



College News

The Modern Lecture

Faculty mix high-tech and high-technique



By Eva Emerson
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The traditional lecture is under attack by educational scholars on pedagogical grounds.

Some, like USC College neuroscientist Michael Quick, look forward to the day when the lecture is gone completely.

Physicist Gene Bickers sees a need to re-think their use in large, introductory science classes.

Sarah Pratt, dean of academic programs in USC College, foresees the evolution of a new model. "We encourage College faculty to approach teaching with the same creativity and rigor they bring to their research, and that has naturally led to the wide range of methods, innovative techniques and technological solutions that define our undergraduate courses," says Pratt, a professor of Slavic languages and literature.

Increasingly, she says, College faculty are embracing a mix of methods to invite students into the life of the mind. "We combine lecture, demos, solving longer problems at the blackboard and other activities as much as possible in our introductory physics series," says Hans Bozler, professor of physics and astronomy. "Using any single mode throughout a class period—lecture or not—is not ideal."

Active Learning

"I really enjoy giving lectures, but it's clear that students are more motivated and learn better in active learning environments," says Quick, an associate professor of biological sciences.

In one undergraduate neurobiology class, Quick asks students to list questions to help guide the content of the course. Students find answers to their questions by reading original scientific literature, presenting and discussing it in class.

"Ideally, students would teach each other, and I would become more of an expert guide who makes sure they don't go too far off-track or get lost," he says.

Encouraging Student Participation

Lectures pose a particular problem for large science courses, says physicist Bickers. A 1998 American Journal of Physics study found lectures less effective than interactive methods in teaching undergraduate physics courses, regardless of class size, students' prior experience with the subject or whether students judged the lecture boring or entertaining.

In response, physics professors and others are turning to new methods and interactive technologies to enliven the classroom experience.

"We're urgently trying to make lecture classes a two-way experience," says Stephen Bradforth, an associate professor of chemistry. "That's especially difficult in large classes, because few students are comfortable answering a question in front of an entire lecture hall."

Clickers

In spring, Bradforth and Bozler tested a new technology called the Personal Response System (PRS) designed to address that and other problems. PRS encourages student participation in large classes while providing teachers with immediate feedback about student comprehension.

"I call it the 'Who Wants to be a Millionaire?' system," says Bradforth. Students use remote control-like "clickers" similar to those used on the TV show, to answer multiple-choice questions anonymously. A computer produces instant results.

Besides increasing attendance, clickers helped Bozler and Bradforth decide whether to spend more time on a subject.

"There were cheers and moans from the students when the answers came up," says Bozler. "You end up with a lot of teachable moments."

This year, the College will introduce PRS equipment in three campus lecture halls and a mobile system for the physics department. Bozler says that faculty in psychology, biology, earth sciences, geography, chemistry and physics plan to use the clickers.

Technology's 'Reluctant Visionary'

Math Professor Robert Penner has been a low-tech, high-concept teacher for decades, enlivening his calculus classes with little more than chalk and an overhead projector.

Now Penner advocates studio classrooms equipped with "smart boards." This spring, he taught calculus in the mornings in a regular classroom and in the afternoon in a studio in the Distance Education Network of the USC Viterbi School of Engineering. Cameras videotaped the afternoon section, while a digital smart board captured Penner's in-class notes. Students can access the video and notes via the web on their own schedule.

Penner says the mean exam score of students in the afternoon course was higher than those in the morning class.

Pratt, who helped organize the project, says the video and smart board technology offer a valuable "re-creation" of the classroom experience that can enhance learning by giving students a chance to go over a concept more than once. "The College has started looking at ways that we can build on this," she says.

Language Games

Daniel Bayer, executive director of the College's Language Center, has introduced new technologies, online resources and led the effort to change language course curricula to improve student learning.

"Now we're digging deeper, working to make technology even better as a learning tool," he says.

Bayer is overseeing the creation of an online computer game to guide students through first-year Italian. This summer Bayer's team, including Francesca Italiano, director of the Italian Language Program, and the Language Center's Edie Ann Glaser, produced a demo of a comprehensive "Virtual Italian Experience."

The game begins with a virtual user visiting a USC Italian course. Next, they'll add a campus tour and a trip to Italy.

Most faculty agree a need remains for lectures in higher education, but technology and new knowledge provide options that can't be ignored.