A COMPARISON OF ONLINE COMMUNICATION IN DISTANCE EDUCATION AND IN CONVENTIONAL EDUCATION

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Abstract *– Many advantages can be achieved using online support for university teaching, such as resource economizing and making courses available independent of time and locations. The online communication between students and teachers lead to both new problems and new opportunities. To investigate this wemadee a comparison and evaluation of two versions of the same short course. The course "Planning and design of web sites" is given at Chalmers University of Technology, Chalmers Lindholmen University College, both as a conventional course (ordinary lectures and workshops at location with online support) and a distance course (fully online). All students use the same web site, which have functionality such as coursework, exercises, newsgroup, chat, etc. Interviews with teachers and students, as well as an inquiry, formed the basis for the evaluation. The evaluation shows that the time asynchrony was considered the most important advantage of the Computer Mediated Communications. We have also found that the distance course students were more satisfied with what they had learned and the web site functionality. We thus concluded that the students in the fully online education adapted better to learning in the digital environment.*

Index Terms – Chat, Computer Mediated Communication, Newsgroup, time asynchrony.

INTRODUCTION

Important aspects of Computer Mediated Communication

At Chalmers University of Technology we are currently emphasizing on learning in digital environments and it's importance for the MscEng programs and other programs. Chalmers Medialab is conducting research and education in the area for the benefit of this development within the university.

The communications between teachers and students can be considered one of the most important aspects of learning. This is also applies to learning in a digital environment. Computer Mediated Communication (CMC), which enables the participants to communicate online, is therefore one of the most important components of computer assisted distance education. Depending on how the education is conducted, CMC is in some cases the only means for the students to contact the teachers and other students. Usually, CMC implies the use of written communication. When comparing written and spoken communication, several important differences exist when it comes to advantages and disadvantages.

How the research has been conducted

We had the opportunity to compare the use of CMC in two different versions of the same course. The course "Planning and design of web pages" was given both as a distance education and as a more conventional education with lectures and laboratory assignments.

We have done a review of the current literature about CMC, carried out course evaluations each semester, and interviewed five of the teachers and seven students from the courses in fall 2000. We evaluated transcripts of online communications, the course web portal, and results from student assignments. Since two of the authors, Thommy Eriksson and Alois Goller, participated in the course as teacher and examiner, they also had the opportunity to evaluate their own experiences from the courses.

A complete overview of these results, including a copy of the course web site, interview transcripts, interview video clips etc., are available on the web at http://www.medialab.chalmers.se/php/lindholmen

A REVIEW OF THE EVALUATED COURSE

Course in web production at Chalmers Lindholmen

Chalmers Lindholmen University Collage is a part of the Chalmers University of Technology, Göteborg, Sweden. The continuing professional development program at Chalmers Lindholmen includes the part time course "Planning and design of web pages" (code LSP140). The course totals in two ECTS (approx. three weeks), but is given part time during nine weeks. The course gives a holistic approach to the knowledge and skills required to produce web sites, as well as about aspects such as marketing on the Internet, project management, web design, HTML, and programming.

Student characteristics

The course aimed at people working at small and medium-sized companies (SMEs). About 60% of the students came from this category, the others were younger MSc/Eng students at Chalmers University of Technology. Generally, the students participating in the course had diverging

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academic backgrounds. About 70% had previously produced simple web pages. The number of participating students each semester ranged from 25 to 40. The number of drop-outs was 25% (distance) 29% (conventional), respectively. For 90% of the distance education students this was the first time they participated in a distance education.

Both the distance education and the conventional education had students from the same geographical area, primarily the city of Göteborg (population 500,000) with suburbs and neighboring towns.

Organic development of the course

The course "Planning and design of web pages" started in the fall of 1997 as a conventional course. Since then, it has been given seven times. Each semester, the course was gradually developed adding new approaches, new content or new technology. In the fall of 1998 the first simple course web site was used, and in the fall of 1999 the distance education started. Also, in the spring of 1999 and 2000 a continuation course was held as a conventional education.

Each semester, e-mail has played a vital role as a dominating technology for CMC. Furthermore, we used a web forum in spring 1999, a web chat with some success in fall 1999, and a usenet newsgroup in 2000.

Both the distance and the conventional education have used the same course web site and CMC applications.

The final concept of the course

The course as it was conducted in the fall off 2000 can be considered the latest step in its gradual development, but not necessarily the last step that could be taken.

