



Successful e-courses: the role of synchronous communication and e-moderation via chat

Successful
e-courses

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Abstract

Purpose – This study investigates: what kind of e-moderation is more effective in the formation of successful web-based courses, and 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 a five-month learning experiment that took place in the context of an e-learning community consisting of 18 e-courses dedicated for primary and secondary school teachers. About 59 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 a case study. Various data (quantitative and qualitative) were collected from both trainers and trainees regarding the teaching and learning which took place within the context of e-learning community. These data were quantitatively and qualitatively analyzed.

Findings – The analysis of the data shows that: the role of SC is crucial for the formation of successful e-courses. Four categories of language used that constitute effective SC via chat, applied by an e-moderator, were identified: social, encouragement, learning and negotiation.

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

Keywords E-learning, Communities, Communication, Teachers, Training

Paper type Research paper

Introduction

E-learning environments are considered by many researchers (McMillan and Chavis, 1986; Harasim *et al.*, 1995; Palloff and 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 *et al.*, 1998). 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 and 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 (e-mail, 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 relate 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 and McAleese, 2004):

- (1) low or non-directive moderation style, when trainers intervene with trainees in order to help them “reflect” while progressing their discussions; and
- (2) 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:

- what kind of e-moderation is more effective in the formation of successful web-based courses; and
- 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 18 e-courses dedicated for primary and secondary school teachers. Such an investigation has not yet been reported.

The paper is organized 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 on, the characteristics of SC in the implementation of a successful e-course are demonstrated, and 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 in teachers’ every day practices. STLC consisted of 18 different electronically supported courses. About 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 e-mail 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™ 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 regarding 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 these methods into account 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; and
- 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:

- *e-Questionnaires*. Appropriate Likert-scale questions were taken into account and the answers were matched up to comparative results of the conducted interviews.
- Semi-structured interviews conducted during different phases of the program implementation.
- The automatically generated log files capturing the occurrence of actions or events.
- The teachers’ reports about their students achievement.

The various data were analyzed 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:

- had a high degree of communication and interaction among the participants;
- focused on cooperation, negotiation and flexibility during their conduction; and
- had the 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, successful chat lessons were 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, which 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". Of the 12 trainees participated in this lesson, nine 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 six weeks. During the conduction of MATH1, all available means of communication, i.e. e-mail, 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:

- As a means of acquaintance, of entrustment, of team building, and to create 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 and friendship, and this social use of SC was the primary purpose of the trainer.
- To organize the lesson and achieve the desired flexibility.
- For negotiation and decision making whenever a substantial number of trainees could attend a synchronous discussion.
- For learning, in terms of explaining something, i.e. 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 six 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 I. These discussions can be separated in two different phases regarding the lesson

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

Table I.
The synchronous discussions that took place in MATH1

conduction. During the first phase, three chats took place and only a 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 and 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 I, 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.

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 regarding 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 were 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 *et al.*, 2005), an interaction coding scheme was used to segment and code interactions. Emphasis was given to the trainer's comments, because through these comments e-moderation was exercised. According to our analysis scheme, the language used by the trainer in the SC of the lesson is categorized in four categories and a few more sub-categories:

- (1) *Social language*. This category contains the following sub-categories:
 - greetings, e.g. "hello John";
 - chitchats, e.g. "tell me what is going on at home";
 - humor that could be a joke; and
 - thanking, e.g. "Thank you Klio".
- (2) *Encouragement language*. This category contains the following sub-categories:
 - pure encouragement, e.g. "good work Kostas" or "you can do it!"; and
 - promise as a motivation, e.g. "I promise I'll do it if you do your work".
- (3) *Learning language*. This language was used to promote learning. Many sub-categories exist in this category:
 - questions promoting the discussion, e.g. "What is your opinion about the environment?";
 - design, e.g. "Combining the problem A with problem B, we may could conceive a more interesting project for students";

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- clarification, e.g. “That is wrong. What I meant was that we need educational activities at school”;
 - explanation, e.g. “In order to do this I create a circle, then I click with the right button of the mouse on . . .”;
 - providing information, e.g. “Tassos, you have to know that this book has many exercises”;
 - direction, e.g. “Now you have until Monday to prepare this learning activity”;
 - proposal, e.g. “If every one of us makes ten exercises and we put them all together we could have at least 100! What do you think?”;
 - retrospection, e.g. “I remind you what we have decided: two activities must be ready by the end, etc . . .” and
 - conclusions, e.g. “Therefore, we can conclude that the software is friendly”.
- (4) *Negotiation language*. This category contains the following sub-categories:
- question for negotiation, e.g. “If you agree, answer me with a YES”;
 - agreement, e.g. “I definitely agree with you”;
 - wonderment, e.g. “Are you a visitor?”;
 - test, e.g. “This is a test, ignore the message”; and
 - request, e.g. “Please Stavros, do arrange that meeting for Spring”

In Table II, 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.

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 (Figure 1).

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 per cent 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 per cent (higher than 10 per cent 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 per cent) 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 on a regular basis with one exception. During chat4 no use of language of encouragement was done by the trainer.

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

Table II.
The frequency of appearance of all language categories used by the trainer in MATH1

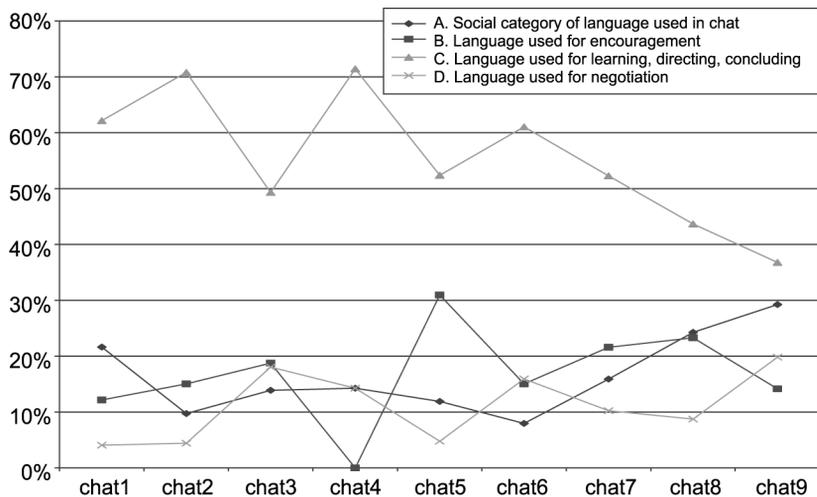


Figure 1.
Percentage of language categories used by the trainer in each chat

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 to 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 C1 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 per cent. Low e-moderation was related to categories A, B and D with a total per cent (for all three categories) of 44 per cent as an average. C1 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 per cent.

Conclusions

A STLC providing 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:

- had a high degree of communication and interaction among the participants; and
- 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 to be 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 not 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 gradual increasing use of it over 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 were used by the moderator of MATH1:

- (1) A: social language used in all discussions in order to establish social bonds, trust and mutual commitment among the trainees.
- (2) B: language used for encouragement and motivation
- (3) C: language used to promote learning
- (4) 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.

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