

## Standing on the Plateau

Recently, I paid a visit to my university's Web site, where I found a campus slideshow for prospective students. Similar slideshows and virtual tours are posted on many other college and university Web sites. These usually contain image after image of young people lounging, walking, eating, and laughing in sun-drenched settings across campus. At the University of Wisconsin–Madison, the students are sprawled on vast lawns in a perpetual summer: “a favorite place to study—and not to study.” They enjoy the lakeshore view from the student union terrace: “famous for its sights and sounds.” They take in the nightlife of downtown Madison: “No matter what time you walk down State Street, you’ll end up seeing someone you know. You’ll always run into someone different, someone new.”

Deeper into the slideshow, students are actually pictured at work, but not in classrooms or lecture halls. They stand outdoors, peering through land-surveying instruments: “the advantage of out-of-class projects and research opportunities.” Or they gather around a computer terminal in an energetically cluttered laboratory: “Research at UW-Madison is a participatory venture, in which students and professors often work side by side.” And in one astounding shot taken through a fish-eye lens, the viewer peers down on an intrepid rock-climber as he reaches the top of a rather formidable campus wall. The quote that accompanies this photograph pretty much sums up the general outlook: “Most of the lessons we learn here are not from lecture halls, not from books. They are from our experiences in life.”

Through the medium of the campus itself, college and university communications offices are offering prospective students (and their parents) the promise of *an experience*. Institutions of higher education (particularly those with centralized campuses) promote themselves, first, as places with people. The physical campus sets up the enabling conditions for a complex social ecology to emerge over time. Large numbers of students engage in daily role-playing (also known as “critical thinking”), during which they “perform” a particular point of view—trying it on for size, explaining, critiquing, justifying, deepening, and reinforcing their understanding while strengthening their group identity. Ask anyone who has ever been through a rigorous program of study, and chances are he or she will remember learning more from fellow students than from professors.

The unique value of campus life, then, is a matter of *proximity*—the ability to position oneself in direct relation to relevant people and resources. The sociologist Erving Goffman called these spatially defined moments of engagement “focused gatherings” in which people are “engrossed in a common flow of activity and relating to one another in terms of that flow.” The gathering takes its form from the situation that evokes it, “the floor on which it is placed,” as Goffman put it.<sup>1</sup> Add to this foundation the ready availability of tools to forcefully express, embody, and exchange ideas, and the campus has all the makings of one vast “collaboratory.”

Despite all this, we continue to design online learning environments that do little more than replicate the remoteness of

a lecture hall. Clearly, any approach to online education that restricts itself to the delivery of pre-packaged content ignores the depth and social texture of campus life, along with the collaborative nature of learning. Of the three broad aims of higher education as identified by learning researchers—(1) skill acquisition and competence with tools and techniques; (2) socialization and induction into the canons of particular communities, professions, or disciplines; and (3) development of an intentional, or self-directed, approach to lifelong learning—current online learning environments are relatively successful in managing only the first, most transactional of goals.<sup>2</sup>

Meanwhile, we’ve reached a critical juncture in our institutional commitments to educational technology. Advances in networking and software design finally allow educators to do far more than merely automate the traditional lecture course. Over the last several years, higher education leaders have outfitted their campuses with fat pipelines and high-speed connectivity. Increasingly, their students come to campus equipped with the latest in commercially available PCs and laptops. Hard drives are bigger, graphics accelerators speed up 3D image display, and faster processing chips simulate real-world physics with relative ease.

At the same time, college and university open source software development projects are signaling dissatisfaction with commercial approaches to meeting pedagogical needs. A growing number of institutions with the capacity to build their own learning software are working to design applications suited to their individual requirements. Proprietary course

management systems may have helped institutions leverage new media, but many in higher education feel these systems are making little headway when it comes to providing innovative technologies for real-time interactions among people, information, and systems. As one analyst concluded recently, “proprietary systems . . . seem to have hit an early plateau,” whereas “open source applications are standing on that plateau looking forward.”<sup>3</sup>

Standing on that plateau, looking forward, open source application developers are taking the time to consider what



they would do differently if they were to design a new online learning environment today, knowing what they now know about the power of computing and networking technologies. For example, the members of the Croquet Project, a new open source initiative, are exploring what it would take to make online learning as personally involving, meaningful, and rewarding as campus-based learning. The project's participants, who are coming together from around the world, believe that a transformative platform for online learning and teaching is finally within reach.

