NATIONAL SCIENCE FOUNDATION

Outcry Shoots Down Funding Reform

To officials in the National Science Foundation (NSF), it seemed like a deal the universities would be delighted to accept: In return for fixed limits on the size of individual grants, the foundation proposed slashing the paperwork and administration required for each grant and using the savings to expand the number of awards each year. But when NSF was on the verge of testing the idea in its division of mathematical sciences this fall, the universities balked. Now, funding reform is on hold, at least for a few months.

Under the proposal, about 70% of the NSF's disciplinary programs budget devoted to mathematics would have been limited to grants in two categories—a "sustaining" grant of $30,000 a year or an "assisting" grant of $20,000, each lasting 3 years. (About 30% of the budget would remain available for "strategic" grants.) When acting math division director Bernard McDonald tested the approach on the 1991 budget, he found that it would have enabled NSF to award 120 additional grants. But there's a catch: The changes also could have meant sacrifice for a few, and that was enough to prompt an outcry.

On 25 September, less than 1 week before the experiment was to have begun, William Harris, NSF assistant director for mathematics and physical sciences, pulled the plug on the scheme. NSF now plans to rework the idea, discuss it with the advisory commission on mathematical sciences on 26-27 October, and try implementing it in January.

The purpose of the flat-budget experiment, according to McDonald, was threefold. The primary goal was to reduce the amount of paperwork and administrative time spent on each grant. This was to be done by reducing the demands for budget documents submitted with an application. Second, NSF hoped to instill a greater sense of "realism" in the process, says McDonald. Many proposals now ask for much larger grants than NSF can afford; the flat-rate system would deflate them. Third, McDonald says, the new approach would allow NSF to concentrate more on the scientific quality of proposals and worry less about a grant seeker's income needs.

Everyone seemed to like the idea in principle. NSF's workload has been growing faster than its staff in recent years, particularly in the math division. Academic panels have encouraged NSF to experiment with the flat-rate concept, including an NSF advisory panel chaired by Jerry Bona of Pennsylvania State University last summer.

But when NSF sent out a notice this fall that it would begun using a flat budget system, a backlash appeared. Peter Sarnak of Princeton University, the current chairman of the math advisory panel, comments that, "We were completely shocked when it was implemented....It came as a surprise that [NSF staffers] hadn't gotten back to us" before putting the plan into effect.

The plan seems to have run aground on one critical point. NSF wanted these grants to cover everything—not just salaries and equipment but university "overhead" fees as well. This would penalize researchers at universities with high overhead rates. When this became clear, some members of the community began to express doubts. A science policy committee of the American Mathematical Society, chaired by Frank Warner, associate dean of the University of Pennsylvania, passed a resolution in mid-September asking for a delay. The resolution noted that "the specifics of the experimental project...have not been sufficiently discussed by the community...." Michael Artin, president of the American Mathematical Society (AMS), and AMS president-elect Ronald Graham also met in September with NSF officials to express concern.

The upshot is that the flat-rate proposal is now being revised, and NSF officials say they'll be ready to unveil a new version in a week. It will allow for more flexible funding of indirect costs, McDonald predicts, for "we did not want to create any tension" between researchers and university administrators.

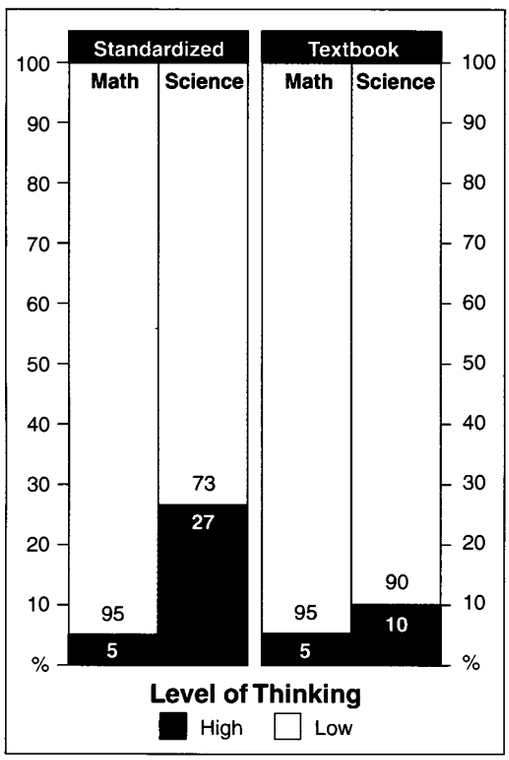
–Eliot Marshall

EDUCATION

Study Flunks Science and Math Tests

The National Science Foundation has reported the results of a $1 million study that supports what education reformers have long argued: School science and math tests—both standardized tests and textbook tests—are bad and exert undue influence on instruction.

The study, by Boston College's Center for the Study of Testing, Evaluation, and Educational Policy, shows, for example, that close to 95% of the items in school math tests rely on "lower level thinking skills" such as memorization, and fail to measure the "higher order" functions that are involved in creative problem-solving.



Simple minded. Most items in six widely used tests rely on recall rather than analytical thinking.

At a 15 October press conference in Washington, D.C., study director George F. Madaus said the study was unprecedented in its scope, including surveys of more than 2200 teachers and interviews with 300 school personnel in six cities, as well as item-by-item analyses of a number of widely used tests.

The teachers said that they don't much like the tests, but they feel compelled to exclude topics they would like to teach in favor of coaching kids on test subject matter because test scores are so pivotal in evaluation of students, teachers, and schools. Indeed, Madaus said some teachers will take up to 20 hours preparing students to take a standardized test. Yet, says the study group, "only about 10% [of the teachers surveyed] mentioned any positive impact of testing programs on motivation of students or teachers."

The study emphasizes that minorities suffer most from these bad tests since it is in predominantly minority classrooms that instruction is most closely keyed to the tests. The educational experience of these students, the group concludes, "appears to be qualitatively different from that of students in low-minority classrooms, and is particularly focused on low level knowledge and skills."

The Boston group said the tests are a serious drag on efforts to change science and math curricula along the lines proposed by various groups such as the National Council of Teachers of Mathematics. But, as Madaus warned, "we're not going to test our way out of the nation's educational problems." Textbooks themselves, as well as teacher training, will have to be brought into line with the new standards, said Madaus.

–Constance Holden