Successful e-Courses: *the role of Synchronous Communication* and *E-Moderation* via Chat

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Abstract

Purpose: This study investigates: a) what kind of e-moderation is more effective in the formation of successful web-based courses, and b) the essential characteristics of Synchronous Communication (SC) that have a positive contribution in the formation of successful courses.

Design/methodology/approach: The previously mentioned issues investigated through a five-month learning experiment that took place in the context of an e-Learning Community consisting of eighteen e-courses dedicated for primary and secondary school teachers. Fifty-nine school teachers participated in this community as trainees, 23 professionals as trainers and two professionals as moderators. In terms of methodology this research can be characterized as case study. Various data (quantitative and qualitative) were collected from both trainers and trainees regarding the teaching and learning took place within the context of e-learning community. These data were quantitatively and qualitatively analyzed.

Findings: The analysis of the data shows that: a) the role of SC is crucial for the formation of successful e-courses. b) Four categories of language used that constitute effective SC via chat, applied by an e-moderator, were identified: A) Social, B) Encouragement, C) Learning and D) Negotiation.

Originality/value: This study contributes in the understanding: a) that SC is crucial in the formation of successful e-learning courses, and b) which are the essential characteristics of SC in order to moderate effectively electronically supported courses.

Introduction

E-Learning environments are considered by many researchers (McMillan & Chavis 1986, Harasim, Hiltz, Teles, & Turoff, 1995; Palloff & Pratt 1999) as potentially useful for both trainees and trainers. In particular, these environments can be used for the formation of constructivist and cooperative learning contexts (Jonassen, Carr, & Yueh, 1989). In such contexts, learners can take advantage of the learning tools provided in order to actively construct their own knowledge as well as to express their inter-individual learning differences. In addition, participation in an *e-Learning Community* generates a substantial increase in useful information access and can develop the trainee's ability to learn on his/her own, beyond the limits of a typical physical classroom environment (Johnson & Johnson, 1987; Rovai, 2001). *Knowledge* could be also acquired within an *e-Learning Community* by exploiting the communication capabilities of networking technologies provided. In particular, learners can exploit these capabilities to enhance their knowledge through negotiation with that of their teacher and of their colleagues. Both synchronous and asynchronous means of communication could be effectively used in electronically supported courses. Asynchronous communication (email, forum, bulletin boards, etc.) provides more scheduling flexibility, while in SC (chat), interaction and feedback are immediate. Furthermore, chat is essentially social by nature (Coates, 1998) as synchronous tools are more effective for social and recreational purposes related to education while asynchronous tools are better at dealing with more *'academic'* aspects of a course (Aoki, 1995, Murphy and Collins, 1998; Motteram, 2001). Essential advantages of SC related to the fact that activities requiring spontaneity can be handled effectively, such as brainstorming, or decision-making, as these require a quick turn-around time rather than extended discussion (Aoki, 1995). Moreover, in a chat an instructional environment that is familiar to students, faculty, and administration can be effectively simulated. At this point, the role of e-moderator is crucial (Harasim et al., 1995). Regarding e-moderation, two distinct styles have been reported (Vlachopoulos & McAleese, 2004): a) *Low* or *non-directive* moderation style, when trainers intervene with trainees in order to help them '*reflect*' while progressing their discussions, and b) *High* or *directive* moderation style, when trainers intervene in both the process of the on-line course and in

the content as well. *High* and *Low* e-moderation have to be used in turns, because the exclusive use of directive moderation style could bring on many long messages containing the trainer's point of view and could generate inactivity among the trainees. *Low* e-moderation could be used more regularly, mostly so as to encourage and facilitate. Non-directive moderation can make inactive trainees engage in conversations, participate, become more active. E-moderation can be performed during asynchronous and synchronous communications (SC).

