

TEACHING IN A TWO-WAY VIDEO AND AUDIO DISTANCE LEARNING CLASSROOM- PERSPECTIVES FROM THE FIRST YEAR

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INTRODUCTION

In January, 1993, the University of North Texas activated a two-way, fullvideo and audio distance learning system. The "SCHOOLinc" system, a research initiative of UNT's Center for Professional Development and Technology, links UNT with two schools in the Dallas Independent School District (Dallas, Texas, USA) via a TI telecommunications line. In addition to the video/audiolink, computers in the classrooms are fully networked.

Instructors quickly learned that major adaptations in teaching style and materials were necessary in order to be successful teaching in a two-way video and audio system.

THE SCHOOLinc SYSTEM

The SCHOOLinc project is part of the Center for Professional Development and Technology headquartered in the College of Education at the University of North Texas (UNT). The UNT classroom serves as the primary program origination site although the two remote classrooms can also be used to originate programs. Members of the Technology and Cognition Department designed and implemented the system at a cost of approximately \$500,000 US.

Each location has an identical video system using two video cameras, a video display device (visualizer) for graphics, VCR, FAX machine, a full-conference audio system, a teacher workstation that acts as a control center, and monitors for both student and teacher viewing. Video may also be sent to the computer monitors at each student workstation. UNT and Cowart Elementary School (approximately 40 miles away) are linked via the TI line. Stockard Middle School is daisy-chained to Cowart via fiber optic cable. The system operates at the full motion video rate of 30 frames per second. When both remote sites are on line the return signal to UNT is 15 frames per second.

All three classrooms are equipped with computers. The UNT room is equipped with both IBM's and MAC'S. Cowart Elementary is equipped with MAC's and Stockard Middle School is equipped with IBM'S. The computers in the remote sites are fully networked via the TI line and connected to the CPDT file server in the College of Education at UNT.

TEACHING IN A TWO-WAY VIDEO AND AUDIO SYSTEM

Two-way video and audio systems are still relatively new in the academic environment. As a hybrid system, many of the traditional definitions of distance education (i.e. Keegan, 1990; Moore, 1990) only partially describe the nature of UNT system. The SCHOOLinc project most resembles what Stone (1990) refers to as a "candid classroom." That is, the faculty member meets with a regularly scheduled class that also happens to be televised to a remote site. Normal classroom activities are more important than slick teleproduction. It is the responsibility of the faculty member to manipulate the video equipment while conducting a regular class session. Our observations are largely based on a graduate level authoring language course taught by the second author. The course was offered one night a week for 3 hours during a regular semester.

Our first semester found full enrollment in the origination classroom with only a few students attending at the remote site. A Teaching Assistant, also enrolled in the course, handled the video controls at the remote site. We found that it was important for the Teaching Assistant to send close-up pictures from the remote site. This made students in the origination classroom feel like the students in the remote site were part of the class. Of course, it was also important to send close-ups to the remote site in order for those students to feel part of the class. In a two-way video and audio system students are separated by distance but participate in the class in realtime. For that reason it is important to keep the students at the remote location involved. We found several methods to be effective. First, and foremost, was to carry on an active dialogue with the remote site students. Another technique was to maintain eye contact by talking to the camera. Remote site students were encouraged to break in with questions whenever necessary (this is a major advantage of a fully-conferenced audio system).

The teacher workstation was designed to be the command center of the rooms. Computer workstations and the video and audio controls were located at the workstation. The four instructors that taught the first flight of classes found the necessity of staying in a chair behind a desk to be somewhat constraining. This placement was important in order to send meaningful pictures to the remote site. If an instructor moved or left their chair they, in essence, would send an empty shot to the remote location. This was particularly problematic with an instructor that was most comfortable teaching by writing on a whiteboard at the front of a room. Wearing a microphone also required that the instructor not stray from the workstation.

The workstations are equipped with a "visualizer" which we like to describe as a video overhead projector. Instructors had to learn to use the visualizer for all graphic work. Most important was to work in a horizontal format due to the 4 X 3 format of the video system. The visualizer has a zoom lens which instructors found to be helpful in showing detail in graphic material.

The video system imposes some requirements for the production of materials. In addition to working in a horizontal format, most graphic materials have to be more simply designed, with larger elements. In general, a well-designed overhead transparency master works well. Computer presentations over a video system also pose some problems. The authoring language course taught by the second author required many demonstrations of various features of the software. Computer output is scan converted to the video system for classroom display. The NTSC video system has problems resolving fine detail and color gradation of computer output. This requires that computer presentations be designed specifically for video. Again, object size is most important.

The most important lesson we learned is that instructors using the SCHOOLincsystem have to be competent in manipulating the video system components. The audio system is passive but the video system requires overt effort on the part of the instructor. The video control panel includes pan, tilt and zoom controls for the cameras. In addition, the instructor must switch between sources. For instance, when turning to a graphic on the visualizer, the instructor must also switch the visualizer "on line" so that students at both the remote and origination site can see the output.

It is also important for the instructor to give students a thorough explanation of how the video and audio components work. Students also have to adapt to viewing material from video monitors and talking into microphones. In our experience we have found that once students are comfortable with the environment that they will start to make requests for shots, or request something be repeated but "this time into a microphone!" In essence, students have to learn how to learn in a two-way system. For instance, a student may whisper to a neighbor in the origination classroom in order not to disturb the rest of the group. But, if said close to a microphone, the audio system will pick up that whisper and transmit it over the speaker system in the remote location.

REFERENCES

Keegan, D. (1990). *Foundations of distance education* (2nd ed.). London: Routledge.

Moore, M.G. (1990). *Contemporary issues in American distance education*. Oxford: Pergamon Press.

Stone, H.R. (1990). Economic development and technology transfers: Implications for video-based distance education. In M.G. Moore (Ed.), *Contemporary issues in American distance education* (pp. 231-241). Oxford: Pergamon Press.