In 1993, IT Times reported on the pioneering and evangelizing work of a few visionary faculty members exemplified by Geoffrey Wandesforde-Smith (now an Associate Professor of Political Science). The articles identified important pioneers and highlighted their efforts to adopt and adapt information technology for educational purposes.

Emergence of Pioneers

The pioneers are those who first developed ways to use technology in teaching. They were highly independent people acting outside of institutional norms to develop a vision that was its own reward. UC Davis was fortunate to have had several such individuals in the early 1990s.

The pioneers had diverse goals related to student learning or access to courses, and many of the pioneers’ projects flowered in a variety of forms. One projected to the creation of a new online journal. In another, faculty were allowed and encouraged to make unrestricted use of server space at the Teaching Resources Center for the development of online course materials. And in a third case, course structures were changed to add computer labs to traditional lecture courses, so that students could learn how to make and manage Web sites. However, the effects of these experimental projects were necessarily isolated and, for some, fleeting. Certainly, students drew some benefit from these projects but, without incorporation into the fabric of the institution, these nice demonstrations would not have lasting impacts.

In 1994, three faculty pioneers, Art Huntley, Dick Walters, and Geoffrey Wandesforde-Smith, along with Frank Samaniego, a visionary Director of the Teaching Resources Center, created the Summer Institute for Technology in Teaching (SITT). This program has run annually since then and has been used as a model for similar programs at other institutions. SITT brought together an eclectic collection of pioneers and early adopters from all over campus, many of whom had no like-minded colleagues in their local or subject areas. The Summer Institute created a cross-campus community in which best practices were shared and fostered. Before the Summer Institute, the pioneers were mostly “lone rangers” striking out on their own. The community created by the Summer Institute reinforced the vision and helped to focus it, leading to institutional recognition.

Selective Institutional Support

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Community Involvement

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Ten Years of Educational Technology Development

A Lesson in Institutional Transformation

by Harry R. Matthews, Director of IET–Mediaworks, and Professor of Biological Chemistry

In 1993, IT Times reported on the pioneering and evangelizing work of a few visionary faculty members exemplified by Geoffrey Wandesforde-Smith (now an Associate Professor of Political Science). The articles identified important pioneers and highlighted their efforts to adopt and adapt information technology for educational purposes.

Ten years later, this article explores the path leading from these pioneering efforts to our current recognition that technology, even as it continues to evolve and present new challenges, is an essential teaching tool.

I

f you were on campus ten years ago, you may have caught the first few issues of IT Times. But more importantly, no matter where you were, you were probably getting your first desktop computer, writing your first few emails, or noticing technology becoming more a part of your home and your workplace. In this issue, we celebrate not only the ten–year anniversary of IT Times, but also a decade of technology services on campus. Each article in this Special Edition is an update of an article that appeared in IT Times ten years ago. You can visit IT Times online (http://ittimes.ucdavis.edu/) to read more old and new articles, which we think combine to tell a story of surprising but steady change at UC Davis.

Educational Technology

continues on page 2
Educational Technology continued from page 1

Researching Cost-Effectiveness

Although “boutique” projects tend to be better developed and more visible than “lone ranger” projects, they don’t often enter the mainstream of institutional life. It was unclear whether their replication across the institution would be cost-effective. So, while the three “boutique” projects at UC Davis were successful, only anecdotal evidence could attest to their value, and their impact remained limited. Scaling up a “boutique” project or approach requires showing that it can be both effective and financially viable. On a small scale, financial viability is not so crucial if the institution finds the project effective enough to warrant its cost. However, on a large scale, the approach must be cost-effective over a variety of disciplinary areas or the institution will not be able to afford it.

