### **SPECIAL EDITION**



BY MARGARET BYRNE

In the last several years, the issue of teaching and technology has gained a strong foothold at UC Davis. A number of events have focused specifically on how technology can enhance teaching and learning. The annual Summer Institute on Technology in Teaching (SITT), which held its fourth conference last summer, fosters a concern for how technology can inspire quality teaching. This theme, which we see gaining momentum at a national — even international — level, was chosen for the Chancellor's Fall Conference in 1996 and was followed in Spring 1997 by the All-University Conference, which brought together all nine campuses to examine and discuss teaching and technology.

Themes that spanned both these conferences included access to technology, technology training, competency versus seat-time, accreditation, intellectual property rights, evalua-

tion and assessment of learning, rising costs, faculty incentives and rewards, and distance learning. Some of these topics have been picked up by the Joint Campus Committee on Information Technology (JCCIT).

### Rethinking learning

A quick survey of the UC Davis faculty reveals a shift toward integrating technology into the curriculum. Many faculty are using email, discussion lists, and Web sites as communication tools, and some are actively engaged in rethinking how to combine learning and technology. To these instructors, technology is not a separate but an integral part of the modern context.

Dedicated both to their students and to experimentation, these faculty transform their entire approach to a course over several quarters. The difficulty — for them and for all of higher education — is that every course is



Illustration by Steve Oerding

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fundamentally different. If we are to preserve what is best about education, then the process of transformation will inevitably be time-consuming, labor-intensive, and slow. Whatever implementations of technology we choose as a campus will need to accommodate both quality of learning and cost savings. We know from the work of peer institutions that integrating technology into some courses can represent significant savings, specifically in terms of capital outlay and the construction and maintenance of new buildings. For example, enrollment at the California State University, which now exceeds 280,000, is predicted to double in the next ten years. To keep pace, the CSU would need to build a new campus every year — an unlikely scenario. While the UC system does not face quite the same challenge, such trends are bound to have an effect. Appropriate uses of technology offer faculty alternatives in an environment of decreasing options and increasing pressures.

### Focusing on quality

UC Davis faculty who use technology in the classroom tend to focus on quality, as one would expect from a major research university. On many campuses one finds the "early adopter" faculty chasing technology trends, but here at UC Davis, technology is rarely the driving force. The underlying goal is the quality of instruction and the appropriateness of technology.

#### A difficult challenge

The innovators who tend to build the models and lead the way for the rest of the faculty are asking some very tough questions, not only about the role of technology, but about the nature of learning, innovation, and the role of the research university in the next century. If, as a community, we fail to address these questions, we risk a significant reduction in quality and influence; if, on the other hand, we take up the chal-

lenge and begin to address the issues before us, we will have the opportunity to provide the nation with a model for the future — one which integrates innovation in research, education, community involvement, and a full range of learning options.

Margaret Byrne is manager of Information Resources' Academic Support Program.

### IN THIS ISSUE

French on the Web 2
Technology in Composition 3
Gary Snyder 3
The Rural Learning Network 4
Internet Book Review 4
Simulations in Physics Classes 5
Laptop Pilot Program 6
Evaluating Internet Sources 6
Virtual Lectures 7
California Digital Library 7

Volume 6 Number 4 
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http://it.ucdavis.edu/it.times/

### **R**EGULAR FEATURES

At Home on the Web	3
Calendar	8
Ergonomically Speaking	2
Online Exclusives	4
You Asked	5

## French Lecturer Masters Web Language

by Aviva Luria

At times she may find it difficult to believe, but Simone Monnier Clay has become a Web page designer. A lecturer in French and the coordinator of the second-year language program, Monnier Clay approached the staff of the Arbor early in Fall quarter to discuss creating a Web site. "I thought it would be great if people on this campus — and on other campuses — could see what the second-year program was about," she says. A Web site would provide resources - such as photographs and a history timeline - to her students, and make the program available for discussion and comparison among other French instructors. "In the French department, we are rather proud of the language program we have developed," Monnier Clay says

When she asked the Arbor staff for help, she didn't realize they would show her how to create the site herself.

"I told them, 'Really, I don't want to program anything.' Because you have this blockage about technology. It's frightening when you haven't handled it much," she says. But Monnier Clay overcame her resistance and found she enjoyed learning. "They are so patient, so helpful," she says of the Arbor staff. "As you start working on one thing it leads to another... You get excited and you want to do more and more. There is no end to the possibilities with technology."

Monnier Clay was the first client trained by the Arbor to create her own Web site. She learned HTML (Hypertext Mark-up Language), the programming language commonly used for Web page construction. She also learned how to scan photographs, saving them in a format that allows them to be displayed on the Web. Photographs depicting French art, culture, and attractions, organized on her Web site by subject and geographical region, now supplement her French courses' online syllabi.

"I see technology as a supplement to traditional teaching methods," Monnier Clay

Simone Monnier Clay constructed a Web site for her students and colleagues.

says. Like many instructors, Monnier Clay has been exploring various instructional technologies. She already uses automated class lists - electronic mailing lists that automatically update subscribers according to current class enrollment — which she says have been "a great success. They have allowed students to contact me freely whenever they have questions about assignments, about ex-

> "Ten years ago I never thought I would be able to learn so much about computers."

— Simone Monnier Clay

ams, and especially when they have grammatical questions or need syntactic clarifications." She finds the lists particularly useful when she's forgotten to mention something in class, or when a grammatical error turns up in a number of student essays. And they can

Editor's Note

With the new year comes a new IT Times. We've redesigned the format and masthead, and we've added new features. In response to the increasing use of technology on campus, the IT Times is also expanding to include more technology-related activities, issues, perspectives, and resources.

