

LIVE INTERACTIVE TELECLASSES: TUNING IN ON REMOTE LEARNERS
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Community colleges can no longer afford the luxury of waiting for students to walk through the front door. Classes must be made accessible to the community and to business and industry by offering convenient times and convenient locations. Yet the quality and rigor of classes must be maintained at high collegiate standards. Fortunately, these two considerations are not mutually exclusive; Portland Community College is resolving them through the use of live interactive teleclasses. The mathematics department at PCC was quick to take advantage of this opportunity and has begun to reap the benefits.

THE SYSTEM

PCC chose to operate the live interactive courses using one-way video and two-way audio. Classes are narrowcast live from a standard classroom outfitted with television equipment. Students enrolled in the television production program operate the equipment, so one teleclass produces opportunities for learning on several different levels. One TV student, dubbed the "wizard", operates all the studio equipment for a single class. The wizard controls three cameras remotely, monitors sound levels, composes the video-out image, and is responsible for beginning and ending computer graphics. From the studio/classroom, the signal is transmitted to a local TV tower which in turn rebroadcasts it over the greater Portland area. The signal's frequency is much higher than that of standard TV signals, and therefore special receiving devices are required at the remote sites in order to downlink.

The remote students have classrooms equipped with microphones, a special telephone, and a standard television which receives the audio-video signal from the studio/classroom. The remote students talk to the instructor through microphones which are connected to the studio/classroom using dedicated telephone lines. When a remote student from one site is talking, the voice comes through a loudspeaker into the studio and is then transmitted over the system so that all the sites can hear comments regardless of their point of origin. The students from one site never see the others in class from the other sites, yet they quickly adapt to pure audio communication. By the end of the term the remote students' personalities have been firmly established to everyone in the class and we are only left wondering what everyone looks like.

PROBLEMS

Clearly, teaching a group of students scattered throughout the city requires extra instructional support and a high degree of organization. Some of the problems encountered were predictable

and easily resolved; others proved more formidable. The college had to create several new lines of governance in order to accommodate the special needs of the teleclasses.

A major problem encountered early on was the lack of a smooth flow of paper to and from the instructor. This has been resolved by having each site designate a person responsible for mailing assignments turned in by remote students to the instructor. The same person receives mail from the instructor and delivers it to the teleclassroom in a timely manner. The mail moves from site to site using a combination of campus and U.S. mail. Most instructors report a minimum of one week turn around time, which is sometimes a source of frustration to students and instructors alike.

The next major problem was the lack of a testing procedure. After a series of false starts, including the use of existing placement testing centers, the procedure currently in place utilizes testing proctors at each remote site. Tests are administered to the remote students in their regular teleclassrooms during class time, just as in a conventional class, then mailed to the instructor.

Given the physical constraints of students in as many as seven different locations, the instructors are forced to be more organized than would be necessary for a conventional class. Lead time for handouts is increased, the timing of tests must be carefully planned, and a fair amount of telephoning on the part of the instructor must take place to insure that tests have arrived on time, etc. The math department compensates first time teleclass instructors with release time from one class of their regular load.

The administrative organization of the college did not accommodate one class and one instructor simultaneously occurring in several locations, and a special policy had to be created. The current arrangement is that each location/campus is responsible for the students registered at that site. This includes having input as to which courses will be offered as teleclasses, provision of the mail person and test proctor, and the provision of administrative support to students who encounter problems. Each location receives the FTE for the students registered at that site.

Many students are apprehensive about taking a teleclass, due to the apparent disadvantages over a conventional class. Students at the remote sites need to be somewhat more independent and assertive in order to use the system to their full advantage. It does require more self-discipline to attend a class where the instructor cannot physically see the students. It is also harder for students to use the telephone to get help from the instructor instead of visiting during office hours. The most significant drawback occurs when there happens to be only one student at a particular site. In such cases, it is virtually impossible to overcome the feeling of isolation. Some students do drop teleclasses for these reasons, but the college has found that

most students rise to the occasion. By the end of a term, most students feel that the benefits outweigh the disadvantages.

BENEFITS

While it is possible to teach mathematics teleclasses in virtually the same way as conventional classes, most instructors have found ways to exploit the system to their students' educational advantage. Many of these were anticipated, but there were also a few pleasant surprises.

The studio/classroom was designed to accommodate multiple modes of presentation. It is equipped with an extensive array of electronic equipment including video and audio tape players, a laser disk player, a slide projector, and an IBM PC clone. All instructors are encouraged to use the equipment in any way they see fit. The studio is equipped with a conventional dry whiteboard, but most instructors write on plain 8 1/2 X 11 inch paper located on a desk console in the front of the class. A camera mounted in the ceiling over the desk allows the students to see what is written. The camera is capable of zooming in, making it possible to share illustrations from other sources or read the display of a calculator.

Using the paper instead of the board has several advantages. The instructor has complete control over what is on screen at any given moment instead of depending on a camera operator with no math background to be able to find "the parametric equations in the previous example." Further, the readability is greatly improved using a camera located 5 feet away from the desk rather than shooting the entire board with a camera across the room. But the most valuable aspect of using paper rather than the board is that it produces a written copy of the lecture. Instructors can refer back to problems worked earlier, which in a conventional class have invariably just been erased. Students often ask to see a problem again after class has ended, and no one can argue about the way a particular definition or theorem was phrased because there is a written record.

The school was surprised to discover that having a class broken into small remote groups can actually be advantageous to the students. School observers and instructors have found that the students within a site bond to each other more closely than is typical in a conventional class. They tend to study together and tutor each other. During class time they often interact with each other regarding what the instructor has said. Consonant with the dynamics of small group interaction, one student generally evolves as spokesperson for the site's concerns. Some instructors actively encourage this type of interaction by asking each remote site to venture an opinion on some issue in the lecture. More often than not, the students confer among themselves and then give a single answer to the class. We have just scratched the surface of possibilities in this unusual class arrangement.

FUTURE PLANS

This is the third year of operation for the PCC Television Network and this term there are five mathematics classes (three calculus and two pre-calculus) on the system. Both the number of remote learners and the number of remote learning sites are growing steadily. This term, in addition to students at all four campuses of PCC, the math teleclasses also have students who take classes at their place of employment. Tektronics, Mentor Graphics, Intel, and Portland General Electric's Trojan Nuclear Plant are presently participating in the system, and PCC is actively working on future expansion with other major companies in the Portland area. We are offering classes on TV which otherwise would only be available at the main campus. For the most part, the math classes are offered in the early morning and late afternoon to accomodate part time students who put in a full day at work either before or after class. The response has been so positive that PCC now faces the problem of not having enough time slots available to handle the demand for classes taught in this manner. We hope to open a second channel by Spring term of the 88-89 school year. Offering live interactive teleclasses requires a tremendous amount of work by many individuals at many different locations. But PCC firmly believes that it is educationally sound, and we are committed to this and other innovations that will enhance our students' educational opportunities.

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