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Boosting Minorities in Science

MANY COUNTRIES ARE INCREASING INVESTMENTS IN SCIENCE AND TECHNOLOGY TO IMPROVE THEIR economies and the well-being of their citizens. For the United States, this priority was emphasized in the influential National Academies 2005 report *Rising Above the Gathering Storm* which called for new funding to bolster education in science, technology, engineering, and mathematics (STEM). But this past September, the Academies reported in *Expanding Underrepresented Minority Participation* that the United States faces a major obstacle in fulfilling this goal.* Because the minority groups underrepresented in science and engineering are the most rapidly growing in the U.S. population, the country must develop strategies to harness this resource to grow a robust science and engineering workforce and remain globally competitive.

The U.S. labor market is projected to grow faster in science and engineering than in any other sector, according to the U.S. Bureau of Labor and Statistics. In 2006, underrepresented minorities, including African Americans, Hispanics, and Native Americans, constituted only 9% of the nation's science and engineering labor force while accounting for nearly 30% of the population. Non-U.S. students (particularly from China and India) account for almost all of the growth in U.S. STEM doctorates awarded in the past 15 years, but many eventually return to their own countries, taking their talents with them.

At present, only 6% of all 24-year-old Americans hold an undergraduate degree in STEM disciplines; for African Americans, Hispanics, and Native Americans, the percentage hovers at 2 to 3%. To reach a national target of 10% (a target already achieved by several countries), the United States will need to quadruple the number of underrepresented minorities with undergraduate degrees in the disciplines. A good place to start is retaining those minority undergraduate students who begin their studies in pursuit of degrees in STEM fields. At present, only about 20% of minority STEM aspirants complete STEM degrees, compared to 33% of white STEM aspirants. Preventing attrition will raise the number of minority doctoral students and will likely boost interest among younger minority students. Increased retention will require increased financial support; the Academies 2010 report estimates that such support would require \$150 million per year to start. An urgent task for colleges and universities is to redesign first-year STEM classes to encourage active learning and collaboration. Engaging students through these types of classes should improve the performance of all students, and it could be particularly helpful in reducing the high rate of attrition for many minorities in STEM subjects.

Just as important for minority students are social support and mentoring. Some are the first in their families to go to college; others simply feel isolated. Fortunately, lessons have been learned from proven, broad-based initiatives such as the U.S. National Science Foundation's Louis Stokes Alliances for Minority Participation and the U.S. National Institutes of Health's Minority Access to Research Careers program. Best practices include precollege summer programs, substantive early research experiences, academic support, social integration, and faculty involvement.

Over the long term, it is imperative that the United States improve the quality of science and math instruction for minorities through the precollege years. Better teacher preparation would particularly benefit minority students, who still have substantial achievement gaps in math and science as compared to white students. It is also necessary for schools to provide advanced science courses and proper academic advising to ensure that more students are prepared to succeed in college science. In the United States, with the new Common Core State Standards Initiative for mathematics, universities and school systems can together strengthen teaching and develop appropriate curricular and assessment materials. Such collaboration will be critical as the nation strives to engage more students in science and engineering.

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10.1126/science.1202388

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