Projects to Enhance Quality and Productivity in Learning and Teaching 1996–97

A Retrospective

Office of the Provost and Vice President for Academic Affairs
California State University, Chico

Projects to Enhance Quality and Productivity in Learning and Teaching

Each faculty project presented in this brochure incorporates one or more of the learning processes listed below and uses a variety of instructional tools. The icons representing these learning processes and tools are printed at the bottom of each project page write-up.

For more information about learning productivity projects, contact the Office of the Provost at California State University, Chico, Chico, CA 95929-0110. Phone 916-898-6101. **http://www.csuchico.edu**.

The Technology and Learning Program has a web site that links to these projects. Visit **http://www.csuchico.edu/tlp/fpp**.

Collaborative Learning
Students work together on projects

Distributed Learning
Share lessons with distant learners

Interactive Learning
Students interact with content

Assessment Tools
Technology-based assessment

Communication Tools
E-mail, newsgroups, chats, conferences

Presentation Tools
Web, PowerPoint, Director, QuickTime

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Letter from the Provost and Vice President for Academic Affairs

Dear Friends and Colleagues:

Higher education in California is faced with a significant number of new challenges that have been detailed on a number of occasions. Our purpose here is not to rehearse all of the challenges, but to note briefly what the central pressure points are. First, we operate with a limited resource base, which has over the last decade dwindled as a portion of the state's total revenue. The California State University system is being asked to respond to a burgeoning need for continued education and an anticipated tidal wave of new students. We are also being asked to prepare students for a world of work in which flexibility, creative thinking, and an ability to use new technologies are paramount. Finally, faculty and staff are asked to respond positively to the diversity of learning styles which students bring to the classroom and to create an atmosphere which leads to student success and demonstrable learning.

It is within this context that a series of related questions has been raised. How can we use new educational technologies to enhance student learning? To help students achieve their goals? How can we do so in a way that would allow us to serve a greater number of students with the same resources? It is critical that we find answers to such questions, because investments in educational technology are costly. Also, the economic future of California, and the country, lies with knowledge-based industries. Successful answers will lead to informed policy.

To help answer some of these questions, the Chancellor's Office of the California State University system made an allocation of $150,000 to each campus for the 1996-1997 year to develop pilot projects to improve

learning productivity. In response, a call for competitive proposals was sent to all faculty and staff at California State University, Chico. We were fortunate to receive thirty-three proposals asking for over $800,000. We thought carefully about how we might best apportion the funds, and after much debate and negotiating, we chose to support the following ten Projects to Enhance Quality and Productivity in Learning and Teaching.

All ten projects were designed to increase quality and productivity in learning and teaching, and to promote student-centered learning environments both within and outside of the classroom environments. This involves students actively by creating their own knowledge, attitudes, and skills.

All ten of the projects experimented with the use of the computer in some way. One faculty created a CD-ROM to make more efficient use of classroom time and enable students to gain needed repetition and reinforcement of the concepts. Other faculty created web-based materials or used e-mail or chats in an attempt to reduce the actual time students spent in class, and increase the amount of time they spent studying and interacting with the course content. In spite of the differences in approaches and disciplines, all faculty reported the following major findings and recommendations.

Major Findings

1. We found that the keys to student success were the same across disciplines and in spite of the technology used, namely: regular class attendance, good time management and study skills, a strong motivation to learn, and a dynamic, well-organized instructor.

2. We found that regular, structured, and intensive discussions with other faculty enhanced faculty productivity, personal confidence, and professional development. Our four formal meetings gave faculty a first-ever opportunity to report on and compare experiments in the classroom with their colleagues in biology, music, physical education, geography, communications, political science, speech pathology, psychology, and women's studies. Most faculty did not know each other or much about the other disciplines when they began, but they all reported that they were enriched professionally and personally by a year-long opportunity to come together regularly to talk about productivity, quality, learning, and teaching.

3. We found that the development of web-based materials for teaching took more time and effort than most faculty anticipated.

Recommendations

1. First and foremost, we recommend that faculty plan learning productivity projects, and design new teaching materials and approaches with the learner's needs and abilities in mind. This means taking the time to get to know individual learners as well as learn more about the nature of human learning. Coordinators of learning productivity projects need to provide well-thought-out opportunites for faculty and staff to learn and to study the nature of student-centered learning and teaching.
2. We recommend that learning productivity projects that can be replicated across disciplines and on other CSU campuses should be encouraged. In particular, Web-based courses or parts of courses and well-done faculty-designed CD-ROMs appear to have the potential for contributing significantly to learning productivity and should, in our opinion, be encouraged.
3. We recommend that coordinators of learning productivity projects focus on assessment. A clear plan of assessment means that the essentials have been well conceived, namely: goals and objectives, implementation, and above all, the needs and abilities of the learner.
4. We also recommend that coordinators of learning productivity projects focus on providing regular opportunities (both structural and informal) for faculty to report on their work, discuss their classroom experiences and efforts at curricular innovation, and receive appropriate feedback and support for their efforts.

Scott G. McNall
Provost and Vice President for Academic Affairs
Summer 1997

Three multimedia products that summarize the Productivity in Learning and Teaching Projects

The Technology and Learning Program in collaboration with the Provost's Office and the Instructional Media Center created three products that describe these Learning and Productivity Projects, how the faculty implemented the projects, what faculty and students discovered in doing the projects, and what were the end results.

