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## SYSTEMS FOR SUPPORTING GROUP LEARNING

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### A. INTRODUCTION

The focus within this guide is on the use of *asynchronous* computer mediated communication (CMC) systems for supporting group learning. That is, systems that allow groups to interact over time as well as over geographical location. This is a different type of interaction to that supported by videoconference or ‘chat’ systems, which allow people to be geographically dispersed, but require them to be present at the same time. E-mail, for example, is a simple form of CMC. Other examples of asynchronous computer conferencing systems are WebLearn discussion forums or web bulletin boards.

The main difference between e-mail and a CMC system is that the structure of a discussion is maintained in a coherent model without the user needing to do anything, making it suited to group-based interactions. With e-mail, messages arrive chronologically and are only grouped if the user takes time to put related messages into folders. Even where threading is supported by an e-mail system, discussion threads are often broken if the subject line is changed.

The main thing is not so much the specific system used, but that, given the potentials and limitations of this type of internet application, how do lecturers ensure that they use it in a pedagogically effective way. The following sections highlight the potentials and limitations of CMC; introduce some models for using CMC; describe examples of use of CMC at undergraduate and postgraduate level and present guidelines for effective implementation/integration of WebLearn forums to support teaching and learning.

### B. POTENTIALS

WebLearn forums allow learners to interact with one another *over time*. This time independence allows students to fit their on-line discussions around their other commitments and responsibilities. Different work patterns can be supported whilst still maintaining a feeling of community amongst the students and staff participating in the course. This is particularly pertinent where students are distributed around the world and potentially in different time-zones.

These systems retain a textual, permanent record of interactions, indicating to a user as they rejoin a discussion which comments have been added since the last time they were there. This is particularly useful if participants have not been able to join in due to, for example, working away, other commitments, or illness. It has been found that online environments are particularly useful for students for whom English is not their first language. They can take the time to check their understanding without ‘missing’

any comments as they may do in a face to face situation. They can also take their time to compose their replies without being under pressure as in a face to face situation.

Learning in an online environment can lead to deeper processing of material because time for reflection is allowed. Due to the textual record that is kept, people can refer back to things that were discussed earlier, and take their time to respond, perhaps researching their answer before putting it on-line.

WebLearn provides opportunities for groupwork that would not otherwise exist e.g. for distance learning students on programmes where all support is done remotely via mail, e-mail or phone/FAX. Where in a more traditional model of support learners may only be able to communicate with their tutor about the subject material and their assignments, use of CMC can allow peer discussion to take place also.

The flexibility over time offered by CMC can be extremely useful for on-campus students, particularly when they are engaged in groupwork. Getting groups to meet is notoriously difficult for staff as well as student groups. This is compounded all the more if these groups then have to meet with other groups.

### C. LIMITATIONS

Asynchronous online discussion is of course not a panacea. Since it is largely a text-based medium (although increasingly new systems support multimedia), there is a lack of expressive richness since no non-verbal cues exist to enhance what is being said, and in particular the way that something is being said. Comments can often appear more critical than intended and great care is needed when this medium is used to give feedback about students work.

The flexibility over time, whilst it has great benefit, can also be a problem for participants. It may be days, depending on the level of activity within a forum, before someone replies to a question.

Decision making can be difficult on-line, again due to flexibility over time and the notion that everyone can have their say in this environment. Strong chairing is needed to come to a conclusion in an on-line environment, although some systems support decision making with features such as voting.

The style of on-line communication has to be developed by the group. Different groups develop different norms and styles as they would in a face to face situation, but on-line communication is different in that it is not formal letter writing and neither is it a postcard. Also the level of discourse may be different for different areas of a system. For example, you would not expect students to communicate in a 'virtual café' in the same way that they would in an on-line tutorial. Sometimes these levels of discourse can be at odds as people continue in an informal way in a more formal area. One way to address this need to learn on-line behaviour is to use familiar face-to-face equivalents to give strong clues to participants about what is expected of them and the tutor in the on-line environment.

#### **D. MODELS OF USE**

A number of models have been identified to clarify the purpose and participants role in the on-line environment. The model in Steeples (1998) gives an overview of these models in increasing order of participant interaction.

##### **NOTICEBOARD**

This is the most simple use of CMC, where participants only have read access to the area and tutor's can post up messages. It has the advantage that participants can get used to moving around the virtual environment using a subset of the systems functionality. It can be seen as a gentle introduction for both staff and students to a system, since the roles and responsibilities of each is clear.

