

BHEF 2006 Issue Brief

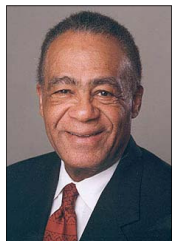
Experts



Gail Cassell

Gail Cassell is the Vice President of Infectious Diseases, at Eli Lilly and Company. She was previously the Charles H. McCauley Professor and Chairman of the Department of Microbiology at the University of Alabama

Schools of Medicine and Dentistry at Birmingham, a department that ranked first in research funding from the National Institutes of Health under her leadership. Dr. Cassell earned a bachelor's degree in bacteriology from the University of Alabama in Tuscaloosa. She earned her master's and Ph.D. degrees in microbiology at University of Alabama, Birmingham.



John Brooks Slaughter

John Brooks Slaughter is the President and Chief Executive Officer of the National Action Council for Minorities in Engineering, Inc. Dr. Slaughter was previously the Melbo Professor of Leadership in Education at the University of Southern California. He

served as president of Occidental College in Los Angeles from 1988 through July 1999. Dr. Slaughter earned a bachelor's degree in electrical engineering from Kansas State University, a master's degree from the University of California, Los Angeles and a Ph.D. in engineering sciences from the University of California, San Diego.

The Challenge of the New Demographics of Higher Education: Increasing Women and Minority Participation in the STEM Disciplines

Despite large growth in enrollments of women and minorities in higher education over the past decade, these students have lower enrollment and degree attainment rates in the science, technology, engineering and mathematics (STEM) disciplines than their counterparts. The roots of this phenomenon are multi-faceted. Few underrepresented minority students show interest in STEM majors and many lack adequate preparation in high school needed to succeed in rigorous STEM coursework. As a result, even those students who do choose STEM majors have less success as evidenced by lower persistence rates for minority students in STEM disciplines. While the number of women enrolling and graduating in STEM disciplines has grown substantially over the past twenty years, they remain significantly underrepresented in most STEM disciplines and also face a set of unique challenges. This session will address these issues.

Panelists at BHEF's 2006 winter meeting reviewed the recommendations of the recent National Academy of Sciences study "Rising Above the Gathering Storm" and, in particular, focused on how to enlarge the overall pool of talent by increasing the number of women and minority students enrolling in and completing undergraduate and graduate programs in STEM fields.

QUICK FACTS

Fact 1

Minority students are less prepared for STEM majors and less likely to choose STEM majors.

Fact 2

Minority persistence and completion rates in STEM disciplines is low.

Fact 3

Minority degree attainment in STEM fields is low.