Based on the above, it is crucial to investigate: a) what kind of e-moderation is more effective in the formation of successful web-based courses, and b) the essential characteristics of SC that have a positive contribution in the formation of successful courses. This study investigates the previously mentioned issues through a five-month learning experiment that took place in the context of an e-Learning Community consisting of eighteen e-courses dedicated for primary and secondary school teachers. Such an investigation has not yet been reported.

The paper is organised as follows: in the next section the context of the study is presented. Next, the research regarding the definition of basic characteristics of a successful e-course is described. Following the characteristics of SC in the implementation of a successful e-course are demonstrated. Finally discussion and conclusions are drawn.

The context of the study

A *distance learning educational* program, named *'School-Teacher's Learning Community' (STLC)*, concerning further training of in-service primary and secondary education teachers, was implemented by the Laboratory of Learning Technology and Educational Engineering of the University of the Aegean, Greece. The duration of STLC was five months. The aim of STLC was mainly the integration of *Information and Communication Technologies* (*ICT*) in teachers' every day practices. STLC consisted of eighteen (18) different electronically supported courses. Fifty nine (59) in-service teachers participated in STLC as trainees, 23 professionals participated as trainers, while two e-moderators were responsible for the overall supervision of STLC.

Participants were supplied with *email* accounts, several *fora* and *chat* services. Bulletin boards, services supporting the writing of documents by multiple authors, advanced security, automatic notification and advanced search services were also available to all members of STLC. The program's software platform, developed with *Microsoft Sharepoint^{TM} Portal Server (SPS),* hosted all the above mentioned services and was presented as a series of web pages.

Most Successful Lessons and the effect of Synchronous Communication

Widely applied methods of course assessment emphasize the examination of the learning results, counting the degree of satisfaction of the participants and the accomplishment of the signified goals of the course (Barnes, 1986; Calder, 1994; Britain and Liber, 1999). Taking into account these methods to assess the effectiveness of the lessons conducted in STLC, some essential elements that constitute a *successful* lesson were considered. These are presented below:

- The degree of *accomplishment* of the predefined lesson *objectives*, from the point of view of both the tutor and the tutee.
- Participation and the average grade.
- The degree of *communication* and *interaction* among the participants.
- The degree of *knowledge* obtained through the learners' participation in STLC, in any way it could be justifiably measured.

Our assessment analysis of the courses provided by STLC, was based on the above elements. In terms of methodology, our research can be described as a *case study* with interpretations based on both quantitative and qualitative data (Cohen and Manion, 1989). These data collected from trainers and trainees were: (a) e-Questionnaires. Appropriate *Likert*-scale questions were taken into account and the answers were matched up to comparative results of the conducted interviews. (b) Semi-structured interviews conducted during different phases of the program implementation. (c) The automatically generated logfiles capturing the occurrence of actions or events and (d) the teachers' reports about their students achievement. The various data were analyzed by using quantitative and qualitative methods such as *Social Network Analysis* (SNA) (Martinez et al. 2003) and data triangulation. SNA was used in studying many asynchronous communications and interaction parameters.. Data triangulation that leads to an increase of evaluation reliability was possible in many cases. Quantitative data were also used to account for, and to relate them with qualitative categories. Thus, our overall evaluation approach can be considered as a mixed one (Frechtling and Sharp, 1997).

What was difficult to measure was the degree of obtained *knowledge*; appropriate *Likert*-scale questions were answered by tutees and tutors and interpretation of interview results were also taken

