CALIFORNIA COMMUNITY COLLEGES

TIPS News

Technology in Education

Telecommunications Infrastructure Project Statewide

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Internet 2: Project Description

Greg Wood
Communications Director,
University Corporation for Advanced Internet Development

Building on the tremendous success of the last ten years in generalizing and adapting Internet technology to academic needs, the university community has joined together with government and industry partners to accelerate the next stage of Internet development in academia. The Internet2 project, as it is known, is bringing focus, energy and resources to the development of a new family of advanced applications to meet emerging academic requirements in research, teaching and learning. Internet2 addresses major challenges facing the next generation of university networks.

First and foremost, it creates and sustains a leading edge network capability for the national research community. For a number of years beginning in 1987, the network services of NSFnet (National Science Foundation) were unequaled anywhere else. However, the

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Technology for Teaching Institute

Ann Koda
@ONE Project Director

The first Technology for Teaching Summer Institute was held June 15-19, 1998 at California State University, Monterey Bay. The Summer Institute was sponsored by the State Academic Senate and the @ONE project.

Seventy-five faculty participants from California community colleges attended three and five day tracks on Web Site Design, Online Course Development, and Multimedia. The sessions provided hands on activities.

Participants worked in computer labs on projects related to their curriculum areas. The labs were conveniently open in the evenings with dedicated instructors to assist participants.

Faculty participants developed their websites and began putting their course materials online. Some of the work done at the institute can be viewed at Jim Locke's site: *http://www.marin.cc.ca.us/~jim/institute.*

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SUMMER ISSUE

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COMMENTARY

Course Design and the New Technologies

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If the organization is ready to change, what is the starting point with the new technologies? In higher education settings, the starting point is learning and learners; in other words, the starting point is the ending point. Traditional course development resembles a Sunday afternoon drive with the driver in full-control of where the passengers go, what they see and do, and what stops they make along the way. The traditional topic outline will not suffice. Choosing a vehicle, or technology, in which to travel, even before knowing the destination, is equally inappropriate.

Designers for courses using the new technologies begin by describing the destination at which the learners must arrive. This new approach rotates the course designer's thinking away from what professors teach to what learners learn. The learners must know what they should be able to do at the end of a course and how to demonstrate that the required learning did, in fact, take place.

Similarly, the new designer describes points along the way where the learner will demonstrate what has been learned. Again, like the traveler, I want to know what places I will visit. I need to know in what sequence I will make these stops. The stops tell me what I need to take along. The sequence tells me how I shall pack.

With the destination defined, course design must now work backwards through the course to identify the intervention points where the professor checks the learning progress. The sequence tells the course designer what information, instructions, or interactions need to be available to the learner at the various stops.

The designer has a closet full of possible activities. In addition, the designer has choices related to the five learner-orientations (sight, sound, touch, smell, and taste); to the four, widely-accepted basic learning-styles (mastery, understanding, self-expressive, and interpersonal); and to the seven, recognized multiple-intelligences (linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, inter-personal and intra-personal).

From all of these choices, the designer develops matrices which show the integration of the activities, the orientations, the styles, and the intelligences. This integration, then, defines all aspects of the learning and all ways to validate the learning. Not all of these matrices will be completed upon the first redesign of a course. Rather, these matrices grow, turn, and twist as the designer learns about the learners.

The clearer that both the learner and the professor are about the actual learning, not the teaching, the more successful the learner will be. Now, with the integration established, the designer chooses the technology(ies) most appropriate for each aspect of the learning.

Title 5 Regulation Revisions Update

Cristina Mora-Lopez
Distance Education Coordinator, CCCCO

The Department of Finance has reviewed the proposed changes to Title 5 and disapproved the language. Their denial of the proposed language in Section 55378 (Separate Course Approval) was based on the determination that the language as written would create an unfunded mandate.

The Distance Education Technical Advisory Committee recommended the proposed initial regulatory changes for three sections. The committee's recommendations did not include changes to Section 55378. The proposed change was recommended by the Statewide Academic Senate through the California Community College System's Consultation process.