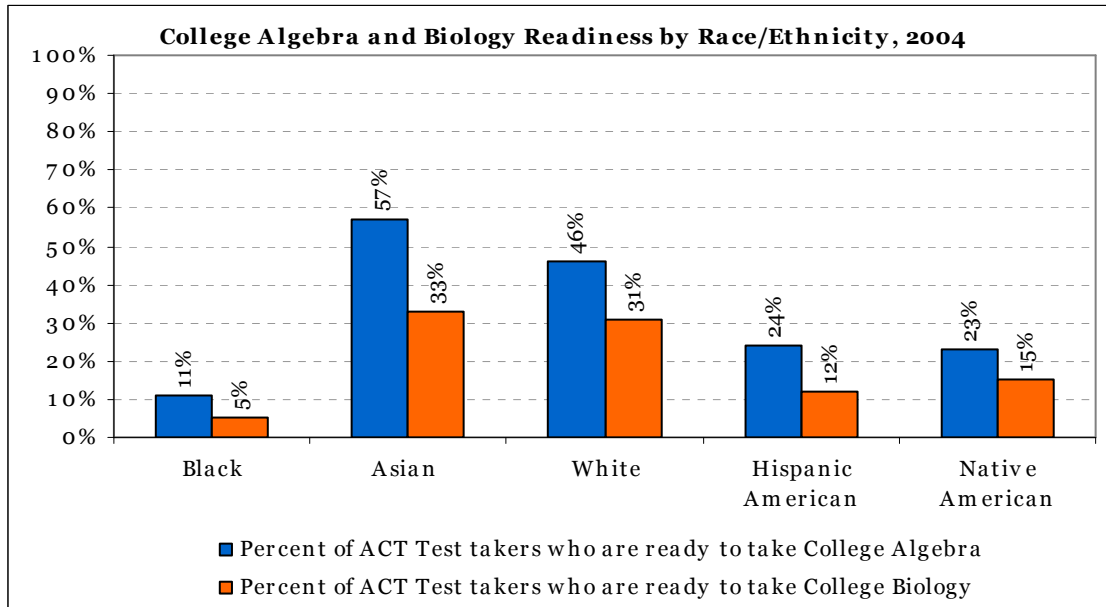
Fact 4

Women remain underrepresented in STEM fields.

Fact 1

Minority preparation for and interest in STEM majors is lower than in whites and Asians. Few minority students planning to go to college have the necessary preparation in core academic subjects needed to be successful in STEM majors (Exhibit 1a).

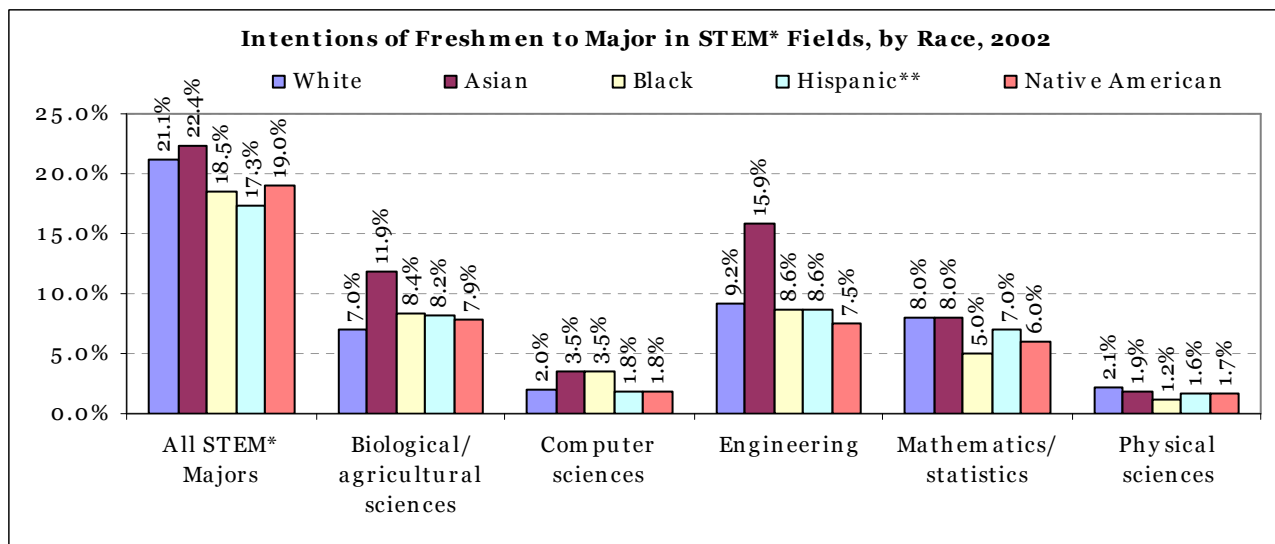
Exhibit 1a



SOURCE: ACT, Crisis at the Core: Preparing All Students for College and Work. (2005).

Among those entering college, few students overall—and fewer minority students—indicate interest in STEM majors, as only 18.5 percent of black students and 17.3 percent of Hispanic students indicated an intention to major in any STEM field (Exhibit 1b).

