EDITORIAL

Use of computer conferencing (CC) or computer-mediated communication (CMC) as a medium for educational delivery has expanded rapidly in the last decade. CC allows learners and teachers to interact synchronously or asynchronously via a computer network.

Effective educational use of this powerful telecommunications medium requires attention to a number of technological, organizational, design, and instructional considerations. "Best Practices of Computer Conferencing in Distance Education," a conference held at The Pennsylvania State University February 25-26, 1996, provided a forum for the discussion of these issues, as well as guides to CC development and practice for participants.

The goals of the conference were to identify and highlight the exemplary practices of institutions using computer
conferencing to deliver courses in higher education contexts. Day One showcased the successful use of computer-mediated instruction at four institutions: Thomas A. Edison College, Rochester Institute of Technology, The Open Learning Agency of Canada, and Houston Community College System. Each institution described its experiences with computer conferencing in terms of administrative issues, course development, faculty issues, and student support. These presentations served as the basis for intensive discussions on Day Two, during which representatives from each of the four institutions moderated interactive sessions of participants to discuss topics central to the use of computer conferencing in distance education.

This issue of DEOSNEWS comprises the presentation by Susan Rogers and Timothy Wells of Rochester Institute of Technology. Later issues will offer those describing the other institutions featured at the conference.

The complete conference report, "Best Practices of Computer Conferencing in Distance Education," may be purchased from the American Center for the Study of Distance Education. This report includes three parts: summaries of the presentations of each of the four "Best
Practices" institutions; overviews of conference discussion sessions on topics related to administration, faculty and instruction, instructional design, and student services; and highlights of the conference schedule including names of presenters, moderators, and student recorders of the institutional presentation and topical discussion sessions.

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COMPUTER-MEDIATED COMMUNICATIONS:
ALTERNATIVE ENVIRONMENTS FOR LEARNING

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COMPUTER-MEDIATED COMMUNICATIONS:
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INTRODUCTION

Higher education is entering a new era driven by a number of converging social changes. In response to these changes, many institutions are developing alternative learning environments, such as distance learning, to meet the educational needs of their students. This paper discusses some of the drivers behind this development and outlines the perspective and distance learning course development philosophy at the Rochester Institute of Technology (RIT). Computer-Mediated Communications has been a significant enabling technology for the development of effective and flexible distance learning. The major issues confronting the use of computer conferencing in distance education from the perspective of administration, faculty/instruction, instructional design and student services are reviewed and illustrated through a simulated scenario
for understanding the process and emotions that come into play during a distance delivered course using computer communications.

THE DEMAND FOR DISTANCE LEARNING

The demand for educational access solutions is being driven by changes in three interrelated areas. First is the change in the student. Non-traditional students have begun to out number traditional age students on university campuses. In many fields, people are faced with a need to renew their educational skills several times during their careers. In some fields, almost constant information updating is required. These learners who are busy, working adults with a great many demands on their lives, are not well served by traditional educational structures. The need to provide effective, lifelong educational experiences to the world's population is becoming a priority for educators.

Second is the evolving view of knowledge which defines learning in terms of students constructing knowledge for themselves rather than receiving knowledge from a teacher (Newman, Griffin & Cole, 1989). As mentioned above, the dramatic rate of change in information alone is forcing us to realize that we don't need an educated population, but rather that we need to become a nation of learners who combine work and education. In the midst of our
knowledge explosion, it is clear that knowledge is not finite or stable, and therefore "schooling" is never over. Learning must become an active and ongoing process rather than a test of memorization skills based on some accepted notion of "core knowledge." Even within school settings, the need for situating learning within functional contexts is seen as important for learning to transfer to tasks outside of the school setting (Lave & Wenger, 1991). At the same time, people require education which is better-timed for their needs. Skills and knowledge which are learned in a classroom setting, often months away from their application in a real-life setting, can be lost quickly (Resnick, 1987).

And finally, the availability of new communications technologies now offer exciting new opportunities and tools for teaching and learning (Pea & Gomez, 1992; Scardamalia & Bereiter, 1991). Traditional modes of education are based on the need to gather around the scarce resources of a learned person and printed thought. Today the world of recorded knowledge is richer, more spontaneous and more transportable than it has been in the past. Telecommunications networks have the potential to interconnect students, teachers and information resources in a conversation of learning that is free from many of the constraints of time, place and physical handicap. While the impact of being able to store sound and moving images is just beginning to be felt in some areas of scholarship, we are beginning to see what the new technologies can
mean for embedding education into everyday settings where it can be more immediately and meaningfully applied (Kubota, 1991; Brown, 1985).