into consideration. In some cases fact-based data could affirm these results, such as SNA parameters, or the accomplishment of a task that required certain *abilities* and *knowledge* by the tutees, which were not known as existing before the lesson implementation. Another way of *indirectly* measuring the degree of *knowledge* obtained was the comparison of answers concerning issues that were dealt with during a lesson, given prior and after the implementation of a lesson. Yet, such interpretations were not quite straightforward because some tutees attended simultaneously more than one lessons and many lessons required similar tasks, even if the content differed. The assessment was measured as an average of several answers (to *Likert*-scale questions of 1-5) given by tutors and tutees concerning each lesson. Based on the analysis of the data collected, *the most successful lessons* were the ones that: a) had a high degree of *communication* and *interaction* among the participants, b) focused on cooperation, negotiation and flexibility during their conduction, and c) had a highest degree of chat-use in comparison to the other lessons. It is worth noting that, SC was initially designed to be used as a means of decision making, team building, learning, brainstorming and reflection. However, in successful lessons chat was used to form a high degree of commitment among the trainees, since decisions were made through mutual engagement and negotiation, and also a high degree of cooperation, interaction and flexibility. The analysis of SC that took place in the most successful lesson of the program, that used chat more than any other lesson in STLC, is presented in the next section.

Analysis of Synchronous Communication in the most successful lesson

The most successful lesson of the program was coded as 'MATH1' and entitled "*The use of Cabri - Geometry software in order to assist the learning of geometrical concepts*". Twelve trainees participated in this lesson while 9 of them successfully accomplished all its learning activities. All of the trainees were secondary and primary education mathematics' teachers, while the trainer was an expert in using *Cabri Geometry software* in mathematics education. This lesson lasted 6 weeks. During the conduction of MATH1, all available means of communication, i.e. email, forum, bulletin boards and chat were used in supplementary ways and for different purposes.

In MATH1, e-mail was used for personal communication and exchange of information/work among trainees of the same group; asynchronous messages were mainly used to inform trainees or to make a public discussion that was not urgent. Discussions that took place in the MATH1-chat room usually were direct, less formal and friendlier. In MATH1, chat was used: a) as a means of acquaintance, of entrustment, of team building, of creating a *Community of Learners* socially attached to each other. Many chats were effectively used in this lesson in order to create the desired bonding, trust, even friendship and this social use of SC was the primary purpose of the trainer, b) to organize the lesson and achieve the desired flexibility, c) for negotiation and decision making whenever a substantial number of trainees could attend a synchronous discussion, d) for learning, in terms of explaining something, exchanging ideas, giving extra information, directing trainees, etc., all done in real time with a high degree of participation.

The role of e-moderator. The trainer used SC in order to practice both *High* and *Low* e-moderation. *Low* e-moderation was practiced mostly through the social dimension of SC that took place as well as through the continual encouragement of the trainees to keep working and participating. *High* e-moderation was practiced mostly through the other uses of chat, i.e. during discussions that were aiming at explaining, directing and promoting the dialogue.

During the 6 weeks of MATH1, nine synchronous discussions took place. These were organized by the trainer and in which the trainer participated. In each chat performed, *social*, *organizing* and *learning* purposes were simultaneously present in a certain degree. All these synchronous discussions are briefly presented in Table 1. These discussions can be separated in two different phases regarding with the lesson conduction. During the first phase, three chats took place and only few trainees participated. During this phase the trainer tried to establish social bonds, trust, mutual commitment and even friendship among the trainees. Also *Low* e-moderation was mostly practiced by means of encouragement and motivation.

During the second phase, the social bonds were established and a *Community of Learners* socially attached to each other had been created. SC became the primary means of communication in the lesson conduction. It was used to design learning activities, to decide about the goals and the context of the lesson, to negotiate, to learn, to assess, to reflect, etc. Participation in synchronous discussions was much higher than in the previous phase while asynchronous communication was rarely used. *High* e-moderation was mostly practiced.

As shown in Table 1, there was a significant break between the two phases. This was due to Christmas vacations and therefore it was important during the first chat of the second phase to emphasize social issues in order to re-establish the bonding that was loosened during the break.

