

Outrage Greet NSF Decision to End STEM Fellows Program

Researchers are shocked and upset by a decision by the U.S. National Science Foundation (NSF) to cancel a high-profile and successful fellowship program that has brought more than 10,000 graduate students into elementary and secondary schools around the country. A recent evaluation says the Graduate Science, Technology, Engineering and Mathematics (STEM) Fellows in K–12 Education program, begun in 1999, brings science to life for students, improves the skills of their teachers, and offers graduate students valuable training in the classroom. So participants don't understand why the president's 2012 budget request would abandon a \$55-million-a-year program that addresses key aspects of the Obama Administration's push to improve U.S. science and math education.

NSF officials say that the GK-12 program, as it is commonly known, has served its purpose and that some of its features will be incorporated into other NSF programs that train graduate students and that partner academic scientists with local school districts. "GK-12 has been effective, but much of it is now being done by other programs," says Joan Ferrini-Mundy, head of the agency's education directorate. "NSF doesn't fund things forever. It was time to take what we had learned and move on, applying those lessons to other settings."

But scientists who have received GK-12 training grants aren't satisfied with that explanation and have launched a campaign to save the program (savegk12@gmail.com). No other program, they say, puts graduate students into the classroom and creates a unique learning opportunity for students, their teachers, and the fellows themselves.

Responding to Ferrini-Mundy's comment, Susan Williams of the Bodega Marine Laboratory at the University of California, Davis, asks rhetorically, "Where are we going to move to? GK-12 is irreplaceable. It addresses the pipeline issue in a way that no other graduate training program does." Williams, who is the principal investigator for a GK-12 grant to improve ocean literacy among high school students, says that "having young scientists as role models can make a lasting impact on students, and the program is large enough to have a real impact on K–12 STEM education."

Win-win-win situation

Rita Colwell launched the GK-12 program shortly after becoming NSF director (*Science*, 29 October 1999, p. 895). The

Graduate Research Fellowship

Begun: 1952

Purpose: To support graduate students pursuing degrees in all fields that NSF funds and to encourage the best basic research.

Current budget: \$136 million

Integrative Graduate Education and Research Traineeship (IGERT)

Begun: 1998

Purpose: To support innovative new models for graduate training, fostering collaborative research that transcends traditional disciplinary boundaries.

Current budget: \$70 million

GK-12

Begun: 1999

Purpose: To support graduate students in K–12 classrooms, improve teacher content knowledge, build ties between university researchers and local schools.

Current budget: \$56 million

CANCELED

Math and Science Partnership

Begun: 2002

Purpose: To support innovative partnerships to improve K–12 student achievement in mathematics and science.

Current budget: \$58 million

Not so jolly fellows. The GK-12 fellows program is slated for extinction in NSF's stable of programs that support graduate students.

program, which gives out 5-year grants that typically support eight to 10 students a year, grew rapidly, reaching \$50 million by the time Colwell left in 2004. It was such a favorite that it was even highlighted in the agency's budget requests to Congress.

NSF operates many programs that support graduate students (see graphic), and its \$900-million-a-year education portfolio also contains an ever-evolving assortment of efforts aimed at teachers. NSF routinely assesses that portfolio, so in 2006 it hired an outside contractor to evaluate the GK-12 program. The review by Abt Associates of Cam-

bridge, Massachusetts, delivered last fall, cited "substantial and credible evidence that the program has clearly been able to achieve many of its goals."

The report found that everyone involved seemed to be benefiting. The fellows became better teachers, learning how to work collaboratively and how to communicate science to a nontechnical audience. The public school teachers improved their knowledge of science and welcomed having graduate science students in their classrooms. The fellows' new skills made them better college instructors, and their off-campus experiences gave them an edge in finding full-time jobs after graduation.

The evaluation also found that the fellows did not take any longer to complete their degree, something that many faculty members had feared. The program's only real weakness, according to Abt, was its modest impact on the students' research skills.

NSF officials cite that "mixed" result in explaining why they decided not to make any new awards, although the agency will honor its commitment to current grantees. Time-tested NSF programs like the much bigger Graduate Research Fellowships do a better job of training graduate students to become researchers, according to Ferrini-Mundy, and newer ones such as its Math and Science Partnership program also give entire university departments a chance to interact with local schools. There also may be better ways to raise student achievement, says Carl Wieman, associate director for science within the White House Office of Science and Technology Policy. "The reality is that, under GK-12, the time available for kids to interact with grad students so that both sides could develop a relationship ... was probably not enough to achieve the impact that one would have liked to see," says Wieman.

Colwell, now a distinguished professor at the University of Maryland, College Park, and at Johns Hopkins University Bloomberg School of Public Health in Baltimore, Maryland, says she thinks it is "unfortunate" that NSF has decided to end the program. "It's been extraordinarily successful. Of course there are other programs for graduate students. But this is unique in using them to bring science into the K–12 class at the same time it supports their graduate education. And given the poor state of STEM education in the schools, this is vitally important."

—JEFFREY MERVIS