This special issue focuses on UC Davis faculty use of technology. It features personal accounts by instructors engaged in integrating technology into the curriculum. It introduces two new regular features: Ergonomically Speaking, by Janet Ford; and Perspective (which provides a campus

member's personal opinion on a technology-related issue). Our popular features remain, including Online Exclusives, At Home on the Web (featuring campus Web sites), the Calendar of technology classes and events, and You Asked (with experts' answers to your questions).

Let us know what you think of these changes. We're always happy to hear from you. Send your comments, suggestions, and questions by email to itpubs@ucdavis.edu or call 752-5965.

Babette Schmitt, editor

also be fun. "I send jokes in French and little things like that."

"Pedagogically, a Web site is an important tool," Monnier Clay says. Students can access syllabi, cultural information, and a historical timeline on her Web site. Faculty from on and off campus can familiarize themselves with the French Department's program, its curriculum and teaching methodology. "It is difficult, if not impossible, to find out about the full language programs developed on any other campus," she says. "Personally, I feel that there's a lack of such resources on the Web."

For Monnier Clay, incorporating technology in her courses is useful for more than teaching students French. "It teaches them technology in an indirect way because, in fact, they are learning French." Hoping to focus more time on her Web project this quarter, and encouraged by the grant she received last year to install a French spell checker in the language lab, Monnier Clay plans to explore other funding options and technology resources. Recently she applied for a grant to develop daily class presentations and activities for the second year French program. "I would like to make this material available on my Web site and hope that this will trigger comments from other faculty. I believe that such exchanges can be beneficial to everyone who teaches and would enhance any program," she says.

"Ten years ago I never thought I would be able to learn so much about computers," Monnier Clay says. "It was just a word processing machine that was a little more convenient than a typewriter. And now it has become this magnificent treasure-box."

#### **Resources:**

Monnier Clay's Web site: http://trc2.ucdavis.edu/french/default.html



### BY JANET FORD, PT, MS

Welcome to a new, informative column on computer and office ergonomics. As physical therapist for Employee Health Services and ergonomic specialist for Environmental Health & Safety, I field numerous questions regarding ergonomic issues. This column will present common questions and offer possible solutions, including resources available to UC Davis employees.

I encourage staff and faculty to submit ergonomic questions and comments by email to ergonomics@ucdavis.edu. I will reply to you individually, but also will select questions to be included with your permission in this column. If you know of a resource, product, or solution which has worked well for you or your department, please share it so that together we can accelerate UCD's ergonomic efforts.

As a kick-off, this issue focuses on Environmental Health & Safety (EH&S) resources available to staff and faculty to learn about, and improve upon, computer and office ergonomics. Future issues will identify other departments' roles in ergonomic efforts on campus, such as Central Storehouse, Facilities, and Information Technology.

Simply defined, ergonomics is the science of matching the work environment to the employee. Improper ergonomics may cause carpal tunnel syndrome and other repetitive stress injuries. On EH&S's Web site, the section on ergonomics includes documents entitled Office Behaviors #1-4 that illustrate main contributors to employee physical discomfort. The documents allow easy identification of incorrect positions or habits and offer information on possible solutions, many of which are easy to implement and provide marked improvement in comfort.

EH&S offers free work site consultation for ergonomic concerns. This can be arranged by emailing ergonomics@ ucdavis.edu or by contacting your department's EH&S Safety Advisor. A listing of safety advisors is available on EH&S's Web page under "EH&S Advisor Program."

#### **Resources:**

EH&S Ergonomics Page: http://ehs.ucdavis.edu/ergback

Send questions and comments about ergonomics to ergonomics@ucdavis.edu.

## **Technology in the Composition Classroom**

BY ANDY JONES, ENGLISH

As a long-time instructor for the English Department, I have noticed that many of the incoming freshmen at UC Davis feel more comfortable with the computer keyboard than they do with the writing principles of argument, audience, and authentic voice. To introduce these and other elements of composition, the English Department, assisted by Information Technology, offers instructors and students a variety of educational methods that reflect a new generation's interest in advanced technology. Computer classrooms (we don't call them "labs" anymore) in Olson, Surge and Hart Halls have their own internal networks that students use to submit virtual copies of essays to their instructor's class folder; they offer instructors a Macintosh connected to an overhead projector; and they provide instructor and student alike a chance to see others brainstorm, compose and edit prose. In effect, such classrooms invite students to view the supposedly solitary act of writing as an opportunity for cooperative learning and confidence-building. By employing these and other tools, instructors appeal to the learning styles of a diverse student body.

An ambitious computer-assisted instructor might try another kind of multimedia demonstration that appeals to the channelclicker. Recently, in my Advanced Composition seminar, I played my students the clip from Citizen Kane where Kane shares his

> I used Microsoft's Power-Point presentation software to project above me my own ten "Principles of Composition."

newspaper's "Declaration of Principles." After we discussed the film's connection to an essay on popular culture we had just read, I used Microsoft's PowerPoint presentation software to project above me my own ten "Principles of Composition." Although the bright blue letters on the fading purple background might seem a bit hokey, the gimmick of flashy presentation software occupied my students' attention with the substance of my ideas. "Writing well," I summed up to the class after reviewing this top ten list, "comes as a result of curiosity, a solid work ethic, and continual revision." I hope the interest of instructors and the patience of students with the variety of media in a computer classroom will provide both these groups the new tools and inspirations for this "practice" of writing.

