

Face to Face Interaction in Distributed Pedagogic Settings
(An overview of real-time interactive technologies and their ability to support traditional teaching, but at a distance)

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Abstract for Program: This paper will begin with a brief discussion of today's e-Learning environment and some of its problems, and then postulate a pedagogic environment significantly more suited to faculty wishing to teach in distributed educational settings but demanding the ability to do so using the more traditional techniques of lecture, oral discourse, and tools for question and answer sessions. The main body of the paper will provide an overview of the technologies, tools and techniques supportive of this improved setting, along with examples of their use. The paper will conclude with some observations about the evolution and future of this technological environment.

Proposal:

Each year Ohio State hosts a "Megaconference," a worldwide volunteer effort with the goal of connecting people together from anywhere on Earth where someone chooses to participate, in order to further the use of videoconferencing in education and research and to advance the state of the art in videoconferencing technology. Prior to this year we have never had more than 200 participants in this single video conference. Our recent conference had 372 registered sites around the globe -- on all continents except Antarctica -- bringing together an estimated audience of more than 3,000 (not including the viewers of all of the video streams).

This is part of a technological evolution as powerful as the advents of the personal computer and the Internet. Communicating with others is ultimately one of the most compelling forces known to mankind, and including video technologies in the communications mix only serves to enhance the experience. Until recently we have been limited by technology (voice is not as satisfactory as video), cost and location (until the evolution of the low-cost, anywhere, anytime video capabilities of the Internet, video communications was relegated to a small percentage of wealthy companies and countries), and capacity (only recently have we begun to see the deployment of sufficient bandwidth to support meaningful video conferencing.) We are on the cusp of this evolution, and the next few years will witness its deployment on a large scale, which is wonderful news for those of us who are unhappy with today's e-Learning technologies.

The Problem with Traditional e-Learning

In the minds of most, "e-Learning" is synonymous with using the web as a place to develop and present course materials to be consumed by students, asynchronously and at a distance. A course management system (CMS) such as WebCT or Blackboard is

typically involved, and faculty/student interaction is generally limited to text-based activities such as e-mail, discussion boards, messaging, or chat rooms. The fundamental idea behind web-management systems for classroom support, archived resources, frequently-asked-questions lists, discussion lists and the like is to provide an environment in which a student can obtain support on an “any time, any place” basis. One assumes that the student is “at a distance – someplace on the Network.” We have been driven to this e-Learning environment because of several necessities, all based on the common need to deploy SOMETHING in reaction to student, administrative, competitive, and peer pressures to incorporate online offerings into the curriculum, and the environment has proven to be less than satisfactory to many.

Electronic mail, discussion lists and the like are hardly the tools of pedagogic environments most comfortable to faculty. These tools are, at best, a poor substitute for the teacher who simply wants to pick up a piece of chalk and begin a sentence with “Look, here is how this thing works ...” And so based on the presumption that several thousand years of developing pedagogic techniques have yielded approaches that work well in the classroom, the problem becomes how to create distributed educational settings which are as close to traditional classroom environments as possible. Advanced networking, IP video and collaborative technologies provide us with an opportunity to accomplish this goal, and, interestingly, many of these techniques are also applicable in traditional settings as well, and we can only imagine what will happen when the creative genius of the professorate and these technologies truly merge.

Technologies leading to real-time pedagogy at a distance

In 1989 William Wulf coined the term “Collaboratory” as a “... center without walls, in which the nation’s researchers can perform their research without regard to geographical location - interacting with colleagues, accessing instrumentation, sharing data and computational resource, and accessing information in digital libraries.” Today Wulf would probably mention classroom settings in his definition because the question of networked collaboration takes on increasing importance in a setting that involves teaching or joint projects in distributed classroom settings.

But, especially with respect to teaching environments, Wulf’s vision could not be fully realized in 1989 because the technologies necessary for his collaboratory were simply not ready. The Internet was in its infancy; faculty were generally unaware of its existence, let alone its potential; bandwidth costs were astronomical compared to today; and the nation had yet to contemplate the idea of a pervasive network to which inexpensive and ubiquitous computers were attached.

In recent years, however, there have been an increasing number of tools and techniques designed to permit faculty to conduct pedagogic activities in real time (synchronous) settings, and new product offerings are evolving regularly. Examples include web meeting spaces, video over IP, and networked collaboration tools, all of which have begun to evolve noticeably and all of which lend themselves to more traditional

pedagogic environments in distributed educational settings. Data collaboration techniques may be among the most important of these new classroom tools.

Data Collaboration and IP Videoconferencing, and the Technologies that Make These Tools Extensible Throughout All of Education

Data collaboration: We define data collaboration as the ability to leverage the Internet to support real-time demonstrations, shared use of data bases or forms, or elements such as shared applications, white boards, web spaces, calendaring and media. All of the elements necessary to support teaching in traditional settings should be included. As examples: the shared white board replaces the flip chart; shared applications resolve the question of a joint review of a student project; and shared calendaring is used to track events and keep students informed of evolving class activities and requirements.

IP Videoconferencing: Our faculty are then left with the problem of seeing and talking to students, in real-time, for reasons of lecture, student discourse, and question and answer sessions. With the addition of the ability to communicate, the collaboratory is now complete. From a technical perspective, questions, such as whether it is possible to conduct teaching and research based on collaborative technologies, are resolved.

Extensible Technologies: But it is the pace of rapid infrastructural change that holds the most potential for realizing the idea of traditional teaching and learning in distributed settings. Convergence, the integration of voice, data, and video onto a single network infrastructure, is one major element, and others include recent evolutions in high-performance networking, wireless (including broadband wireless), advances (most notably in Europe and Asia) in third generation and fourth generation cellular technologies, the advent of true nomadic computing, and the like. Each of these advances serve to extend the network, its services, and its applications, and inherent in these advances are IP videoconferencing and data collaboration tools. Of importance to those concerned with digital divide issues, key foci of many of these technologies include rural America along with other, more traditional difficult-to-reach or difficult-to-serve areas of the nation, such as inner cities, struggling K-12 environments, and reservations.

Focus of the paper contemplated by this proposal: This paper will begin with a brief discussion of today's e-Learning environment and some of its problems, and then postulate a pedagogic environment significantly more suited to faculty wishing to teach in distributed educational settings but demanding the ability to do so using the more traditional techniques of lecture, oral discourse, and tools for question and answer sessions. The main body of the paper will provide an overview of the technologies, tools and techniques supportive of this improved setting, along with examples of their use. The paper will conclude with some observations about the evolution and future of this technological environment.