In 1999, the Andrew W. Mellon Foundation solicited grant applications from universities interested in researching the cost-effectiveness of online education. A multi-disciplinary team of investigators secured a grant for UC Davis. The UC Davis Mellon research program studied 10 different general education courses in areas as diverse as Agricultural Economics and Asian Art History. The Mellon program compared the costs of online courses with those for traditional face-to-face courses. Most of the UC Davis courses in the study were hybrids, in which part of the course, typically the lecture material, was placed online, while other parts such as office hours and discussion sections, remained face-to-face. Usually, each course was offered simultaneously in both formats — traditional and hybrid — and students chose one or the other. The research team then measured educational effectiveness and costs for both offerings and compared them. Educational effectiveness was measured using the grades on the in-class examinations, written questionnaires, and focus groups. The team also took into account the amount of faculty time spent on the hybrid courses.

The results of the study revealed that student performance was found to be almost the same for both delivery methods, with the traditional method only slightly better. This is a remarkable result, considering that this was the first round for the online version, while the traditional version had been polished over many years. Further study is needed to determine if subsequent development of hybrid courses can make them more effective. The cost study generally indicated a small savings over the life of the course for the online version. Costs for online and traditional courses scale differently: the costs for the online method increases more slowly than those for the traditional version. The net result from the research is that online content delivery can be a cost-effective alternative to a traditional lecture in the UC Davis undergraduate environment.

Meeting Institutional Challenges

Institutionalization develops out of addressing important institutional problems. At Davis, the main institutional challenge has been maintaining educational quality in the face of rising enrollments and limited physical resources.

Developing an Institutional Structure

In 1998, UC Davis created a new advisory structure for information technology, which included an advisory coordinating committee for academic computing, known as the AC4 (http://ac4.ucdavis.edu/). This committee brought together senior administrators, faculty, students, and staff from across the campus. The AC4 also facilitated the creation of the team that submitted the Mellon grant application. More recently, it has provided a forum and served as a catalyst for the dissemination of the Mellon research results and the adoption of online technology at the institutional level.

Creating Dedicated Champions

Institutionalization of educational technology also requires champions, and in particular champions who are respected on technical, administrative and pedagogical issues, and can integrate these points of view. The new institutional structure and the Mellon program provided the basis for the formation of an effective champion at UC Davis. In July 2000, John Bruno, the Vice-Provost for Information and Educational Technology, created a new unit, now called Mediaworks. An educational technology group was formed as part of the unit. This group developed the educational technology used in the Mellon project and have also applied it to a major chemistry course and a major psychology course, thus benefiting most students on campus. Working in collaboration with the deans, Mediaworks provides the infrastructure for widespread cost-effective use of educational technology at UC Davis.

Fostering Future Progress

Ten years ago, the campus was starting to emerge from a period of major budget reductions. Today, we are entering another similar period. For some, being the “new kid on the block” might make educational technology a particularly vulnerable target for cuts. On the other hand, educational technology provides a cost-effective solution to a number of problems the campus needs to address, including waiting lists for classes, summer session classes, limited number of classrooms, large (impersonal) classes, and student expectations for technology use.

Whether educational technology fares well or badly in the current climate, it is surely destined to become a greater part of the teaching, learning, and assessment landscape at Davis over the next ten years. The educational subcommittee of the AC4 is debating the vision for 2013 and while there are differences of opinion over the rates of change, there is agreement that educational technology will grow. As we face competition in the offering of courses, our own courses will continue to improve, but more fundamentally we need to think about “the Davis experience,” those factors that make a Davis education unique and valuable, an experience not yet captured on a transcript but that will last a lifetime.

The next ten years will force us to articulate, assess and improve these intangible contributions that we make to students’ lives. Perhaps it is in these areas that the current crop of pioneers will emerge. We must strive to recognize them and encourage them, as was done ten years ago in IT Times, in this Special Edition, and in new ways to come.

