

Essay 6. Using Educational Technology to Enhance Learning and Teaching

Introduction

Information technology (IT) offers tremendous promise for enhancing the academic experience. Educational technologies include not only the Internet, which provides access to university websites directly tied to courses as well as to resources around the world, but also innovations in recording, collaborating, and responding technologies that offer enhanced environments for scholarly interaction and intellectual pursuit. These technologies are valuable when they serve the larger educational goals of the university: to create active learners who not only master the content of their chosen fields, but also develop techniques and modes of critical thought that will enable them to be informed and discerning citizens and contributors to their professions.

Most UCLA students are immersed in information technology in their daily lives. They expect that their academic lives will be similarly rich in technology, and that they will leave UCLA as technology-savvy graduates. Both faculty and students are end users of educational technology, and from it they gain vastly improved *access* to course materials and to one another. But crucially, the technology landscape now includes a rich mixture of new *kinds* of course materials: discipline-specific multi-media content, simulations, and applications, as well as tools for communication, collaboration, writing, and research. Educational technology holds the promise of creating more interactive classes, engaging students more deeply and more actively in the course content, and contributing to a student's learning of complex concepts by adapting to the student's level and progression of understanding.

To improve the learning experience significantly and consistently across the undergraduate and graduate curricula, however, UCLA, like comparable institutions, faces many challenges in developing practices, policies, and resources to adapt to ever-changing educational technology. These challenges are not merely financial, though they are obviously that; they also include a leadership challenge. In this essay, we focus on our capacity to build on our diverse experiences and to develop a more cohesive approach to leadership, infrastructure, and services based on a shared understanding of the uses of technology that will have the greatest impact on student learning and faculty teaching.

Reflecting on Past Successes: Three Examples

1) **Support for Technology in Instruction.** For over two decades, the Office of Instructional Development ([OID](#)¹) has provided a broad range of services in support of undergraduate instruction. Innovation grants, many of which include the use of technology, are awarded directly to faculty each year. OID's [Teaching Enhancement Center](#)² provides training and consultation in the use of technology. Their Teaching Assistant Technology Training Program, initially funded as a national model by the Fund for the Improvement of Post-Secondary Education, includes modules on the effective use of technology by graduate students. Most recently, OID has provided such innovations as video streaming, [podcasting](#)³, and classroom personal-response systems. Other support for innovation by faculty and teaching assistants occurs in units across the campus, at the level of either the division (e.g. the [Center for Digital Humanities](#)⁴ and [Social Sciences Computing](#)⁵) or the department, program, or individual faculty (e.g. [Virtual Office Hours](#)⁶ in the Department of Chemistry and Biochemistry). The new [Institute for Digital Research and Education](#)⁷ and the NSF-funded [AccessGrid](#)⁸ support graduate education in the use of technology for computation and simulation across units and campuses.

The largest educational technology impetus at UCLA in recent years has been the Instructional Enhancement Initiative (IEI), which is both a program and a funding mechanism for providing some components of the educational technology infrastructure at the department and division level. In 1997,

the College began to charge a per-unit fee for all regular undergraduate courses and became an early adopter of the now-standard practice of universal course websites. College IEI money is distributed to departments or other units in its four academic divisions. As detailed in a recent [report](#)⁹, these resources (~\$5.5 M/year) support the development and maintenance of course web sites, course management systems, student computer laboratories, the computing commons in the library ([CLICC](#)¹⁰), and the web portal to individualized course information ([MyUCLA](#)¹¹), and assistance to faculty in the use of educational technology. The Henry Samueli School of Engineering and Applied Sciences now similarly assesses a per-unit [fee](#)¹² to provide computing resources for all its undergraduate courses.

The implementation of the IEI has been a noteworthy success in meeting educational technology challenges specific to UCLA, in part by forming a consensus around the model of a common enterprise that is implemented and administered locally. The IEI builds on UCLA's culture of distributed innovation by placing resources as close as possible to the point where support and services for students and faculty are needed. However, IEI resources arise from and are dedicated to undergraduate courses; there is no equivalent general support for graduate education.

2) Governance. Under the leadership of the Associate Vice Chancellor-Information Technology (UCLA's CIO), who heads the Office of Information Technology ([OIT](#)¹³), UCLA has made significant progress in establishing a governance structure for deciding institutional IT direction, policy, and investment. The Information Technology Planning Board ([ITPB](#)¹⁴)—a joint faculty Academic Senate-Administrative board responsible for strategic planning and policy recommendations for academic and administrative applications—was established in 2001. Because of the importance of technology for education, the Faculty Committee on Educational Technology ([FCET](#)¹⁵) was established soon after to provide advice to the ITPB and to the (then) College Provost. Now, with a broader membership, it serves that role for the CIO and the Vice Provost for Undergraduate Education. Local units' governance models vary, with some having very active faculty advisory committees. The Campus Computing Council ([CCC](#)¹⁶) brings together the IT directors from local campus units.

