SCIENCE EDUCATION

Grad Students Head to Class As New NSF Teaching Fellows

Thirty-one universities are participating in a $13 million, high-profile project to help students, teachers, and would-be scientists

As a third-year graduate student in organic chemistry at the University of Kansas, Lawrence, Donald Probst is well on his way to becoming a professor or an industrial chemist. But on Tuesdays, Probst takes a detour from his career path, driving 40 minutes along Interstate 70 to spend the day at an inner-city high school in Kansas City, Kansas. He teaches chemistry to students hampered by inadequate preparation and high absenteeism. He also "tutors" the regular teacher, a biologist by training who was suddenly asked to take on chemistry and introductory physical science classes.

But the students and faculty at Wyandott High School aren't the only ones who are learning. Probst hopes that his year in the classroom will help him hone his own skills explaining his work to the public.

Probst's adventure is funded by a new program at the National Science Foundation (NSF). Last month, Kansas became one of 31 universities to receive 2- to 3-year grants from NSF's Graduate Teaching Fellows in K-12 Education (GK-12) program, a favorite of NSF director Rita Colwell. The program, which gives 1-year stipends and tuition support to graduate students and advanced undergrads, supplements the agency's existing research fellowships and assistantships. Its aim is to raise student achievement, upgrade classroom teachers' skills, elevate the importance of teaching in the research community, and create a cadre of science communicators.

"We want to send a message that [teaching in the public schools] is part of what scientists should do," says mathematician Dennis DeTurck of the University of Pennsylvania, which will receive $1.5 million over 3 years. But, although nobody disputes the fellows' potential contribution to U.S. elementary and secondary math and science instruction, some educators say that the program's expansive goals and the variety of approaches it is supporting will make its long-term impact extremely hard to measure.

GK-12 is on a fast track. Colwell, who launched the program barely 6 months after joining the $3.9 billion agency in 1998, rarely gives a speech without mentioning this initiative. She told Congress last month that she hopes to more than triple the $13.4-million-a-year program by 2001. Although universities had a scant 90 days to draw up proposals for this year's awards, 157 applications were submitted, and the quality was so high that NSF nearly doubled the sum of money it initially planned to spend.

The winning institutions, which have promised to involve more than 1200 would-be scientists, are taking widely different approaches. At Kansas, Probst and five colleagues from other graduate departments are already spending one full day each week at Wyandott High School as "apprentices," explains chemistry professor and project director Janet Robinson, a former high school chemistry teacher. This winter Robinson, who chose the fellows, hopes to add eight undergraduates to the mix.

Spark of interest. University of Kansas graduate student Don Probst engages students in a Kansas City high school chemistry class.

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In contrast, the University of Rhode Island (URI) is in the midst of a stiff competition for its 12 slots. The winners, who must be graduate students, will receive a semester of pedagogical training, followed by summer workshops involving the teacher with whom the fellows will be paired in the 2000–01 academic year. "I'm not going to throw them into the classroom until they're ready," says URI's Gail Scowcroft, associate director of marine and environmental education and a former marine biologist.

Penn's approach falls between those two extremes. DeTurck has signed up 11 graduate students and 8 undergrads and has put them through 6 weeks of examining classroom materials and readying projects before sending them into the classroom for a range of activities. A project at Lea Elementary School, for example, will send fellows and students into the neighborhood to survey existing foliage and calculate where to plant trees. For math instruction, "we're concentrating on grades 3 to 5 because that's where the wheels start to fall off [in math achievement]," says DeTurck. In science, the focus will be on supporting new teachers in grades 4 and 8.

Most of the GK-12 winners have already received grants under existing NSF education reform projects. "We're not novices," says Robinson, who notes that her university and Kansas State recently received a $2.5 million teaching training grant from NSF to work with several local schools. "We know the needs of the district and what works."

The tremendous variation across programs may make it hard to draw lessons about what works, however. "If NSF really wants to learn the best way to improve science education and communication skills through the use of graduate fellows in the classroom, it would be helpful to have common benchmarks [for measuring success]," says Scowcroft, who will work with an outside evaluator assigned by NSF. "We don't have any now. I don't even know who else got money." The program's vast scope, encompassing school-age children, graduate students, and classroom teachers, muddies the waters further, notes Texas A&M University mathematics professor David Sanchez, former chair of an advisory panel to NSF's education directorate. "What do you want to accomplish, and who are you trying to change?" he asks, noting that each audience poses a special challenge.

Probst isn't worried about the big picture. He says the GK-12 fellowship opens up a new world outside a graduate student's usual roles in the lab and the college classroom. Although he'll sacrifice a bit of time in the lab on his research project, which focuses on potential pharmaceutical uses of a class of sulfur compounds, he thinks the trade-off will be worth it. "Scientists have a hard time explaining to people what they do because it's often so technical," he says. "I think that's an important skill to learn. I'm also hoping to see that look of open-eyed wonder when a student understands something that I've said and says, 'Hey, that's neat.' "

–JEFFREY MERVIS