The inclusion of the sentence in Section 55378 was intended to reinforce regulation section 55376 (Instructor Contact) and place an emphasis on the continuing responsibility of local curriculum committees. This language would require curriculum committees to review courses with a focus on "regular effective contact." Therefore, the new sentence, did not contribute to the primary intent of the regulations. The removal of the sentence from Section 55378 will not alter the original intent of the proposed regulatory change.

Because of the fiscal impact review and interpretation by the Department of Finance, the elimination of Section 55378 requires approval of the language by the Board of Governors and will require a new public comment period. The expiration of this new public comment period is August 28, 1998. The Board is being asked initially to approve the regulations and delegate authority to the Chancellor to adopt the regulations. The proposed language is as follows:

APPENDIX A:
Proposed Revisions to Regulations on Distance Education

1. Section 55316.5 of Article 1 of Subchapter 4 of Chapter 6 of Title 5 of the California Code of Regulations is amended to read:
55316.5 Additional Courses.
Notwithstanding any other provision of law, after June 1, 1994, the following additional types of courses may be offered pursuant to this Chapter, consistent with guidelines developed by the Chancellor:
(a) Nontransferable courses designed to meet the requirements of Sections 55805.5, 55806, and 55002(a) or (b);
(b) Noncredit courses conducted as distance education independent study.
This Section shall become inoperative on ~~July 1, 2000~~, January 1, 2002 unless a later adopted regulation deletes or extends this date.
Note: Authority cited: Sections ~~66700 and~~ 70901, Education Code.
Reference: Sections 70901, 70902 and 78310, Education Code.

2. Section 55317 of Article 1 of Subchapter 4 of Chapter 6 of Title 5 of the California Code of Regulations is amended to read:
55317. Ongoing Responsibilities of Districts.
Any district conducting courses under Section 55316 or 55316.5 shall:
(a) Maintain records and report data through the Chancellor's Office Management Information System on the number of students and faculty participating in new courses or sections of established courses;
(b) Provide to the local governing board no later than ~~July1, 1995~~, August 31, 1998, and annually thereafter, a report on all distance education activity;
(c) Provide other information consistent with reporting guidelines which shall be developed by the Chancellor pursuant to Section 409 of the Procedures and Standing Orders of the Board of Governors.
This section shall become inoperative on ~~July 1, 2000~~, January 1, 2002, unless a later adopted regulation deletes or extends this date.
Note: Authority cited: Sections 70901, Education Code.
Reference: Sections ~~66700 and~~ 70901, 70902 and 78310, Education Code.

3. Section 55376 of Article 2 of Subchapter 4 of Chapter 6 of Title 5 of the California Code of Regulations is amended to read:
55376. Instructor Contact.
In addition to the requirements of Section 55002 and any locally-established requirements applicable to all courses, district governing boards shall ensure that:
(a) ~~Each section of a credit transferable course which is delivered as~~ All approved courses offered as distance education shall include regular ~~personal~~ effective contact between instructor and students, through group or individual meetings, orientation and review sessions, supplemental seminar or study sessions, field trips, library workshops, ~~or other in person activities. Personal contact may be supplemented by~~ telephone contact, ~~and~~ correspondence, voice mail, e-mail, or other activities.
(b) All ~~other approved courses offered by~~ distance education courses shall be delivered ~~include regular contact between instructors and students~~ consistent with guidelines issued by the Chancellor pursuant to Section 409 of the Procedures and Standing Orders of the Board of Governors.
Note: Authority cited: Section 70901, Education Code
Reference: Sections 70901-70902, Education Code

Wilson Announces Grant by the Alfred P. Sloan Foundation to the California Virtual University

SACRAMENTO - On June 23, 1998, Governor Pete Wilson announced that the California Virtual University (CVU) received a $250,000 grant from the Alfred P. Sloan Foundation.

"The goal of the California Virtual University is to make our state's higher education institutions accessible to a greater number of Californians, and to anyone around the world interested in accessing high quality, affordable education at a distance," Wilson said. "The Sloan Foundation's support provides important financial resources the project needs and the prestige and recognition it deserves."