3) Educational Technology Leadership. The ITPB developed a campus-wide vision for educational technology with two goals: 1) to integrate students into an educational technology-enhanced teaching, learning, and research environment, and 2) to use the Internet to support scholarly interaction, both to engage students and to enhance external access to UCLA. This vision for Educational Technology has been continuously reviewed and refined through the IT governance structure. Over the past six years the FCET has developed a strategic vision and recommended educational technology services and initiatives, as demonstrated in the [Annual FCET Report](#)¹⁷. In 2003, it established the Brian P. Copenhaver [Award](#)¹⁸ for Innovation in Teaching with Technology, an award given annually to honor faculty who successfully experiment with new educational technology, to help faculty share their experiences with others, and to build a UCLA community of educational technology innovators. More recently, the FCET recommended that the campus converge on a Common Collaboration and Learning Environment ([CCLE](#)¹⁹), both to support instruction with a common environment and to provide a platform for interdisciplinary research and other collaborations. The CCLE will thus further integrate research and teaching, serving undergraduates, graduate students, and faculty.

Current Challenges in Advancing Educational Technology

To some degree, the early launch and success of a broad range of services and programs throughout the campus has created a culture and set of practices that make it costly and difficult for UCLA to achieve significant systemic change and broad educational technology improvement. Although intertwined, the challenges for UCLA can be sorted into three major categories.

1) Educational Innovations. How can we build a research-rich educational environment for undergraduate and graduate students, using educational technology-enabled pedagogy to achieve clearly articulated learning outcomes? UCLA does not lack ideas about how to do this. In addition to

the efforts of individual faculty such as those recognized by the Copenhaver Award, and individual graduate students such as those teaching through the [Collegium of University Teaching Fellows](#)²⁰, there have been many studies and pilot projects, e.g. an OID pilot project on [Blended Instruction](#)²¹, an Academic Senate study of [online instruction](#)²², and a FCET recommendation for an [Open Course Ware project](#)²³. There are several “islands of excellence” where students benefit from such innovations. However, these benefits are generally not realized beyond individual classes to the broader campus community. There is no systematic process for assessing impact beyond standard course evaluation forms. Other than the Copenhaver Award, there is little in the current resource and reward system for faculty that fosters investing the time required to incorporate innovative educational technology. The challenge for UCLA is thus to engage systematically in 1) assessing pilot efforts in terms of learning outcomes; 2) disseminating these successful ideas and encouraging adopters; 3) continuing assessment throughout larger scale implementations; and 4) rewarding innovators.

2) Building a Cohesive Instructional Technology Environment. Because responsibility and funding for educational technology programs is at the school, division, or department level, each unit has its own infrastructure, including about course management systems. The many such systems deployed across UCLA create a problem for students who must use different systems across courses, and for faculty and graduate students who teach in more than one unit. And for administrative functions such as the Library and Registrar, unnecessary complexity is added to an already highly technological and rapidly changing environment. More generally, core educational technology services are uneven across campus, with some units providing models of excellence and others lagging behind.

The CCLE initiative, mentioned earlier, is intended to help remedy this situation, and it has already become a catalyst for bringing the campus together to develop more effective governance and service delivery approaches, and fostering a spirit of cooperation. In 2006, an innovative campuswide process to define requirements and assess options resulted in a widely applauded decision to adopt the [Moodle course management system](#)²⁴ for the CCLE. In 2007, with the support of key campus groups (OIT, OID, CCC, the Library), a cohort of staff members from units across campus contributed extensively to an alpha-phase implementation of Moodle. The EVC/Provost then allocated seed funds to facilitate a second phase of planning (Fall 2007) designed to determine the scale, scope, and architecture of, and to develop a funding model for, a wider implementation of the CCLE for 2008 and beyond.