This booklet is the first product which summarizes who and what was involved in each project. The second product is a video where faculty members personally describe their projects and give insight into what they and their students discovered. The third product is a web site (http://www.csuchico.edu/tlp/fpp) which serves as an index to the class/faculty web sites produced during the projects.

The images in this booklet were captured from the web sites on a computer screen where the resolution is very low. This booklet was produced using high resolution printers so you will find that some of the images appear jagged or out of focus. We strongly suggest visiting the web sites using your Internet Web browser and the address listed above so that the graphics are not only distinctly visible but also interactive!

We hope that after viewing the material you might be inspired yourself to think about how technology can enhance the quality and productivity of learning and teaching. We would like to thank all of the faculty who worked diligently to put these projects together, the Provost's Office which encouraged and supported the faculty in these new endeavors, and Information Resources and the Technology and Learning Program which also supported, assisted, and consulted in bringing together the resources to make it all possible. These projects are wonderful demonstrations of how well the people of California State University, Chico work together to create vision, implement a plan, and demonstrate what a great place and great learning environment we have to offer our students.

Kathy Fernandes
Associate Director for TLP

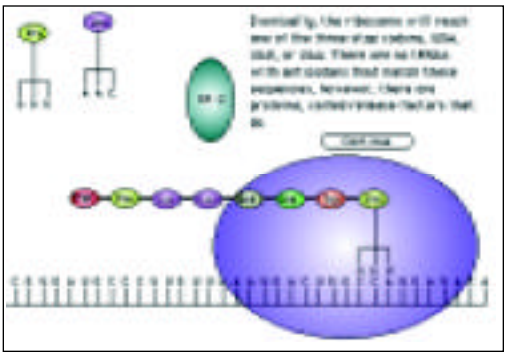
Jeffrey R. Bell, Ph.D. &
James Pushnik, Ph.D.

An Asynchronous Learning Environment for Biology

Dr. Jeffrey Bell and Dr. James Pushnik created an asynchronous learning environment (ALE) on the World Wide Web to replace the lecture portion of Biology 8 (Principles of Biology). Their intent was to increase the number of opportunities for students to be actively involved in learning. While participating in ALE, students continued to attend traditional laboratories where they had direct contact and interaction with course instructors.

The online ALE provides students with dynamic web pages, multimedia tutorials, interactive simulations, instant and personalized feedback on homework problems, secure online grading, and links to alternative educational materials on the web. The ALE allows students to progress through the course at their own pace while receiving prompt feedback on their performance with little intervention from the instructor. Students are able to learn when they want, where they want, and at their preferred pace. Increased control over the learning process empowers students and increases learning. Multimedia capabilities of the WWW allow multiple modes of presentation to reach students with diverse learning styles.

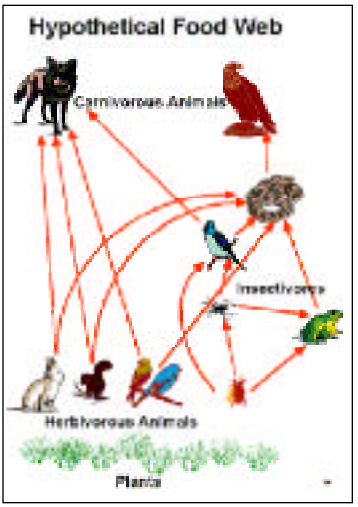
The ALE has several advantages over the traditional lecture. It is more efficient, scales well to larger class sizes, can be easily improved, can be customized to fit the needs of individual students or groups of students, can be easily transferred to other classes or



universities, and it is not bound by the dimensions of the classroom or the calendar. Response from students to learn-ing new processes through this type of technology has been enthusiastic.

Interactive animations and online quizzes were produced using Macromedia Director and incorporated into the web pages. Students can view on the web an animation of "transition" and then take a quiz. If the student does not get the correct answer, the animation will play again until the student gets the correct answer. The immediate feedback and interactive experience has proven effective for students who have used it so far.

Discussion groups and the use of online conferences increased student-student interactions as well as student-instructor interactions. The use of newsgroups in the course was successful in demonstrating improvement in student reasoning and writing skills. PowerPoint presentations received positive response from students, demonstrated by higher test scores.



Many of the modules produced during this project have already been incorporated into several other biology classes; however, a complete evaluation will follow the fall semester of 1997 when the full online version will be delivered to Biology 8 students over the network without the use of classroom lectures. Assessment of the effectiveness of the ALE will be made by doing a controlled experiment where half of the students in Biology 8 receive the traditional lectures while the other half use the ALE in place of the lectures.

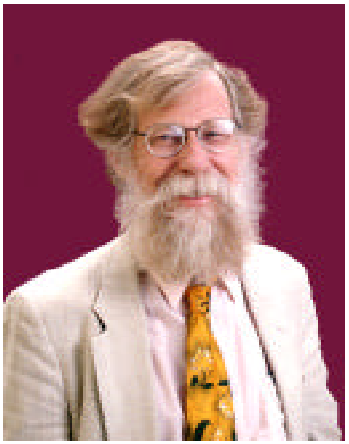
The assessment will encompass five levels: a student survey of perceived preferred presentation formats, quizzes, instructor and peer evaluations, a final student survey, and finally three standardized examinations.

