

EVALUATING TEACHING PRESENCE IN A VIRTUAL ENVIRONMENT: EXAMINING INTERACTIONS IN A FORUM OF THE PROEDI SOCIAL NETWORK

Eliana Santana Lisboa, Clara Pereira Coutinho

Universiry of Minho (PORTUGAL)
eslisboa2008@gmail.com, ccoutinho@ie.uminho.pt

Abstract

With the spread of Internet and digital technologies the discussion forums usage in informal spaces, as for example in virtual social networks, became a strategy which aims to establish and strengthen the social bonds between teachers/students and students/students and, above all, promote collaborative learning. Based mainly in a form of asynchronous communication, the use of the forum allows complementing activities in the classroom through social, cognitive and teaching presence. The presence of teaching, considered in the literature as the most important of the three in online learning, has as main objective to promote an environment where knowledge sharing and the increase of construction of meanings within the community. It is in this context where the present study fits, whose objective is to assess the presence of teaching in the social network forum PROEDI (Teachers in the Digital Era – www.proedi.ning.com) entitled "The importance of Educational Technologies" and that was applied to a group of prospective teachers who attended a master's degree in Education from the University of Minho. The results obtained in the analysis of the contributions posted came to prove that the role of the e-moderator has fallen far short of the initially expected since their participation was very shy when it comes to mobilize and encourage students to participate in discussions and also to socialize knowledge. However, the results obtained also led us to conclude that the presence of teaching in a social network can happen not necessarily associated with the effective intervention of the e-moderator, but as a result of the involvement and willingness of students to learn.

Keywords: Teaching Presence, Interactions, PROEDI, collaborative learning.

1 INTRODUCTION

The use of computer-mediated communication – CMC – is already a reality in institutions of higher education. This is because many of them already used this type of communication, with special emphasis on video conferences as a means of ensuring greater universalization of education, anytime and anywhere [1]. In addition, it is also true that the use of discussion forums in informal spaces, such as virtual social networks, has become a strategy to promote collaborative learning, strengthen social bonds between teachers/students and students/students in classroom context [2].

According to [1], teaching and learning in a CMC context is a complex activity and also very challenging, requiring appropriate theoretical perspective that takes into account the analysis and measurement instruments that can effectively evaluate the contributions in a virtual community. In the literature analyzed, there is no consensus among theorists about the advantages of this type of communication in the teaching and learning process. This is because, according to these authors, the face-to-face communication is richer because "context provides multiple non-verbal or paralinguistic cues such as facial expression and tone of voice" [1] thus making a richer communication towards emotional and social, that can influence the attitude of the subject and also in the evaluation of the educational process. Some authors emphasize that CMC might be termed a lean medium, in that much of the information that creates and sustains the group dynamic of face-to-face groups is simply not transmitted [1]. On the other hand, [3] believes that the written language in the educational context can provide a greater accuracy in the organization of thought, thereby providing the exercise of higher psychological functions, i.e. a deeper knowledge and more scientific rigour.

Based on a predominantly asynchronous communication, the CMC aims at emphasizing traditional education also predominantly supported in cognitive, social and teaching presence, social presence. These elements are part of the creation and development of virtual communities developed by [1], on which we will focus in the following paragraphs.

The study we present in this paper had as main objective to evaluate the presence of teaching in the social network forum PROEDI (Teachers in the Digital Era – www.proedi.ning.com), entitled: “ICT in Education”. The activity involved a group of 32 students that attended 2nd grade Bologna Masters in Teaching (Mathematics, Biology, Portuguese Language and Foreign Language/Spanish) at the University of Minho, Braga, Portugal, during the second semester of 2010-2011. The participation in the forum of discussion was one of the strategies implemented in the “Educational Technology” curricular unit in order to complement the face-to-face sessions (3 hours/week, 15 weeks) and to develop ICT competences among the prospective teachers.

2 COMMUNITY OF INQUIRY MODEL

This model was developed by [1], with the goal of providing a conceptual framework that could identify the essential prerequisites for an educational experience to succeed taking into account the CMC. This template is part of an exploratory search and predicts that learning occurs through the interaction between three elements: a cognitive presence, a social presence and a teaching presence.

The cognitive presence is defined as being a component that allows participants to a particular community build meanings through discussion forums [1] [4]. The cognitive presence reflects the development of higher psychological processes, giving possibility for individuals to establish relationships with other existing knowledge, acquiring analysis competence and critical reflection.