A related challenge concerns three of our campus’s learning spaces. First, according to OID’s [Classroom Technology Plan](#)²⁵, furnishing UCLA classrooms with the newest educational technology equipment lags behind other UC campuses. Currently, only 50% of UCLA’s 200 general assignment classrooms are adequately outfitted. In response to OID’s plan, the Acting Chancellor has committed \$800,000 in permanent funds to be allocated over a two-year period, 2008-2010. These newly allocated funds will ensure that all general classrooms are equipped by 2011. Second, while much of UCLA’s general public space has wireless coverage, the campus is involved in debates about the need for providing wireless connectivity within its academic buildings. And third, the UCLA Library must consider how to provide students more access to its digital resources, as well as more workspaces.

3) Leadership. At UCLA, leadership in implementing educational technology currently follows the fully distributed structure of instruction on campus, and coordinating our decentralized institution to produce a federated environment requires creative leadership. Unlike some of our peer universities, UCLA has no single position or office solely concerned with advancing the use of educational technology. Responsibility is shared among key organizations (i.e., OIT, OID, CCC, the Library) through active, robust governance processes. While the benefits of a federated environment are significant, connecting and leveraging local and institutional efforts is a challenge, not just for educational technology but for all aspects of IT. UCLA is pursuing a model of “Coordinated Autonomy” in which IT infrastructure and services are neither centralized nor decentralized but

“layered”, meaning that local components are on top of shared, co-owned, institutional components. This strategic vision is summarized by UCLA’s CIO in a recent [Educause essay](#)²⁶.

Next Steps: Assessing the Use of Technology to Enhance Learning and Teaching

In approaching the report for the WASC *Educational Effectiveness Review*, the FCET will be working with faculty and others to develop an extended essay that will give an update on UCLA’s further development of a common collaboration and learning environment (i.e., the CCLE) and the issues of centralization and leadership that it raises. The report will also focus on three projects initiated by faculty, selected to illustrate the challenges to students and faculty in using educational technology to: 1) engage students more deeply and actively in course content; 2) incorporate information literacy instruction to develop basic research skills; and 3) use feedback about student performance obtained in a blended instruction model to inform the redesign of a large introductory course.

Project 1. Student Engagement. Current technology makes it feasible for a wide range of courses to include multi-media student projects, which facilitate active learning of course content while also enhancing students’ technology skills. An example that will be highlighted is Professor Tim Groeling’s course on *Political Communication* (Communication Studies 160), the core class on media and politics. Professor Groeling received a [2004 Copenhaver Award](#)²⁷ for introducing a video project in which students make political campaign ads, and then evaluate fellow students’ ads. This enhancement to the course was developed without significant university support and uses computing resources available to all students. Professor Groeling has done some informal assessment of the educational technology components of his course in the context of overall course evaluation. For the Educational Effectiveness report, we will consider how to introduce a more formal assessment of the educational technology component, and how to encourage others to adopt this sort of innovation, with the important goal of minimizing any new burden on the instructor.

Project 2. Information Literacy. Broadly defined, information literacy is the set of skills students need to locate, evaluate, and use information effectively and ethically. Students need these essential skills throughout their careers, and early information literacy experiences are foundational for advanced capstone experiences (*Essay 5*); yet many undergraduates come to UCLA with critical gaps in this skill set. To address this problem, the College Library (1) has developed a comprehensive [Information Literacy Program](#)²⁸ for all undergraduates, (2) assigns each freshman cluster team (*Essay 4*) its own reference librarian to work with the faculty and TAs to design information literacy exercises tied to writing assignments, and a [research guide](#)²⁹ for the students’ seminar projects, and (3) offers a [Fiat Lux seminar on information literacy](#)³⁰ for cluster freshmen wanting more intensive training. For the Educational Effectiveness report, we will assess the partnership between the librarians and the Freshman Cluster Program, documenting how it benefits cluster freshmen, TAs and faculty, as well as strategies for extending it to other general education and lower-division courses.

Project 3. Student Learning and Course Design. A course in introductory statistics is essential to a large number of majors at UCLA, and students may enroll with widely varying skill levels, unrealistic impressions of their own competence, and different needs for using statistical tools and measures. The traditional model for Statistics 10 included three hours of lecture and one hour of a TA-taught section each week for the 1,700 students enrolled. This educational technology project, coordinated by Senior Lecturer [Mahtash Esfandiar](#)³¹, focuses on course redesign to address the contextual issues above and to introduce statistics as a science of data. A blended instruction model with a significant online component using Moodle was developed to maximize the role of the students as active learners and to provide detailed information to students and faculty alike on their skill levels. Each week, students participate in online quizzes, and lectures are immediately tailored to address issues identified by quiz results. For the Educational Effectiveness report, we will examine the impact of the Statistics 10 redesign on student learning, as well as faculty and student satisfaction.