The course web site included a news bulletin board, schedule, glossary, a web-based textbook, quiz questions, assignments, assignment submission, overview of assignment results, and a newsgroup (earlier versions also included a web chat and student presentations). The teachers had an administration interface with web forms for updating the web portal and evaluating the assignments. The course web site was designed and built by the teachers themselves. Figure 1 and 2 shows the course web site.

The conventional education had lectures and hands-on assignments for 3 hours each Wednesday evening. The distance students met once in the classroom for a three hour course introduction. The students in both the distance and conventional education were given an assignment each Wednesday with a deadline the following Monday. Each time, a set of multiple-choice quiz questions had to be approved before the student could submit the weekly assignment. Both distance and conventional students participated in the same newsgroup. To start an initial debate in the newsgroup, a questions was posted by one of the teachers ("Why did the dot-com vendor Boo.com go out of business?"). It was mandatory to give at least one answer. The newsgroup was considered as an extra feature where students could debate or ask questions. In earlier courses the web chat had been used for chat sessions with the teachers for 30 minutes each Thursday.

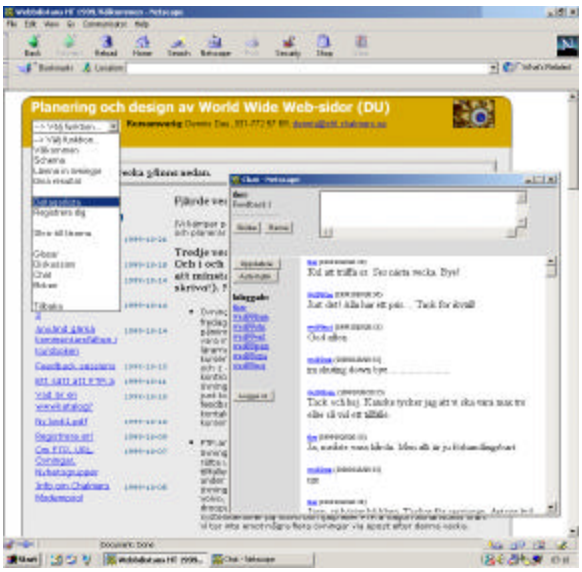


FIGURE. 1
SCREEN DUMP OF THE USER INTERFACE OF THE COURSE WEB PORTAL. IT SHOWS THE POP-UP MENU USED FOR NAVIGATION, THE CHAT WINDOW AND NEWS MESSAGES (IN THE BACKGROUND).

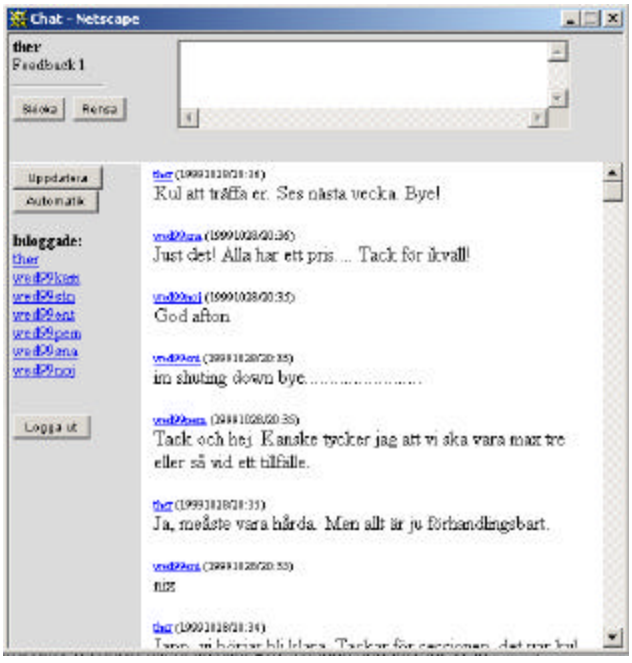


FIGURE. 2
CLOSE-UP OF THE CHAT INTERFACE OF THE COURSE W EB PORTAL.

DISCUSSION

Time asynchrony is the most important advantage

It is widely observed [1,2] that the advantage for students in distance education is that they can participate asynchronous both in time and place. The student interviews and course evaluations we have conducted clearly shows that it is the asynchrony in time which is by far the most important aspect. No students answered that it was a benefit to be able to study anywhere, but there where many spontaneous comments about the advantage of being able to study anytime. Especially the postgraduate emphasized this, and commented themselves that the reason was that daytime jobs and family constrained their freedom in time considerably. This is consistent with other research [3].