The social presence relates to the creation of a favourable environment, in such a way that the participants feel comfortable and safe to express their ideas. It is fundamental in a community because it helps developing the ability to express opinions, viewpoints and, above all, respecting the diversity of opinions in the group [5]. Thus, social presence becomes of great importance for cognitive presence to be effective, since it prepares individuals to learn collaboratively, to discuss ideas with solid arguments and within ethical principles, thereby developing critical thinking, and finally, favouring learning [1] [6].

Finally, the presence of education, understood as the provider of the components mentioned before, aims to promote a space conducive to the sharing of knowledge and construction of meanings. [1] established three important functions that the e-moderator performs in the process of creating an educational presence. The first function concerns the responsibility to design and organize the space, which predates the creation of the community, remaining throughout all the process of its implementation. This includes the preliminary selection, organization and presentation of the issues that will be addressed, as well as the design and development of learning activities and their evaluation. Secondly, it implies the creation of strategies and activities that seek the involvement of all participants, which can be shared with all group members. Thirdly, the role of education that goes beyond moderating the learning experiences and it happens when it contributes in an instructive way so that discussions become more rich and meaningful, contributing for the socialization of information and knowledge building. Finally, we can infer that the presence of teaching is a means of strengthening the social and cognitive presence, with the purpose of achieving the final results, i.e., a collaborative learning.

In the following topic, we will specify with more detail the presence of teaching, since this the one that we will use in the analysis of PROEDI network discussion forums.

2.1 Teaching presence in online environments

It is undeniable that the teaching presence assumes greater importance, configuring itself as an essential element so that learning can occur in a virtual community. But for this to happen, we agree with [7] who state it is of fundamental importance the follow-up of a leader or an e-moderator able to energize and involve all members and create a friendly and socially positive environment, conducive to collaborative learning, prolonging their “life cycle, i.e. its sustainability” [7].

It is also true that not only the-moderator should assume this function, but also other members of the community can be e-moderators through a shared leadership. According to [8], this situation can only occur with the existence of some attributes such as creativity, motivation and being emotionally sensitive, to be able to understand the factors (individual pace, diversity, etc.) that may interfere in the online interaction.

In this study we will adopt the analysis model developed by [9], which had as its starting point the method of analysis proposed by Garrison, Anderson, and Archer's in 2000 and focused in the analysis

of the variable that is most directly under the control of teacher – the task of creating and sustaining "teaching presence" in a text-based computer conferencing context" [9]. In this context the presence of teaching can be identified and analysed taking into account three categories: Design and Organization, Facilitating Discourse and Direct Instruction, which will be described below.

Design and Organization – this category relates to the responsibility to design and organize the space, which predates the creation of the community, remaining throughout the process of its implementation. This includes the selection, organization and presentation of preliminary issues which will be addressed, as well as the design and development of learning activities and their evaluation. According to [10], at this stage it is important to define together the community coexistence rules, and also give attention to the language used, as well as the type of speech. It can be seen has a activity planning phase that focuses on providing all details that will appear, as well as in finding possible solution. For a better understanding of the analysis of these categories, we will specify their main features:

Facilitating Discourse – this is the creation of strategies and activities that seek the involvement of all participants, which can be shared with group members. We believe that this category is of great importance because it is connected directly to the collective construction of knowledge. A process that is challenging and stimulating is crucial to creating and maintaining a community of inquiry [9]. Is a process that has to do with the creation of group identity, identifying its weaknesses and strengths, with the purpose of reaching a consensus at the end of the discussions generated there. Through active intervention, the teacher draws in less active participants, acknowledges individual contributions, reinforces appropriate contributions, focuses discussion, and generally facilitates an educational transaction [9];

Direct Instruction – this category goes beyond moderating the learning experiences. Broadly speaking, this category includes those indicators that assess the discourse and the efficacy of the educational process [9], contributing instructively for that discussions become more rich and meaningful. During this phase it is crucial that the e-moderator guides the reflection of the group, confirming or disproving the understanding of the subject by means of evaluation and feedback. But this feedback should be based on solid epistemological bases, because at that stage, if we call it like this, the comments must be explanatory and illustrative to make the links among contributed ideas, to diagnose misconceptions, and to inject knowledge from diverse sources such as text-books, published articles, and internet-based resources [9]. But the authors are quite emphatic in stating that this is effective only within a context where it is the social presence that brings about the idea of the "other" and the cultural differences, as realities experienced by elements of the group. And for a better analysis of transcripts of the speeches from the CMC, we present a framework containing the categories with their descriptors.