##### **QUESTION AND ANSWER**

This model is similar to that of a FAQ. This can be introduced to students as a route by which they can ask for help from the tutor and/or from each other. Typically this is a problem oriented dialogue, and has the benefit that tutors can see this from the questions that are asked what students real problems are with the course. These issues can then be addressed in class or tutorial time if a general misunderstanding has occurred. They may also form a useful resource for future cohorts of students, perhaps with the tutor pulling out the main points to be carried forward. It also provides a useful tool to tutors when redesigning the following year's course.

##### **ELECTRONIC DEBATE**

This takes the metaphor of the formal debate with a proposer for and against a motion to set the scene, followed by a general debate where all students are encouraged to participate. Two examples of debate models in use follow below.

##### **ELECTRONIC SEMINAR**

This discursive model can be used in a variety of ways and lends itself well to situations where students are all working through course material at a similar pace, for example, a typical on-campus undergraduate course. It is not so well suited to situations, e.g. as with some distance learning programmes, where students can be at a wide range of different points in the study material and so focussed discussion is problematic.

Different roles can be adopted here either by design or left to emerge. So, for example a tutor may decide that participants must each take a turn to initiate a seminar session (be the Leader), or it may be left to whoever is on-line first to initiate discussion about a particular reading.

##### **COLLABORATIVE LEARNING (OR LEARNING TO COLLABORATE)**

Online forums allow participants to work in ways that may otherwise be impossible due to constraints of time or location. It is also possible to encourage students to use the messages and schedules to coordinate tasks - breaking down a project into discrete tasks and using the virtual environment as a project management tool. Students can also be encouraged to collaborate on tasks - actually using the medium to achieve a

shared goal. Use of CMC allows project discussions and decisions to be made as a group, over time.

## GLOBAL LINKS

CMC offers the potential for 'visiting speakers' without the need to have the person physically present. For example it can be a way of involving authors of papers who may be based in other countries and unlikely in a traditional course, to be able to attend and debate their writing with students. Since virtual learning environments alleviate the need for them to travel and allows them to participate at a time and a place convenient to them, students can be exposed to global resources and people that would otherwise be unavailable.

## E. EXAMPLES OF USE

### UNDERGRADUATE

#### *Using CMC to support team-based negotiations*

In the Law department at Lancaster University, a second year course, Common Law of Obligations, has harnessed CMC to develop independent student learning. The essential feature of the learning environment of the course is that students should develop the ability to learn independently, rather than through (over) reliance on lectures or textbooks. However, such *independent student learning* is not an isolated individual activity. On the contrary, one of the key characteristics of the course is *collaborative learning*.

*Student Teams* are responsible for organising the preparation of work for the seminars and the presentation of the completed work. Teams are supported by regular consultation sessions with the course tutors (one of whom takes primary responsibility for each seminar group and the component teams). The Teams support *four elements* of the course design. *Firstly*, the development of team-working skills (with both written guidance and tutor support). *Secondly*, the creation of a framework for facilitating greater social integration of students from diverse backgrounds in the year cohort. *Thirdly*, the creation of a basic learning support structure through peer discussion. *Fourthly*, the creation of a motivational factor students are less willing to let down their team-mates than to let down the lecturers or a standard seminar group by failing to attend or to prepare work.

Second year undergraduates are formed into teams of 5-6 participants. These teams are then grouped into sets of four, with each team representing a different claimant or defendant in a legal case. Each set of four teams is then expected to negotiate an out of court settlement for their client within a period of 2 weeks, using the on-line CMC environment to conduct negotiations. In previous years this particular role play had been run in face-to-face sessions, with a final plenary used to try and agree a settlement.

This had been fairly chaotic, with tutors not having the benefit of being present at the negotiations leading up to the final plenary. Students also complained that it was difficult to get meetings arranged between the various teams due to other pressures on their time. As with all features of this course, the design is backed by the assessment design. 50% of the overall assessment is based on coursework assessment (CWA).