The CVU, a joint project of the University of California, California State University, California Community Colleges and the Association of Independent California Colleges and Universities, ties together into a single Internet-based catalog the online and technology-mediated course offerings of California's accredited colleges and universities. The CVU extends the state's higher education system to people who are unable to take advantage of traditional on-campus instruction.

"The California Virtual University is an important experiment to overcome the barriers of time and distance for educational opportunities.," said Dr. A. Frank Mayadas, Program Director of the Alfred P. Sloan Foundation. "We at Sloan have been impressed with the progress made by the CVU, and hope that our support accelerates its ongoing evolution,"

The California Virtual University web site can be found on the Internet at *http://www.california.edu*. Currently, 89 California campuses link more than 700 courses and over 70 complete programs, from certificates through Ph.D., to the catalog.

The Alfred P. Sloan Foundation is a philanthropic non-profit institution known nationwide for its support of education innovations that utilize the Internet and related technologies. The foundation was established in 1934 by former General Motors president Alfred P. Sloan, Jr. During 1996, the Sloan Foundation authorized $53 million in grants. At the end of 1996, the market value of the Foundation's total assets was in excess of $1 billion. More information about the Sloan Foundation can be found online at *http://www.sloan.org*.

Summer Institute

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The opening session of the Institute featured Dr. John Ittelson from CSU, Monterey Bay. His topic was "Setting the Stage - An Introduction to Instructional Design for a New Educational Age." On Wednesday, videoconferencing sessions were held with I. Jukes from Vancover and West Valley College in Saratoga.

Carl Brown, of the High Tech Center, addressed technology related issues, resources, and policies which are changing how higher education meets the needs of students with disabilities. Carl explored valuable design methods to make web sites accesible to students with low vision.

Future training and co-sponsored events will be posted on the @ONE web site *at http://one.fhda.edu*.

Charging for Videoconferencing

Charles Mawson
Telecommunications Analyst, CCCCO

Several colleges have contacted the Chancellor's Office asking how to charge for the rental of their videoconference equipment. The State of California, Department of General Services charges $150 per hour plus line charges for their system. According to other sources, some companies charge as much as $250 per hour plus line charges.

The following are factors to consider when calculating a billing rate for videoconferencing services (*Some of the following figures are approximate, and should be determined for your site.*):

Initial Investment Costs:

ISDN line installation **:**($220/per line) x 3 lines= $660
voice phone **:** installation cost may vary
modem phone **:** installation cost may vary
room wiring/remodeling/lighting : $5,000 - $50,000
(See *www.classrooms.com* for more information.)
PictureTel Venue 2000 **:** $25,000

Ongoing Costs:

ISDN line charges **:** ($39.00/mo) X 3 lines = $120.00/mo
voice phone : monthly charges
modem phone : monthly charges
long distance charges: $0.14/min/line (MCI)
6 lines x $0.14 = ($0.84/min) x 60 min = $50.40/hr
room maintenance **:** (lighting, heat, air)

Total Cost per hour to client (based on above figures)**:**

ISDN installation	= $ 0.32
ISDN line monthly	= $ 0.70
long distance	= $ 50.40
room rental	= $ 3.50
technician	= $ 30.00
Venue replacement (2 yr model)	= $ 6.00

Using the above figures, a minimum charge of $50.00 per hour is necessary just to cover line charges; a charge of between $75.00 & $100.00 per hour is neccessary to be reimbursed for all costs to the college.

Contact Charles Mawson at 916-327-5902 or *cmawson@cc1.cccco.edu* for more information, or to discuss a more exact model for cost reimbursement.

