THE ROLE OF COMPUTER-MEDIATED COMMUNICATION IN E-LEARNING

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E-learning most often implies the use of computers in learning. Though this is true, there are definitions of e-learning which grasp the meaning of e-learning more adequately. As a starting point, e-learning can be defined as „an open form of education accessible time- and location-independently on computer networks, which organizing the teaching and learning processes, possessing optimal and effective knowledge-transfer, learning methods and integrating the learning material, the learner's resources, the tutor-learner communication, and the interactive software into a standardized system, making it accessible to the learner". [2] In this definition there are several points which should be highlighted, namely:

- open form, i.e. accessible to everyone
- time- and location-independently accessible
- organizes the teaching and learning processes
- integrates the learning material, the learner resources, the tutor-learner communication, and the interactive software.

In addition to these, the communication between the individual learners, which is often mentioned in today's learning activities, shouldn't be neglected, as well.

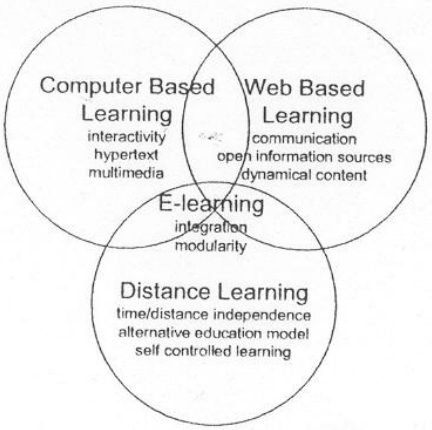

Figure 1 [1]

Figure 1 shows the main elements of e-learning, following the previous definitions. After this, other factors can be enumerated, such as:

- distance learning
- modularity
- communication
- integration
- etc.

Looking over these, the necessity of using information technology is inevitable. On the following pages I dissects the role of a subset of information technology, the computer mediated communication in e-learning.

CMC IN E-LEARNING

Figure 2 shows the main interactions between the participants of an e-learning course. The course material is delivered via unspecified methods, and is depicted by dashed lines. The main interpersonal communications are showed, as well, between the tutor and the learners, and between the groups of learners, as well. One may notice, naturally, that this scenario cannot be applied to all e-learning courses, only to those, where cooperative learning is involved. Cooperative learning – or collaborative learning – can be defined as the instructional use of small and medium-sized groups through which students work together to maximize their own and each other's learning. [5]

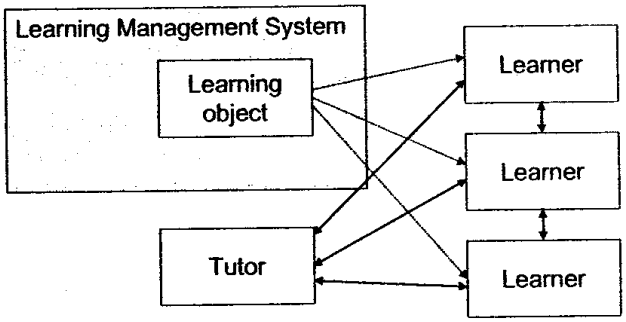

Figure 2
Interactions in collaborative e-learning settings

As the picture shows, there are several communication lines between the participants. Even in this simple case, where only three learners are active, the number of the connections seems to be important. In other cases, the figure of connections can be denser, naturally. One can imagine what level of load does these communication links generates on the tutor, and on the learners. In traditional settings, this is handled during lectures, and on face-to-face sessions, but in e-learning courses, taking into consideration the time and distance constraints, the use of computer-mediated communication tools is unquestionable.
Computer-mediated communication in the broadest manner can be defined as a form of interpersonal communication that uses some form of computer technology to transmit, store, annotate, or present information that has been created by one or more participants. [5]

COMMUNICATION TOOLS

The classification of different aspects of communication tools can be carried out by when they are used (when) and where they are used (place).
Under the first criteria (when) communication tools can be classified as synchronous and asynchronous. Synchronous communication means that people are com-

municating with each other at the same time, and in asynchronous communication they communicate in different times i.e. they can send and receive information any time they want. Obviously, synchronous communication requires simultaneous participation of all involved, therefore its use in e-learning and distance learning is less frequent. Examples for synchronous communication are: lectures, phone calls, chat. Asynchronous communication does not require simultaneous presence, resulting in more flexibility in access for the learner. Books, video and email are examples of it. The second criteria (place) allow us to distinguish between communication tools in the function of the participant's physical distance, classifying them into *same place* and *different place* categories. The ubiquitous presence of the internet, the www, made the information more portable, more accessible than ever, and allowed the blooming of communication tools which allowed people to communicate with each other at *different places*. This constitutes one of the driving forces behind e-learning.