CATEGORY	INDICATORS
Design and Organization	Setting curriculum, technology, tools
	Designing methods
	Establishing time parameters
	Utilizing medium effectively
	Establishing netiquette
Facilitating Discourse	Identifying areas of agreement/disagreement
	Seeking to reach consensus/understanding
	Encouraging, acknowledging, or reinforcing student contributions
	Setting climate for learning
	Drawing in participants, prompting discussion
	Assess the efficacy of the process
Direct Instruction	Present content/questions
	Focus the discussion on specific issues
	Summarize the discussion
	Confirm understanding through assessment and explanatory feedback.
	Diagnose misconceptions
	Inject knowledge from diverse sources, e.g., textbook, articles, internet, personal experiences (includes pointers to resources)
	Responding to technical concerns

Table 1: Grid of analysis of teaching Presence (adapted from [9]).

3 METHOD

The curriculum unit "Educational Technology" is an elective discipline for degrees integrated on Bologna's Masters. It has duration of 45 hours and is taught once a week, with duration of 3 hours each on a face-to-face session. The goal is to develop in students the digital and pedagogical skills that make them users of technologies in the classroom. At the beginning of the course were offered some theoretical contributions with the aim of assisting the understanding of the conceptual foundations of educational technology – theories of communication, theories of learning, information society – and thus justify the use of technologies such as cognitive tools in the teaching and learning process.

The classes were theoretical and practical and were taught in an integrated manner, i.e. from the moment that a few potential of tools and its characteristics were discussed, there was also offered the opportunity to students to experience and explore in the classroom, with the goal of ensuring a better understanding of the contents, by adopting the methodology of "learning by doing".

It was with this aim that during lessons that students were prompted to the construction of a WebQuest using Google Sites, and also the construction of a Blog that would serve as a digital

portfolio necessary so that the teacher could follow the evolution of student learning, whereas there would be posted the reflections about the subjects worked in classroom [11].

Parallel to this and to improve the students' understanding about this theme, it was created the PROEDI social network forum entitled "The Importance of Technology in Education", containing the following introductory text: «the video "the Importance of Technology in Education", that can be accessed just below, starts and ends with a question: What is that technology will do for us in 15 years? What reading do you make from this video? What is the role of school and teachers in this context?»

The PROEDI Social Network was designed with NING software and is part of a PhD project, whose central objective is to explore new approaches to training and professional development of teachers that emerge from the new paradigm context known as Web 2.0 [12].

The Forum started on 31 March 2011 and ended on June 22, because in the opinion of the professor it should only be active during the stage in that discipline was being taught. We had the full participation of students in the class accounting for a total of 101 contributions posted in the forums.

In methodological terms, the empirical study is analytical because of the fact that research is based on a content review process in which the data source is a PROEDI social network. Its goal is to analyze the social presence on the forum entitled "The importance of Technology in Education".

Analytical research is a modality of non-experimental or descriptive studies or [13] in which the investigator, based in a grid, shall examine the content of documents in different formats, such as books, newspapers, radio programs or web sites. Analytical research is based on a grid of analysis developed by the investigator in the light of the objectives of the study and on the basis of a thorough literature review. Once the investigator takes advantage of techniques in which the data are obtained by processes that do not involve direct collection of information from the subjects investigated, analytical research integrates the so-called "not interfering" method, because they are capable of ensuring the control of numerous strange variables associated with all methods based on inquiry and/or observation [14].

3.1 Data collection

In order to characterize the sample the questionnaire associated with the NING social network was used. It allowed us to find out gender, age, social network habits, education level and ICT skills of the forum participants.

As our goal was to assess the presence of teaching, we employ content analysis, taking as parameter the indicators developed by [9]. Considering the number of contributions in forums, that exceeded more than a hundred, we turned to software WebQDA which is a qualitative data analysis program that was developed at the University of Aveiro. It analyses texts, videos, audio and images. The same works in a collaborative environment and Internet-based distributed [15].