Also the teachers mentioned the advantageous asynchrony in time (all of the four teachers were engaged on a freelance basis and had other daytime occupations). Only one teacher once mentioned in the interviews that it was an advantage to be able to teach where ever they wanted.

Of course, this applies especially to the online communications between teachers and students, since all CMC technologies - except chat, video conferencing and similar real-time applications - are asynchronous.

One interesting observation is that both distance education and conventional education students appreciated the time asynchrony. However, it became evident in the interviews was that the distance students usually had chosen the distance education because of their lack of time and demanding daytime work.

CMC and course web portal demand more teacher resources in distance education

During most of the courses in 1999 and 2000 there has been quite a number of technical problems with the course web portal and the associated databases. Of course, a majority of the students commented and complained about, although no one considered the problems so severe that they hindered them in their learning. It was mostly considered an annoyance. A number of students also stated that they noticed a lack of communications between the teachers. The teachers confirmed this in their own interviews. Almost all of these problems can be referred to the lack of project management and time.

Setting up a distance education and especially building a course web portal takes a lot of time and is in greater need of project management then a conventional course, as has been observed by others [4]. Probably a project manager with responsibility for "production" should have been appointed.

Also, the CMC demands more time from the teacher in a distance education then in a conventional education [5]. At a first glance, CMC in a distance education could be mistaken for being a way to rationalize the teacher's involvement. In some way this is correct. One timesaving advantage with CMC, especially when using newsgroups or chat is that the teacher only need to answer a specific question once since all students can see both the question and the answer. Another expected timesaver is that students help each other, thus putting less strain on the teacher. Our evaluation of the online communication from the fall of 1999 supports this, but the effect is very small. About 30% of the questions in the newsgroup were answered by a fellow student instead of one of the teachers.

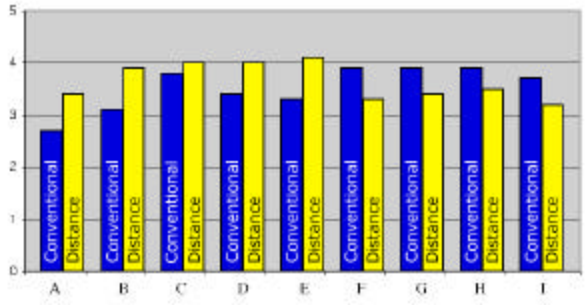
However, there are several reasons why CMC in most cases need more teacher resources. First of all, it takes longer time to write then to speak. Second, it is more difficult to get an overview of an online discussion with many participants when compared to "onplace" class lectures. Our own experiences clearly confirm this. During a class lecture we could, without trouble, have a class discussion with 30 students. But in the newsgroups we started to loose the general view and context when more then five students answered a question. When using chat, it was even more difficult to grasp the debate with five to seven participants. The reason for this probably is that chat is missing the threading of messages and that it is committed in real time. Thus it is more difficult to comprehend how the messages respond to each other.

One often mentioned advantage of the slow written communication in CMC is that the students take more time for reflection when debating [5,6,7]. Our experience confirms this. All students who participated in our online debate about the failure of Boo.com managed to give thoughtful comments with good insight in the topic. Similar debates during class lectures were usually shorter and more polarized.

The distance education students where generally more satisfied

When comparing the results from the students course evaluations, two small but obvious differences can be seen, as is shown in figure 3. When answering questions about their satisfaction with the course, the distance education students where generally more satisfied then the students participating in the conventional education. This despite the fact that they had as many complaints about technical problems with the course web portal etc. as the other students. When evaluating the distance education students spontaneous comments they also seem to be more satisfied.

Furthermore, they where generally less satisfied with the communication with the teacher. Several of the distance students commented that they never had the feeling of having a teacher present. For example, when being asked about their opinion about teacher performance, they had very few opinions. Other researchers have made similar observations [8]. We also asked the distance education students what they missed most compared to taking a conventional education. The most common answers were "the lectures" and "the assistants answering questions in the



A Are you satisfied with how much you have learned?
B What 's your general opinion about the course?
C What 's your opinion about teacher competence?
D What 's your opinion about web portal functionality?
E What 's your opinion about web portal content?
F What 's your opinion about communication with the teachers?
G What 's your opinion about the use of the newsgroup?
H What 's your opinion about peer-to-peer communication?
I What 's your opinion about teacher communication in the news-group?