These changing social conditions have resulted in an increased demand for alternative educational environments at institutions like the Rochester Institute of Technology (RIT). Distance education is no longer a marginal activity at RIT; it is becoming an important means of providing access to educational opportunities and resources. Distance learning has the potential of meeting the new educational demands because it can provide instructionally effective, highly interactive learning experiences which are flexible, equitable and responsive to individual needs (Verduin & Clark, 1991).

EVOlUTIONARY DESIGN FOR DISTANCE LEARNING

In many cases, distance learning has been limited by investment in systems which view the role of technology as replicating classroom instruction as closely as possible. Indeed, a faculty member at one seminar on distance education remarked, "I don't want to change anything I'm doing--I want to use my same overheads--I just want to push the back wall of the classroom back 1,000 miles." Many researchers suggest opportunities for future application of highly evolved "distributed multimedia learning
environments" which will "foster transferal of knowledge through communication technologies, rather than seeking a single, integrated solution to meet instructional needs. A rich and adaptive learning environment can be constructed to improve on the weaknesses of the classroom. By involving faculty in decisions regarding the selection of instructional tools, and using technologies more familiar to faculty and students, the development of new distance learning environments can be driven by the needs of the learner and learning situation, rather than by the pre-selection of a specific method of delivery.

RIT's approach is one that is built on the belief that by selecting from a range of technologies based on their unique instructional strengths, distance learning can provide a rich learning environment with affords:

individually responsive time frames for learning activities;

multiple representations of information;

learning which is situated within a real-world context;

participation of all learners without limitations of class time;

opportunities for inclusion of learners with special needs; and
a community of learners based on intellectual interests rather than physical proximity.

DISTANCE LEARNING AT RIT

Currently six RIT degree programs are available to students who may never attend regular classes on-campus. Therefore, distance learning strategies must be sufficiently flexible to meet the demands of a range of content areas. In developing instructional programs for RIT learners at a distance, the constraints of the learners, their location, and the subject matter of the course drives the selection of instructional approaches. The instructional strengths and opportunities provided by each communication technology are considered, along with its weakness or disadvantages. Instructional experiences are offered at the place and time of the learner's choosing as much as possible, while still taking advantage of instructional strengths of group interaction. Faculty receive assistance and guidance in the use of available instructional technologies to enable them to have more control over their distance teaching methods. At the same time they are oriented to what will be a changed role for them in a distance learning environment. Rather than viewing themselves as information providers, they are encouraged to see themselves as facilitators and mentors for
learning. They are encouraged to explore special instructional demands of their own discipline which might be addresses through a new instructional strategy. (Sadly, for many college-level instructors, this may be the first time anyone has asked them to seriously examine their instructional methods or their own view of knowledge.) In addition, students may receive assistance in becoming familiar with a new type of instructional approach to help them both with the technology as well as to encourage active involvement in their own learning (Gunstone & Northfield, 1992).

In course design, the instructional objectives and tasks are analyzed based on the presentation, interaction, practice, and assessment demands of the particular subject matter. Unless it is a new offering or special training program, course objectives are usually already set by the offering department. The learning objectives for a course will not vary due to the delivery methods; distance and on-campus courses are equivalent in terms of credit and recognition by the university. But each task within a course can be explored to discover the essential features required for the instructional technologies to build the course's learning environment. The following table presents examples elements presentation, interaction, and practice elements that will need to be supported by the delivery technology, within the overall framework of the course objectives:
PRESENTATION INTERACTION PRACTICE

Faculty

Declarative Knowledge Reinforcement Skill Development

Procedural Knowledge Problem solving Engagement

Schema building Tutorials Transfer of

Pacing Peers Knowledge

Motivation Cohort building

Collaboration

Resources

Libraries

Data bases

THE ROLE OF COMPUTER-MEDIATED COMMUNICATIONS

Providing appropriately responsive communication and interaction between the distant student and faculty is a continuing challenge. However, it is the strength of ongoing interaction with faculty and other students which distinguishes university instruction from purchased self-instructional programs or mass educational programs. Mail, individual telephone calls and class meetings
provide the oldest forms of interaction for distance courses; however RIT quickly realized the need to augment existing telephone and mail channels with audioconferencing and computer-mediated communications. With these additions, our distance courses have become increasingly interactive and permit a learning environment which surpasses most classroom settings for supporting student participation and interaction (Coombs, 1989). Computer-mediated communications allows for time and place independence, and at the same time enhances interaction, among groups and individuals, unlike almost any other communications technology or instructional approach (Berge & Collins, 1995; Mason, 1990; Harasim, 1989). Using personal computers and modems, learners are able to create and submit homework, receive feedback, take a self-test, interact with their instructor and others, and access software, library resources and advisory information.