3.2 Characterization of the sample

As was said above, our sample consisted of students belonging to the Master in Teaching, from several subjects, namely: 05 Spanish Teaching, 07 Portuguese Teaching and Classical Languages, 12 Biology and Geology Teaching and 08 Math Teaching, making a total of 32 students plus teacher who worked as the community e-moderator. So, we can say that our total sample consisted of 33 people. Of these, 11 are male and 22 are female. The vast majority, i.e., 19 students belong to the age group of 20-25 years, 04 belong to the age group of 26-30 years, 03 belong to the age group of 31-35 years, 01 belongs to the age group of 36-40 years, 02 belong to age group of 41-50 years, 01 belong to the age group of 51-55 years and 01 belongs to age group 60 years and 56-60. Two of them did not respond.

With respect to training in ICT, of 27 who responded, 03 have advanced knowledge, 09 have average knowledge, 12 have basic skills, 03 have no training and 06 did not report.

The item that asked whether they participate in other social networks, 14 members answered affirmatively, 05 negatively and 14 did not respond. In this item, the social networks that were featured were: Ning, Facebook, Orkut, Twitter.

And finally, the item sample that enquired the members about some virtual community, 01 person replied that participated, 10 responded that were not members of any virtual community and 22 did not respond.

4 RESULTS

In total we had 101 contributions and about 52.139 words. The analysis model illustrated in table 1 comprises 03 categories and their respective indicators. In the first category named "Designs and Organization" was not found evidence of the presence of teaching. This can be justified by the fact that the PROEDIA social network is an environment that was not necessarily designed for this activity and that on the contrary, it served only as a teaching resource to support the activities of the curricular area, and therefore it was not required from the teacher to note some measures such as the environmental and curriculum organization, the definition of work methods, or to set a timeframe in which activities could be developed.

In category "Facilitating Discourse", we had a total of 69 instances (see table 2), which were distributed among the indicators as follows: i) identifying areas of agreement/disagreement (15); ii) seeking to reach consensus/understanding (14); iii) encouraging, acknowledging or enhancing student contributions (10); iv) setting climate for learning (8); v) establish the participations and promoting discussions (10) and assess the effectiveness of the process (10).

Category	Indicators	Definition	Number of evidences	Evidences (example)
Facilitating Discourse	Identifying areas of agreement/disagreement	Identify disagreement of opinions - Cognitive Conflict	15	<i>I agree with the fact that new technologies can mainly present advantages, but there also a risk with regard to the isolation that can create in students.</i>
	Seeking to reach consensus/understanding	Meeting of congruent links when two seemingly contrary opinions are being expressed.	14	<i>I think everything will depend on how we use it, or for whatever purposes, this is because in a while these technologies that are in vogue today will be outdated and it doesn't mean that they will have less importance, as with the traditional education</i>
	Encouraging, acknowledging, or reinforcing student contributions	The teacher supports and encourages participation, commenting and encouraging responses from students.	12	<i>Will the teachers, who are now active, have the knowledge necessary for the implementation of these new technologies in the classroom?</i>
	Setting climate for learning	Promote a welcoming environment and that particularly respects the opinions of everyone in the achievement of a final product-learning	8	<i>That's it. You have to invest in lifelong learning. We can always learn and we always have something to learn.</i>
	Drawing in participants, prompting discussion	Question, interrogate and raise possible responses from students	10	<i>You tell us that the teacher is a "pilot of technologies". But what roles should the teacher play so that he/she can lead this "train" to a safe location and susceptible of multiple learning?</i>
	Assess the efficacy of the process	Provide constructive feedback contributions, taking into account the objective of the discussions	10	<i>But your comment touched on a fundamental point, namely the need for educators to share concerns, experiences, and pursue new ways to upgrade.</i>