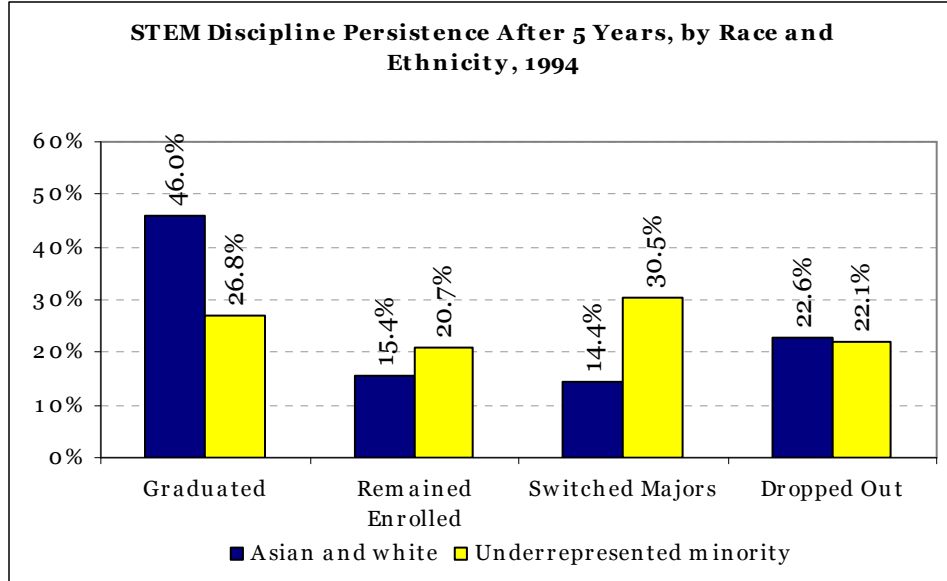
Exhibit 1b



SOURCE: Higher Education Research Institute, University of California at Los Angeles, Survey of the American Freshman, special tabulations. (2002).
 * For purposes of this document STEM excludes the Social Sciences.

Fact 2

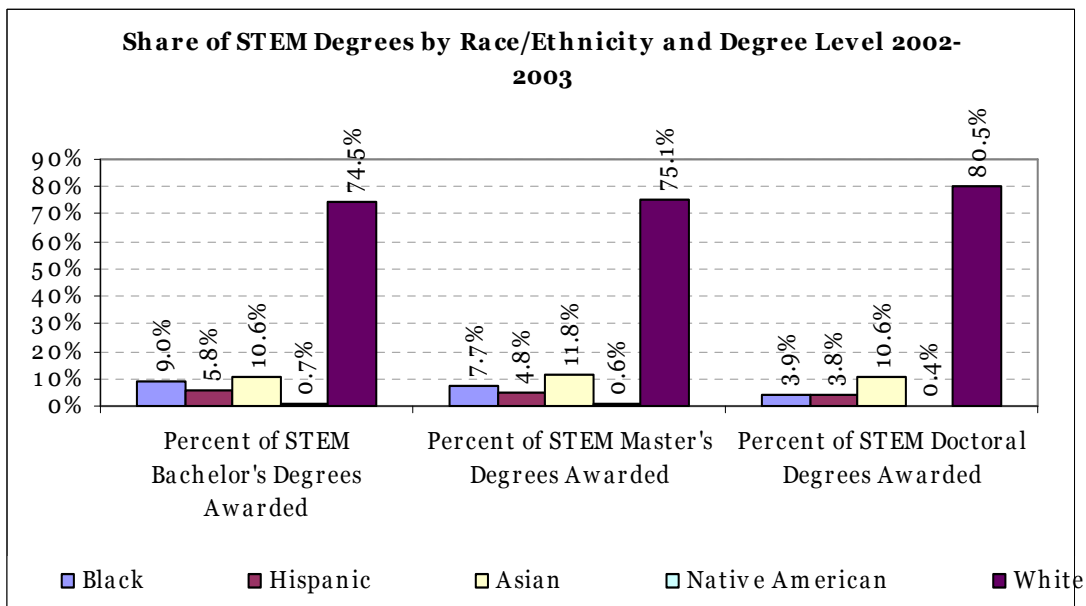
Minorities have lower persistence and completion rates in STEM majors. Only one in four underrepresented minority students in STEM majors earned a degree in that field within five years—this compares to less than 50 percent for all undergraduate students. Minority students in STEM majors are also more than twice as likely to switch to other majors as are white and Asian students. However, they are no more likely to drop out of college than white or Asian students are.