I've been pleased with the success of my students, evidenced best by their own instructive use of advanced media in my computer-aided composition classes. Toward the end of this past quarter, students taught their colleagues from the instructor's Mac by projecting examples of the brainstorming, drafting, revising, and editing they completed for their research papers. Students in my Technical Writing class used one of my favorite teaching tools to deliver presentations on the topics of their final projects. While students in the class learned about El Niño, the economics of Microsoft, and the applications of infant sign language, the authors of these reports learned how to create and present documents that are clear, economical, and wellorganized. By requiring interaction and public speaking from my students, I remind them what I realize every day that I teach: You never learn anything so well as when you explain it well to someone else. More than ever before, the computer-assisted classrooms at UC Davis allow instructors and their students to do just that.

Andy Jones is a lecturer in the English Department.

### Why I Take Good Care of My Macintosh

GARY SNYDER

Because it buzzes while printing like a planer in a woodshop Because it jumps like a skittish horse and sometimes throws me Because it is pokey when cold Because plastic is a sad, strong material that is charming to rodents Because it is flighty Because my mind flies into it through my fingers Because it leaps forward and backward is an endless sniffer and searcher, is my faithful hound Because its keys click like hail on a rock & it winks when it goes out, & puts word-heaps in hoards for me, dozens of pockets of gold under boulders in streambeds, identical seedpods strong on a vine, or it stores bins of bolts; And I lose them and find them, Because whole worlds of writing can be boldly layed out and then highlighted, & vanished in a flash at "delete" so it teaches of impermanence and pain; Because my wife likes it, & because my computer and me are both brief in this world, both foolish, and we have earthly fates, Because I have let it move in with me right inside the tent And it goes with me out every morning We fill up our baskets, get back home, Feel rich, relax, I throw it a scrap and it hums.



his poem was originally submitted to the *Turn-Around Times*, the predecessor of the *IT Times*, and printed in March of 1988. At the time, Gary Snyder reported that he had a Macintosh Plus with

a 20 Mb hard disk. Today, Snyder uses a Mac Powerbook 1400cs, with 750 Mb. We reprint this poem with his permission.

Gary Snyder joined the faculty at UC Davis in the spring of 1986. Last year Snyder was awarded Yale University's Bollingen Prize in Poetry. Prior recipients include Robert Frost, Robert Penn Warren, and Wallace Stevens. Snyder is a member of the American Academy and Institute of Arts and Letters. He received the Pulitzer Prize in 1975 for his collection of poems entitled **Turtle Island** [New Directions Press: 1974].



Submissions are welcome; please send them by email to itpubs@ucdavis.edu.

### Teaching Resources Center

### http://trc.ucdavis.edu/trc/

The Teaching Resources Center (TRC) was founded to encourage excellence in teaching among UC Davis faculty. Their Web site aids this goal by providing online information about special events and programs, teachingrelated grants and fellowships, support for the use of technology in teaching, and a listing of course Web sites.

### Academic Senate

http://www.mrak.ucdavis.edu/Senate/ senateho.htm

This page has links to a variety of information for ladder faculty, including membership, meeting minutes, committees, and a number of documents such as the Senate Manual and the Faculty Handbook. Links are also provided to Academic Senates at other UC campuses.

### **Academic Federation**

http://www.mrak.ucdavis.edu/acadfed/ federation.htm

Academic appointees not belonging to the Academic Senate are part of the Academic Federation. This site provides information about membership, committees, the Federation's newsletter, and various teaching awards for which members may be eligible.

### Automated Class Mailing Lists

http://sysweb.ucdavis.edu/faqs/classlist.html

Class mailing lists are a useful communication tool between instructors and students. Now, class mailing list administration is simplified by automatic generation and updating. This page describes the procedures for setting up a list, outlines features of automated lists, and provides answers to common guestions.

### **Experts Directory**

http://www-experts.ucdavis.edu/experts/

Here is an index of UC Davis faculty, searchable by last name, area of expertise, or any other keyword.

- Richard Darsie

# The Rural Learning Network: A Virtual Faculty Room

BY RICK POMEROY, DIVISION OF EDUCATION

Imagine that you are a fifth grade teacher in a small school district in the Sierra Nevada foothills or a rural Central Valley agricultural town. Your school is the center of the community; most students will attend their entire elementary years on your campus. How do you know how they are doing? Is their academic development on a par with that of students in larger districts? Are their social skills developing in a way that will allow them to integrate into the larger suburban high school for grades 9-12? Or, possibly you are a student teacher, seeking exposure to a wide range of curriculum ideas or management strategies to use in your classroom. Who do you talk to for answers? Your colleagues and fellow student teachers are helpful but their perspectives are limited to the same situations that you are experiencing.

Attempting to address these concerns, Assistant Professor Maureen McMahon and I are engaged in collaborative work with Waggoner Elementary School and Winters Middle School in Winters, Cache Creek High School in Yolo, Camptonville Elementary School in Camptonville, and Yuba Feather School in Challenge to study the creation, implementation, and utilization of a Rural Learning Network (RLN). Envisioned as a virtual faculty room, the RLN offers student teachers and rural teachers email communications, work group links, and curriculum development opportunities. These tunities might otherwise be impossible given the geographical distances and boundaries that exist within this extended community.

> Teachers and student teachers used the RLN as a source for lesson and resource ideas.

Emulating a faculty room conversation, the RLN strives to bring together teachers and student teachers who share many of the same goals, questions, and concerns. Participants often post questions or ideas to the RLN listserver and receive responses from throughout the RLN community. These conversations have evolved from simple social interactions to extended conversations on the use of technology in classrooms. Teachers are sharing student work between sites, developing collaborative scientific studies, and exchanging curriculum ideas. Student teachers who began the project during the 1996-97 school year are now participating as they enter their first years of teaching.