Category	Indicators	Definition	Number of evidences	Evidences (example)
Direct Instruction	Present content/questions	To Facilitate learning The teacher shares his knowledge with students.	10	<i>One of the urgent issues is to think of a teacher training that meets the needs and social demands of the learning society</i>
	Focus the discussion on specific issues	Directing attention to certain concepts or information that is necessary to establish or pursue the construction of knowledge.	11	<i>I mean that, despite being relevant to consider the increasing adaptation of teaching to different social realities, we should not condone with absurd extremes associated with the aphorism "join them".</i>
	Summarize the discussion	Synthesize the main ideas of the students' contribution	12	<i>The role of the school and teachers in this context is to understand and introduce in our workplace learning environments that can contribute increasingly to our educational practices becoming more attractive and consistent, reaching the first objective that education has: learning. This is the goal that today is referenced by the use of ICTs in education.</i>
	Confirm understanding through assessment and explanatory feedback.	Commenting on students' participation	10	<i>In response to what you asked XXXX, I believe that technology is an indispensable tool for the construction of knowledge because it develops students' creativity, group work autonomously and serves as a resource for teacher causing the student to be more dynamic and a co-constructor of knowledge.</i>
	Diagnose misconceptions	Teacher comments outlining activities of learning, causing students to realize their potential misconceptions	10	<i>Technologies is not only the motivation and exploration of a syllabus, but also the development of the student as a citizen, promoting initiative capabilities and fostering critical spirit, decision-making, persistence and autonomy.</i>
	Inject knowledge from diverse sources, e.g., textbook, articles, internet, personal experiences (includes pointers to resources)	Supply of different search sources so that students can deepen their knowledge on the subject.	9	<i>Actually your comment is well-founded, because as Castells (2003) said, the virtual environment is an extension of physical world, in all its dimensions and arrangements and therefore is subject to vulnerabilities, typical of human nature.</i>

Table 2: Evidence of the presence of Teaching (model adapted from [9])

In the category "Direct instruction" was accounted 62 contributions distributed among the following indicators that are going to be presented in descending order of number of occurrences. At the top we find that the indicator that stood out was to "summarize the discussion" with 12 occurrences, followed by the indicator "focus of the discussion on specific issues" with 11 occurrences. The indicators "Present contents/questions" and "Diagnose misconceptions" have 10 occurrences, succeeded by indicator "Inject knowledge from diverse sources, e.g., textbooks, articles, internet, personal experiences (includes pointers to resources)" with 09 occurrences. The only indicator that was not covered in this category was the "Respond to technical issues".

From these results we can conclude that, in fact, some practices make much difference when in a virtual community members are committed to the sharing of knowledge and collaboratively knowledge building. It is undeniable that, both in the speech of professor and students, identifying converging and/or divergent points, with the purpose of seeking consensus and understanding of the content discussed is a primary factor. Apart from helping to sharpen the discussion, it also encourages a cognitive conflict-imbalance in our cognitive structure, thus requiring a critical reflection of what we know and what needs to be assimilated. This results in a change of the mental processes of the individual that faces new attempts to establish a balance between the cognitive subject and the object knowable, and resulting in significant learning [16]. Another important indicator relates to encourage, recognize and reinforce the contribution of students so that everyone in a community can be

recognized and thus develop a sense of belonging, i.e., feel valued and co-constructors of knowledge, thereby promoting discussions[17].

The category “Direct instruction” can be understood as the exercise of an intellectual and academic leadership in the sense that this is the time when people are asked to organize thought and constructing meanings. In our study, the items that were featured were the "Focus of the discussion on specific issues" and "Summarize the discussions" with respectively 12 and 11 occurrences. These numbers despite not being quite expressive, since we were expecting more, are still convincing when concerning teaching presence. We say this because it is of great importance in a virtual community that the e-moderator takes due care to ensure that the focus of the discussion is not misrepresented, otherwise the objectives will not be achieved. In addition to “Summarize discussions” favors that the whole community can take note of the key points discussed in the topic, thus facilitating the comprehension of the contents or the underlying concepts. As for the student, this is a central issue because it is at this point that the e-moderator can realize the development of higher psychological processes, referred by [18], which for us is a way of perceiving the students’ assimilation of concepts.

Considering also that the class was heterogeneous, we thought I would better to look at the number of occurrences per study area. To this end, we have grouped the students into two groups: humanities (Spanish and Portuguese Teaching and Classical Languages Teaching) and exact sciences (Comprising students of Biology Teaching and Mathematics Teaching). Allied to this we also categorized the teachers’ contributions, i.e., the e-moderator. Thus, 46 occurrences of students’ participation from the exact sciences, and 16 students from humanities and 45 occurrences of teachers’ participation.

According to [15], the questioning may be considered the most important step in a process of qualitative analysis of data. It is a way to examine, within the system of categories, the ones which were already codified by the investigator, the patterns and relationships, as well as the data triangulation.