50% of the CWA (25% of overall assessment) is based on team submissions, the other 50% being based on individual submissions. The remaining 50% of the overall assessment is a standard 3 hour examination. Individual marks for team submissions are varied by peer evaluation of contributions, subject to tutor moderation. Students were provided with printed guidelines for the conferencing facilities and one introductory “training” session was provided at a lecture. Students had already been required to use the conferencing pages to post outline arguments for the Debate and Moot presentations at earlier seminars, so they were (or should have been) familiar with the medium. Each team was provided with its own private conferencing page as well as access to inter-team conferencing pages within its seminar group. The facts for the negotiation problem were provided only on the electronic ‘noticeboard’ (read-only access to students). Student reaction to using the system has, on the whole, been enthusiastic. Using the system has provided a number of advantages:

- staff have noticed an increase in the quality of interactions over the ‘face to face’ sessions previously used;
- the extent of independent student research conducted in arguing settlements among a proportion of the students was formidable;
- staff have been able to follow negotiations and step in when things are in danger of getting out of hand or going off track – impossible to do when groups were meeting away from the tutor;
- students have not been bound by time or location in order to conduct their negotiations. This has been particularly beneficial to students living off-campus. If they had their own PC, they could gain remote access to the University server and were able to participate from home using a standard web browser.

A corollary to this last point is that although groups have a designated group only area, this was rarely used, since the small team groups found it easy enough to meet. It was the inter-team interactions that the system was particularly helpful in supporting.

#### *Using CMC to support Collaborative Learning*

The overall aim of The Internet as a Tool for Collaborative Learning project was to establish an international student-based learning project around resources found on the Internet. Three volunteer teams of undergraduate students at Lancaster University (UK), at University College, Galway (Eire) and at Florida State University, Tallahassee (USA) together investigated a common problem by identifying resources available on the Internet and collaborating in their appraisal of those resources.

A support and discussion network was established using computer-mediated communications (CMC). This network allowed the four teams to engage in electronic discussions and share on-line multimedia resources. The network was a good medium for students to share things which they found of value and to comment upon such materials. The international collaboration was intended to promote the articulation and sharing of different viewpoints and contexts/cultural values that can aid ‘deeper processing’ of information, concept refinement and active engagement in the learning task. In addition, the acquisition of computer literacy, information seeking, communication and collaborative working skills were objectives supported in this project.

The project has been judged by its participants to be a success, finding it 'good fun' to take part, because it was 'interesting and different'. They have learned about communication online and about sharing information online while engaged in a real task. These tools have therefore been the *medium* for communication, not the message. They did begin to help each other with the task, and were beginning to gain confidence to ask questions of each other about the contributions each person made.

POSTGRADUATE

### **MA in Management Learning (MAML) -**

<http://www.lancs.ac.uk/users/manschool/depts/ml.htm>

One postgraduate professional development programme where CMC supports the central principle of the development of a learning community, is the 2-year part-time MA in Management Learning at Lancaster University. Participants meet as a large group at regular intervals for face-to-face workshops over the 2-year period. In between, whilst back at their own place of work, participants work in small groups called sets, typically of four to six participants. The purpose of the set is similar to that of an action learning set, where each person can bring ideas or problems to a set of peers to discuss and receive feedback and advice. In the case of MAML, participants are discussing their coursework, the topic or focus of which is identified by each individual student on the course i.e. there is no one 'essay title' which all students must address.

Participants can choose whether to meet face-to-face or use the virtual environment and there is usually about 50% of the course using the environment at any one time. The CMC environment allows the group to continue to share ideas, challenge preconceptions and support each others work throughout the periods of study away from the face-to-face sessions. The system is also used to support the collaborative assessment process that involves feedback from all set members about the work submitted.

### **Postgraduate Certificate in Learning and Teaching in Higher Education**

(<http://www.leeds.ac.uk/sddu/pgcert/index.htm>)

At the University of Leeds all participants on the PGcertLTHE take part in an online CMC debate. The 'thrilling courtroom drama' is an asynchronous group task designed to model a blended learning approach with changes of pace, place and players. It is particularly well suited to the rather 'formal' interface of the Bodington forums but it could be transferred to any other VLE.

The learning design centres around 'roles' an online asynchronous debate 'play' which supports and enhances the face-to-face teaching on the module. The debate runs for 6 weeks and participants take specific roles as proposers, seconders, debaters, whips and judges. A 'job description' is provided for each of the roles which outlines the progress of the 'play' and timetable of proceedings. An online debate room and judges chambers are provided for group working. The debate motion is presented to participants in the form: 'This house believes...' and the participants are divided into two opposing groups with three independent judges drawn from the group.