Acknowledgements: Much of this material is taken from the script for a DVD that explains the seven stages of educational technology transformation in more detail. Freja Koch narrated this DVD and wrote some of the script that is quoted here. The DVD is available from Henry Matthews, IET Mediaworks (hrmatthews@ucdavis.edu). The Andrew W. Mellon Foundation (http://www.mellon.org/) also made the DVD possible. You can visit the UC Davis Mediaworks Web site at http://mediaworks.ucdavis.edu. For consultation with your educational technology projects, contact Mediaworks (http://mediaworks.ucdavis.edu) at 752-2133 or mediaworks@ucdavis.edu.
Reflections of a Pioneering Professor
Advances in Educational Technology
By Geoffrey Wandeforde-Smith, Associate Professor of Political Science

Like many UC Davis faculty in the social sciences and humanities, I'm a great believer in term papers as learning tools, and have always required them. But tracking and grading an average of 100 student papers in large upper division classes is a challenge.

In 1991, persuaded that email could speed the iterative evaluation of student drafts and rewrites, I tried using it not only for personal communications but also for this new purpose. This caused some consternation and resentment, because neither personal computers nor email were then widely deployed on campus outside of the sciences and engineering. I worked to change this state of affairs with Joan Gargano and Ken Weiss, whose job it was to promote educational uses of distributed computing.

Because they thought I was curious and a risk-taker, Gargano and Weiss introduced me (in 1993, I think), to what was then called the World Wide Web. At the time, the Web browser was a "stand-alone" application. I sensed immediately, however, that once the Web became integrated with email, as well as with spreadsheet applications, word processors, and presentation programs like PowerPoint, neither teaching nor learning would ever be the same again.

This was a vision shared by those of us who established the Summer Institute on Technology in Teaching (SITT) in 1994 and by many, though not all, of those who became SITT alumni/ae. Because the learning curve for using the Web was steep – good Web editing programs were only three or four years old and faculty had no direct and unrestricted access to servers in 1994 – PowerPoint became (and remains to this day for the vast majority of faculty) the teaching technology of choice. It is an obvious improvement over the chalkboard for organizing and presenting lecture outlines.

Moreover, Web browsers did not immediately become integrated with other tools on a PC platform. They work painfully slowly over a modem connection. And, if one wanted to develop or have students develop Web pages and Web sites as expanded alternatives to lecture notes and term papers, there were still other obstacles to consider.

Classrooms were not equipped in the early 1990s in ways that made it easy or pleasant to use the Web (or even PowerPoint) for teaching purposes. The first projectors installed in some of the larger lecture rooms in 1997 (though often without good roll-down screens) were crude and clumsy, and connecting them to the network was a nightmare. Laptops were a scarce faculty resource, although now just about anyone who wants one can have one, and they are a standard supplement (or alternative) to desktop machines.

Today, because large numbers of faculty have insisted on it, the vast majority of classrooms have media cabinets, first installed in 1999. The Smart Panel in the media cabinet connects a laptop to the network (by dynamic host configuration since 2001) and a new generation of high quality projectors display material stored on the laptop or gathered, almost instantaneously over high-speed network connections, from servers that can literally be located either just around the corner or in any other corner of the world.

Bringing Facts and Figures to Life

... T H E N A N D N O W ...

When students and professors conduct research, publish books or give presentations, they have the burden of conveying complicated data or concepts in an organized and lucid manner. Illustrations, graphs, maps, and charts are often used to bring ideas and numbers to life. As technology has advanced, so have the methods for helping scholars present their information via illustrative means. Above, we used work by Claudia Graham, Mediaworks Artist, to illustrate the evolution of educational graphics in classrooms on campus over the years. For more information on getting help with graphics and course materials, contact Mediaworks at 752-2133.
How to Email Yourself into the Witness Protection Program
Netiquette for the 21st Century
by Nancy Harrington

1. Advice from the 90s: Use the Appropriate Degree of Formality (“Take time to make sure no electronic communication embarrasses you later”). There’s some advice many of us regret having overlooked! It takes just one caustic remark coupled with the use of the ‘reply to all’ feature to make us glad for the existence of witness protection programs. Organization officials and attorneys who once may have overlooked electronic communications when conducting investigations now include it routinely. Emails are considered official communications and are discoverable in terms of legal proceedings. There is more than embarrassment at stake these days. Updated Advice: Make your messages ‘concise,’ not cryptic. (Some things just don’t change.)