Early research on the use of the RLN has indicated that faculty and student teacher

reaction to the virtual faculty room analogy is quite accurate. Electronic conversations appeared to be following patterns typical to faculty rooms in schools across the state. Messages posted to the RLN were reviewed for content and coded as either social, administrative, or informational. During the first several months, the content of the messages was largely social or administrative in nature. As participants became familiar with the RLN and the benefits it could provide, the majority of the messages became informational. Teachers and student teachers used the RLN as a source for lesson and resource ideas as well as a way to offer suggestions to those seeking information about science content.

The Rural Learning Network has created a community of teachers in small schools whose unique teaching situations have, until now, existed in semi-isolation.

Rick Pomeroy is Supervisor of Science Teacher Education, Division of Education.

#### For more information:

Rural Learning Community Network: http://education.ucdavis.edu/K-12/TRLN.



This month's Online Exclusives feature:

- · Video Streaming, by Paul Verwey.
- Humor in the Classroom, by Len White.
- Instructional Technology Resources for Faculty. Campus resources include:
- Facilities and services (such as the Teaching Resources Center, the Arbor, the Technology Support Program, computer classrooms, and the Center for Advanced Information Technology).
- Pilot projects (e.g., the Remote Access Management Project, laptop rental program, faculty server, and computerbased tutorials).
- Learning opportunities.
- Help in the Classroom.
- Tools.
- Publications.

Selected off-campus resources include:

- Conferences.
- Electronic publications.
- Organizations.

To access Online Exclusives, go to the Web at <a href="http://it.ucdavis.edu/it.times/">http://it.ucdavis.edu/it.times/</a>

## Internet Book: A "Must" Read

#### REVIEW BY AVIVA LURIA

Although How to Find Agricultural Information on the Internet, written by Mark Campidonica and published by UC's Division of Agri-



culture and Natural Resources, is primarily designed for agriculturalists, it's a great resource for any novice Internet user. The book lays out the basics of obtaining and making productive use of

Internet access, especially for those interested in information retrieval for research or business. Email and the World-Wide Web, as the two most widely-used services, receive the most attention, complete with cautions, guidelines, and tips for making the most of professional mailing lists, Web searches, and information itself. The book's straight-forward, friendly, and informative style makes it possible to read it from cover to cover, either as a first introduction or a guide to exploring the Internet.

Real-life examples depict farmers and other agricultural professionals looking for and retrieving information, addressing the hazards of "flaming" (being chastised on a mailing list by fellow subscribers), and distinguishing between information and graphics protected by copyright and those in the public domain. The section entitled "Understanding Web-wide Search Tools" describes the difference between the two most common types of search tools, Web spiders and indexes, and offers tips on making the most of keyword searches. Very rarely is the book's information so focused on agriculture that its advice can't easily be extended to other fields. It's a definite must for anyone who is new to the Internet or would like to learn more about it.

The book's editor, Jill Shore Auburn, was until recently the associate director of the UC Davis-based Sustainable Agriculture Research and Education Program (SAREP). She is now national program leader for sustainable agriculture for the USDA. Auburn initiated SAREP's award-winning Web site for sustainable agriculture, one of the first Internet sites geared to farmers and other agriculture professionals.

The online version, at *http://www.sarep.ucdavis.edu/pubs/Internet.htm*, contains about 20% of the text of the printed version, as well as ordering information.

### YEAR 2000 PRESENTATIONS

Introduction to the Y2K Problem

Get a general overview of the Year 2000 problem and how you might be affected by it. January 27, 1:30-2:30 p.m.

### PC Hardware: CMOS, BIOS and Operating System

Find out how to check your machine for Y2K compliance.

February 3, 1:30-2:30 p.m.

PC Software: Vendor Specific Applications

Learn about resources for determining software compliance.

February 10, 1:30-2:30 p.m.

All presentations will be held at the Center for Advanced Information Technology (CAIT), Shields Library, First Floor.

## **Simulations Help Teach Difficult Concepts**

by Aviva Luria

For nearly fifteen years, Rod Cole has been a pioneer in the use of technology in the classroom. As a lecturer in physics, and particularly as an instructor for the Physics 9 series — the introductory course for physics, engineering, and other science majors — Cole finds himself faced with the task of presenting difficult physical concepts to large groups of beginning students. Creating animated tutorials has made this task easier.

In the early '80s Cole began creating digital films using a VAX machine, a VCR, and a graphics application. "Ten seconds of video tape would take all night to film — if nothing went wrong," he says. This is the process by which the first computer animations were made.

Now, using QuickTime or Java, Cole might be found creating a tutorial for his students on the very morning of his class. "With simulations I can do a lot of things that I can't do with real materials," he says. He can slow down the evolution of time, allowing students to see things that might not be obvious or visible in nature. One of Cole's QuickTime movies shows a wave encountering interference from a barrier; the wave inverts and becomes two waves, the original, above-surface wave fading out as the other moves in the opposite direction. Although wave machines using real water are often used to demonstrate this process in physics classes, the natural phenomenon happens too quickly to allow students to see what really happens, Cole says. The simulation, which demonstrates the process more slowly, makes the reaction clearer to the viewer.

"Concentrating on the math shortchanges the concepts. We use the computer simulations to build the conceptual understanding in the students."

- Rod Cole

Cole has never been satisfied with students learning by rote; he aims for students to develop what he calls a "gut feeling" about physics, as well as intellectual comprehension. The computer tutorials help students gain this deeper understanding by allowing them to visualize the fields that they're learning about. Traditionally, the teaching of electricity and magnetism relies heavily on mathematics, he says. "Concentrating on the math shortchanges the concepts. We use the computer simulations to build the conceptual understanding in the students."

