

## Rewards—at Last—for Top Teachers

Ohio State University plant biologist William A. Jensen was addressing his first class of the new term when a commotion broke out in the back of the lecture hall. To his amazement, Jensen spotted OSU's president, Gordon Gee, striding down the aisle ahead of various university and department officials, along with a camera crew. In his hand was the largest apple Jensen had ever seen—Gee's way of letting Jensen know he was one of eight faculty members chosen for excellence in teaching. "Let me tell you, I was pleased," says Jensen, the 2-year-old incident still fresh in his mind. It didn't hurt that the surprise "fruiting" was accompanied by a \$1500 check and a \$1200 raise.

Although most school administrators lack Gee's dramatic flair, the concept of rewarding good teaching is taking hold at universities across the United States. Science departments at small liberal arts colleges have long been known for their emphasis on classroom excellence, but university science departments have tended to hire and promote on the basis of research grants, publications, and scientific awards. Now, thanks in part to public displeasure with rising tuitions and falling test scores, that's starting to change—although whether the changes are dramatic enough remains open to question.

OSU's program, dating from the mid-1970s, was among the first. But many others have since joined the ranks of schools reordering their priorities. "We're paying a lot more attention to teaching when it comes to promotion and tenure decisions than we did a decade ago," says physicist June Matthews, undergraduate academic officer of the physics department at the Massachusetts Institute of Technology. The department also has started asking for three letters of recommendation addressing teaching ability, and student evaluations play a role in promotion decisions.

**Apple of his boss's eye.** William Jensen was honored by Ohio State president Gordon Gee—not for his grants, for teaching!

As with Ohio State, many schools are offering awards to drive home the notion that good teaching gets noticed. The University of California, Davis, pays \$25,000 each year to a single professor with an outstanding teaching record. The Virginia Polytechnic Institute and State University gave out 35 teaching awards last year, valued at up to \$20,000. Some went for individuals and others to departments to develop curricula. Individual winners are inducted into the school's "Academy of Teaching Excellence," and departments are marked by a special seal in college publications. For sheer generosity, though, it's hard to top the University of Florida. Last year, the school gave 165 faculty members raises of \$5000 each in base salary because of their performance in the classroom.

Although nobody objects to such teaching-based promotions and awards, some professors think their colleagues need more than cash to refocus their attention on the classroom. Subhash Minocha, a plant biologist who has been teaching at the University of New Hampshire for 20 years, says teaching needs a higher profile; he suggests "teaching chairs," dissemination of articles on teaching styles, and greater representation of teaching-oriented faculty on long-term planning committees. "This shouldn't only be about money or plaques," he says. "What we really need is continuous talk about the importance of good teaching."

The message also needs to be brought home to university administrators focused too narrowly on the short-term payoff of research excellence, says William Spicer, a professor of applied physics and electrical engineering at Stanford University. "An appreciation of teaching has to be built into the culture of the place," he says. "You have to get the feeling that the administration really cares." A few more presidents toting apples couldn't hurt.

—David Freedman



for various compounds; the results are turned over to county officials. As in research, students learn by making mistakes. "They'll get all excited over a peak at sample site number 5, want to see their duplicate measurement, and then find out they forgot the duplicate. Next time they remember," says Susan Kegeley, who designed the course with associate professor Angelica Stacy.

Teamwork is another tactic that nudges students into active roles and also prepares them for jobs in the real world. Educators call it cooperative learning, and former NSF program officer Stanley Pine got a vivid view of its power during a site visit last year to an NSF-funded experiment in an introductory chem lab at Clemson University in South Carolina. Pine attended a traditional lab, then crossed the hall to a cooperative section of the same course and was shocked at the difference. In the traditional sections, he says, students "were so quiet, and the expressions on their faces were so dull; they just wanted to get done and get out of there." In the new class, "the kids were so excited about what they were doing; they were really communicating."

In the cooperative sections, student interaction and group output on both written and oral reports are so high that Chem 101 now meets the university definition of a "communications-intensive" course, says lab director Melanie Cooper. Educational studies have suggested that this approach also promotes gender equality, and Cooper found that to be true at Clemson. Only about 13% of the women dropped out of the cooperative sections, compared with 22% in the traditional sections. (For men, the rates were 8% and 9%, respectively.) Women in the new lab sections also performed better on the lecture exams.

Part of the impetus for cooperative learning comes from data showing that students who have just recently mastered a concept are sometimes better than a professor at explaining things to their peers (p. 890). Also, since a shrinking percentage of today's students will be remaining in academia and vying for faculty slots, there is less reason to rely on science classes to "weed out" the best and the brightest. Not only is experience in teamwork a valuable asset for grads seeking jobs in industry, it's also a crucial part of building a natural science community, says Jeanne Narum, director of Project Kaleidoscope, based at the Independent Colleges Office in Washington, D.C. The project identifies and disseminates successful programs and, like many of the new educational efforts, is funded by diverse sources, including NSF, the Department of Education, and several private foundations.

Narum's point is exemplified by the introductory physics course at the University of Delaware, where 180 students work in teams of four or five—and are graded as a group. "When you observe them, you find that they aren't talking about Saturday night's date," says professor David Onn. "They're actually talking about the problem, talking physics." Reports Tobias, who visited the class during a noisy group quiz, "The intensity of the conversations was absolutely thrilling."

The fourth major shift in pedagogical approach is technological, although not always in the gee-whiz vein. At Clemson, students used low-tech equipment, an economic necessity in some cases and part of a growing trend in chemistry (p. 889). But at other institutions the sky is the limit, with students using comput-