To present the questioning, we use descriptors present in the software WebQDA: most frequent words and matrixes. These last were organized having regard the students in exact sciences and humanities and the categories mentioned above.

The 50 most frequent words found in occurrences categorized were: technologies (118), education (75), teachers (69), learning (43), knowledge (33) and information (26). This somehow proves that the focus of the discussion was held and once again we realize the importance of pedagogical function exercised by the e-moderator that besides of having people not to shift from the main objective of the thematic, also contributed to the exchange of information and socialization of knowledge [19].

However, the matrixes correspond to the crossing of variables and in the specific case of our study they were elaborated taking as a reference the students and the e-moderator’s (teacher) participation, and the respective categories (see table 3) below:

Table 3: Matrixes are established between the students and teachers’ participation and the categories of teaching presence

Matrixes	References
Students x facilitating discourse	33
E-moderator x facilitating discourse	34
Students x Direct instruction	36
E-moderator x Direct instruction	20

Looking carefully to the table we find that the teaching presence concerning the category “Facilitating discourse” was greater in the language of the e-moderator both in occurrences as in words. While students have submitted 33 occurrences, the e-moderator presented 34 occurrences. However, in what concerns the matrix established on the category direct instruction, students stand out in relation to the e-moderator. While this has only 20 occurrences, students present 36 occurrences, a difference that we believe to be quite significant. This can be a clue that students have acquired autonomy in the management and construction of knowledge.

5 CONCLUSION

We are aware that the teaching presence is a component from virtual community model and as well as the other components, it is not necessarily the responsibility of the teacher or e-moderator. However the data from our study does not reveal very encouraging because, in theory, the categories and indicators would need to be more evidenced by the e-moderator, whereas, as referred to in the literature, "its role is exalted as element that mobilizes and encourages the group to participate, helping it to socialize knowledge, exchanging information and developing competencies and skills". [2]

We believe that this may be a limitation of our study, because we don't have enough data to say if the results come from an ineffective contribution or timid of the e-moderator or a strategy that aims at the full exercise of a shared leadership, characteristics of virtual communities/networks whose relationships are heterarchic [20]. However, and reaffirming the ideas of [8], the e-moderator should do proper interventions either through feedback, evaluative synthesis at the end, or even during the process of discussions, so that the construction of knowledge is seen as a final product of the interactions between the group.

In the case of our study we expected a more effective participation of the e-moderator and if this had happened, we would have a larger number of occurrences in the forums' contributions. This is because its function was to instigate and encourage the exchange and sharing of knowledge and especially help students in the production of meanings.

Our study has shown that the teaching presence in a social network may not occur only by effective intervention and-moderator, but mainly by engagement and willingness to learn from the students. We do not want to say that the e-moderator is not important; on the contrary, we believe that the attitude of some may have been influenced by constant questionings from the e-moderator that little by little was nurturing in teachers a critical sense and also the desire to participate and feel recognized.

To conclude, we believe that the teaching presence can be the result of continuous desire to learn on the part of students that, given a specific theme, they may feel motivated to discuss, apart from the prior knowledge about the subject. With regard to the e-moderator, this component can only be glimpsed when constantly monitoring students' participation, thereby emitting constant feedback and keeping the group motivated.

ACKNOWLEDGEMENTS

This article was developed under a research project of the Center for Research in Education (CIED), University of Minho, Braga, Portugal.

REFERENCES

- [1] Garrison, D. R.; Anderson, T.; Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 1-19. Available at: http://auspace.athabasca.ca/bitstream/2149/739/1/critical_inquiry_in_a_text.pdf. Consulted the: 15.12.11.
- [2] Lisboa, E. S. (2010) *Aprendizagem Informal na Web Social? Um estudo na rede social Orkut*: Dissertação de Mestrado em Ciência da Educação. Braga: University of Mimho.
- [3] White, E. M. (1993). Assessing higher-order thinking and communication skills in college graduates through writing. *The Journal of General Education*, 42, 105-122. Available at: <http://www.eric.ed.gov/PDFS/ED340767.pdf>. Consulted the: 20.12.11.
- [4] Garrison, D. R.; Anderson, T.; Archer, W. (2004). *Critical Thinking, Cognitive Presence, And Computer Conferencing In Distance Education*. p.1-24. Available at: http://communityofinquiry.com/files/CogPres_Final.pdf. Consulted the: 30/08/09.
- [5] Lisboa, E. S.; Coutinho, C. P. (2011). *Comunidades Virtuais: Sistematizando Conceitos*. In: revista Científica de Educação a Distância - Paidéi@ .V. 2, N°4. Available at: <http://revistapaideia.unimesvirtual.com.br/index.php?journal=paideia&page=issue&op=current>. Consulted the: 01.12.11

