Someday every lecture will be webcast. That was the vision of Professor Lawrence A. Rowe, the founding director of the Berkeley Multimedia Research Center (BMRC), which pioneered the use of Internet video in higher education by broadcasting an entire course, for the first time, in 1995. Thirteen years later, the implementation of the Opencast Project and Community marks a major advance in achieving Rowe's vision.

The 1995 course broadcast began the process, at Berkeley, of putting academic video on the web free and open to the world. In 1998, the Berkeley Internet Broadcasting System streamed 7 courses for 283 enrolled students and for anyone else who could get video on the Internet. During 2000, 26 courses accounted for 111,000 worldwide views. These numbers grew to 40 courses and 4.5 million views by 2006, when those counts began to go not only through the roof but out the windows and doors with the use of Google Video, iTunes U, and YouTube.

By 2001, webcasting had become such a part of campus culture at Berkeley that it was moved out of the BMRC and into the new central Educational Technology Services. The renamed webcast.berkeley became an expected part of large gateway courses in the sciences. Students reported that the webcasts were a big help in classes in which the professor's delivery style or accent was hard to understand, and many non-native speakers of English liked to be able to review important content they did not understand. Students who missed a class found watching webcasts immensely more informative than borrowing someone's notes. Students with learning disabilities stated that the webcasts opened up a range of possibilities for them. Many students liked the option of seeing how a topic was taught by another professor. Students also loved the RSS subscription, which meant that lectures automatically appeared on a laptop or iPod for "anywhere, anytime" convenience. Professors too were won over by the value for their students and by the grateful e-mail they received from all over the world.

As many colleges and universities have found, webcasting fits so naturally into students' lives that they quickly see it as an essential part of a course. After a short pilot of webcasting introductory courses at Harvard, students considered it a part of their Harvard education that could not be taken away. Webcasting changes the lecture experience. Students report that, freed from frantic note-taking, they can use class time to pay attention to the professor's line of thought and can ask more intelligent questions. Notes can be taken later, while watching the webcast, with classroom knowledge of what's important and with the tools to go back to get exact words and ideas and to skip over nonessentials. Some students report also watching webcasts to see how another professor explained a difficult concept in a previous semester.

Attendance is still an open question, even after thirteen years of webcasting at Berkeley. There has always been a drop-off in attendance in large lecture courses, and there is no solid evidence that the drop-off experienced today is entirely due to webcasting. A faculty symposium on the topic revealed various opinions. A popular economics teacher stated that students have to make the best use of their time and added that if they find listening to webcasts more effective than attending class, then that may be the best thing for them to do. Another pedagogical point made was that the professor needs to make each class interesting enough that students want to be there. There was some discussion of implementing coercive attendance measures and withholding information. But the most striking comment came from one of Berkeley's best teachers, whose course is scheduled at 8 a.m. He said that attendance in his class is down considerably and that this decrease has taken away the fun of teaching. He added that even if, by some objective measure, the students are getting as much out of listening to the webcasts as from experiencing the lecture firsthand, he is not getting as much out of teaching.

Webcasting forces a reexamination of the lecture. If the pedagogy of higher education were being invented today, with the tools and resources we have now, it is unlikely that we would decide to reinvent and re-present content every semester for each new group of students. But the lecture class continues today. In a series of focus groups at Berkeley, we found that students see the function of lectures as organizing content. The content is in the course site, on the web, in the library, in the textbook, and in the reader. The lecture provides a guide to help students organize that data into knowledge and reveals the secrets to how their proficiency will be assessed. Students also felt that they had a role in organizing
the materials relevant to their learning experience. The main tool they wanted in lecture classes was desk space. They took for granted a robust course site and the lectures on the web. They wanted to use class time to see the big picture, to use the textbook, the laptop, and their pre-existing notes to create a kind of learning map for themselves as they listened to the professor’s line of thought. They could do this only if they knew that they could later take notes from the webcast.

The many open educational resources on the web make it easy to listen to lectures at top universities. It is striking how many of these lectures are works of art, leading the listener through a thinking process to a new understanding, a new place. And they are often deeply involving performances. Professors create new connections, new realizations, on the spot. One Berkeley professor has the quirk of repeating his last phrase over and over as he formulates a synthesis. In traditional video, we would have edited that out, but in the real world of the webcast, the repetition is thrilling because the listener knows that the next sentence will be a revelation.

One graduate student noted that he received an excellent undergraduate education because he blended lectures from MIT and Berkeley on the web with the interactive strength of the small regional college he attended. More and more, we hear of instructors at other colleges assigning Berkeley lectures and discussing them in class. Higher education may be evolving to a place where lectures are commodities given by the great lecturers on the web and where classes are local, small, interactive, and focused on helping students organize ideas into their thinking and their lives. We have all heard that the instructor’s role is evolving from being the “sage on the stage” to being the “guide at the side.” But the emerging norm in higher education may instead be a sage on the web and a guide at the side.

Webcasting is a boon to mobility- and sight-disabled students and a godsend to the learning-disabled. One student told us: “I am a learning-different student, so webcast is essential to me.” Strictly speaking, every lecture should also be captioned for the hearing-impaired. Every institution has that as its goal. The question is whether to move forward before the goal is achieved. At Berkeley, we caption every class that has a hearing-impaired student. In some rooms the student can follow the captions on a laptop live in class. The cost is about the same as providing a signer, but the student still has the captioned lecture to study from. At the same time, we have been working hard toward the day when all our courses will be captioned. Our pilot successes have taught us that universal access is truly a universal benefit. A captioned class is searchable, making it a much more valuable learning tool. One of the difficult things about learning from a lecture is knowing what is going to be important. Most of us try to concentrate on everything, which is not how the mind works. Listening to a searchable lecture, we are more relaxed, knowing that we can go back when we hit an important word we did not grasp the first time.

As noted at the beginning of this column, a number of colleges and universities are coming together to plan the academic webcasting of the future through the Opencast Project and Community (http://www.opencastproject.org), with the support of the William and Flora Hewlett Foundation and the Andrew W. Mellon Foundation. As part of this project, Berkeley installed origination and encoding equipment in thirty-seven classrooms and implemented a new software package, webcast.berkeley “next generation,” in the summer of 2008. Linked with Apple's Podcast Producer, this software highly automates the process from the classroom to webcast.berkeley, iTunes, and YouTube. A number of other member institutions—such as Columbia, ETH Zurich, and Georgia Tech—are also contributing a great variety of valuable video tools to the Opencast Community.

There is every reason to believe that the Opencast Project and Community, created by a worldwide higher education community, committed to open source, with software and experience in place, will change the ecology of academic video in the near future. Webcasting every lecture already seems like a narrow goal. Our video vision today is broadening to encompass the open-source webcasting ecosystem of the future.

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