2. Advice from the 90s: Summarize What You Are Responding To (“When posting a response, summarize the parts of a message or article to which you are responding”). Always a good idea, especially when dealing with those of us—a growing number I might add—for whom every movie is a double feature! This is fairly easy advice to follow since the ‘reply’ function often automatically includes the text of the original message and all the ensuing correspondence. Although this sometimes means receiving an email the size of New Jersey, it’s better to see the whole picture before jumping into the fray with a response. The ‘reply’ function has the added advantage of keeping the same title throughout the correspondence, making it easier to locate messages on a given topic. Updated Advice: Include the original and ensuing correspondence in your replies, and don’t change the subject line.

3. Advice from the 90s: Keep Paragraphs and Messages Short and to the Point (“Make your messages ‘concise,’ not cryptic”). Sing it, sister! Now that email is a major rather than minor form of communication, some of us (and I’m not mentioning any names here) haven’t figured out that it isn’t the best format for delivering philosophical treatises. What, I ask you, is more dismaying than being confronted with an email message that requires the use of the scroll button, three times? One practical way you can keep emails short is to simply reference a Web page where more information resides, rather than recreating all the info in the text of your email. If this doesn’t work you might also attach a document with more info, or even suggest a follow-up phone call. Updated Advice: Don’t write anything in email you wouldn’t want to read aloud in court.

1993

Kevin Mitnick becomes the first computer hacker to make the FBI’s 10 Most wanted fugitives list.

The World Wide Web, Linux, America Online, Windows 3.1 and the first polymorphic computer viruses arrive.

1994

Pizza Hut initiates Web-based ordering system.

“Good Times” virus hoax circulates through Internet email.

1995

Kevin Mitnick is arrested and later pleads guilty to seven counts of wire fraud, computer fraud and illegal interception of a wire communication.

Kerberos password is implemented automatically on all new UC Davis email accounts.

1996

Hackers discover an SSL flaw in Netscape.

1997

I got my first computer and began doing what I am still doing today: playing nethack/moria."

Then, we had to use our imagination to predict what communications and research would be like. Today, the places we can virtually visit or the people we can virtually interact with are limited only by our imaginations.”

—Leng Siakkhasone, staff

—Andy Jones, Lecturer
Security Challenges Continue
UC Davis’ IT Security Coordinator Looks Ahead
by Robert Ono

Who would have believed ten years ago that we would now take for granted the many conveniences of email, high-speed Internet connections, and the ability to reach deep into the Internet community? Yet these capabilities became prevalent in an amazingly short period of time, as have a number of new computer security issues.

If there is a common theme running through the history of these computer security issues, it is that computers and networks continue to be threatened on a regular basis. However, the nature of the threats has changed over time. Prior to the 1990s, file and boot sector viruses spread via diskettes were a major concern. Then, during the 1990s, viruses became more efficient, transmitting themselves via email and network connections, causing widespread computer infections. Next, in the late 1990s, Internet worms and broad denial-of-service attacks became a pressing threat. In the past few years, as more personal information is collected electronically, identity theft has become a significant security issue for both organizations and individuals who may wonder about the integrity of their social security number, credit card information, or other personal data. And most recently, international tensions reveal that the information technology we so heavily depend upon could be considered our greatest and most exploitable vulnerability.

What are we doing on campus to encourage the integrity and appropriate level of confidentiality for electronic information? The campus recognizes that no single security measure can be a panacea. Rather, information security requires a rainbow of preventive measures, including but not limited to routine assessments, detection and investigation of computer incidents when they occur, and measures supporting the recovery of compromised computing systems. Currently UC Davis is working towards a secure environment by:

• Providing technical education opportunities that promote secure information practices and help to prevent security incidents. In June, the campus will host its first IT security technical and management education opportunity with the UC Davis IT Security Symposium (http://itessymposia.ucdavis.edu/security/index.cfm).