"I believe students do not have the 3-D

visualization skills they used to have. Probably it comes from not playing in the same way. Students used to take things apart a lot more than they do now. The tutorials really help students with visualization problems," he says.

Students in Cole's Physics 9 class work on exercises in the computer labs in groups of two or three. They can also work on the problems on their own time, whether in a lab or on a personal computer.



Rod Cole's QuickTime movie simulates a wave encountering interference.

Cole's Web site provides a link to the necessary plug-ins, so that students can run the tutorials using the Web browsers on their own machines.

For Cole, using technology in the classroom is about more than simply teaching the same topics in a new way. "Now I can teach certain things that I wouldn't have had any hope of getting across to students," he says. "It opens up a whole new world of what you can do in a class."

### For more information:

Cole's Web site: http://maxwell.ucdavis.edu/~cole/

Tutorials:

http://maxwell.ucdavis.edu/~electro/



Q. What is the best way to create animation for Web pages?

- Jeff deRopp, NMR facility

A number of technologies can be employed to deliver animation on the Web. The technologies can vary significantly in their sophistication, intended purpose, and effectiveness. The nature of your project, as well as your time, technical background, motivation, patience, bandwidth, and those of your viewers, will contribute to your selection of the appropriate technology. It is only after considering all these factors that you will be able to deter-

## mine which is the "best" approach for your purposes.

Animation depicts motion by rapidly displaying a series of slightly altered images. It can be useful on course Web sites for conveying concepts that are visual in nature and not readily described with language or still images. For example, vegetable crops Professor Carlos Quiros uses animations to illustrate genetic processes for his Genes and Gene Expression course.

When they talk about Web animation, most people are referring to GIF, or Graphic Interchange Format, files. Newer GIF standards allow for some timing control, transparencies, and other minor sophistications. (For free advice and software, check out the Animated GIF Artists Guild Web site.) GIF is great for short animations (less than 20 seconds), particularly if the animation loops (continually repeats itself) or has little color variation among the images. Most browsers support GIF animations without requiring plug-ins (extra, often free programs that add features to a browser), and that alone can be an important consideration.

For longer sequences or more complex images, video formats such as MPEG, Quicktime, or AVI may save you bandwidth. These are the most widely used and distributed video formats on the Web.

A good example of a more specialized way to distribute animations is MacroMedia's Flash. Flash does an excellent job of creating animations from "vector" graphics, or images made up of collections of simple lines, boxes, and shade fillings. Because the images are collections of simple shapes, the bandwidth savings can be very high.

Resources on campus include Creative Communication Services, which can help in all phases of your project, from creating original artwork to delivering your animations on the Web. The Arbor, the faculty center for teaching and technology, is a good place to start: they offer consulting services and can direct you to further resources.

### Resources:

Genes and Gene Expression course: http:// veghome.ucdavis.edu/bis101/ANIMATIO/ animation.html

Animated GIF Artists Guild: http://www.agag.com/

MPEG: http://www.mpeg1.de/mpegfaq/ index.html

Quicktime: http://www.quicktimefaq.org/

AVI: http://www.rahul.net/jfm/avi.html

Flash: http://www.macromedia.com/ software/flash/

Creative Communication Services, Instructional Media: http://ccs.ucdavis.edu/, 752-6516

The Arbor: 174 AOB IV, http://arbor.ucdavis.edu/, arbor@ucdavis.edu, 754-2115

— Jon Gorroño, Web Administrator, Creative Communication Services

## Laptop Pilot Program: A new resource for faculty

by Aviva Luria

Teaching a course with 440 students and holding up to 20 office hours per week taught Bob Thornton that a small laptop can make a big difference. Before enrolling in a quarterly Instructional Laptop Loan Program, Thornton, a senior lecturer in plant biology, would borrow and then return a laptop for use in his ecological principles and plant biology class. This meant that four times a week, before each class, Thornton had to check or reconfigure the laptop. Renting a piece of equipment on an hourly basis is generally more suited to infrequent, rather than long-term, use. So when Thornton considered using the laptop in a second course, he applied for a quarter-long loan through the pilot laptop program, sponsored jointly by the Teaching Resources Center (TRC) and Information Technology (IT).

"With the loaner, I'd spend less time and energy on logistics and have more time to develop the course materials," he said. Having the laptop for the entire quarter allowed Thornton to extend his use of animated simulations to the second class, as well as to show students in class how to navigate the course Web site and introduce them to other sites with relevant material. Thornton says the animations help to illustrate biological

processes that many students have trouble understanding.

### The program provides its participants with technical and pedagogical support.

Thornton is one of 11 faculty members who have participated in the Laptop Loan Project since its inception in the Fall of 1997. The pilot project enables instructors without laptops or without adequately powerful laptops to experiment with new forms of inclass teaching using computer-based audiovisuals. In addition to the laptop (4 - 5 Macintoshes and 4 - 5 PCs are expected to be available for Winter and Spring quarters), the program provides its participants with technical and pedagogical support from IT and TRC staff.