Table 1: The synchronous discussions that took place in MATH1

No	Date	Participating trainees	Purpose of Discussion	Phases of chat use
1	5/12/2003	4	Mostly social	1st phase: mostly *Low* e-moderation, social bonding.
2	9/12/2003	6	Social and organizing learning activities	
3	15/12/2003	7	Social and organizing learning activities (decision making – creating groups)	
4	12/1/2004	9	Mostly social and planning activities	2nd phase: mostly *High* e-moderation, negotiation, decision making, learning, reflection, assessment.
5	14/1/2004	8	Social and learning (assessment and encouragement)	
6	19/1/2004	10	Mostly organizing the last activities	
7	22/1/2004	6	Mostly learning (assessment of activities)	
8	26/1/2004	8	Mostly assessment of activities and reflection	
9	2/2/2004	11	Reflection and assessment. Social (farewell)	

An interesting fact was that not even one of the trainees had ever used any form of SC before participating in MATH1. By studying the data regarded the use of SC in MATH1, we can conclude that the trainer took full advantage of the potential of SC and cautiously proceeded in using this service more and more, for social purposes as well as for learning and organizing the lesson.

Qualitative analysis of synchronous discussions in MATH1

As previously mentioned, a mix of quantitative and qualitative methods was used during the analysis of SC that took place in MATH1. Taking into account Quantitative Content Analysis techniques (Chi, 1997; Murphy and Collins, 1998; Kapur, Voiklis and Kinzer, 2005), an interaction coding scheme was used to segment and code interactions. Emphasis was given to the trainer's comments, because through these comments was e-moderation exercised. According to our analysis scheme the language used by the trainer in the SC of the lesson is categorized in 4 categories and a few more sub-categories.

A: Social Language. This category contains the following sub-categories: a) greetings, eg. *"hello John"*, b) chitchats, e.g. *"tell me what is going on at home"*, c) humor that could be a *joke*, and d) thanking, e.g. *"Thank you Klio"*.

B: Encouragement Language. This category contains the following sub-categories: a) pure encouragement, e.g. *"good work Kostas,"* or *"you can do it!"*, and b) promise as a motivation e.g. *"I promise I'll do it if you do your work"*.

C: Learning Language. This language was used to promote learning. Many sub-categories exist in this category: a) questions promoting the discussion, e.g. *"What is your opinion about the environment?"*, b) design, e.g. *"Combining the problem A with problem B, we may could conceive a more interesting project for students"*, c) clarification, e.g. *"That is wrong. What I meant was that we need educational activities at school."*, d) explanation, e.g. *"In order to do this I create a circle, then I click with the right button of the mouse on.... ."*, e) providing information, e.g. *"Tassos, you have to know that this book has many exercises"*, f) direction, e.g. *"Now you have to prepare this learning activity until Monday"*, g) proposal, e.g. *"If every one of us makes 10 exercises and we put them all together we could have at least 100! What do you think?"*, h) retrospection, e.g. *"I remind you what we have decided: two activities must be ready by the end, etc…"*) and i) conclusions, e.g. *"Therefore we can conclude that the software is friendly"*.

D: Negotiation Language. This category contains the following sub-categories: a) question for negotiation, e.g. *"If you agree, answer me with a YES"*, b) agreement, e.g. *"I definitely agree with you."*, c) wonderment, e.g. *"Are you a visitor?"*, d) test, e.g. *"This is a test, ignore the message"* and e) request, e.g. *"Please Stavros, do arrange that meeting for Spring."*.

In Table 2, the frequency of appearance of each of the above mentioned categories and sub-categories of language used by the trainer in every chat is presented.

Table 2: The frequency of appearance of all language categories used by the trainer in MATH1

Categories of language used	chat1	chat2	chat3	Chat4	chat5	chat6	chat7	chat8	chat9
Category A: Social Language									
A1. Greeting	10	6	10	3	4	7	8	13	11
A2. Chitchat	5	4	5	0	1	0	3	5	18
A3. Humor	1	0	5	0	0	2	3	6	2
A4. Thanking	0	1		0	0	0	0	1	0
Total	16	11	20	3	5	9	14	25	31
Category B: Encouragement Language									
B1. Encouragement	9	17	27	0	13	13	17	24	14