So, what is the Croquet Project? Imagine you are a graduate student in astronomy and have been asked to demonstrate your knowledge of Kepler's Laws. You launch a software application on your computer and enter a three-dimensional online world. Inside this persistent environment, you use the drop-down menu to quickly design and deploy a dynamic simulation of the solar system. As your simulation runs, your professor enters the 3D online lab space and takes a closer look. Your professor downloads a file from his own hard drive into the virtual laboratory, and it appears inside a display

window he just created with a click of the mouse. Remarkably, you and your professor are now able to see one another make additions and changes to the same document, all while keeping up a steady banter with the help of network-enabled telephony built into the software system. Impressed with your work, the professor invites his entire introductory astronomy class to a viewing and discussion of your simulation. From across campus, hundreds of students gather inside the virtual lab. The instructor's video image (captured by the web camera on his laptop) is visible to the students he guides through

the demonstration. Classmates wander among the planets, talking together in small groups, adjusting the timing and motion of the celestial machinery, annotating elements of the scene with comments or references, and gaining an unprecedented appreciation for Kepler's Laws in action.

This vision of the future in computer-mediated education is driving the efforts of the open source Croquet Project. The project is designed specifically to make the most of advanced campus networks and the untapped computational resources of individual machines by enabling safe and secure cooperation—among machines, among user interfaces, among content developers, among users, and among institutions.

Croquet is the combined vision of its six core architects: David A. Smith, David P. Reed, Andreas Raab, Julian Lombardi, Mark P. McCahill, and the computer visionary Alan Kay. The winner of both the 2003 ACM Turing Award and the 2004 NAE Charles Stark Draper Prize, Kay is famous for his design of the now-familiar desktop metaphor for personal computing, as well as his object-oriented approach to computer programming. In some respects, the project is a way of fulfilling Kay's abiding vision of the computer as a “meta-medium” and harnessing its full expressive power. Recognizing

that little had changed since Kay introduced the overlapping windows interface thirty years ago, the Croquet team intends to provide a comparable computing standard for a new age of collaborative work and learning.

As of this writing, researchers and technologists from twenty universities have joined the higher education development effort, jointly spearheaded by the University of Wisconsin and the University of Minnesota. This open source development community is working to ensure that the Croquet platform is able to address the special needs and concerns of higher education. Programmers and educational application developers interested in familiarizing themselves with the Croquet programming environment are welcome to download a developer's preview of the technology from the Croquet Project Web site (<http://croquetproject.org/>). A more complete release of the Croquet technologies is planned to appear on the Croquet Web site later this year.

Higher education is moving closer to an online learning environment that captures the social vitality and collaborative spirit of the real-world campus. A growing open source community of learning researchers, software architects, visualization and simulation specialists, and user interface designers has taken up the challenge, lending their expertise to the Croquet Project. Such next-generation systems promise to extend the primary advantages of campus-based learning into the online realm, deepening and transforming the way we teach and learn.

#### Notes

1. Erving Goffman, *Encounters: Two Studies in the Sociology of Interaction* (Indianapolis: Bobbs-Merrill, 1961), 9–10.
2. Kenneth A. Bruffee, *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge* (Baltimore: Johns Hopkins University Press, 1993).
3. Christopher D. Coppola, “Will Open Source Software Unlock the Potential of eLearning?” *eLearning Dialogue*, December 1, 2004, <[http://www.campustechnology.com/news\\_article.asp?id=10299&typeid=155/](http://www.campustechnology.com/news_article.asp?id=10299&typeid=155/)>.

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