FIGURE. 3
DIAGRAM SHOWING SOME OF THE RESULTS FROM THE COURSE EVALUATION ANSWERED BY THE STUDENTS PARTICIPATING IN FALL 2000.

laboratory assignments". Here it was obvious, and stated by some students, that when working with assignments the asynchronous distance education is quit disadvantageous. When the students encounter difficulties in doing an assignment, they need help as quickly as possible. When asking the questions in a newsgroup it can take hours or even a couple of days before they get an answer, which result in a loss of context (the student have to remember what the assignment was all about when she finally reads the answer) or even failure to submit the assignment before deadline. This was pronounced in our course since the students only had five days, including a weekend, to do the assignment. Especially students with daytime occupations experienced difficulties in meeting the deadline when their questions in the newsgroup were not answered quickly enough.

It is not surprising that the distance education students where less satisfied with the communication. Obviously they had fewer "natural" possibilities to communicate since they met each other and the teachers only once in real life. But why were they more satisfied in general? Why did they seem to have a more forgiving attitude to the technical problems? Could it be that the distance education students was more engaged in their own learning and had a more mature attitude towards their own learning and their own responsibility for it? Other researchers have proposed that distance education is best suited for more mature students [1,2]. As one of the teachers commented during the interview; "distance students are either very ambitious are just curious about how it is to study at a distance".

Distance education students participated less in CMC

When we compared the number of postings in the newsgroup used during the fall of 2000, we found that only 22% of the postings where from the students participating in the distance education. This is somewhat surprising since these students obviously would have gained more from the CMC then the students participating in the conventional education.

One reasonable explanation could be that the teachers in their real life meetings did more to encourage the use of the newsgroup when speaking to the class. This implies that in distance education, the online tutors need to exert themselves even more to encourage the use of online communication.

Online student presentation most useful in hybrid distance/conventional education

It was obvious during the interviews that the question about online student presentation was a bit controversial. During one semester we published portraits and personal presentation of the students on the course web site. Some students and several of the teachers had concerns about having student presentations. It was considered uninteresting, not relevant, and that it could be sensitive for some students to publish portraits. Other researchers have concluded that student presentations could give room for prejudices about gender, race, social status etc [9].

However, there were also positive comments about student presentations. It can give a better sense of presence when communicating with teachers or students online, if one knows how that person looks. This applies to both distance and conventional education. It was also stated that student portraits could be of value when CMC is used in a conventional education. The portraits and presentation thus become a bridge between the faces the students see in class and the names they see in the chat or newsgroup. This advantage is not applicable for CMC in a distance education.

CONCLUSIONS

- The most important and most surprising conclusion of the study is that the differences between CMC in the distance and the conventional courses were so small. Except for the differences mentioned, generally the comments from students were very similar regradless of which variant of the course they participated in. This could impliy that CMC is equally useful and has the same basic challenges regardless of the course format. One additional explanation could also be that the conventional course to a large extent was conducted as distance education. The students only met three hours each week and used the same course web portal and the same CMC applications. Maybe the differences would have been more accentuated if the distance education had been compared to a fulltime conventional education.

- Further surprising was that the distance education students where more satisfied with the course as a whole. We thus conclude that the students in the purely online education adapted better to learning in the digital environment.
- The distance education students where less satisfied with the online communication. They never experienced the teacher as being present and even felt alone. This implies that CMC must use technology that makes it possible to experience the presence of teachers, e.g. an indication on the course web portal which teachers are online and not, similar to ICQ.
- In future attempts the make the teacher present, careful consideration must be taken not to ruin the important advantage of time asynchronous distance education. Especially postgraduate students appreciate the possibility to learn and communicate whenever time is given.

Finally, we have a subjective personal reflection about our attitudes as teachers towards the students. When communicating online with the students we made no differences in how we interacted with the students. They got the same online attention and equal feedback on assignments (usually we never considered if the students was a distance student or conventional student). But when recapitulating the courses, it is mostly the students we have met in person who we remember. It was much more difficult to learn the names of the distance education students. It where as if they had never existed.

FUTURE PLANS

The course "Planning and design of web pages" is currently canceled. Chalmers Medialab will continue the research in issues regarding learning in digital environment. We will participate in a number of course development in the MScEng programs at Chalmers University of Technology, using both CMC and other applications. This includes several ongoing projects together with the School of Electrical and Computer Engineering. In August 2001 we will start a project together with the School of Mechanical and Vehicular Engineering and participate in the development of a preparatory course for the School Mathematical and Computing Sciences.

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