B2. Promise	0	0	0	0	0	4	2	0	1
Total	9	17	27	0	13	17	19	24	15
Category C: Learning Language									
C1. Question promoting dialogue	18	17	18	4	5	5	15	15	15
C2. Design	5	1	4	1	0	0	1	3	1
C3. Clarification	5	7	0	0	0	1	2	1	0
C4. Explanation	0	10	3	1	0	11	0	3	1
C5. Providing Information	5	5	1	0	2	8	1	1	3
C6. Direction	6	11	18	3	8	22	15	12	8
C7. Proposal	1	15	16	3	3	7	5	4	5
C8. Retrospection	1	1	0	0	0	1	1	1	0
C9. Conclusion	6	13	11	3	4	14	6	5	6
Total	46	80	71	15	22	69	46	45	39
Category D: Negotiation Language									
D1. Question for negotiation	0	0	3	0	0	8	0	0	3
D2. Wonderment	0	4	15	1	1	1	6	4	7
D3. Agreement	2	1	4	1	1	7	3	3	11
D4. Test	1	0	0	0	0	0	0	2	0
D5. Request	0	0	4	1	0	2	0	0	0
Total	3	5	26	3	2	18	9	9	21

In order to exercise *High* e-moderation, the C language category was mostly used by the trainer, with comments that were supposed to help trainees learn through clarification, explanation, conclusion, retrospection and by giving information. *High* e-moderation was exercised by designing activities, proposing and directing the trainees. The sub-category of questions applied in order to promote dialogue could be considered *Low* or *High* e-moderation depending on the information given or the way the question was expressed. Low e-moderation was mostly practiced through the use of the other language categories and especially through category B which was used for encouragement.

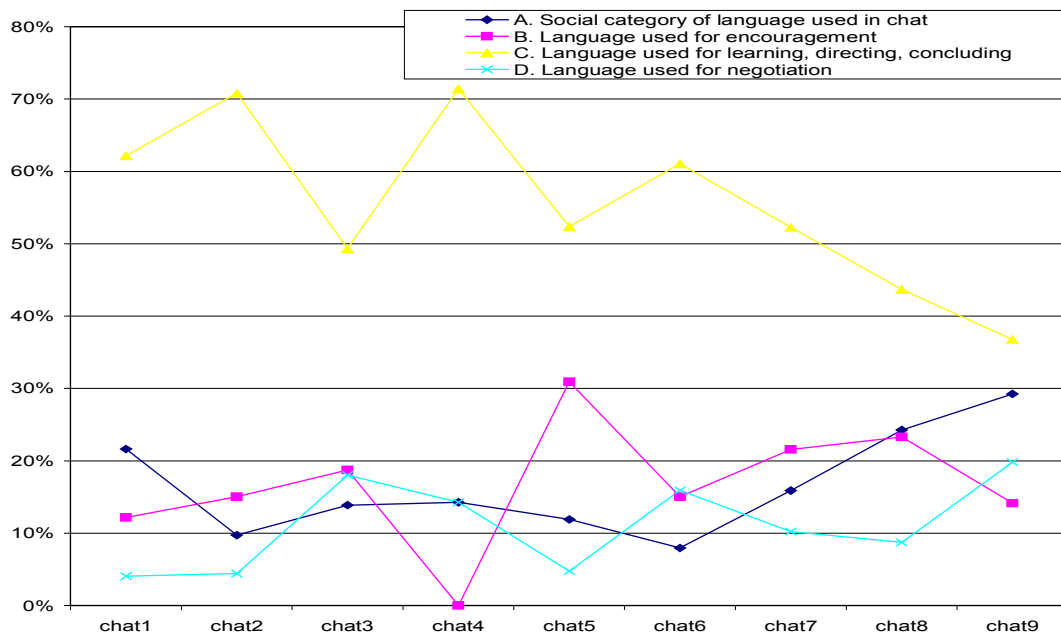The Figure 1 presents the percentage of language categories used by the trainer in each chat.