After this classification, the different tools of communication are as follows:

Table 1

Classification of communication tools

	Synchronous	Asynchronous
Same place	**Interpersonal** Tutorial Informal discussion **Group** Lecture/seminar Group work Informal discussion	**Interpersonal** Books/library Cd-rom **Group** TV
Different place	**Interpersonal** Phone conversation Chat **Group** Teleconference Audioconference Video-conference Chat MUDs	**Interpersonal** Book, letter, memo, fax Videotape/audiotape Answering machine/voice mail Email Computer program **Group** Mailing lists USENET Bbs, forum systems Groupware www

The communication tools shown in table 1 contain traditional tools besides the computer-involved ones. Obviously, in an e-learning course, the use of computer-mediated ones is almost exclusive. Taking into consideration the advancement of email, groupware and forum systems, where the delivery of textual information, audio and video clips is straightforward, the use of non-computer mediated communication tools can be almost completely eliminated. In addition, a general feature of e-learning, namely the distance learning aspect, makes clear that only a few of the tools in Table 1 used during an e-learning course, as follows:

- chat i.e. synchronous, interactive delivery of short textual information
- email, including the transfer of almost any kind of file, videos, computer programs
- computer programs, here used mainly for education/demonstration purposes (apart from their role in the e-learning infrastructure)
- Mailing lists, which allows the simultaneous delivery of a message to many
- Forums and bbs systems, with the forming groups and their interaction
- www, the world-wide web, which can constitute a standardized platform to all of the above, thus allowing simple access to the individual learners to their messages and the learning material.

These tools can have their economical benefits and costs, as well.

BENEFITS

There is specific learning material, starting a course for which would not be economically feasible due to the potentially low numbers of learners interested. In these cases, with the use of online sessions, these materials can be covered, thus fulfilling the needs of the learners, and the requirement of efficiency.

In the case of geographically dispersed student, the use of computer-mediated communication allows the more efficient use of student time, due to the asynchronous aspect of the tools.

Another advantage of these tools is that they allows the meeting of not only geographically, but culturally different groups, thus promoting a better understanding between groups of the society, especially in collaborative learning sessions, in which case these groups, whose members may have never met in real life, have to solve problems together.

The use of synchronous and asynchronous communication tools can diminish the need for campus meeting rooms, thus decreasing the costs related.

The modularity of learning objects, the learning material allows the easy accommodation of new, or specific material, making the education more flexible. This flexibility even allows the inclusion of courses from other institutions, when the main institution lacks a specific competence, for example.

COSTS

The costs of using these computer tools must not be neglected. These mainly relates to:

- the investments in hardware and software
- the maintenance of hardware and software
- the development or acquisition cost of specific software's
- system administration
- lending hardware and software to students
- etc.

In the case of an e-learning course, there are costs associated with the development of learning material. This should be treated carefully, since there may be serious copyright questions involved.

An other cost difficult to measure is the time devoted to participating in on-line chat sessions, answering emails, providing feedback. Care must be taken to ensure that these activities do not impose such high time demands that it becomes physically impossible for the instructor to handle his everyday tasks.

INTEGRATING COMPUTER-MEDIATED TOOLS INTO THE ORGANIZATION

Besides the use of CMC for communication between the learner groups and the tutors, communication happens at an other level, namely between the participants of the organization delivering the course. Figure 3 shows the general interactions between the units of an institution, related to the preparation and delivery of a course.

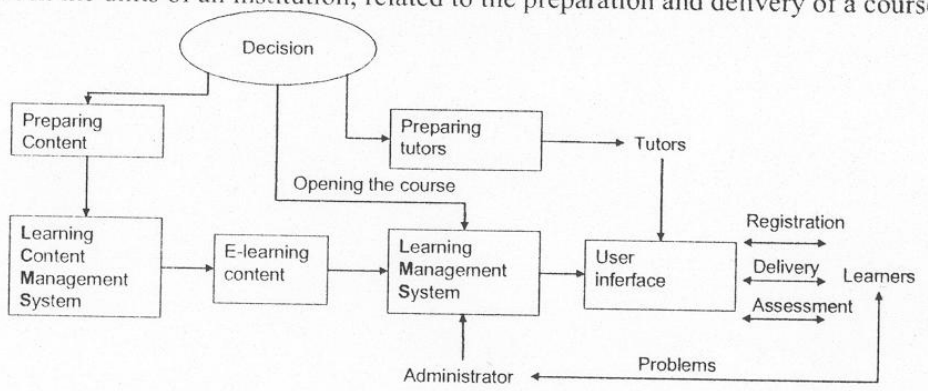

Figure 3
Starting an e-learning course

The figure shows that the tasks related to the delivery of a successful course mean communication in the organization itself. This can be handled mainly in three ways:

- Using separated communication tools - even traditional ones – in the organization, and the standardized tools for the communication with the learner
- Using two different communication media, one for the internal communication and one for the learners
- Integrating the two communication systems, i.e. using the same forum/groupware/chat system for the internal tasks of delivering the course and during the course

Naturally, other solutions exist, but these do not apply to even the most basic e-learning courses. Further analysis is required related to the advantages and disadvantages of these approaches.

CONCLUSION

From the first part of this analysis it can be stated that the use of communication mediated tools for the delivery of an e-learning course is of utmost importance, due to the distance-learning nature, and the evident economical benefits of e-learning. The choice of tools depends of the specific environment, and standardized solutions exist which make easy their everyday utilization.

But one should not forget the intra-organization aspect of education services, which can be handled in different ways. With the connecting of the two separate communication areas, a shape similar to that of a customer management system (CMS) emerges, what – taking into consideration the fact that learners are "customers" of the teaching institution, and the possibility of effectively handling the information load – renders this approach desirable.

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