

Recruitment and Retention Strategies for Undergraduate STEM

Recent research indicates that while more students are starting college with the intention of majoring in science, technology, engineering, or math, actual completion rates are lagging, especially among underrepresented minorities. The number of students entering college to pursue a STEM career has increased substantially over the past six years. The number of students actually graduating with a degree in a STEM discipline, however, shows no proportional difference than the number of U.S. STEM graduates in the 1970s. Moreover, the make-up of the student population entering into the STEM disciplines is significantly unbalanced. White and Asian students continue to dominate the STEM completion rates for 2004 freshman who completed their degrees in 2008 (four years) and 2009 (five years), or 24.5% and 32.4% respectively. Latino, Black, and Native American students who initially began college as a STEM major had four-year STEM degree completion rates of 15.9%, 13.2%, and 14.0%, respectively. The difference between White and Asian American STEM majors is more apparent in five-year STEM completion rates. Approximately 33% of White and 42% of Asian American STEM majors completed their related bachelor's degree within five years of entering college. In contrast, five-year STEM completion rates for Latino, Black, and Native American students were 22.1%, 18.4%, and 18.8%, respectively. The data show students are taking longer to complete their degrees and many others simply choose a non-STEM major, or leave the institution as a freshmen altogether.¹

For the social and economic well-being of our nation, we must strengthen federal STEM programs to not only help attract students, but also to retain their interest in pursuing careers in mathematics and science throughout the undergraduate experience. Students must be supported through networks that include faculty role models and mentors. The federal role in these programs should enhance access to undergraduate STEM education and use university models centered on effective mentoring principles to encourage completion of undergraduate degrees in the STEM disciplines. There are examples of effective programs that recruit and retain students into mathematics and the other STEM disciplines, including for underrepresented minorities. The U.S. needs systematic efforts to replicate them on a national scale. In addition, scholarships are essential to support promising students who might otherwise be denied opportunities. All of these strategies must be integrated into effective programs that will provide:

- High school-to-college bridge programs in STEM;
- Active recruitment of students from diverse backgrounds into the study of mathematics;
- Training for faculty to advise and mentor students pursuing STEM majors;
- Profound undergraduate research experiences that link them to STEM fields and real-world applications of science; and
- Preparation for transition from college to graduate school in mathematics and science.

¹ Mitchell Chang, Sylvia Hurtado, Kevin Eagan and Josephine Gasiewski, "Degrees of Success: Bachelor's Degrees Completion Rates among Initial STEM Majors", Higher Education Research Institute at UCLA, January 2010.