The Teaching Resource Center's Wini Anderson is the first point of contact for participants. She, along with other faculty members, is a point person for pedagogical issues involving teaching and technology. "The TRC provides consultation regarding alter-



David Fahy uses a laptop to teach first-year Japanese language students.

cerning past experiences of students and in- instructor to the classroom, demonstrating structors with similar projects at UCD, and how to plug in the laptop, configure it for evaluation options for mid- and end-of-quar- various uses, control room lights, and operate ter student feedback," Anderson says.

each participant to the workings of the laptop, ments to the classroom multimedia equipoutlining what technical attributes and software programs are included. Tim Billingsley of

native teaching strategies, information con- IT Instructional Media can accompany the the video projector. When necessary, IT Computer and Printer Repair orients Billingsley also facilitates repairs or adjustment.

see "Laptop" on page 8

## Perspective **Evaluating Internet Sources**

BY SUSAN PALO. CAMPUS WRITING CENTER

Students are increasingly using the Internet for research but they are often uncritical readers. I am currently exploring why students are gullible about the Internet. And I am devising methods to teach them to use Internet sources critically.

Trained researchers realize that because there are few editorial policies and market forces governing the quality of material on the Internet, the reader must beware. Generally, students do not share this caution. Why? Most obviously, because they are students: the aim of their education, still a work in progress, is to teach them to read critically the materials in their field. Such abilitieswhether the ability to assess experimental design in a research article or the persuasive interpretation in a history paper-are cultivated far into graduate school.

But students are also not wary about Internet sources before they read them. This "why?" is to me a more interesting question. I have noticed that few UC Davis students, except for seniors in their majors, understand the thinking behind these two observations: 1) their major professor would not self-pub-

lish her current research on the Internet; 2) the "facts" or "information" on an advo-

cacy Web page might not be reliable, but the page could be a primary source for research on attitudes or a point of view not available elsewhere.

I think that we who have been trained in print media fail to see how critically we use bibliographic information about texts. Our judgments based on bibliographic data are largely subliminal but highly trained. We prejudge texts by considering such clues as date, genre and format, type of publication, publisher, review policy of journal, name and title of author(s), affiliation of author(s), documentation apparatus and style, references, and even length of text.

Which would you trust or use, a current research article in the New England Journal of Medicine or one in Scientific American; a UC Press book or a vanity press book; a ruling by the State Water Board or the Save Mono Lake newsletter? You'll say that your answer depends-but you know the subliminal calculus for figuring out the relative worth of sources for different research purposes. Most

undergraduates do not.

Further, this bibliographic information is relatively hidden for Internet sources-but it's also great fun to figure it out and demands much sharper detective skills than bibliographic data from print sources. Taking a bibliographic approach to Internet sources becomes a lively introduction to critical

### Resources

If you are interested in evaluating Internet sources or teaching students to evaluate them, much advice is available on the Internet. But let the reader beware.

http://www.vuw.ac.nz/~agsmith/evaln/evaln.htm (A bibliography on evaluating Internet sources)

http://www.science.widener.edu/~withers/advoc.htm

http://www.science.widener.edu/~withers/inform.htm (These last two are useful introductions to evaluating an advocacy page and an informational page.)

Or you can e-mail me at *sepalo@ucdavis.edu*, requesting a workshop through the Campus Writing Center's workshop program.

reading.

Thus, as a teacher, my critical focus on Internet sources begins with bibliographic data, not content and certainly not graphics or Web page design. I aim to excite critical thinking that will ultimately extend to content. With the students, I usually first "read" a bibliography or reference list from an article,

> inferring the quality of the sources from the citation data — usually a revelation to students. Then I give students several problematic Internet pages and ask them to reach a preliminary assessment of their probable reliability based on bibilographic data. Students become much more skeptical readers after these exercises.

> Susan Palo is a lecturer in the Campus Writing Center.

### Look Into The Future

## Virtual Lectures: The Course of the Future?

BY HARRY MATTHEWS, BIOLOGICAL CHEMISTRY

"You could pause at slides that you needed a little time to muse over and skip over those that you felt you already had a good grasp of"<sup>1</sup> said a student evaluating a course delivered by computer at UC Davis. Last quarter, for 100 medical students, 23 virtual lectures replaced 23 physical lectures. Available on 5 CDs, these multimedia teaching materials were the primary source of course content for BCM 410A, a required first year medical student course in molecular and cellular biology. Each lecture is based on animated computer graphics that are very effective in explaining the concepts of protein molecular biology.

Over the last 15 years, these lectures—in their physical form—have followed a steady progression from blackboard to overheads and slides to multimedia to oblivion.

At UC Davis, there are some brilliant lecturers who should never stop lecturing and don't need multimedia props. But what about "ordinary mortals" whose best efforts to excite and enthrall students meet with limited success? Can the computer do a better job? Is the virtual lecture the course of the future—delivered by computer and controlled by the student? Another student thought so: "This is definitely something that should continue to be implemented in the future."<sup>2</sup>

Overall, the students in BCM410A valued the ability to choose the pace of the lecture, the schedule and the location.<sup>3</sup> The success of the interactive virtual lecture (see figure) already has important implications for teaching spaces, network infrastructure, resource sharing and distance education.

This is a period of rapid change. I don't see undergraduate education improving in the face of increasing class sizes unless the process changes dramatically. Mass production is not the answer to higher education's problems. But mass customization might help. Today's virtual lectures already provide a unique experience for each student. Students explore the material at their own pace and the order of their choosing. Different students will check different glossary entries and tutorials. The "lectures" will evolve with increasingly sophisticated interaction between the student and the computer. The computer will "understand" and respond appropriately to an increasing number of questions and will adapt to each student's learning pace and style. We already have adaptive examinations—it is time we exploited this technology for learning.