Distributed Learning

Interactive Learning

Presentation Tools

Communication Tools



Jon S. Ebeling, Ph.D., Professor of Political Science, Assisted by Mike Peevers, Student in Computer Science and Electrical Engineering

Introductory Statistics in the Social Sciences Using a Computer Enhanced Design for Presentation

Professor Ebeling has designed an integrated lecture/discussion course with computer enhancements using a web page system. The impact of the course is still under investigation. Initial indications comparing the experiment with the control suggest there are some positive outcomes for both the instructor and the students. As is usual in social science research, the results are not entirely clear. Not surprisingly, significant student gains in the course are partly conditional on student characteristics brought to the course.

The course presents fifteen chapters of a standard statistical text and a software package, STATA 4, to students in undergraduate and graduate courses. The test is the differences in student gains in the course with the enhancement and without the enhancement. The course focuses on the use of statistical computations, reasoning with statistics, and integration of the results into clearly written formal reports using computers.

The data bases used in the course are high quality. The Inter-University Consortium for Political and Social Research, the Mervyn Field Institute Polls of California, and the annual General Social Survey of the U.S. serve as data bases for the courses. All of these data are available at the Social Science Data Base Archive at California State University, Los Angeles. Students get opportunities to work on high quality surveys of the public's attitudes and opinions. The instructor encourages social scientific values and research methods.

The course requires that the students complete four formal research projects of no less than five pages each. The reports require the use

of statistical computations, word processing and the use of the data bases. All passing papers must show use of the literature available in Meriam Library. The instructor grades the students on over twenty-five assignments in a semester. The assignment of grades on weekly homework produces the final grade.

This three-semester experiment used a quasi-experimental design to measure the rates of change across a pre- and post-test in statistical reasoning and computation. The control group consisted of a course offered in the fall term, 1996, not emphasizing the use of the web pages. The experimental groups are two classes in the spring term, 1997, and two classes in the fall 1997 term.

The results indicate that in the fall 1996 term the students had a moderate and significant increase in gain scores. This is the course without the use of the web page enhancements. The spring 1997 term gain scores in statistical knowledge indicated that the enhanced instruction had the effect of providing a greater potential gain for students. Those students who expressed more motivation and who had more resources at their disposal showed the greatest gains. The courses presented with the web page do not seem to change the quality of student performance in academic terms. This may be due to a lack of motivation, a lack of academic skills, or a lack of capital resources for individual learning. These results suggest that some students need preparation in academic skills and access to computing capital before using web based instruction.

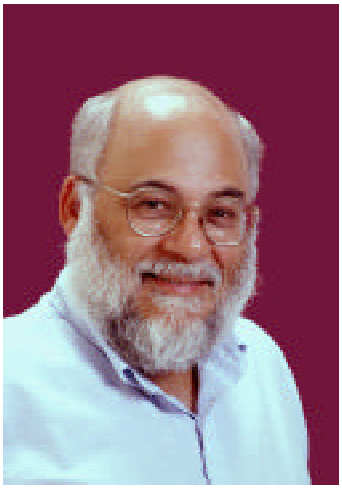
With respect to the impact on the instructional system, the design and presentation of the course materials require a considerable commitment of time and resources by the instructor. However, the presentation of the material on the web did provide the instructor increased freedom from grading homework assignments. Students answer quiz questions on the world wide web, and this reduces the amount of homework grading the instructor must do.

Some students enjoyed the web pages, even though many did not use them to their full advantage. The instructor encouraged the students to use the web pages as frequently as possible. At the end of the experiment the instructor will measure the relationships between the frequency of use of the web pages and student gain in knowledge. The instructor will publish an article on this research in the near future.

Interactive Learning

Presentation Tools

Communication Tools



Sam Edelman, Ph.D.

Bringing Internet Capability and Resources to Communication Theory

Introduction to Theories of Information and Communication is one of three core courses that all students in the School of Communication must take. This includes students in Communication Arts and Sciences, Journalism, and Communication Design. Due to budget contraints the enrollment for a single section of COM 100 ranges from 150 to 220 students per semester. Normally the course is taught via lecture and primarily multiple choice tests.

Dr. Edelman and his colleagues stated the problem as: "*…how do we increase the intimacy of the course and the numbers of graded writing assignments focused on student outcomes and success in comprehending complex theories while reducing the dependence on multiple choice tests and regurgitation of faculty lectures and text materials without increasing substantially the costs of the course.*"

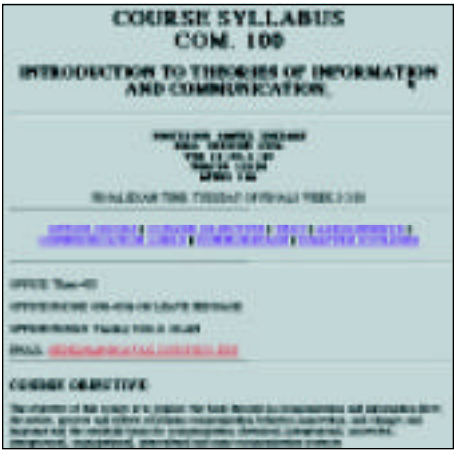
Dr. Edelman sought to improve the level of intimacy and perceived learning for students in the fall 1996 through the use of the World Wide Web, e-mail, and CommonSpace (a collaborative writing program). These tools gave students the chance to explore resources on the Internet in the field of communication studies, gave the students the means for outside class/group interaction among themselves and the professor, and provided a means for group discussion and collaboration of writing assignments.

