forum	517	156
Number of accesses by the educator	182 (35.2% do total)	9 (2.5% do total)
Average number of accesses by students	9.6	5.7
Number of students enrolled in the module	39	39
Overall number of students involved in the forum (including passive participants)	35	26
Number of students actively involved in the forum	9	5
Postings by the students with questions to the educator	18	7
Postings with responses from the educator to the students' questions	17	3
Postings with motivating messages by the educator	5	0
Postings with student-student interaction	3	0
	8118 (6.5 pages)	2344 (2 pages)
	36561 (30 pages)	1779 (1.5 pages)
Number of accesses to the content of the module	838	493

Source: the authors, based on field data

The analysis of the data and the simple comparison of the figures presented in Table 1 show that the interest and the attitude of the educator are key factors to determine the level of interest of the students for the technological resources used in distance education.

If the educator does not believe or is not interested in the success of the initiative, it will be very difficult for the students to take advantage of it. Because of that, it is fundamental that the educators involved in distance education know how to structure and facilitate interaction, mastering the use of the electronic resources available to this mode of education. However, that requires them to be suitably trained beforehand, as Wilson and Stacey (2004) remind us.

FINAL CONSIDERATIONS

This study has clarified something that had already been noticed by Moore (1989), McIsaac and Gunawardena (1996), Northrup (2002) and Biocca *et al.* (2003): the pro-active attitude of the educator in using distance education tools is essential for the educational objective to be accomplished. In case of module A, the educator was present in the virtual learning environment all the time, motivating, instigating the students, debating contents and adopting the electronic forum as a technological tool to support his objectives. This educator received a very good evaluation by the students, after the end of the module.

The educator in charge of module B was also well evaluated by the students, who acknowledged his knowledge and the overall teaching performance. They remarked, though, that he did not pay attention to the students outside the traditional face-to-face meetings. The students also understood that the educator did not give the same importance to the electronic forum that the previous educator. It is possible that he compensated his poor performance in the distance education part of the module by providing more attention to students in the presential part of it. Even if that was the case, he lost an important opportunity of using the electronic forum at least as a complement to his conventional teaching tools.

When educators are invited to teach modules in a semi-presential or distance education course at the university where this research was carried out, they are advised to respond to any student's request in the virtual learning environment in 48 hours, at the most. However, analyzing the results of the current study, and based on the findings of other researchers whose work was discussed in previous sections of this paper, one notes that this frequency of interaction is not

enough for the educator to be “seen” in the forum, i.e. for him to be perceived as being always present.

The interventions that were carried out by the educator in charge of module B restricted themselves to answering, in a very brief and objective way, the doubts that students had. No attempt was made to broaden the scope of interaction. In some cases, the educator used the two days that he was entitled (or even a little longer) to provide a student with feedback. In the practical world of distance education, two days are a very long time. It may be suitable to bureaucratic demands of secretary services, but never to fulfill academic curiosity. Scientific inquietation does not resist such a long period of silence! The brain shifts to different thoughts and/or pleases itself with the current level of knowledge.

We thus suggest that the university changes its guidance for response in 48 hour. Educators involved with distance education courses should be aware that they have to be much more available than that. They should develop the habit of interacting with the students, using asynchronous tools such as the electronic forums, whenever they find the time, no matter if they only have a few minutes to do it. This is very important for the students not to have the sensation that they are ‘speaking to themselves’ in the virtual world.

This study had a descriptive nature but, above all, it was exploratory. The authors had their own expectations, which were molded by the experiences of other researchers whose work was reviewed. As it usually happens in exploratory studies, the authors conclude this research with the feeling that they now have more questions that need to be answered than when they started to work. Several research fronts result, which can lead to future studies.

One thing that caught the authors' attention was the radical difference in the level of interaction that happened in the electronic forums of the two modules of the Project Management course that were studied in detail and those of the other course, which we also intended to analyze, but were discarded because there was practically no interaction. It is possible that groups exist that are more inclined to interact in virtual environments than others do. Studying the sociological issues involved may lead to the identification of practices that can improve the results, even in the case reluctant groups are challenged to use the new technologies of distance education.

Another intriguing observation, especially in the interaction that happened in the electronic forum of module A, was the lack of responses by the other students to questions that were specifically addressed to them by their peers. They remained untouched in almost all cases. Could the students be so conditioned by previous experiences with traditional educational processes that they only pay attention to the communication with the educator, not valuing knowledge that could be obtained from their colleagues' experience? Alternatively, could the fact that the educator was so present in the forum make the students think that he would take for himself the task of answering questions addressed to the other students? The issue concerning student-student interaction in virtual environments needs to be better understood, which could motivate new studies with that specific objective in mind.