- [6] Anderson, T. (2004) Teaching in an Online Learning Context. In: Terry Anderson,& Fathi Elloumi (Editores). Theory and Practice of Online Learning (2004). Canadá: Athabasca University. Cde.athabascau.ca/online_book. Available at: http://cde.athabascau.ca/online_book/contents.html. Consulted the: 20/08/09.
- [7] Miranda, M. S.; Osório, A. J.(2008). Liderança em Comunidades de Prática Online – Estratégias e Dinâmicas na @rcaComum. In: Núcleo de Informática na Educação Especial – NIEE.UFRS. Available at: em: http://libra.niee.ufrgs.br/niee/eventos/RIBIE/2008/pdf/lideranza_comunidades.pdf. Consulted the: 25/08/09.
- [8] Salmon, G. (2000). E- moderating: The key to teaching and learning online. London and New York: RoutledgeFalmer - Taylor & Francis Group
- [9] Anderson, T.; Rourke, L.; Garrison, D. R.; Archer, W.(2001). Assessing teaching presence in a computer conferencing context. In: JALN Volume 5, Issue 2 - September 2001. Available at: <http://auspace.athabascau.ca/handle/2149/725>. Consulted the:01.11.11
- [10] Barberà, E. G. (Coord.) (2001). La incógnita de la educación a distancia. Barcelon: Horsori
- [11] Coutinho, C. P.; Lisbôa, E. S. (2011). Perspectivando modelos de formação de professores que integram as TIC nas práticas lectivas: um contributo para o estado da arte. In: Moreira et al. (eds.).Old Meets New: Media in Education – Proceedings of the 61st International Council for Educational Media and the XIII International Symposium on Computers in Education (ICEM&SIIE'2011) Joint Conference. (pp. 251-262). Aveiro: Universidade de Aveiro
- [12] Lisbôa, E. S.; Coutinho, C. P. (2011). Teachers in the digital age: design and validation of a social network interface. In: International Technology, Education and Development Conference, 2011, Valencia - Espanha. INTED2011 (International Technology, Education and Development Conference). Valencia - Espanha : IATED, 2011. p. 005503-005508.
- [13] McMillan, J.; Schumaker, S. (1997). Research in Education: evidence-based inquiry. 6ª Ed. Boston: Pearson Education, Inc.ggion
- [14] Lee, R. (2003). Métodos não interferentes em pesquisa social. Lisboa: Gradiva
- [15] Souza, F. N; Costa, A. P.; Moreira, A. (2011), “Análise de Dados Qualitativos Suportada pelo Software webQDA”. Atas da VII Conferência Internacional de TIC na Educação: Perspetivas de Inovação (CHALLENGES2011), pp. 49-56, Braga, 12 e 13 de Maio, (CD-ROM, ISBN: 978-972-98456-9-7). Available at: http://www.webqda.com/flash_content/artigoChallenges2011.pdf. Consulted the:01.12.11
- [16] Becker, F. (2001). Educação e Construção do Conhecimento. Porto Alegre: Artmed Editora.
- [17] Palácios, M. (1996). Cotidiano e sociabilidade no cyberspaço: apontamentos para discussão. In: Antonio FAUSTO NETO & José Milton PINTO (Orgs). O Indivíduo e as mídias. Rio de Janeiro: Diadorim.
- [18] Jonassen, D. H.(2007). Computadores, Ferramentas cognitivas: Desenvolver o pensamento crítico nas escolas. Porto: Porto Editora.
- [19] Ryan, S., Scott, B., Freeman, H.; Patel, D. (2000). The virtual university: the Internet and resourcsebased learning, London: Kogan Page.
- [20] Franco, A. (2008). Escola de Redes: Novas visões sobre a sociedade, o desenvolvimento, a internet, a política e o mundo globalizado. Curitiba: Escola-de-Redes.