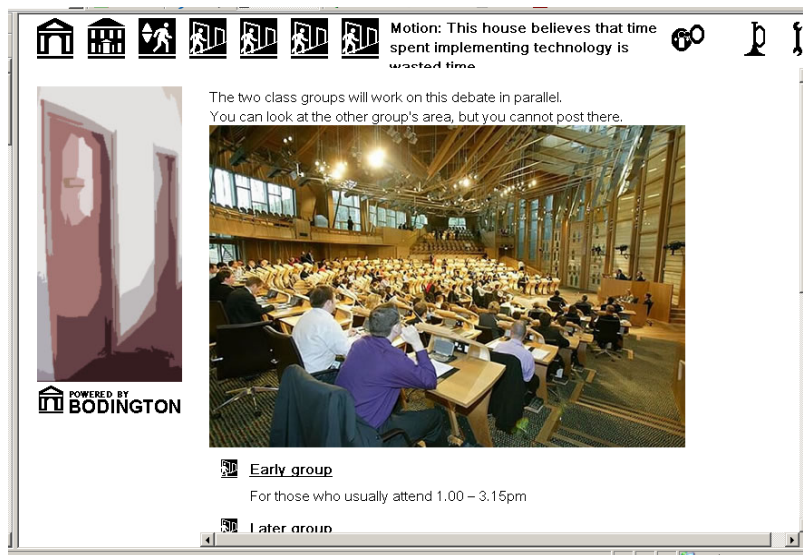


Figure 1: Screenshot showing the online discussion area including a illustrative photograph of the Scottish Parliament debate chamber (used with permission).

The group work towards a specified goal, using their role descriptions and the timetable of proceedings. Although there is quite a lot of preparation for the teacher before hand, while the debate is running, the responsibility for the process/success lies with participants and they make use of the tracking, monitoring and 'history' tools in Bodington to whip their teams into shape. The result is to create an online environment where the teachers 'voice' plays almost no significant role in progressing the task. This is a fascinating compliment to the face-to-face sessions during which the tutor is facilitating and talking with individual participants and groups for much of the session.

In the context of this masters level teaching it is important to recognise that participants come to the class with preconceptions and opinions which may be deeply entrenched. The task is designed for deep learning and knowledge construction, asking participants to call upon existing knowledge and to re-order their thoughts and test those in this new context. The vehicle of a debate encourages participants to search relevant literature to provide more than anecdotal evidence support their position. They are also involved in discussing their ideas with their team and hearing the opinions of others. The groups involved in this debate always bond during the task and this is reflected in the way they organise chairs and tables in the face to face sessions. The group identify their own criteria for assessing the success of the task. In addition to promoting group work and peer support online this debate has the advantage of building a lasting, peer reviewed knowledge base for the cohort as they bring and analyse evidence in support or opposition to the motion.

This is an assessed course, but participation in the debate is not specifically assessed. Each cohort have seen near complete participation. The only exceptions being participants who missed the first key face-to-face sessions and failed to bond with a team. By calling upon participants' competitive nature and enthusiasm for knowledge we are able to move beyond extrinsic motivation for participation in online tasks.

Feedback gathered from participants indicates that they find the task stimulating, challenging and enjoyable and that they see the relevance of the process as well as the activity.

*“When first outlined I wondered whether this task was going to be taken seriously by the participants. It seemed very ambitious. As a result, the degree of participation and quality of the contributions made in the on-line forums took me by surprise. It seemed that most participants took their own contributions very seriously and the whipping roles helped peers to encourage others in engaging with the task. The competitive element in the task also helped bond the two opposing groups in a united purpose and encouraged participation.”*

*“Best online task: certainly labour-intensive, but outcome much more obviously useful (others felt more like hoops to jump through though).”*

*“The online debate was a lot of work and was quite daunting initially, but I think it was an inspired and very valuable task – it certainly engaged me more than some of the ‘sit and listen’ sessions.”*

*“People did seem to engage with the online debate and most engaged with the literature. I think it was an interesting idea and one to repeat.”*

*“I think I see the debate as something which provided a structure to have more in-depth group work: a successfully complementary medium to the sessions, in which, due to the limitations of time, we don't have the opportunity for research before we bring our ideas together. It did something which we couldn't do in the face-to-face sessions (good use of technology ;-))”*

Feedback to review the nature of the task has also been gathered from experienced academic colleagues.

