

Data Sources: Trends in Doctoral Degree Recipients in Science, Mathematics, and Engineering by Race/Ethnicity, 1996 to 2005

The Bureau of Labor Statistics estimates that by the year 2014, the U.S. will be facing a substantial labor shortage, as the economy will produce nearly 19 million new jobs but the total labor force is predicted to rise by fewer than 15 million persons (Hecker, 2005; Toossi, 2005). Economic growth, combined with retirements among members of the “baby-boomer” generation, will combine to create nearly 55 million job openings over the next decade. More than one-third of the new employment opportunities could be available to highly educated workers, particularly those with training in engineering, computer science, and physical science fields (Toossi, 2005). The resulting shortage of skilled workers thus could adversely affect future American economic growth (Southerland, 2003).

The impending labor shortage comes at the same time as America’s population of racial and ethnic minorities will be rising substantially. According to the U.S. Census Bureau, the combined population of Latino and African

American citizens will rise 36% between 2004 and 2020; in the same time span, the White, non-Hispanic population will increase just 4% (Redd, 2006).

Increasing the number of racial/ethnic minorities with advanced training at the graduate level, particularly at the doctoral level, is therefore a crucial element for meeting future workforce needs. Improving the doctoral student retention and completion rates of under-represented racial/ethnic minority groups could substantially address many of these workforce issues. However, progress toward improving the share of under-represented persons with doctorates in science and engineering disciplines has been a daunting task, as recent data from the Survey of Earned Doctorates (SED) indicate.

According to the SED, the proportion of science and engineering doctoral degrees awarded to under-represented minorities (African Americans, Latinos, and Native Americans/Alaska Natives) has changed very little over the past ten years. Among minorities, education remains the largest field for doctorates (NSF, 2007). Under-represented minorities collectively accounted for only 6% of all engineering doctoral degrees awarded to U.S. citizens in 1996, and the proportion of these degrees conferred to minorities in 2005 increased to just 9% (see Table 1). At the same time, the share of under-

represented students who received doctorates in education rose at an even faster rate, climbing from 15% to 19%. Physical sciences, life sciences, and mathematics and computer sciences also saw small gains in proportions of degrees conferred to minorities, but by and large the share of degrees conferred to minorities remains below those for other groups.

In the same time span, the share of engineering degrees to White, non-Hispanic Americans grew from 67% to 70%, the share awarded in physical sciences increased from 73% to 79%, and the proportion conferred in life sciences grew from 75% to 77%.

Overall, the percentage of all doctoral degrees conferred to persons from under-represented minority groups rose from 9% to 12%, while the share to Whites declined slightly, from 77% to 76%. The slow pace of increase in degrees awarded to non-White persons occurred despite the large increases in these persons who entered doctoral studies. Collectively, the number of African American, Latino, and Native American/Alaska Native students seeking doctorates more than tripled from academic year 1992-1993 to 2003-2004, and their share of total American citizen student enrollment rose from just 10% to 21%. Conversely, the White, non-Hispanic American proportion of doctoral students fell from 83% to 71%, as the rate of growth

in White student enrollment lagged that of all other groups (NCES, 2004 and 2006). The fact that greater increases in doctoral completion have not resulted from the large gains in minority enrollment suggest that student retention rates remain

a continuing problem for under-represented students.

Furthermore, while minorities are a growing share of doctoral enrollment, much of their enrollment remains concentrated in education and other fields outside of science and technology. As Table 2 demonstrates, among U.S. citizens and permanent residents, just 8% of under-represented minority doctoral students were enrolled in life and physical science disciplines in 2003-2004 (the most recent year of available data from the U.S. Department of Education), compared with 11% of Whites and 15% of Asian/Pacific Islander Americans. Conversely, 25% of under-represented students were pursuing doctorates in education, compared with 16% of Whites and 6% of Asians. While the increased racial diversity of students engaged in doctoral studies is welcome news, it appears that minorities remain under-represented in the science and technology fields that are critical for economic growth in the 21st century.

The continuing small representation of persons of color with doctoral degrees, particularly in the science, engineering, and mathematics fields, is among the growing concerns over workforce issues that relate to the economic health and competitiveness of the United States. Increasing minority student enrollment and success rates in doctoral education

Table 1. Distribution of Doctoral Degrees Awarded to U.S. Citizens and Permanent Residents, 1996 to 2005, by Race/Ethnicity

		Engineering	Physical Sciences	Math and Computer Sciences	Life Sciences	Social Sciences	Humanities	Education	Total
1996	URM	6%	5%	4%	6%	9%	9%	15%	9%
2005	URM	9%	7%	7%	10%	13%	12%	19%	12%
1996	Asian/Pacific Islander	26%	20%	22%	18%	10%	4%	3%	13%
2005	Asian/Pacific Islander	18%	10%	16%	11%	7%	5%	3%	9%
1996	White, Non-Hispanic	67%	73%	72%	75%	79%	85%	81%	77%
2005	White, Non-Hispanic	70%	79%	73%	77%	76%	80%	75%	76%

Source: National Science Foundation, 2007.

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could be a key element in solving the potential labor and knowledge shortage in technology and science fields. Graduate deans, as key leaders of the doctoral enterprise, have always been concerned about student success rates, and have continually devised new methods for improving program effectiveness. Future research on doctoral education should remain focused on devising strategies that work best for increasing minority student degree success.

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Table 2. Major Fields of Study for American Doctoral Students Enrolled in U.S. Graduate Schools* in 2003-2004, by Gender and Race/Ethnicity

Race/Ethnicity	Humanities	Social Sciences	Life & Physical Sciences	Mathematics, Engineering, & Computer Sciences	Education	All Others
White	11%	19%	11%	9%	16%	34%
URM**	8%	15%	8%	6%	25%	37%
Asian***	8%	15%	15%	18%	6%	38%

*Includes only U.S. citizens and permanent resident enrolled at four-year public and private, non-profit universities based in the United States.

**Under-represented minority (URM) students, including African Americans, Native Americans, Latinos, and persons of more than one race or ethnicity.

***Includes Pacific Islanders.

Due to rounding, details may not total to 100%.

Source: National Center for Education Statistics, 2006.

CGS New Deans Institute and Summer Workshop a Great Success!

The 2007 New Deans Institute and Summer Workshop in San Juan, Puerto Rico proved to be a highly successful meeting. A near record crowd of 106 attendees was recorded at the New Deans Institute, while the Summer Workshop realized 250 attendees. The meeting featured three plenary sessions, four Dean Dialogues and twelve Hot Topic sessions covering topics ranging from financing graduate education to dual and joint degrees to fundraising. Several networking lunches and receptions provided attendees the opportunity for much discussion and interaction.

We would like to thank the CGS Board, meeting presenters and the following sponsors for helping to make the meeting a success: Educational Testing Service, GradSchools.com, and ProQuest/UMI Dissertations Publishing. We would also like to thank the following member institutions for their support in sponsoring the refreshment breaks: Alabama A&M University; Arkansas State University; Clemson University; College of Charleston; College of Graduate Studies, Medical University of South Carolina; Emory University; Florida State University; Georgia Southern University; University of Alabama; University of Alabama at Birmingham; University of Arkansas; University of Central Florida; University of Florida; University of Georgia; University of Tampa.