Figure 1: Percentage of language categories used by the trainer in each chat

The main points derived from the analysis of the language used by the trainer (Figure 1) in each chat are:

- *Social language* was used in a high degree during the first chat (over 20% of the overall language used in that chat). This was needed in order to initiate the process of establishing

social bonds, trust, mutual commitment and even friendship among the trainees. A substantial percent (higher than 10% in most cases) of the language used, had a social nature in all of the synchronous discussions. The levels of social language used became high, even higher than the first chat (close to 30%) during the last two discussions. This was due to the bondage that had been created between the trainer and the trainees and the accomplishment of the lesson goals that left more time for socialization.

- *Encouragement language* was given at a regular basis with one exception. During chat4 no use of language of encouragement was done by the trainer. During this particular chat emphasis was given to the re-organizing the lesson after the Christmas' break. The language used mostly in that discussion was that of direction and proposal and it was the briefest discussion of all. *High* e-moderation was mostly used in that period in order to drive the trainees back to the right working path.

- *Negotiation language* was used in all discussions. In the first two chats it was used in a lower degree than average because the participation was small in those discussions and other means of communication (asynchronous) were also used during this period.

- *Learning Language* was used in a high degree in most synchronous discussions. As previously mentioned, this language was the basis for exercising *High* e-moderation (with the exception of subcategory C.1 *question in order to promote the dialogue*, which could be also considered *Low* e-moderation). The use of this type of language normally declined during the last three synchronous discussion sessions, because the lesson was ending, its goals had been achieved and mostly assessment and reflection was needed.

- The categories of the language used were balanced in all synchronous discussions performed in the context of this lesson. In all cases the discussions served social and learning purposes to a certain degree. Moreover, the use of *High* and *Low* e-moderation was also balanced in a high degree. *High* e-moderation was related to subcategories C2 to C9 and that was an average of 41%. *Low* e-moderation was related to categories A, B and D with a total percent (for all three categories) of 44% as an average. C.1 *question in order to promote the dialogue*, which could be considered *Low* as well as *High* e-moderation was used at an average of 15%.

Conclusions

A *'School-Teacher's Learning Community'* providing with 18 different electronically supported lessons was conducted. Many different means of communication, asynchronous and synchronous, were provided. The analysis of the data shows that the most successful lessons, both according to trainers and trainees, were the ones that: a) had a high degree of *communication* and *interaction* among the participants and b) focused on cooperation, negotiation and flexibility during their conduction. SC was used in a higher degree in most successful lessons than in less successful ones. SC was proven very effective as a means of decision making, team building, learning, brainstorming and reflection. In successful lessons SC was also used to form a high degree of commitment, cooperation, interaction and flexibility.

A significant fact regarding the use of chat in the most successful lesson (MATH1) was that no one of the trainees had ever used any form of SC before participating in this lesson. Yet, it became the primary means of communication in the lesson conduction and was also linked to the great success of MATH1. This was due to the appropriate use of chat by the trainer and especially to the mindful and gradually increasing use of it in two lesson phases. During the first phase the trainer managed to establish social bonds, trust and mutual commitment among the trainees. During the second phase, SC became the primary means of communication in the lesson conduction and it was mainly used for negotiation, decision making, learning, reflection, assessment as well as to keep up the social bonding. Four distinct language categories (A, B, C, D) and several sub-categories used by the moderator of MATH1:

- A: *Social language* used in all discussions in order to establish social bonds, trust and mutual commitment among the trainees.
- B: *Language used for encouragement and motivation*
- C: *Language used to promote learning*
- D: *Language used for negotiation*.

Language categories A, B and D were mostly used in order to exercise *Low* e-moderation. On the other hand, most of language category C (not all subcategories) was used in order to exercise *High* e-moderation. The language used in the synchronous discussions of this lesson was balanced. Moreover, the use of *High* and *Low* e-moderation was also balanced.