ON THE WEB
Videoconferencing Resources

- *Smarter College Classrooms*
  A complete source of classroom information for colleges, architects, and facilities planners.
  http://www.classrooms.com

- *ITRIX*
  Videoconferencing lighting systems, design, and consulting services
  http://www.itrix.com

- *Creative Videoconferencing Room Design*
  Guidelines for designing and preparing rooms for group videoconferencing.
  http://www.ifmaboston.org/vidconrm.html

- *ZD Net Products*
  Reviews of videoconferencing products and issues.
  http://www.zdnet.com/products/videoconferenceuser/index.html

- *Videoconference Resource Center*
  Extensive site covering many aspects of videoconferencing. Includes articles, bulletin-board forums, product reviews, and classifieds.
  http://www.videoconference.com

- *International Telecommunication Union*
  An international organization within which governments and the private sector coordinate global telecom networks and services. The ITU-T, the Telecommunication Standardization Sector of the ITU, creates standards for videoconferencing.
  http://www.itu.ch/

- *VidConf Mailing List*
  VidConf deals with video and audio conferencing technology and its uses in daily life. To subscribe, send a message to *majordomo@pulver.com* in the message body type, "subscribe vidconf" (no quotes).

Classroom Design For Video Teleconferencing

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Over the past four years we have designed and built a number of distance education classrooms at National University. While the basic design has been similar, we continually find ourselves reevaluating earlier decisions in the light of present needs. Since this issue is a recurring one for distance education practitioners, discussing design decisions may prove useful to others faced with designing a room for video teleconferencing.

First and foremost, we must decide how the room will be used. Will it be used primarily as a teaching site, a receiving location, or a combination of both? Also, will the facility be used by other members of the institution for other purposes?

If the room is primarily a teaching site from which instructors will be facilitating a course, then the first decision involves control of the equipment. This single decision, more than any other, will guide the overall design. This question is a difficult one, and not everyone will be pleased with the decision. Instructors who see themselves as technologically "savvy" will want control over the cameras and shot sequence; others will be thankful if they do not have to worry about technology and can rely on a technician to take charge.

In many cases, the answer to this question is based on the institution's structure. Does the institution offer courses on a semester system, a quarter system, or, as in the case of National University, on a monthly basis? The answer will influence the schedules of faculty who need to be oriented to the distance education room in terms of course preparation and comfort with the equipment.

Those fortunate enough to be able to spend four months or more with faculty members preparing them to teach through video teleconferencing will likely succeed in teaching instructors to manipulate cameras, audio, and images in a way that does not detract from the learning process. Those without this luxury of time may want to consider designing the teaching location based on a more traditional broadcast model, where technicians control the cameras, audio levels, video feeds, and character generation, thus allowing the instructor to focus on facilitating the learning process. The latter model also provides some latitude in terms of the sophistication of equipment installed.

For simplicity this discussion assumes that the location to be designed is primarily a teaching site. This assumption will allow us to look at further design issues related to the two models outlined above.

The Broadcast Model

This model has both benefits and drawbacks for designing an institutional facility. The broadcast model allows use of a smaller classroom as a studio for the instructor and students, but also requires an adjacent room, somewhat larger than a closet, for use as the control room. At National University, typical dimensions for our teaching classrooms/studios, which seat up to thirty students, are thirty feet by thirty feet. Locating equipment in the classrooms so that it can be controlled by the instructor would require a larger room; in the broadcast model, however, most of the equipment is located in the control room.

Equipment required in a typical classroom/studio based on the broadcast model includes, but is not limited to, cameras, microphones, an instructor's station, and monitors. Design considerations for each of these components is discussed below.

Cameras - Three cameras are needed: an instructor camera, a student camera, and a document or overhead camera for slides and still images. The instructor and student cameras should be three-chip CCD types that provide a high-quality video signal. This consideration is important since even the best CODECs (coder/decoder) will degrade the signal as they digitize and compress it prior to transmission over the telephone lines. A single-chip CCD camera is adequate for the document camera since the signal degradation will not be as severe when still images are run through the CODEC.