The implementation did not go smoothly. After the first meeting with the class, Dr. Edelman discovered that at least half the class either had no e-mail account or had clear technophobia. The class was then broken into groups to attend training sessions for learning how to use e-mail, WWW, and CommonSpace.

Throughout the semester there were other problems with sending e-mail enclosures between the students and the professor, and rampant virus problems. CommonSpace, although useful for editing and teacher commentary on students papers, did not work very well for groups of students trying to collaborate on their papers.

Despite the problems throughout the semester, students showed a marked improvement in attitude toward the course, perceived learning, and comprehension of the course material. Using communication and

computer technology did not make teaching communication theory easy, but the combination proved to be synergistic. Students' comments showed they felt they had benefitted from the course in significant ways.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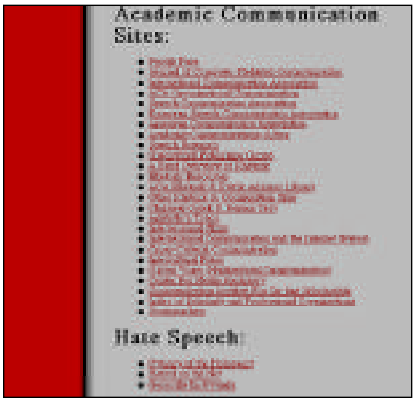
COM. 100
INTRODUCTION TO THEORIES OF INFORMATION AND COMMUNICATION

Dr. Edelman felt that the repetiton of ideas and concepts through lecture, PowerPoint presentations, text readings, outlines of lecture on the web, open book essay exams, and open access to student questions via e-mail led to a more intimate classroom and to greater student learning and greater confidence in their own knowledge of the content.

Before the spring 1997 semester, CSU, Chico's Technology and Learning Program invested in SoftArc, Inc.'s FirstClass groupware for instructional use. With this additional instructional tool, faculty and students were able to e-mail their enclosures, chat with one another in small groups, and create their own conferences based on topics covered throughout the class. The introduction of this tool alone changed the technological instructional environment. It became more productive and more efficient than was possible with the existing campus pine e-mail system.


Academic Communication Sites:

Hate Speech:


Communication Tools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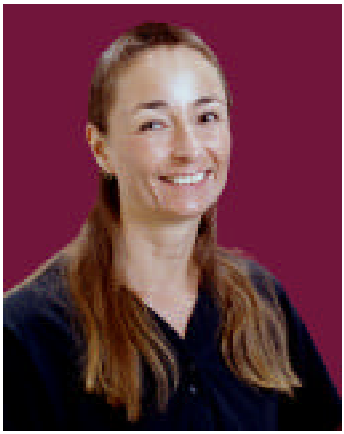
Collaborative Learning



Susan W. Hardwick, Ph.D. and Elizabeth Renfro

Re-Visioning Teaching and Learning in General Education: Integrating Technology, Collaborative Learning, and Social Constructivist Pedagogies into a Human Geography Course and a Women's Studies Course

Dr. Susan Hardwick and Elizabeth Renfro redesigned curriculum for two cross-disciplinary general education courses. They aimed at increasing use of technology in ways compatible with student-centered learning, social constructivist pedagogy, and multicultural education. In the fall 1996, Dr. Hardwick and Elizabeth Renfro redesigned GEOG 002 (Human Geography).

In spring 1997, Elizabeth Renfro enhanced the project by redesigning and initiating an ongoing student peer-mentoring program in WST 10 (Introduction to Women's Studies).

The overall goals for both projects included (1) creating a model GE course to be disseminated to other CSU campuses and universities across the country and internationally through electronic connections; (2) facilitating regular interaction of students, faculty, and teaching assistants anywhere and anytime using e-mail connections; (3) building student awareness and increasing competencies in the wide variety of technologies; and (4) directly involving students in their own knowledge-making based on the use of collaborative pedagogical strategies.

In GEOG 2, technology was integrated into the class via weekly e-mail questions, web-based research assignments featuring "web sites of the week" based on the weekly topics, and interactive group discussions that required regular out-of-class communication online. A collaborative format combined lecture/discussion, video and slides, real world problem-solving assignments and critical thinking, and hands-on mapping activities. Students received individual grades for weekly e-mail answers to posed topical and geographical questions, two essay exams, and their "web site of the week" contributions. Group points were given for completion of weekly mapping activities, team posters, and written papers with oral presentations. Accord-

ing to student outcome assessment, evaluation of student performance and attitudinal change, and instructor satisfaction, the project is judged a success. Nearly half of the students in this class stated their interest in changing their major to geography!