*“I liked the idea of the debate because it offered participants the opportunity to experience an exciting and different approach to learning. We are trying to encourage them to be innovative in their approaches to teaching and learning and this was a good example.”*

*“It provided an example of an appropriate use of technology to support face to face learning, an opportunity for you to 'practice what you preach'. The participants gained the opportunity to experience contributing to an online discussion for themselves and to take on different roles. You also gave them the opportunity to experience the thinking behind the task from design through to evaluation a valuable experience for PGCert participants.”*

*“I have read, and thoroughly enjoyed, the judgements. Certificate colleagues are to be congratulated for their contributions. I am left with the impression that the debate has caused (some) colleagues to analyse and evaluate the evidence – the literature- far more carefully and diligently than they would have without the incentive of the debate. And, as M-levelness is partly about analysis and evaluation of the literature...”*

Colleagues who are interested in trialling the model in their own teaching are welcome to the University of Leeds materials including role descriptions, debate storyboard, and indicative structure for delivery online in conjunction with face-to-face teaching.

#### **F. CRITICAL SUCCESS FACTORS**

Discussions with current users of various conference systems reveal a number of generic guidelines that can improve the experience of using conferencing for both lecturers and students and are summarised below:

##### **EDUCATIONAL PURPOSE**

The educational purpose for which the system will be used should be simple in the first instance while tutors and students get used to the system (e.g. posting notices, clarification of concepts covered in a lecture, discussion on readings etc.). The educational purpose should be clearly articulated by the lecturer so that participants know what is expected of them and what to expect of their tutor, during the life of the conference.

##### **NEED**

People need to see a real purpose for computer-based discussions (i.e. one important to them and their learning) before they will use the system in meaningful ways. Although some learners are fascinated by the technology in its own right, tutors should state clearly the benefits that conferencing can offer to learners and to tutors.

##### **TRAINING**

Initial training in the use of a system; the practicalities of reading items, responding to them and navigating around them, is seen as critical for getting use of the CMC system off to a flying start. Guidance in good practice, about how to contribute, can also be useful (e.g. don't put in a 10 page essay since it is highly unlikely that people will read it all). Naidu et al (1995), also sees this initial training as important, but adds 'it is also certain that training up-front in the use of CMC will be insufficient.' He suggests that technical support and help should be available continuously throughout the duration of a course involving online discussion.

##### **INFORMATION OVERLOAD**

Participants should not be faced with a huge amount of information in the conference the first time that they join it. The temptation can be to provide a significant number of items and responses so that it looks as though the conference is thriving. However, participants experience information overload fairly quickly and will be put off. It is better to have just one or two items (e.g. one for people to introduce themselves and a first discussion topic) that people see on joining the conference. More items can easily be added later, once new participants feel confident moving around the system.

In addition, although previous courses may have used a conference and left the material available to new cohorts, it is best to provide this in a different, probably read only, conference. Alternatively, tutors may decide to draw out the most interesting elements of a discussion, to make them available for future students. Although this is clearly applying a tutor's interpretation upon the discussion it is a useful way of

repurposing discussions amongst peers, to make materials available for future students.

## HEADINGS

The topic or item headings are the first indication of the purpose of an item. They should be used to give a clear message about this purpose. For example, 'Discussion of Readings Weeks 1 & 2' is better than just 'Readings', since it gives an idea of the purpose of the item (discussion) and the topic (readings weeks 1 & 2). It also provides a sense of the cadence of the item - that it will probably last 2 or 3 weeks, since different readings for further weeks will be discussed in another item. Another example is to have a Coffee Bar item - giving strong clues that this is a space intended for the more social aspects of the course. Incidentally, creating a Cafe item also acknowledges to learners that the tutors who have organised the conference do value the social dimensions of learning.

## INITIAL ITEMS

The initial item placed under a topic or item heading should give participants guidance on how contributions are expected to be made to that item. In the first example above (Discussion of Readings Weeks 1 & 2), the first item could suggest that people ask for clarification of any aspects of the paper about which they are unclear, or if they disagree with the points made and want to see what others think and so on.

In the second example (Coffee Bar), the initial item should make it clear that this item is intended for non-academic discussion, for example, arranging social events.

