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ABSTRACT

Over the past seven years, Northern Arizona University (NAU) has implemented NAUnet, a professional-broadcast-quality, two-way audio, two-way video instructional television (IITV) system. The IITV system provides a face-to-face environment where students and faculty can see and hear each other and engage in discussion. Recently, several courses delivered via NAUnet have acquired a World Wide Web-based conferencing enhancement so that discussion continues in the NAU Online Virtual Conference Center among students and faculty between the broadcast classes. One humanities professor has made particularly good use of the integration of synchronous television with asynchronous computer conferencing. This paper presents observations drawn from his courses. The discussion covers: (1) teaching methodology, including the transition from live television to live television with Web-enhancement, student assignments, and grading; (2) introduction of Web-based threaded conferencing "conversational spaces"; (3) benefits, including increased student interaction and participation, multiple perspectives in class discussion, and the ability for the instructor to have greater input into each student's learning experience; (4) continuing concerns, including student access to the Internet and student frustration with the divergence from more familiar teaching models; and (5) student reaction. (AEF)

Using Web-Conferencing With Primarily Interactive Television Courses

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Introduction

IITV at NAU

Northern Arizona University has a long tradition of delivering courses at multiple sites across the state. While NAU promotes itself as the best residential student experience in the state, NAU also has the mission of providing 3rd and 4th year higher education to the rural areas across the state. For many years, this was accomplished by "circuit rider" faculty and part-time faculty who lived close to the various sites. Over the past seven years, NAUnet, headquartered in Flagstaff, has been implemented using federal and state dollars. NAUnet is a professional-broadcast-quality, two-way audio, two-way video instructional television system. It has been set up with a control room at each site, so any site on the system can both originate and receive courses. The system features two digital circuits between the south of the state and Flagstaff; the balance of the circuits are analog, carried on a microwave system with sufficient bandwidth to carry audio, video and data signals.

At the front and rear of each television classroom is a 60 inch viewing screen. At the heart of the video system is a nano-splitter that divides this viewing screen at each site into nine panes. Each of those nine panes can be divided into four so that there can potentially be up to 36 sites interacting with each other across the state. The students talk to each other over voice-activated microphones on each student desk. The site operator can bring up to full screen the speaker at any site so that, for a few moments, that person has the stage. Courses are broadcast live to the various television classrooms across the state and are also broadcast over local cable television systems.

The IITV system provides a face-to-face environment where students and faculty can see and hear each other and engage in discussion. Most of the usual social context cues (for example, age, gender, ethnicity, educational level and socio-economic status) are evident or can be deduced so are available to aid in the communication and community-building process. Time, however, is limited to 55 or 70 minute periods, which limits the time available for each student to give input into the discussions. Typically, the faculty person lectures, with the occasional question to the students. A limited number of the more verbal students often provide the majority of student input. Learning by observation and listening may occur, but many students do not have the opportunity to express their opinions or ideas to their peers or to the faculty person.

Recently several courses delivered via this network have acquired a web-based conferencing enhancement so that discussion continues in the NAU Online Virtual Conference Center

among students and faculty between the broadcast classes. A total of forty-three classroom courses were similarly enhanced during Spring semester, 1998.

The NAU Virtual Conference Center is powered by Caucus Software. This web-based, asynchronous, conferencing system was chosen, in part, because it is accessible via any web-browser, through any venue that provides access to the browser: local and national commercial internet service providers, college labs and wired dorm rooms; from work, home, public libraries or public computer labs on campus. Many students and faculty have experience using a web-browser when they start the course, so accessing the web-based conferencing system is a relatively small step forward.

One humanities professor has made particularly good use of the integration of synchronous television with asynchronous computer conferencing and it is his courses from which the following observations are drawn. This particular professor teaches to as many as 16 sites across the state and has as many as 150 students in each of two classes taught each semester.

Teaching Methodology

The teaching methodology has changed very little in the transition from live television to live television with web-enhancement. The instructor has developed a series of twelve, cumulative written assignments that the students must complete; one assignment a week during the semester. The first assignment is to explain the teaching/learning model used for the course. The 2nd assignment is to "dump out" what is known about the topic of the course, or the topic chosen by the student. This sets a baseline against which future elaboration can be gauged. Each assignment elaborates on the preceding one to illustrate the acquisition of the perspective addressed in subsequent steps in the learning model. These assignments follow an "escalator format" whether the course is focused on a single topic, or the students apply the steps to their own choice of topics.

Prior to the implementation of the web-based conferencing system, students kept their weekly written assignments in a folder and turned them all in at the end of the semester with their final project. Some students wrote an assignment a week; some students put off the writing until the last week or two of the semester. The teaching methodology always required collaborative work: typically students exchanged their written assignments with others at their own site, offering critique of each other work, also in writing. The course work culminated with a final project in which students could demonstrate, in their choice of media, what they had learned.

Students started the course with an A grade and maintained that A by showing increasingly sophisticated levels of elaboration, analysis and integration in their written work and appropriate application of the steps of the learning model. This was problematic for students who are used to regular graded assignments and tests as they received little or no feedback on their written work from the faculty member during the semester. While students at the individual sites got to know one another and sometimes to talk before and after class, students across sites were rarely able to socialize with each other or pursue any collaborative learning efforts.

The faculty member was able to get to know only those students who typically spoke up in class. He was also faced with an enormous amount of reading at the end of the semester when assignments and final projects were turned in.

Introducing Web-Based Threaded Conferencing "Conversational Spaces"

At the beginning of Fall semester, 1997 a web-browser-accessible "virtual conference center" was introduced to NAU using software that created conferences for individual classes, and used "items" as conversational spaces within the course conferences. Students continue to attend two televised classes per week.