The fact that the study restricted itself, at the end, to the analysis of the interaction of the same group of students with two different educators using electronic forums consists on an important limitation of the study, and prevents inferences to be made. However, as the findings of the study match the results of previous research, providing measurable data about a concrete case of use of

new technologies in distance education, we believe that the proposed objective was achieved in a satisfactory way.

REFERENCES

BELLONI, M. L. **Educação à distância**. Editores Associados. 1999

BIOCCA, F., HARMS, C., BURGOON, J. K.. Toward a more robust theory and measure of social presence: Review and suggested criteria. **Presence**, Vol. 12, No. 5, 456-480. 2003

BULLEN, M. Participation and critical thinking in online university distance education. **Journal of Distance Education** 1-32. 1998

CINELLII, Gustavo Bianchi. Ferramenta para acompanhamento da participação do aluno em sessões de fórum aplicada no ensino a distância via Web. Boletim **Técnico Larc - Série Dissertações e Teses**. Volume 04, 2006

HARASIM L. M; HILTZ S. R.; TELES L.; TURROF M. **Learning networks**: a field guide to teaching and learning online. MIT Press, 1997

HOPPERTON, L. Computer conferencing and college education. **The College Quarterly**. 1998.

Disponível em: <http://www.senecac.on.ca/quarterly/CQ.html/HHH.079.W98.Hopperton.html>.

Acesso em: 25/02/2008.

LÉVY, P. **O que é o virtual?** São Paulo : Editora 34, 1996.

MANSUR, A. **A gestão na educação a distância**: novas propostas, novas questões. In. Litwin, E. (Orgs.). Educação a Distância. Artmed Editora, 2001.

MARKEL, Sherry L. Technology and education online discussion forums: it's in the response. **Online Journal of Distance Learning Administration**, Volume IV, Number II, Summer 2001. Disponível em: <http://www.westga.edu/~distance/ojdla/summer42/markel42.html> Acesso em: 20/02/2009

McISAAC, M. S.; GUNAWARDENA, C. N. Distance Education. In D. H Jonassen (Ed.), **Handbook of research for educational communications and technology: a project of the Association for Educational Communications and Technology** (pp. 403-437). Macmillan, 1996.

MOORE, Michael Graham . Three types of interaction. **The American Journal of Distance Education**, Vol. 3, No. 2, pp. 1-6. 1989

MORAN, J. M. **Novas tecnologias e mediação pedagógica**. 12. ed. Campinas: Papyrus, 2006.

_____. **O que é educação a distância?** Disponível em: www.eca.usp.br/prof/moran/dist.htm (2002) Acesso em 25 out/2007.

_____. **A educação que desejamos novos desafios e como chegar lá**. Campinas: Papyrus, 2007.

_____. Integrar a Internet com um novo paradigma educacional. **Revista Ciência da Informação**, v. 26, n. 2, maio-agosto 1997a, p. 146-153.

MUIRHEAD, Brent. Enhancing social interaction in computer-mediated distance education. **Educational Technology & Society**. 2000.

MURPHY, K., Smith, P., STACEY, E. Teaching presence in computer conferencing: lessons from the United States and Australia, **Proceedings of International conference on computers in education**. P. 694-698, IEEE Computer Society Press. 2002.

NORTHRUP, Pam T. A framework for designing interactivity into Web-based instruction. In. **The ASTD E-learning Handbook: best practices, strategies and case studies for an emerging field**. Rossett, Allison. American Society for Training and Development. McGraw-Hill Professional, p. 127-138, 2002.

PALLOFF, Rena M.; PRATT, Keith. **Construindo comunidades de aprendizagem no ciberespaço: estratégias eficientes para salas de aula on-line**. Porto Alegre: Artmed Editora, 2002.

PARKER, Angie. Interaction in distance education: a critical conversation. **Educational Technologie Review**. 13-17. 1999.

WILSON, G; STACEY, E. Online interaction impacts on learning: teaching the educators to teach online. **Australasian Journal of Educational Technology**. 2004, 20(1), 33-48.

Note:

¹ The model proposed by Moore in 1989 has been changed along the time. However, it is still the base for any empirical study that involves the interaction of students in a virtual environment.