Microphones - Also needed is a series of push-to-talk microphones, at least one for every two students. In our design we experimented with a variety of microphones and microphone placement options. These ranged from ceiling-mounted microphones to single microphones used by one or two students. While the ceiling-mounted microphones were aesthetically more pleasing, they did not work well, particularly in filtering ambient room noise. The signal to noise ratio was so high that student input could not successfully compete with noise from the air

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conditioning system, low-level student conversation, even the occasional crunching of Dorito chips! Ceiling-mounted microphones also are subject to building code restrictions.

We also experimented with table-mounted open microphones, but these had similar problems with ambient room noise. Another major problem with open gated microphones was related to the echo cancellation software/hardware of the video teleconferencing systems. It appeared the systems had been specifically designed to work with only one or two cardioid microphones; when trying to adjust the room to a series of open microphones the feedback algorithm did not work. These problems are currently being addressed with the use of push-to-talk microphones, which eliminate the need to constantly adjust the gain to account for room noise and have overcome the difficulties experienced with the echo cancellation systems.

The importance of good audio cannot be over-emphasized.

Nothing will destroy the reputation of the system faster than poor audio quality.

Instructor's Station - The instructor's station should be supported by a variety of equipment: computers for display of digital presentations or access to the Internet, wireless microphones, pointing devices, a monitor which displays the signal being transmitted, a scan converter for the computer, and, possibly a display station for use with an answer response system similar to OneTouch.

Monitors - In addition to the monitor on the instructor's station, two larger monitors, no less than 35 inches in diameter, should be installed. One monitor should be mounted at the front of the room in line with the student camera and the other at the rear of the room in line with the instructor camera. The audio from the remote site may be played through either the monitors or a separate sound system. Our experiments with a variety of monitors and television receivers indicate that adequate viewing of text on the screen and presentations made from the remote locations necessitates 1) a screen size of at least 35 inches, and 2) mounting/support of these monitors that will allow for a clear line of sight from anywhere in the classroom.

The specifications outlined above are minimum requirements for the design of a videoconferencing classroom. The importance of good audio cannot be over-emphasized. Nothing will destroy the reputation of the system faster than poor audio quality. Students seem willing to adjust to the less-than-optimal quality of thirty frames/second video transmission, but will complain adamantly about poor audio quality.

The broadcast model offers a great deal of flexibility in terms of the type and quality of equipment installed in the control room. The trained technicians running each class are able to control a wide range of technology. There are, however, a series of decisions that need to be made prior to the final design. A few of these decisions deal with the issue of camera controls and video recording of class sessions. There are two options for camera controls: either the technicians will control the cameras through a remote pan and tilt system or equipment similar to CameraMan, which has an infrared tracking system to automatically track the person wearing the transmitter, can be installed. We have experimented with both and have come to rely on the remote pan and tilt systems, which give the technician ultimate control over the shots.

If class sessions are to be video recorded, a high-end edit deck in the control room will facilitate the process. These decks are designed for long hours of use and will hold up better than less expensive consumer models or commercial playback/record decks.

The following are what we have found to be the minimum video equipment requirements for the control room:

Pan and tilt control system-for the operation of the cameras in the classroom

A series of black and white preview monitors- one for each camera, one for the remote site, and one for the signal being sent to the record deck

Two commercial SVHS play decks- and one commercial SVHS record deck

Preview monitors for each VCR deck- and the record deck

A character generator- for text and a color preview monitor

One waveform and vector scope- to allow for

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Classroom Design

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color correction on classroom cameras

One 13 inch or 15 inch program monitor- which displays the signal being broadcast

A video switcher- allows switching of video feeds and application of a variety of special effects

Audio equipment requirements include the following:

An audio sound mixer- microphone mixers, and amplifier

Speakers that allow monitoring of the outgoing signal

Headphones- that will allow the technician to hear the signal without ambient sound from room noise

Cassette deck- and CD player for music

Other equipment which is desirable, but not essential, includes laserdisc players, computers with NTSC boards installed, and testing equipment.

Of course the key to these systems is the video CODEC, multiplexes, and audio cancellation boards that facilitate the change of the analog to digital signals that can be transmitted over regular telephone lines. These systems sit behind the control equipment with output video and audio feeds from the audio mixer and video switcher feeding into the CODEC.