SOURCE: Huang, G., Taddese, N., and Walter, E. *Entry and Persistence of Women and Minorities in College Science and Engineering Education*, Figure 8. (2000).

Fact 3

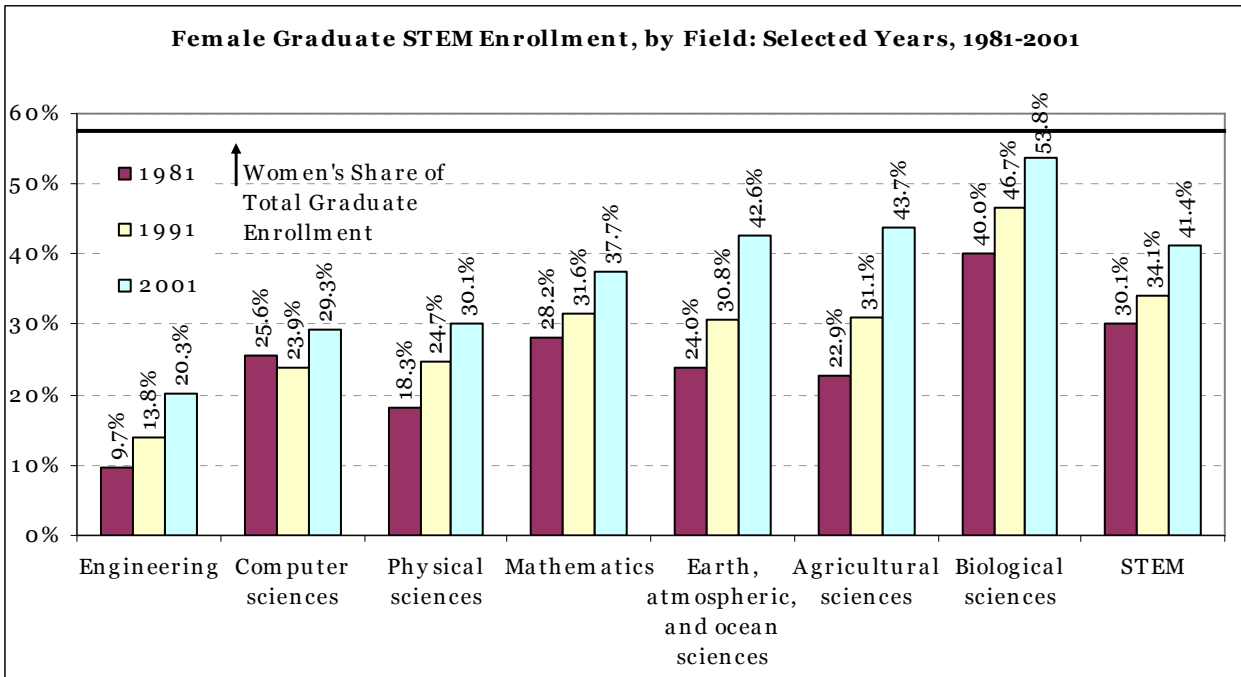
Despite progress, the gap between minorities and whites in degree attainment remains large in STEM fields. These disparities grow larger at each successive level of study, with underrepresented minorities constituting a smaller portion of STEM enrollments and degrees awarded.



SOURCE: *Digest of Education Statistics*, National Center for Education Statistics. (2004)

Fact 4

Women remain underrepresented in STEM disciplines despite significant advances in most fields. Although women outnumber men in overall graduate enrollment, they remain underrepresented in STEM fields. While women accounted for 58 percent of the total graduate enrollments, they represented only 38 percent of mathematics enrollments; 34 percent of physical, earth, atmospheric, and ocean sciences enrollments; 29 percent of computer sciences enrollments; and 20 percent of engineering enrollments. Women are most significantly underrepresented in the fields of engineering and computer sciences, and have made the least progress in computer science enrollment over the past 20 years.



SOURCE: *Science and Engineering Indicators*, National Science Board, based on National Science Foundation, Division of Science Resources Statistics, WebCASPAR database system, <http://caspar.nsf.gov>. (2004)