For spring 1997, Elizabeth Renfro redesigned WST10 to further enhance the student-centered learning model that she and Dr. Hardwick had developed in the fall. She also incorporated technology with extensive collaborative and cooperative activities supported by a new peer-mentoring program. Students unanimously found the peer-mentoring program valuable in a number of ways. For example, students felt that their learning was enhanced by having personal attention even though it wasn't directly from the instructor; students were also more engaged and more committed in the course and in the subject matter itself; and finally, students enjoyed teaching one another. The student mentors also found the experience valuable, and the interest in peer mentoring has quadrupled from seven students to twenty-nine.

The keys to success of these projects were developing methods to blend sound pedagogy, solid course content, and technology. Students took responsibility for their own learning and became actively involved in the project. Students developed higher level thinking skills and a greater ability to analyze data and draw conclusions. Students retained course content longer and increased their skills. Students learned positive interdependence with others. Students learned how to take individual accountability for group assignments. Students became more comfortable using technology regularly to complete class assignments as well as communicate both with other students and faculty involved in the project.

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Donald G. Holtgrieve, Ph.D. and Susan Hardwick, Ph.D.

Going Geo-Digital: Using Multimedia Technology in Historical Geography to Enhance Collaborative Learning and Teaching

This team project created a new set of resources for GEOG 235 (Historical Geography of the United States) and integrated these resources into the class using student-centered learning. The questions this project team proposed were: *"Is student-centered learning compatible with the user of multimedia maps available on the web?"* And more specifically, *"Does the integration of student-centered learning and technology enhance faculty and student productivity in our Historical Geography class?"*

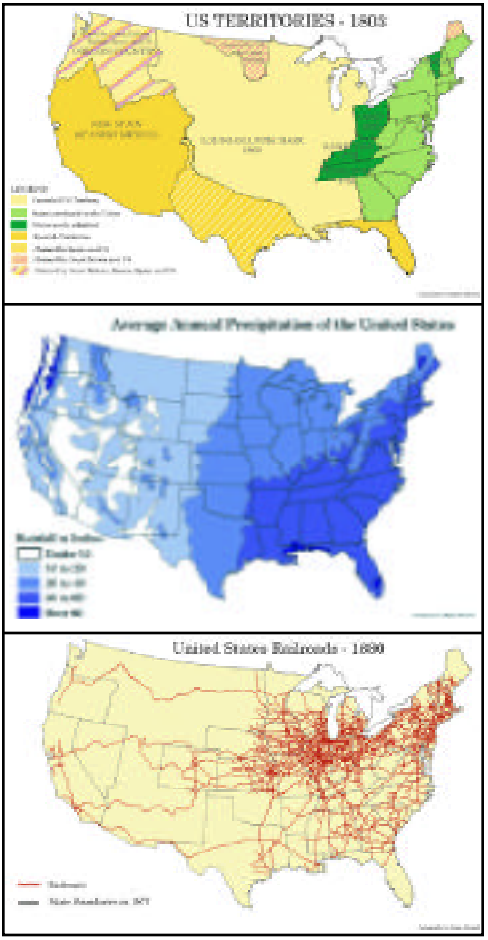
Teaching and learning historical geography using large wall maps, duplicated black and white maps, and oversized reference book maps can be awkward. Analyzing data and noticing geographical relationships can be difficult when different maps use different formats, scales, projections, shading, and symbols. Sharing resources such as atlases and other map reference books in the classroom can be inefficient and costly when teaching historical geography via distance education.

In the fall 1996, Dr. Donald Holtgrieve and graduate student Megan Coppick created a set of original, standardized multimedia maps on the web for GEOG 235, Historical Geography of the United States. All the maps are the same size and use the same scale, projection, and symbols. This made analyzing geographical relationships much more easily apparent. The maps are all viewable in color using a web browser or by projecting them over TV in the distance education classroom. The maps can be downloaded and printed to a color printer connected to any computer on the Internet. The maps are readily available for the world to use in learning activities for history, geography, American studies, social science, and liberal studies students.

In spring 1997, Dr. Susan Hardwick's GEOG 235 students collaboratively designed thirty student-centered learning activities involving these maps.

Collaborative groups of learners worked together to design course syllabi, solve problems, develop learning activities, and design examination questions. Faculty joined with students in a classroom that is an integrated learning committee in this process. Student-centered learning provides a deeply egalitarian model where everyone, no matter what their prior knowledge or experiences may have been, works together to expand possibilities for learning and growing.

Assessments were conducted to measure (1) mastery of content, (2) attitudinal and behavioral change, and (3) improvement in the use of collaborative and technical skills.



Student Responses

"There was a lot of critical thinking involved. We threw out different ideas and somehow got good questions out of them. I think geography is really all about asking questions."

*"The strangest part of it all is that I actually **wanted** to attend each and every class period."*

"On a scale of 1 to 10, I'd have to rate this class a 20!"

"Before walking into this class, I didn't like geography, in fact, I truly hated it. Honestly, it intimidated me. Now I find it fun to look around me and try to figure out what changed the environment."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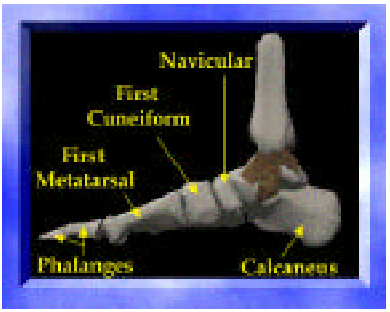
Distributive Learning

Tom Little, Scott Barker, ATC, with Thomas M. Welsh, Ph.D.