The physical design of the control room is a matter of personal choice and often depends on the configuration of the room. A window equipped with one-way glass will allow the technician to make quick visual reference checks of the room in case of technical problems.

Instructor-Controlled Model

The main difference between the instructor-control model and the broadcast model is the absence of a control room. The classroom design in this model is similar to that in the broadcast model; however, additional monitors, a small video signal selector, and a small-group video teleconferencing system are additional equipment requirements.

The presence of the small-group video teleconferencing system in the classroom triggers the most critical design decision, that of placement of cameras and monitors. Those who have seen these systems in operation know they have two basic configurations: single monitor and dual monitor.

The main camera for the systems is a compact one-chip CCD camera with a built-in pan and tilt that sits on top of one of the monitors located on a cart. In most cases, the small-group system should face the students so that they can see the remote site(s), any information that the instructor puts on the document camera, and other video signals being displayed. A second camera on a pan and tilt will be controlled by the instructor from the instructor's station. Additionally, a large monitor will need to be mounted in line with the instructor's camera to enable viewing of the remote site(s) as they are presenting.

The instructor's station is another major consideration in the room design. The instructor will be controlling the audio levels and video signals that go to remote sites and to the local monitor in the on-site classroom; cueing up videotapes, audiotapes, and CDs, and controlling the cameras. As a result, the instructor's station needs to be modified or purchased with these functions in mind.

Several companies now provide a touch-screen interface that will interact with the CODEC and the auxiliary video and audio components to provide the instructor with an intuitive means by which he or she can control the equipment. Integrating one of these systems into the design is highly recommended.

Also necessary are SVHS record and play decks, as well as audiocassette and CD players. These items, which are all situated in the control room in the broadcast model, must now become part of the instructor's station or be controlled from the instructor's station.

The configuration of the microphones should remain the same as in the broadcast model and should be fed into gated microphone mixers prior to being fed into a soundboard. This configuration offers maximum control over the audio characteristics of the room.

There is no one right way to design a room for instruction via two-way video/audio teleconferencing. Cost of the instructional environment, the institution's course structure, and the availability of instructors for training are critical considerations in design decisions.

Contact with others who are practitioners in the field can provide valuable insights into what has worked and not worked with room design. Each generation of small-group systems brings with it innovations that may address previous obstacles. Those who have experimented with recent installations are often the best resources for designing a video teleconferencing classroom.

Electronic Surveying: A Decision-Making Tool

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Project Director, "Connecting the Campuses"

Tom Levitan
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Part One of Two

When the "Connecting the Campuses" project wanted to test an electronic, decision-making model, the project team believed that a surveying software was a vital component for collecting data through email/web sites. The team wanted a software that could electronically create and send a survey, receive the responses, compute statistical calculations on the received information as it arrived, and create understandable charts for use in presentations.

"Decisive Survey" from Decisive Technology in Palo Alto was selected. The particular version that was selected permitted the surveying of 100 individuals at one time. Moreover, the survey could be sent out multiple times. The problem created by this choice was that collected data had to be merged because the "sample" used was greater than 100. The merged analysis had to be conducted in SPSS (a high-powered statistical package) or a spreadsheet/database program.

The software offered four kinds of survey items: (1) multiple-choice that solicited a single response; (2) a different multiple-choice in which respondents could choose multiple answers, including "all of the above;" (3) "rating" in which respondents could select from a range of choices; and (4) "short-answer" in which respondents could provide information in their own words. Taking the advice of the software creators who claimed that respondents lose interest after 10-15 questions, the project team limited the survey instrument to 10 questions initially, a count which was expanded because one question was split to improve understandability. The team developed items for all four options.

Because the team wanted to test the complete turn-around cycle of the survey, a short-time frame was allowed for the full cycle. The e-mail distribution list was created on June 1, 1998. This list contained individuals who had registered for or attended virtual conferences conducted under the project. A day or two later, an e-mail note was sent from the project director to the potential respondents alerting them to watch for the survey. This e-mail also explained what the project team was trying to learn from conducting the survey. By June 5, the survey was transmitted electronically to the list with instructions to complete the response by June 14. Several surveys were returned by remote email systems because addressees were unknown. A number of the addresses were corrected and the surveys resent.

