

Distance Learning at Home

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Despite the decline of the dot coms, university administrators, with dollars dancing in their eyes, continue to create organizations, including for-profit corporations, to deliver distance learning courses and academic degree programs to working adults. Amidst the scramble for position in the educational marketplace, far less energy and time has been devoted to a more mundane, costly, and perhaps more important task: preparing campuses for the information age. In most colleges and universities, a small number of faculty members have experience with distance learning pedagogies, the campus infrastructure has not been fully modernized, institutional cultures are indifferent or hostile, and resources have not been set aside to bring potentially transformational technologies to resident faculty and students.

Teenagers today have lived their lives in a rich multimedia soup. As undergraduates they expect, and may even require, that their formal learning environments contain this same richness. When integrated with lectures, discussions, and labs, technology mediated learning can support multiple learning styles in a single course, help contextualize new information, and give students fluency with electronic information as basic tools of life. It can even eliminate some of the barriers of the "real" world. No one can "see" the contours of convective heat loss from a leaf under various conditions, but it is possible to model it mathematically and then create visual displays of the phenomenon.

The technology also provides opportunities for students to learn while working with faculty on advanced research. At the University of Virginia, Professor of History Ed Ayers began the Valley of the Shadow Project, a hypermedia archive of thousands of sources, for the period before, during, and after the Civil War in Augusta County, Virginia, and Franklin County, Pennsylvania. Students assembled and transcribed newspapers, census data, and military records, and helped prepare an electronic cultural atlas. One undergraduate mastered Macromedia Flash Shockwave so that he could design and build the project's animated theatre maps. When complete, the archive reached out, via web sites, CD ROMs and books, to secondary schools, community colleges, libraries, and universities, inviting visitors to investigate every facet of the Civil War, and reconstruct the lives of women, African-Americans, farmers, politicians, soldiers, and sometimes, their own ancestors.

To use the technology of distributed learning to build a community of faculty, students, librarians, and technical staff requires a comprehensive plan. It should start with programs and end with the facilities and services to support them. There are two ways of encouraging faculty to deploy new technologies to redesign courses. Limited consultation with information technology staff can help faculty, who already have some knowledge of how to implement their project on-line, to "learn to plant and harvest." At Cornell, for example, over 1500 instructors have had some help in establishing web sites that post assignments, make class notes and reserve readings available, set up discussion boards, and invite e-mail communication among professor, TA, and student.

The second model, “planting and harvesting with them,” enlists the faculty member in a team of instructional design, graphic design, library, and technical professionals in a “full service” approach to creating and designing a course that might utilize animation or computer graphics. Department chairs and deans might be given vouchers to insure that resources are allocated on the basis of academic merit. Course Improvement Grants may well include cash outlays for faculty and graduate student release time, and require fellows to meet with one another at least once a month to share problems and solutions in a collaborative environment. At the University of Virginia, this approach produced some extraordinary courses, dozens of faculty ambassadors for distributed learning, and helped transform the institutional culture. We estimate that supporting twenty faculty fellows over an academic year will cost \$400,000. It will also generate a need for additional information technology staff.

This approach will require facilities and services that do not exist in adequate form at most of our institutions. At minimum, high capacity connections to the Internet will have to be provided and/or enhanced. Depending on the method of implementing video transport, other kinds of inbound and outbound transmission media, such as satellite and ISDN lines, may be needed. The campus network infrastructure should be capable of delivering switched 10/100 MB services to desktops in offices and residence halls and the campus backbone should be “overprovisioned” so that it will not degrade the quality of digital video transmission.

Many colleges and universities have some classrooms with network connections and capability for displaying multimedia course materials, including streamed moderate quality video. Few have enough. Several fully automated “distance learning classrooms” with the capacity for two-way interactive communication with a second classroom setting, on campus or at another institution, should be available as well. When they are, among other uses, the specialized expertise of a faculty member, in social security law or high energy physics, can be “leveraged” in “hybrid” courses, taught “face-to-face” on a campus but available as well on the Internet, in real time, at a half dozen institutions throughout the United States and abroad. Finally, the demand for core digital assets—the hardware and software for servers on which courses and parts of courses will reside, as well as the tools and skilled personnel to organize and manage digital content—is certain to increase exponentially in the next decade.

The cost of connectivity will depend, of course, on the current state of the communications infrastructure and the size of the institution, but some estimates can now be made. The annual cost of a T3 connection to the Internet is about \$250,000, and an OC3 connection about \$800,000; both will support e-mail and web traffic as well as distance learning. The bill for equipping a fully interactive classroom for thirty students is at least \$175,000. Servers and software to deliver instructional materials are \$40,000-\$50,000 each. Each five interactive classrooms, moreover, require one high-level technician and an on-site support person whenever the classroom is used. A network to support a top-flight institution with 20,000 students will need a staff of 20-30, not including those who look after applications.

Because digital information technologies are so different from their print-on-paper predecessors, institutions should redraft intellectual property and conflict of commitment policies. In addition, faculty and administrators should decide whether to allow individual faculty, departments, deans, and/or presidents to contract with third parties to deliver distance learning programs? Should a

gatekeeper decide whether a program is done "in-house" or by an outside agent? Raising these issues disrupts the peace; failing to raise them—and very soon—may prove to be even more dangerous.

Libraries, too, must adapt to education in an information age. In addition to replacing card catalogues with on-line search engines, staff must be able to help faculty and students identify resources on the Internet—images, archives, and bibliographies—in the creation of courses and the completion of assignments. Libraries are probably the most appropriate locus of responsibility for managing the copyright clearance process for materials incorporated into courses, an essential task given the potential liability for copyright infringement. Increasingly as well, librarians initiate and collaborate in the creation of on-line material suitable for instruction and research. While maintaining traditional functions of book and periodical acquisition and maintenance, libraries will need substantial appropriations for these new activities.

The best way to insure that new technologies will produce a radical transformation in pedagogy in institutions of higher education, is to support what faculty do best and care about most: teaching resident undergraduates and graduate students and engaging in research. Distance learning missionaries suggest that the only way to pay for infrastructure and faculty training is to offer large-scale, high-priced courses, certificate programs, and degrees to learners in the workplace. While perfectly reasonable, especially in the absence of other sources of funds, this approach may well put the cart before the horse by expecting faculty members to design courses for hotel managers in Singapore and engineers working for General Motors, when they are unfamiliar with the technology, less than passionate about continuing education, and skeptical about whether academic quality will be diluted in programs delivered over distance, and offered principally for their potential to turn a profit.

It will be beneficial, in the long run, and perhaps even necessary, we believe, to approach distance learning as a gardening rather than a re engineering project. It will require initial plantings in familiar soil, in plots that the gardeners recognize as their own. Distance learning, like most effective and enduring instruction, should begin at home.