In these humanities courses each student created their own virtual conversational spaces in which to put their weekly writing assignments rather than writing them out on paper. Other students could then read these assignments and comment on them. Students soon discovered the fastest way to attract other students who could offer information and critique was to read and comment on other students' work, thus creating some reciprocal social obligations.

Gains

The addition of this online venue for class discussion has had several remarkable results. Students from across the state can now interact together online, building on their accustomed interactions in the television classroom. The television course provides an ongoing personal context—for the most part, students can eventually put names, faces and voices together when they read the online conference contributions. Students who take the course over the campus cable system can also participate with their peers in a way that has been impossible in the past. This has led to greater identification with the class group and increased participation on the part of these erstwhile invisible class members.

The conversational time possible for these courses has expanded far beyond the two 70-minute class periods that are televised each week. Students are entering assignments and commentary into the course conference day and night throughout the week. Many students spend 8 or more hours a week on task, which time is recorded by the conferencing system, as is the items that they read besides their own.

Students are welcoming each other to the conference center, critiquing each other's work, offering each other suggestions, finding and sharing resources. Reading each other's work allows students to bring multiple perspectives to bear on their own work and often "unblocks" students when they reach an impasse in their own thinking.

The faculty member quickly found that he did not have to comment on each student's work—the other students were doing that for him. While he does read all new input at least four times a day, directs student work with strategically placed questions and comments as they work their own way through the steps of the learning model he has provided for them. Points raised in the television classroom are commented and elaborated upon in the web-based computer conference. The faculty person also remarks during the televised portion of the course on what he has read from the students in the web-based computer conference.

The time in which discussion can take place has expanded to 24 hours a day, 7 days a week (given a student has this kind of access to a networked computer). This has made it possible for all students to contribute to the discussions, without feeling pressured by the limited time available in the televised portion of the course, or by fears commonly experienced in front of a camera. Students can now take the time to reflect and consider their input, revise and edit their contributions until they are comfortable "publishing" them to their peers. Students can now engage in multiple conversations with multiple course members and read, study and critique each other's assignments, often offering insightful suggestions and valuable resources.

The ethnic population of Arizona is as varied as its topography. Flagstaff in the north is at 7000 feet, Yuma in the south at less than 2000 feet. The northern non-white population is heavily Native American, whereas the southern non-white population tends to be more Hispanic. There are two large urban centers in the state (Phoenix and Tucson) and vast expanses of rural reservation where many homes have neither electricity or running water.

Languages typically spoken among the course members includes English, Navajo, Hopi, Apache and Spanish. Non-native speakers of English are not hampered by lack of facility in spoken English when making written comments in the web-based conferencing center. Nor are differentially abled students penalized—working in the virtual conference center a partially sighted student and one confined to a wheelchair with cerebral palsy who had a severe speech impediment found themselves, for the first time, on a equal footing with their peers.

Each student has their own particular point of view and opinions influenced by their ethnicity, culture, life experience, age, gender etc. These different points of view can now be shared with other class members as each topic is discussed from these multiple perspectives.

The faculty member has found the reading load is now spread over the entire semester. The evolution of the student's learning is now accessible to his inspection as he reads their weekly assignments and listens to their classroom comments. He can have greater input into each student's learning experience as he is able to comment continually on their online assignments and written comments to other students.

Continuing Concerns

Most of the students are able to gain access to computers running a web-browser at regular intervals, but some still can not. Only one of the television classrooms is still without networked computers, and those will be installed during this summer. Those students without internet access have been encouraged to fulfil all the course assignments on paper. During the televised classes some students who were without Internet access have expressed a sense of dislocation and of missing out on the sense of community developed by those who were working together in the virtual conference center.

Some students flourish under the learning regime used in these courses. While they report working harder than in most other courses, they also appear to experience greater personal growth and acquire transferable intellectual tools that they can use in other courses. Other students are continually frustrated by what they perceive to be the lack of faculty-imposed structure and the divergence from teaching models with which they are familiar. They are at

a loss to gauge their own progress towards the A they are seeking, when their progress is not constantly validated by quizzes, tests and graded assignments.

Student Reaction

During the first class meeting of the second semester students were introduced to the combination of technologies used in the course. To assuage the anxieties of students new to the combination, students who had taken a similar course the preceding semester were asked to express their opinions. The following comment, transcribed from the video-tape of that meeting, was made by an adult student at one of the state-wide locations. She is a nurse, who works at nights and is a single parent, working on her bachelor's degree. Her words summarize comments made by a number of other students who also added their opinions:

> On the first day last semester when I was introduced to this new way of doing things I wanted to quit, right then. It was hard enough making it to a site for the television class without having to use a computer, too. But I didn't have much option. I had to have a humanities class and there wasn't anything else that fit my schedule. By the end of the first week, I was feeling a little more comfortable; by the end of a month I was really enjoying myself; by the end of the semester I wished I could take all my courses like this.

Autobiographical Sketches

Mauri Collins is Research Associate and Adjunct Assistant Professor in The Institute for Learning and Technology at Northern Arizona University. **Zane Berge** is director of the Training Systems graduate program at UMBC. Both are widely published in the field of computer-mediated communication used for teaching and learning. Most notable are seven books they have co-authored: *Computer-mediated Communication and the Online Classroom* (Volumes 1–3) (1995) and a more recent four volume series, *Wired Together: Computer Mediated Communication in the K12 Classroom* (1998). Berge Collins Associates also consults and conducts research internationally in distance education.

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