The software generated a survey for each potential respondent. The survey itself arrived as text in an electronic mail message. This e-mail contained several items: (1) some explanatory instructions about completing the survey; (2) e-mail addresses of the survey creator and the project director so that problems could be addressed quickly; (3) the survey itself; and (4) a "survey authentication marker." This software-generated "marker" contains letters and numbers that uniquely identify an individual survey and facilitate the results-collection/follow-up when individuals return their responses.

Upon receiving the email survey, respondents created an e-mail reply-message that contained the survey itself and the responses. Respondents were told to be certain the "marker" appeared in the body of their response or the results could not be processed.

The completed responses were transmitted by e-mail to an address created to receive them. The survey software automatically collected and processed surveys from an e-mail inbox. Some surveys were returned without the authentication marker. This required they be processed manually, either by pasting an authentication marker into the survey or manually entering the data.

The software kept track of responses and provided for follow-up surveys to be sent to those who had not responded. Since the research analyst does know how any particular individual responded, this raises questions about anonymity in some kinds of surveys.

***Part Two** will appear in next month's issue*

Internet2

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privatization of that network and the frequent congestion of its commercial replacement have deprived many faculty of the network capability needed to support world class research. This unintended result has significantly impacted the university research community in a negative manner.

Secondly, it will direct network development efforts to enable a new generation of applications that will fully exploit the capabilities of broadband networks media integration, interactivity, and real time collaboration to name a few. This work is essential if new priorities within higher education for support of national research objectives, distance education, lifelong learning, and related efforts are to be fulfilled.

Thirdly, it will integrate the work of Internet2 with ongoing efforts to improve production Internet services for all members of the academic community. A major project goal is to rapidly transfer new network services and applications to all levels of educational use and to the broader Internet community, both nationally and internationally. The project will be conducted in phases over the next three to five years. Initial participation is expected from leading research universities, a number of federal agencies, and many computer and telecommunications companies. In the initial project phase, end to end broadband network services will be established at participating universities. On a parallel basis, teams of university faculty, researchers, technical staff, and industry experts will begin designing applications. It is expected that within eighteen months, "beta" versions of a number of applications will be in operation among the Internet2 Project universities.

University Participation in Internet2

At an October 1996 meeting in Chicago, representatives from 34 universities unanimously agreed to endorse the goals of the project. Their institutions committed to finding the resources necessary to participate in the project, and pledged initial funding to enable planning efforts to proceed without delay. Project support from the academic community has grown quickly. To date, over 100 universities have become members of Internet2. Each member university has pledged substantial staff resources and financial support for the duration of project

Internet2 Partnerships

Soon after the announcement in October 1996, the project's central goals were adopted as part of the White House's Next Generation Internet (NGI) initiative. In his State of the Union message on February 4, 1997, President Clinton committed his Administration to supporting a "second generation of the Internet so our leading universities and national laboratories can communicate in speeds 1,000 times faster than today." By extending the partnership between academia, government, and industry that created today's commercial Internet, Internet2 will accelerate the development of next generation Internet technologies and contribute to continued U.S. leadership in this emerging industry.

In most respects, the partnership and funding arrangements for Internet2 will parallel those of previous joint networking efforts of academia and government. The NSFnet project is a very successful example of this partnership. The federal government will participate in Internet2 through the Next Generation Internet initiative and related programs.

Internet2 will also join with corporate leaders to create the advanced network services necessary to meet the requirements of broadband, networked applications. Industry partners will work primarily with campus-based and regional university teams to provide the services and products needed to implement the applications developed by the project. Corporations such as Ameritech, Cisco Systems, Digital Equipment Corporation, IBM, MCI, Sprint and Sun Microsystems have already pledged their support for Internet2.