The strength of the computer is that in most cases students and faculty do not have to be on line at the same times to benefit from their interactions. While the equipment is somewhat less pervasive, connections to the computer system can take place through the same telephone link as an audioconference. As an example, through the world-wide Internet, a student can log on from the United Kingdom and be involved in a discussion in an RIT course. While on-line he or she can also send a personal note to a fellow student and check the library catalog for a reference source.
GETTING STARTED

In 1985, RIT began the process in introducing computer-mediated communication into its distance learning courses. In preparation, a survey of students was conducted that revealed that 75% of current distance learning students had access to a computer either at home or at work. A license for conferencing software that would run on the institution's existing VAX cluster was purchased and, at the time, NOTES was one of only two alternatives, so the decision was not as complex as it would be today. Two courses were selected to pilot the use of computer communications: Introduction to Computers and Programming and Modern American History. These were selected first based on faculty interest and on the diversity of subject matter and student interest in the system.

A decision was made to loan modems and software and to develop relatively simple documentation to allow students to focus on the content of their course rather than the complications of computer connectivity. The institution also made a commitment to provide connectivity to students regardless of their physical location without requiring additional long-distance charges. This philosophy was built on the assumption that the telecommunication network was the equivalent of the classroom, and thus should be provided by the
university. A combination of local dial-up connections, nationally
distributed dial-up "points of presence" and a toll-free number
continue to be used to provide the flexible and ubiquitous
connections required by RIT's geographically dispersed and
increasingly mobile students. Students were required to provide
what was determined to be their "standard" learning tools, such as a
telephone, television, VCR and computer. At the time a standard of
VT100 emulation was established. While this sounds very minimal
today, at the time there was some controversy given that the choice
excluded many popular machines in use at the time. This type of
decision confronts RIT today as it seeks to make use of more
sophisticated software systems. Assuring a balance between
pedagogical capabilities and flexible access continues to be a
challenge.

Results with using asynchronous computer conferencing for course
discussions have been especially rewarding. No one is excluded
from participation due to time limitations of the class or
communications barriers. Students for whom English is not their
first language as well as deaf and blind students have found the
conferences especially useful (Coombs, 1989). Faculty have the
ability to reinforce learning objectives and do on-going problem
solving either with individuals or in groups, and students can build
cohort relationships. A measure of the usefulness of the system is its
pervasive integration into the daily operation of the university. Since
its introduction, computer-mediated communications has been
adopted by all but three of the one-hundred and fifty distance
delivered courses at RIT and supports many of the administrative
functions of distance learning as well. While we first licensed the
software to support distance learning courses, it is now being use to
support committee work, on-line counseling services and general
institutional "chatter." In addition, many faculty who first began
using NOTES in their distance learning courses have extended the
technology to their on-campus courses because it adds a useful
communication capability not available in the classroom. This
integration into the daily communication functions of the university
adds another dimension of complexity to the decision to replace the
software. However, the lack of upgrades to the software and the
inability to integrate graphical notations into the conferences is
driving RIT to at least begin the transition to another solution.

SUMMARY

RIT has developed a distance education system designed to bring
together the unique capabilities of the Institute with the educational
needs of communities of learners in a cost-effective, timely, and
productive fashion. While we have had excellent results with
computer-mediated communication, we continue to insist that the
instructional demands of the subject matter and the appropriateness
of instructional technologies to deliver it should guide the adoption of alternatives. As with all choices, economic issues drive the feasibility of alternatives. Cost-benefit analysis must take into account as many issues as possible. We need to recognize the shifts in costs between student and institution. Finally, the willingness of the institution and its faculty to view the new technology as means to significant change and improvement, rather than a supplemental activity, must be considered when assessing the feasibility of an alternative learning method. The preparation of faculty and support staff to change their methods, as well as the comfort level of the learners, can be major concerns. In addition, the hidden reward systems and politics of the institution must be considered in the selection of alternatives.

The underlying assumption for RIT's distance learning program is that the evolving technological alternatives must be responsive to educational needs. We believe the key to future success in establishing alternative learning environments will be the ability to connect appropriate technological solutions to instructional problems. Then future technological developments will provide even greater opportunities to expand and improve instructional efforts.

REFERENCES