Once the computer takes the burden of content delivery and the learning of basic intellectual skills, the professor can return to interacting personally with students in groups of less than 10 with sharp focus on skills and attitudes. This was done as a companion to the virtual lectures last quarter and as a student said, of the small groups: "The process of 'bouncing ideas' off each



Students were asked how valuable virtual lectures were. The horizontal axis shows the number of students who gave the responses listed on the vertical axis.

other is a great learning tool in itself" $^4$  and, best of all, "They were fun, good to wake up to." $^5$ 

#### Author's Notes:

1 Quoted from midterm evaluation #5 for BCM410A, 1997.

2 Quoted from midterm evaluation #80 for BCM410A, 1997.

see "Virtual Lecture" on page 8

# **California Digital Library**

BY BEVERLEE FRENCH, GENERAL LIBRARY

Scholarly publishing is being transformed by information technologies. Whereas until recently knowledge was reviewed, edited, and fixed in an unalterable form, publishers are beginning to make their print journals available in electronic format. New journals, such as UCD Professor Art Huntley's *Dermatology Online Journal*, are appearing only in electronic versions. In order to provide important scholarly material to the desktop at any time and any place, the UC Davis Library has begun to license some of these materials for the UC Davis community. The UC Davis General Library's Web site contains links to electronic journals such as the Journal of Biological Chemistry, the American Journal of Mathematics, Modern Fiction Studies, and the Journal of Physics. The California Digital Library (CDL) has already linked articles from these and other full-text titles to its MELVYL System's abstracting and indexing databases.

The California Digital Library has evolved from several driving forces. Envisioned more than a year ago by UC President

Engineering Librarian Linda Yamamoto points out the benefits of online access to senior Christine Nati.

Atkinson as the "Cyberlibrary," the digital library will be shared among the nine campuses and even beyond the University. The mission is to provide a core of scholarly electronic resources to UC students and faculty. What many consider a crisis in scholarly publishing is also a motivating factor in making the journals available electronically. Periodical prices have risen 10 to 20% every year for the past ten years, and the portion of the scholarly output that UC libraries, like many research libraries, can provide to its faculty and students, continues to shrink. The California Digital Library is expected to facilitate changes in scholarly publishing that would allow universities and scholarly societies to manage knowledge review processes without commercial publishers.

The Library and Planning Action Initiative Task Force has recommended that the California Digital Library focus initially on building a critical mass of literature in science and technology, where the migration to electronic formats is most rapid. By delivering current publications via the Web through a consistent interface and structure (the MELVYL System), the CDL will save faculty and students time otherwise spent tracking down articles. Eventually, many publications will be available only in electronic format.

One of the University's operating principles is to license material only if every authorized UC student, faculty, and staff member is entitled to access the material from any location. Information Technology on our campus is already testing authorization and authentication mechanisms that will ensure secure remote access to the California Digital Library as well as to many other restricted University data files.

The California Digital Library will be created through the collaboration of librarians, faculty and information technology representatives from all nine campuses. Faculty groups thus far have been enthusiastic about the potential of the digital library. Over the next quarter, the science librarians at UC Davis will be concentrating on communicating with, and getting input from, faculty about the CDL science and technology collection.

Librarians are available to make short presentations to faculty or seminar groups and provide consulting services by email. They will gather recommendations on what to include in the California Digital Library.

Beverlee French is Associate University Librarian and UC Davis's representative to the CDL Science and Technology Task Force.

### **Resources:**

Beverlee French: *bafrench@ucdavis.edu* General Library: *http://library.ucdavis.edu* California Digital Library: *http://* 

lpai.ucsf.edu:8080/outcomes/cdl

Library and Planning Action Initiative Task: http://lpai.ucsf.edu:8080

Academic Senate Notice:

http://www.ucop.edu/senate/notice/nov7notc.pdf



### January

20 • Database Design Concepts: 9:30 - 11 a.m., Cabernet Room, Silo.

> O Internet via Modem: Mac OS: 9:30 -10:30 a.m., MU East Conference Room.

Library and Internet Resources on the Web: 11 - 11:50 a.m., Carlson Health Sciences Library

O Internet via Modem: Windows 95: 11 a.m. - Noon, MU East Conference Room.

**#** Electronic Mailing List Administration: 1:30 - 4:30 p.m., TB 134.

☆ Fundamentals of Netscape: 5 - 8 p.m., TB 134.

21 **G** Find Information on the Web for Research: 11 - 11:50 a.m., Microcomputer Room, 163 Shields Library.

> **%** Web Publishing: Creating Effective Web Pages: 1:30 - 3:30 p.m., Founders Boardroom. Buehler Alumni Center.

> ☆ Fundamentals of Eudora: 4:30 - 8 p.m., TB 134.

Now through February 13, webs://textiles and new technology. Exhibit of actual and virtual works from various countries. Design Gallery, 145 Walker Hall. M-F, 12-5 p.m., Sun 2-5 p.m. http://design.ucdavis.edu/texandtech/

4

5

9

22 • Fundamentals of Excel: 1-5 p.m., TB 134.

Get Started Searching with Melvyl on the Web: 2:10 - 3 p.m., Microcomputer Room, 163 Shields Library.

- 23 Get Started Searching with Melvyl on the Web: 11 - 11:50 a.m., Carlson Health Sciences Library.
- 26 ◆ Using an Access Database: 1:30 - 3:30 p.m., TB 135.
- 27 🕸 Fundamentals of Word: 8 a.m. - Noon, **TB 134** 
  - **%** Web Publishing: Working with Frames: 5 - 8 p.m., TB 134.
- Fundamentals of Eudora: 1 4:30 p.m., 28 TB 134.

Get Started Searching with Melvyl on the Web: 2:10 - 3 p.m., Microcomputer Room, 163 Shields Library.

- ♦ Fundamentals of Netscape: 5 8 p.m., TB 134. 29 **O** Hot Topics in Computer Graphics:
- Animation and Video: 11 a.m. Noon, MU East Conference Room.