• Providing security assessment guidance, risk assessment guidance, and campus security alerts via the security Web site (http://security.ucdavis.edu).

• Developing greater analysis capability for hostile network traffic.

• Developing an incident reporting function that can accept human reported incidents and automated reports to create campus advisories.

• Developing authentication services and intrusion detection capabilities consistent with strategies recommended in previous technology projects.

Looking Ahead...
How will the information security challenges on and off-campus change in the next ten years? Already we are seeing many conveniences of email, high-speed Internet connections, and the ability to reach deep into the Internet community...
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 ravines 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.

Why I Take Good Care of My Macintosh
by Gary Snyder

This poem has never been published in any of Gary Snyder's books but has appeared twice in IT Times over the years, due to popular demand. When IT Times first ran this poem in 1988, Snyder reported that he had a Macintosh Plus with a 20 Mb hard disk. Today, he uses a G3 Mac notebook. Snyder won the Pulitzer Prize in 1975 for Turtle Island. He recently retired from his position as UC Davis faculty and is currently working on North American forest management issues, California water debates, and a new book of poems.
View From an Incoming Freshman Campus Technology Transforms Matriculation
by Mara Abrams, student

Compare the matriculation activities of an incoming freshman 10 years ago to those of an incoming freshman today and you’ll witness an utter transformation of the campus technology. This technology has revolutionized not only the day-to-day processes that students must follow, but their expectations for them, the channel of communication between ourselves and campus officials, and even the overarching structure of college life.

Course Registration
One campus unit that has evolved parallel to advancing technology is the Office of the Registrar, the unit responsible for handling student enrollment in the thousands of courses offered on campus. Believe it or not, this process once involved pencil and paper. Students had to fill out a form with their top six class choices and drop it off at the Registrar’s Office, according to Associate Registrar Don Barclift. Office employees would then manually key the students’ information into an algorithm-based scheduling system. If students didn’t like the classes that they were assigned, they would have to then go to the Rec Hall, where campus departments set up tables where students could request changes. The lines leading to the tables would often snake out the doors and around the grassy area outside of the Rec Hall, extending all the way onto the sidewalks of La Rue Road (as shown below in the photo circa 1990).

Thanks to emerging technology, the Registrar’s Office was able to do away with these impossibly long lines (and tedious labor) by establishing the telephone registration system, RSVP, in 1993. “It’s hard to believe that students once had to register for classes in-person, but it demonstrates the extent to which technology has impacted the functioning of this campus. Nine years after its arrival, RSVP was retired in December 2002 to make way for Web registration to become the sole method for course registration. The Registrar worked with IET to develop Web-based registration and for a four-year period made available both phone and Web-based registration methods. But by 2002, it became clear that students

Recruitment
It is clear that this past decade has brought about changes for enrolled students, but recent technologies have also benefited prospective students. The Office of Undergraduate Admissions and Outreach now utilizes WhyUCDavis (http://why.ucdavis.edu), an e-recruitment Web site, as one of their key promotional tools. WhyUCDavis has not replaced the campus’ traditional marketing methods, such as the use of brochures and campus tours, but rather has changed the focus of UC Davis outreach. Print publications, which are getting smaller, tend to encourage students to visit specific Web sites for more information.

According to Alice Hom, associate director of Undergraduate Admissions and Outreach Services, Davis was struggling to maintain its competitive position within the UC system in terms of being a first choice campus among high school graduates looking to attend a UC. WhyUCDavis, a collaborative effort involving several campus units, was created in an effort to improve the image of UC Davis by keeping up with prospective students’ demand for Web-based information about colleges.