Interactive Multi-Instructional Technologies Model (IMIT)

The IMIT project team's goal was to increase quality and productivity in teaching and learning by empowering the students to incorporate conceptual content with critical thinking. The project team designed, implemented, and delivered an integrated, student-centered, networked multimedia learning environment in PHED 116, Principles of Sports Injury Managment, and PHED 181, Reconditioning of Athletic Injuries.

Students were collaboratively engaged using various instructional technologies. The project team developed the syllabus, calendar, animations, and quizzes on the Web using Macromedia Director (and Shockwave), created conferences and rehabilitation scenarios for students to interact and discuss with other students using FirstClass, delivered tests via LXR* Test, and distributed grades on the web using Excel and Excel's Internet Assistant. The educational process including preparation, delivery, interaction, and evaluation were all done online. This technology makes these classes easily taught using distance education.



Measurements to assess quality and productivity were developed and collected in both classes. Data indicates that students in lower level classes

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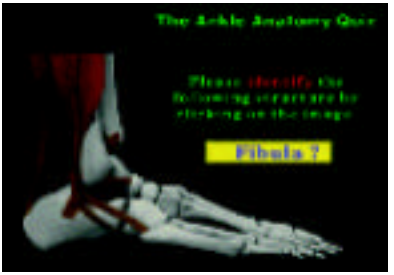
Distributed Learning

Collaborative Learning

struggle more with the technology than students in advanced classes. The cognitive level of work accomplished and the quality of discussion and critical thinking in PHED 181 was similar to a graduate level course.

The project team notes that perhaps due to the dehumanistic nature of the online environment (i.e., absence of facial expression, body language, tone of voice) a successful online implementation must be highly structured.



When the student is functioning in an online environment, there is an increase in the feeling of isolation and insecurity. Consequently, there is an increased demand for the professor to provide individualized feedback and support to enhance professor-student communication.

Communication Tools

Presentation Tools

Assessment Tools

John F. Long, Ph.D.

Distributed Tutored Video Instruction (DTVI) Course Development

This project was a part of Sun Microsystems Laboratories' research activities comparing Tutored Video Instruction (TVI) to Distributed Tutored Video Instruction (DTVI).

TVI evolved from Stanford University's Engineering School and involved videotaping a classroom lecture and replaying it at distant sites in small interactive group settings. A facilitator, knowledgeable in the subject matter, urges group members to stop the tape when necessary to further discuss or clarify the course material. Early findings suggested that TVI students outperformed those attending the lecture. They reasoned that, spurred by the facilitator, the students grasped the subject matter better because of the interactivity.

DTVI is a form of desktop video conferencing software that merges the methods of TVI over broadband networks. In the fall 1996 and spring 1997, Dr. John Long and two student assistants taught CDES 065 (Foundations of Broadcasting and Cable), using the DTVI tools and methods. The control group was a large lecture class. Two other groups were self-selected into either a TVI or DTVI treatment.

This project's primary objective was to validate DTVI as an effective instructional mode using TVI as a benchmark for comparison. Test performance was the main variable used to examine the differences. There were also a few anecdotal variables. Many implementation details and results are proprietary to Sun Microsystems Laboratories and cannot be shared. Results will be forthcoming. For more information on Sun's background and overview of the project, see **http://www.sunlabs.com/research/**.

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Technology and Learning Program

Kathy Fernandes, Associate Director for TLP

Setting up a Technology-Enhanced Learning and Teaching Environment

The Technology and Learning Program at CSU, Chico is responsible for supporting the faculty in successfully implementing their projects. The goal is to create a technological environment with the fewest barriers for the faculty, the students, and the University as a whole.

Some of the original barriers were

- Incompatibility of student e-mail with faculty e-mail such that enclosures were difficult and confusing to use, making it an ineffective tool.
- No standard chat facility available on campus.
- Faculty lacked autonomy to create their own technological class environment to support their pedagogy.
- Misconceptions about what specific software tools were able to do for faculty and students as well as inefficient use of the tools that were available.
- Availability of software and hardware to students so that whatever tool the faculty chose to use could be supported by Student Computing, User Services, and the Technology and Learning Program. For example, Netscape plug-ins needed to be standardizied on campus in student computing labs, faculty computers, and staff computers.

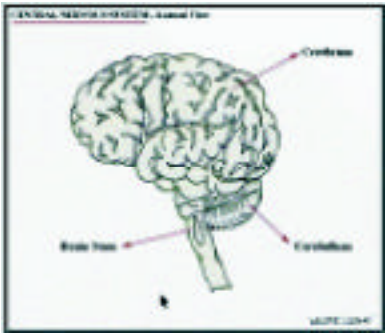
TLP chose to invest in SoftArc Inc.'s FirstClass groupware to be used specificially for instructional use. Faculty and students could then very simply e-mail their enclosures, chat, and create their own conferences. Within the first semester we had more than 1200 faculty and students in more than 40 academic courses using this product on campus and internationally.