Additional support for Internet2 will come from collaboration with non-profit organizations working in research and educational networking. Affiliate organizations already committed to the project include: MCNC, National Center for Supercomputing Applications, Northwest Academic Computing Consortium, NYSERNET, OARnet, SURA, PeachNet, Merit, CiCNet, and the State University System of Florida. The cooperation between these corporations, government agencies and private industry enables Internet2 to effectively leverage research funding, accelerate development of campus networks, and create new standards and technologies urgently needed for advanced research, and eventually, by all Internet users.

(The Internet2 web site can be found at *http://www.internet2.edu*)

Distance Learning and Information Competency

Dee Mooneyham
Librarian, Taft College

Earlier this year, California community college libraries shared ideas for integrating information competency programs into the curriculum. One way is through distance learning.

For many years, Taft College, a small college located in western Kern County, has required a Library Skills course for graduation. This one-credit course focuses on basic reference tools and on writing a research paper. At any time, a student may take one of several sessions offered each semester. Even so, the requirement is difficult for many students to fulfill, especially for our Dental Hygiene students because of their closely scheduled curriculum.

I was offered a 1997 summer stipend to design a Distance Learning course for these types of students. The course could be accessed over the World Wide Web but would still be comparable to the classroom version.

The research and writing of the course was the most difficult yet exhilarating experience of my library career! I alternately blessed and cursed this new technology which required learning an entire language (web-editing programs were in their infancy at the time). Although I found many online tutorials geared to using a particular institution's OPAC (Online Public Access Catalog) or to searching the Internet, few mentioned traditional print sources. I had to keep reminding myself the goal of the project was to teach students to use a physical, rather than a virtual library. However, I did not want to just write an online textbook; I wanted to exploit the capabilities of the Web, incorporating as many hypertext links as appropriate (to appease the "mad clickers").

The final format is in six modules which follow the units taught in the regular course. I planned to give the students great leeway in submitting assignments, but a veteran distance leaning colleague assured me that students need deadlines. The final exam is administered in the library, and is identical to the classroom version.

Out of 31 who enrolled, fifteen students have completed the course. Although we specified familiarity with email and with the World Wide Web as a prerequisite, we did not put anyone to an actual test. Many of the students who dropped simply could not interact with the computer, even after a personal orientation session and a lot of hand-holding.

Here are some comments on exit questionnaires from the fifteen students who did pass:

> "It wasn't too difficult, but I wouldn't say it was too easy either."
>
> "Before this class I had no idea how to use most reference sources."
>
> "I had a great time doing modules for the experience of research (fun!)."
>
> "I would like to see more exercises to get me comfortable with the use of the library "
>
> "I liked using the Internet. Some of the sites weren't found or took too long to come up, but it didn't hinder the course."

The URL for the course is: *http://www.taft.cc.ca.us/Distance_Learning/LibDL/index.htm*.

I will be revising the course this summer and would welcome any feedback. I know I will be editing History of Libraries; it is my favorite module, but it's probably less important to "information competency" than is the hands-on practice with research tools.

There are now so many excellent examples of online Bibliographic Instruction (BI) courses (see Cal Poly's Information Competence Project at *http://www.lib calpoly.edu/infocomp/related.html* for a list). The more we share our ideas for BI, the easier it will be to design courses which promote information competency among our students and which show them how vital the library can be now and in the years beyond college.

4CNet Announces New Director of Network Services

The California State University, Office of the Chancellor, Telecommunications Infrastructure Support Services, is pleased to announce that Michael A. McLean has been promoted to Director of Network Services for 4CNet

Mike McLean previously held the position of Customer Services Manager for 4CNet. As Director of Network Services, Mike will oversee and manage the three network functions of Customer Support Services, Engineering & Configuration Management, and Network Facilities and Services.

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TIPS News focuses on projects funded by the California Community Colleges Chancellor's Office that involve technology in education. *TIPS News* also features other issues concerning distance education in California, including videoconferencing and online learning.

If you have an article suitable for publication in *TIPS News*, or are interested in writing material for publication, contact:

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