The pilot version of WhyUCDavis rolled out in March 2001 and catered specifically to students newly admitted to the Humanities, Arts and Cultural Studies (HArCS) academic program in the College of Letters and Science. Cross-collaboration between HArCS, Public Communications, IET, Student Affairs Research and Information, Undergraduate Admissions and Outreach Services and most recently, the College of Agricultural and Environmental Sciences and Advising Services has since allowed the site to take flight. The current version now targets prospective students of all majors. Since its introduction last March, 162,281 unique users have visited the site. This substantial number suggests the contribution technology has made to our more traditional outreach approaches in a fairly short amount of time.

In addition to the function of catering to the demand of potential students, WhyUCDavis enables admissions personnel to better manage their workload. “Recruiters just can’t be everywhere at all times to disseminate information about the campus,” Hom says, adding that WhyUCDavis allows individuals to obtain the information they’re looking for at any time of the day.

So what’s in store for freshman matriculation in the next 10 years? Barclift is hopeful that we have only begun to see the potential of technology to inform and respond to student needs and expectations. “Technology will continue to play a key role in the future. We will continue to keep current with technology advances in order to improve the services we offer our students and the campus community,” he says.
Beyond the Card Catalog

Ten years ago, there were few options available to individuals who wanted to use library services without actually making a trip to the library. Today, there is a richer variety of electronic and print resources. The library has converted many print documents to digital formats and the card catalog of today are online databases that allow library users to search from their home computers. Campus individuals can now also search over 213 databases covering many specializations and interdisciplinary fields and reach several thousand full-text journals and books.

The new Harvest Library Catalog improves upon the Melvyl catalog, which was introduced over a decade ago. Another new library tool for UC Davis faculty, staff, and students is the Harvest Library Portal. The portal features broadcast searching among several databases simultaneously and offers MyUCDavis-like functions, such as one’s own private electronic bookshelf and space for customized saved searches to be run against one’s pre-defined list of databases. For more information on these search tools visit http://ilibrary.ucdavis.edu/sprin2003/library.html or visit Shields Library’s main page at http://www.lib.ucdavis.edu.

Shelving Books in the Digital Age
Ten Years of Change for Shields Librarians

As surely as online search engines and databases replaced old-fashioned card catalogs, other transformations are occurring in the contemporary library. "Media is distributed differently in different eras," says Gail Yokote, Assistant University Librarian for Research Services and Collections at Shields Library. For instance, while vinyl may have prevailed as the best audio format in past eras, digital compact discs are now the norm. These changes present new challenges to librarians. "When it is no longer realistic to assume that the average library user owns a record player, it’s time for the library to decide whether or not the content on the records we house is worth keeping," Yokote explains. "If it is, we have to update our holdings with CDs instead." Along with this challenge comes a number of legal issues, due in large part to the new Digital Millennium Copyright Act (DMCA) which presents guidelines about reformatting media.

Since UC Davis must comply with the DMCA, librarians are developing a familiarity with legalese they wouldn’t have had to deal with ten years ago. Other forms of media housed in the library—especially historical documents or photos—are protected from the ravages of wear and tear when they are reformatted. By scanning a set of photos and placing the new digitized images on the Web, library patrons no longer have to travel to hushed special collections rooms in which rare artifacts are housed under the proverbial glass. In order to provide this preservation of materials and convenience to users, the modern librarian is learning to come up to speed with scanning equipment, image resolution transfer, and Web navigation. "The digital age is providing new avenues for faculty and students conducting research, but it also requires more work and skill on the part of library and Web navigation." The digital age is also providing new avenues for faculty and students conducting research, but it also requires more work and skill on the part of the librarian," Yokote explains.

Likewise, most major publishers have begun to distribute their magazines and newspapers online, in addition to the traditional print formats they offer. Thus, librarians have to decide how to receive the materials via the usual print subscription, or online via a license that can be costly and prohibitive. Again, licenses and legal ramifications come into play, adding to the growing pains introduced by this digital era.

Yokote attests that "the biggest challenge now and in the future will be to accommodate the multiple formats that publishers produce and distribute and to swiftly deal with all the licensing agreements that come our way."