## ACTIVITY

Most conferences exhibit the phenomenon of having many people registered, but only a few people actively contributing to the discussion. Research at the Open University (Mason, 1995), suggests that there are three kinds of participant in a conference:

- those who post and read messages
- those who read messages but rarely post
- those who join once, never to return again

The research also suggests that roughly one-third of a student group falls into each category. The phenomenon would appear to be independent of the particular conference software chosen, although it seems likely that the more user friendly a system is, the more likely people are to make contributions.

Research by Riel and Levin (Riel & Levin, 1997), analysed seven electronic networks and drew some conclusions about the factors that are likely to give rise to a successful network. They conclude that successful networks (ones that report a high level of use coupled with good user reports of efficacy) are more likely to result when the answers to the following questions are 'yes':

Does the group already exist?

Does this group have a need for telecommunications?

Is there a shared goal or task with a specified outcome?

Will the access to the technology be easy and effective?

Will all participants have regular patterns of mail access?

Is there a person who will facilitate group planning and work?

Riel and Levin found that, of the seven networks they reviewed, those that failed lacked between two and four of the above features, whereas those that succeeded lacked only one feature. They conclude that it is possible to create a thriving network community even if one or two of these factors is not present, but that this puts more emphasis on the other factors.

Riel and Levin offer the following advice:

1 Network communities can be organised either by well-established relationships among people who seek new ways to co-ordinate their collective work or a shared commitment among relative strangers to a specific task. A network of strangers seeking to find common interests is likely to fail.

2 The response opportunity or access to the network should be very easy and reliable.

3 There should be some form of leadership for the group. The group needs one or more people who take on the responsibility of monitoring and facilitating the group interactions.

#### **G. TUTOR AND LEARNER ROLES**

It is critical for the success of a discussion forum supporting teaching and learning that both tutors and students commit themselves to spending time on-line and that they do so visibly, even if it is only leaving a brief message to say that they have read something and will return to it with more comment later. Another critical factor is clarity about the roles that tutors and students are adopting when engaging in this environment. A number of different roles may be adopted over the length of the course, depending on the educational aims. However what follows are some thoughts about the roles that could be adopted.

##### **TUTOR ROLES**

It is essential to be proactive initially to encourage learner participation, making it worth the effort of logging into the system. It may also require contacting those who do not appear on-line to ensure that there is no technical difficulty being experienced. A tutor could then decide to take a more monitoring and steering role, only intervening if learners are getting wildly off-track and leave much of the interaction to the learners themselves, having briefed them appropriately. Or a more proactive role could be adopted, seeding discussions, assigning tasks to learners, linking ideas from several messages to make a point, or summarising a discussion to signal the end of that topic perhaps.

## LEARNER ROLES

A CMC environment can allow students to take more control over their learning, initially perhaps just over the time and place of learning. However, it allows all students to have a voice without the need to fight for airtime as in a face to face situation. This can allow different students to take the lead at different times, perhaps in a formal way e.g. taking responsibility for starting a particular discussion topic. Depending on the particular educational implementation adopted, it can provide an environment for small group working allowing students to develop valuable group working, collaboration and coordination skills. They can also develop reflexivity as the on-line environment retains a copy of all interactions and students can be encouraged to revisit material and reflect upon it. There is also an opportunity for peer assessment since all interactions are held on-line.

### I. CMC LINKS

There are extensive links related to CMC which the reader of this report may wish to follow. These include:

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McConnell, D *Implementing Computer Supported Cooperative Learning* (London, 1994);

Laurillard, D *Rethinking University Teaching* (London, 1994);

O'Malley, C. (ed.) *Computer Supported Collaborative Learning* (Berlin, 1994, NATO ASI series. Series F: Computer and System Science, 128).

Steeple, C, *Effective Strategies for On-line Tutoring* SEDA publication (1998).

Naidu, S., Barrett, J. and Olsen, P. (1995) 'Improving Instructional Effectiveness with Computer-mediated Communication' *ALT-J* 3.2, pp. 63-75.

Mason, R. 'Scalability of On-line Courses' Conference paper delivered at ALT-C, 1995, 11-13th September, The Open University.

Riel, M. M. & Levin, J. A. 'Building Electronic Communities: Success and Failure in Computer Networking' *Instructional Science* 19 (1997), pp. 145-169.

Paulsen M (1995) The Online Report on Pedagogical Techniques for Computer-Mediated Communication [Online]. Available : <http://www.nettskolen.com/forskning/19/cmcped.html#v> (accessed Nov 2004)