References

Aoki, K. (1995). "Synchronous multi-user textual communication in international tele-collaboration," Electronic Journal of Communication, Volume 5, Number 4, at http://www.cios.org/getfile\AOKI_V5N495

Barnes, B. (1986), "Evaluation of learning activity in voluntary organisations", University of Lancaster, Reproduced from 1986 Conference Proceedings, pp. 151-155, SCUTREA 1997

Britain S., Liber O., (1999), "A Framework for Pedagogical Evaluation of Virtual Learning Environments", University of Wales – Bangor, JISC Technology Applications Programme

Calder, J. (1994), "Programme Evaluation and Quality", London: Kogan Page

Chi, M. T. H. (1997). "Quantifying qualitative analyses of verbal data: A practical guide." The Journal of the Learning Sciences, 6(3), 271-315

Coates, G. (1998), "Chat Rooms And The Art Of Being There While Somewhere Else", University of Leicester, http://www.leeds.ac.uk/educol/documents/000000666.htm (last retrieved January 2006)

Cohen, L. and Manion, L. (1989), "Research Methods in Education", Routledge, London.

Frechtling, J., Sharp, L., (1997), "User-Friendly Handbook for Mixed Method Evaluations". Directorate for Education and Human Resources Division of Research, Evaluation and Communication NSF.

Harasim., L., Hiltz, S.R., Teles, L and Turoff, M., (1995), "Learning Networks: a field guide to Teaching and Learning Online", MIT Press, Cambridge.

Johnson, D.W. and Johnson, R.T., (1987), "Learning together and alone", Prentice Hall, Englewood Cliffs NJ.

Jonassen, H.D., Carr, C. and Yueh, H-P., (1998), "Computers as Mindtools for Engaging Learners in Critical Thinking", Tech Trends, vol. 43(2), pp. 24-32.

Kapur, M., Voiklis J. and Kinzer C. (2005), "Problem solving as a complex, evolutionary activity: A methodological framework for analyzing problem solving processes in a computer-supported collaborative environment", International Conference on Computer Supported Collaborative Learning: CSCL 2005. Taipei.Taiwan.

Martinez, A., Dimitriadis, Y., Tardajos, J.,Velloso O. & Villacorta, M. (2003), "Integration Of SNA In A Mixed Evaluation Approach For The Study Of Participatory Aspects Of Collaboration", ECSCW'03 Workshop on Social Networks, 14-18 September, 2003, Helsinki, Finland (W5 Moving From Analysis to Design: Social Networks in the CSCW Context), http://www.ischool.washington.edu/mcdonald/ecscw03/papers/martinez-ecscw03-.pdf, (last retrieved January 2006)

McMillan, D.W. and Chavis, D.M., (1986), "Sense of community: a definition and theory", Journal of Community Psychology, vol. 14 (1), pp. 6-23.

Motteram, G. (2001), "The role of synchronous communication in fully distance education". Australian Journal of Educational Technology, 17(2), 131-149. http://cleo.murdoch.edu.au/ajet/ajet17/motteram.html

Murphy, K., Collins, M., (1998), "Development of Communication Conventions in Instructional Electronic Chats", in Journal of Distance Education, 12(1/2), 177-200.

Palloff, R.M. and Pratt, K., (1999), "Building Learning Communities in Cyberspace: Effective strategies for the online classroom", Jossey-Bass Publishers, San Francisco.

Rovai, A.P., (2001), "Classroom community at a distance: A comparative analysis of two ALN-based university programs", The Internet and Higher Education, vol. 4, pp. 105-118.

Vlachopoulos P. & McAleese R., (2004), "E-moderating in On-line Problem Solving: a new role for teachers?", in (Eds) M. Gregoriadou, S. Vosniadou, C. Kynigos & A. Raptis, Proceedings of 4th Hellenic Conference with International Participation, on "ICTs in Education", Athens, vol.1, pp. 399-406.