Creating a flexible and effective technological learning and teaching environment does not happen by chance. Collaboration among the faculty and support staff is a key component to blending the needs of faculty, students, and the University. Learning productivity can be gained all over campus given the right environment and tools.

Patrick K. McCaffrey, Ph.D.

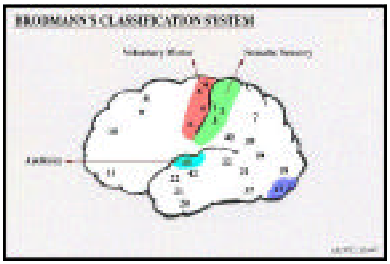
Teaching Neuroanatomy of Speech, Swallowing, and Language Through the World Wide Web

Dr. Patrick McCaffrey teaches the neuroanatomy and neuropathologies courses that constitute the neuroscience requirement for the Speech Pathology master's degree. Neuroanatomy is the prequisite to the neuropathologies classes. Many students who miss the window of opportunity to take neuroanatomy in the fall must wait a full year to get into sync with the series of prerequisite classes. In addition, many of the master's students need more flexible schedules since many are out of the local area or are re-entry students with full-time jobs and/or family obligations. Traditional distance learning with televised lectures still requires students to coordinate their schedules.

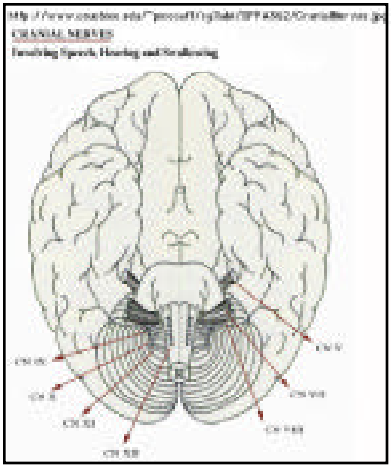


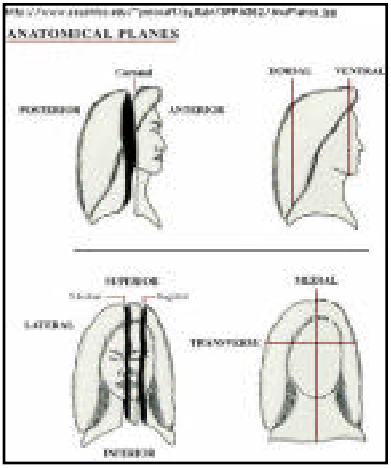
The World Wide Web provides opportunities to learn without the constraints of meeting at a common place and time. Students can interact with the material over the Internet at their own pace.

This project was designed to put SPPA 362, Neuroanatomy of Speech, Swallowing, and Language, on the World Wide Web. The course syllabus, class notes, study questions, reference materials, and class assignments were put on the web. They include more than sixty pages of text, graphic images, and links to a number of universities and other institutions that have reference materials on the Internet. The Technology and Learning Program staff provided technological consultation and developed graphic images which were linked to the text.



Six students who are unable to take the course on campus have made arrangements to take it on the Web in





fall 1997. When students need clarification regarding class notes, readings, or graphic images, they will use e-mail to get in touch with the instructor, other students, or a graduate assistant. Students enrolled over the Internet will take the same proctored examinations as those given on campus. Thus, valid outcome assessment can be made.

Putting this project on the Web has already enhanced quality and productivity in teaching and learning. The web pages have greatly enhanced the on-campus course, allowing students to interact with the material. It has increased the class FTE for next fall. Provided that this project and the other projects published here are disseminated to other CSU campuses and higher education institutions as well as presenting and demonstrating this project to national and statewide conferences, FTE could continue to increase, thus furthering the productivity.

Interactive Learning

Distributed Learning

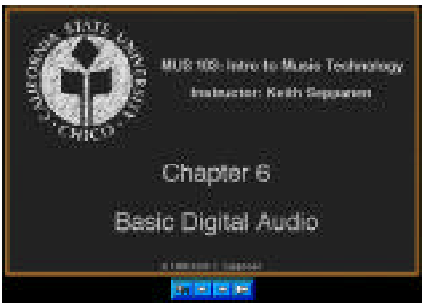
Presentation Tools

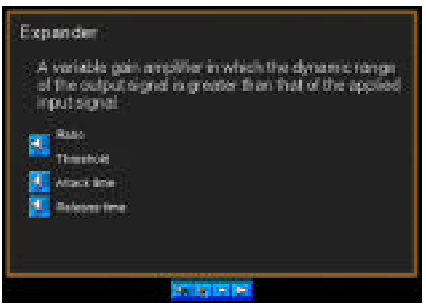
Keith C. Seppanen

Enhancement of Music Technology Instruction

Keith Seppanen's project goals were to improve the quality and productivity in Music 103, Introduction to Music Technology. His focus was to improve classroom efficiency and increase student comprehension by developing an interactive multimedia program which would replace the blackboard and transparencies. Seppanen felt he could increase classroom efficiency by spending less time drawing sound waves and formulas on the board, shuffling transparencies, and turning the overhead projector on and off. He also felt he could increase student comprehension by creating animations which showed the signal flow moving through sound equipment and creating sound clips which would demonstrate different sound waves and sound theory.