### February

♦ Fundamentals of Excel: 1 - 5 p.m., TB 2 134.

# Fundamentals of Web Publishing: SDPS, 5 - 8 p.m., TB 134. (Two-day course offered 2/3 and 2/5)

☆ Fundamentals of Windows 95: 8 a.m. -Noon. TB 135. ☆ Fundamentals of Netscape: 1:30 - 4:30

p.m., TB 134. • Desktop Publishing Design Concepts:

9 - 11:30 a.m., 1113 Academic Surge. □ Melvyl Special Features and Advanced Search Techniques: 11 - 11:50 a.m., Microcomputer Room, 163 Shields Library.

• Using a FileMaker Pro Database: 1:30 - 3:30 p.m., TB 134.

□ Get Started Searching with Melvyl on the Web: 3:10 - 4 p.m., Microcomputer Room, 163 Shields Library.

☆ Fundamentals of Word: 8 a.m. - Noon, TB 134.

O Transitioning to Windows 95, 11 a.m. -Noon, Cabernet Room, Silo.

**%** Web Publishing: Simple Image Manipulation: 1:30 - 4:30 p.m., TB 134.

◆ Fundamentals of PageMaker: 1 - 5 p.m., 10 TB 134.

Get Started Searching with Melvyl on the Web: 3:10 - 4 p.m., Microcomputer Room, 163 Shields Library.

11 🔅 Fundamentals of Eudora: 8:30 a.m. -Noon. TB 134.

> Library Skills for Term Papers: 11 -11:50 a.m., Shields Instruction Room, 2nd Floor

- ♦ Working with Excel Charts: 1:30 3:30 p.m., TB 134.
- □ Find Information on the Web for 12 Research: 2:10 - 3 p.m., Microcomputer Room, 163 Shields Library.

#### Key to Classes & Seminars

- **% Information Provider Series**: Staff Development & Professional Services. Faculty and student registration: learnit@ucdavis.edu or 754-8091.
- Library Instruction Programs: LibraryClass@ucdavis.edu or 752-4381.
- Staff Development & Professional Services (SDPS): Enroll online at http:// sdps.ucdavis.edu. Call 752-1766 for an application or catalog.
- Student/Faculty Series: Information Technology; call 754-8091 or email learnit@ucdavis.edu.
- Technology Intensive Seminars: No  $\mathbf{O}$ registration required; call 752-1766 for more information.

## Laptop

#### from page 6

Consultants at the Arbor work with faculty to ensure they have the software and expertise needed to create the desired teaching tools. Through the Arbor's housecalls program, a staff member can meet with the faculty member in his or her office. Recipients may also be introduced to the New Media Lab in Meyer Hall, for access to additional equipment and software, as well as other resources, depending on their needs.

"Naturally every faculty person is different, their uses of technology are different, so their needs are different," says Margaret Byrne, manager of Information Resources' Academic Support Program, which manages and staffs the Arbor. "The program aligns the need of the faculty member with the best staff person."

The program has allowed some instructors to experiment with the introduction of technology in the classroom. "I am very interested in exploring how best to use the computer in foreign-language learning," says David Fahy, a lecturer in Japanese. "We now have a computer classroom in the Language Learning Center (in the basement of Olson) and I am beginning to integrate Web material into my classes."

Time in the Language Learning Center's computer classroom is limited, so Fahy made use of his laptop to introduce materials and programs that his first-year Japanese-language students would use on their own in the lab. It also facilitated working together as a group. A class writing exercise, for example, might involve a prepared text that was projected in the classroom, with students making suggestions for altering it. "Students get involved in the document, directly contribute to it, discuss it as it unfolds. This helps to get the students involved and interested and, of course, to get them to understand better," says Fahy. Work completed in class could be posted easily on the class Web site, with practice exercises created to complement or expand on it.

Part of Fahy's experimentation involved the best integration of a laptop with the equipment in UC Davis mediated classrooms. His and other participants' observations, along with student evaluations, will help the TRC and IT gather information about benefits and disadvantages, to both instructors and students, of classroom laptop use

"We expect to develop more precise and useful assessment tools to help instructors judge what applications and practices might work best in different instructional contexts," says Anderson.

#### **Resources:**

Wini Anderson (Teaching Resources Center): weanderson@ucdavis.edu; 752-6050 for more information on the laptop program.

In addition to the Arbor and TRC, a number of IT support services are available for faculty who are interested in incorporating technology into the classroom. These include the Technology Support Program, Creative Communication Services' Instructional Media, and the Center for Advanced Information Technology. For more details, see this issue's Online Exclusives (page 4).

## Virtual Lecture

### from page 7

3 The main disadvantage was lack of speedy response even using a local CD-ROM drive. The lectures are designed for delivery over the Web but there is inadequate bandwidth for this. To completely refresh a 21" computer screen 30 times a second with 24bit color needs 1.4 billion bits/second. Maybe



something like this will be the future unit of network speed, i.e., 1 user unit (UU) = 1 billion bits/sec. I know compression will reduce this load, but the need for interactivity and sound will increase it again.

4 Quoted from midterm evaluation #68 for BCM410A, 1997.

5 Quoted from midterm evaluation #21 for BCM410A, 1997.

Harry Matthews is professor of biological chemistrv.

### For more information:

Matthews' Web site:

http:/trc.ucdavis.edu/HM

Description of Virtual Lectures: http://trc.ucdavis.edu/coursepages/bcm410a/ virtual.html

Sample of Virtual Lecture: http:// trc.ucdavis.edu/coursepages/bcm410a/ sample.html

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