Seppanen used Macromedia Director and Authorware to create learning modules or chapters. These modules contain animations, sound, detailed diagrams, and other graphics. These modules were then shown in class during the lecture. Students were also able to download these self-running modules to their own computers from the Music 103 World Wide Web pages. The web pages contain the class lecture notes in addition to the down-loadable modules. Students could print the class lecture notes in advance. This gave students the opportunity to preview or review the lectures and therefore spend more time in class listening and actively participating in class discussions rather than needing to take tedious notes.





Seppanen also pressed the modules onto a CD-ROM which saved students time in downloading.

The variables measured during

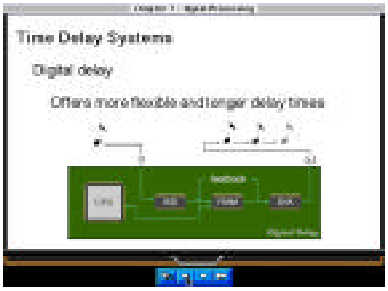
this project included use of classroom time, student participation in class discussion, student interest, and student knowledge.

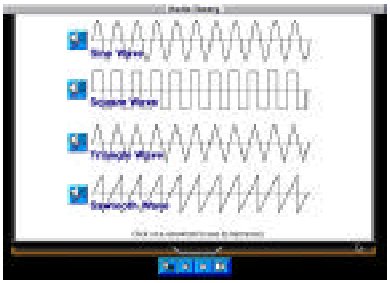
Seppanen was able to cover more material in depth and introduce additional material to his class, than was possible in the traditional classroom environment.

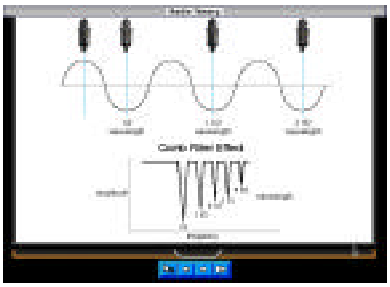
Students who took full advantage of the modules and lecture notes showed a significant increase in their understanding and retention of the course material.

Students showed a great acceptance of this method of teaching. They shared a desire to have more courses taught this way.

Some students did not regularly attend class, assuming that all the information they needed was on the Web or in their textbook; however, these students discovered that the supplemental material was not enough to completely understand or retain the concepts presented in class. In the future, Seppanen will require class attendance as part of the grade for the class.







Interactive Learning

Presentation Tools

Thomas M. Welsh, Ph.D.
and Brian Oppy, Ph.D.

Event-Oriented Course Design for Internet-Based Learning

The goal of this project was to create a systematic, robust, effective, and replicable model for designing university courses for distance learning contexts using Internet technology. The Event-Oriented Course Design (EOD) model was developed by the project director, Dr. Thomas Welsh. The model emphasized asynchronous learning strategies where learners and instructor need not be present at the same time, thus improving productivity for both the students and the instructor.

The model was developed with four criteria in mind: (1) systematic; (2) replicable across content areas; (3) technology independent; (4) also useful in traditional contexts so that a course could be taught simultaneously to both local and distant students, thereby increasing FTEs with minimal additional use of the campus infrastructure.

The EOD model contains a five-step process for moving a course from a traditional environment to an Event-Oriented Design environment. This includes determining what class events could be defined as fully synchronous, limited synchronous, or asynchronous, and then specifying appropriate technologies that enable and support those class events. The EOD model was first implemented and refined for CDES 272, Developing Instructional Products. This class was redesigned for the web. Adobe Photoshop, Adobe Acrobat, Macromedia Director, and Shockwave Audio technologies have all been used for this application of the EOD model. Chat technology was also used.

Dr. Brian Oppy used formative evaluation strategies throughout his PSY001A (Principles of Psychology), course. A mix of one-on-one and small group evaluation techniques were used. Formal evaluation was investigated

for these variables: student-perceived learning, student perceived efficiency in using technology to take the course, and student assessments of ease-of-use of technology incorporated into the course. From the first implementation in the fall 1996 to the second implementation in spring 1997, there were considerable improvements in all variables; however, there was a small sample size for both semesters and the participants for these pilot tests were local learners and not distant learners. Only after an EOD-designed course is fully implemented over an entire semester with distant learners will it be possible to gauge actual learning outcomes.

The following variables were also of interest, and data were anecdotally gathered but were not formally investigated due to limited resources: degree to which EOD methodology is systematic and replicable, degree to which EOD methodology is technology independent, faculty perceptions of ease of course development, and use of technology to deliver course.

Dr. Oppy is using the EOD model for PSY 001A (Principles of Psychology). He will be using SoftArc Inc.'s FirstClass for student interactivity and discussion on psychology principles. Dr. Karen Jost is using EOD for CDES 271 (Performance Analysis). The implementation of these courses is planned for fall 1997.


Distributed Learning


Interactive Learning


Communication Tools

Projects to Enhance Quality and Productivity in Learning and Teaching

For a copy of the video of faculty summarizing their projects, contact the Technology and Learning Program at CSU, Chico, 916-898-6167.

A Web site for this project is also available at ***http://www.csuchico.edu/tlp/fpp***

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William Post, Director
&
Kathy Fernandes, Associate Director

Information *Resources* & TLP