

Data Sources: Financial Aid for Minority Students in STEM Fields

Over the past decade, the total annual costs of attending graduate and professional school programs full-time has grown 65%, and now averages nearly \$29,000, according to the National Center for Education Statistics (NCES). For students pursuing degrees in science, technology, engineering, and mathematics (STEM) fields, the task of paying college expenses has been particularly daunting. On average, in academic year 2003-04, full-time master's degree candidates in these fields faced average total education-related charges (including tuition, fees, educational supplies, living costs, and miscellaneous education-related costs) of more than \$27,000, while those seeking doctoral degrees had average expenses of about \$34,000.

Paying for STEM graduate education is a particular challenge for students from underrepresented racial/ethnic minority groups. African American, Latino, and Native American/Alaska Native families generally have lower incomes than other populations, and previous research (e.g., St. John, 2001¹) has suggested that these students are the least willing to borrow to pay for education at any level. For racial/ethnic minority students, grant and fellowship aid is thus critically important for improving both access and persistence in graduate STEM education.

What resources do students from underrepresented groups use to finance graduate education in STEM fields? Do these students receive grants, fellowships, and assistantships at the same level as other enrollees? And what implications can be drawn from any differences in financing STEM education by race/ethnicity? Information available from NCES' 2004 National Postsecondary Student Aid Study (NPSAS) gives answers to these questions. NPSAS is a triennial survey of both undergraduate and graduate/professional students enrolled in higher education institutions in the 50 US states, the District of Columbia, and Puerto Rico. The most recent survey has a sample size of 80,000 students in graduate/professional studies, statistically weighted to represent the roughly 3 million students enrolled in post-baccalaureate programs in academic year 2003-04. The NPSAS data provide critical evidence that current trends in enrollment and fellowship-based financial support may be limiting underrepresented students' ability to achieve

master's and doctoral degrees in STEM fields.

The NPSAS data reveal that African Americans, Latinos, and Native Americans are underrepresented in graduate STEM education, especially at the doctoral level. Just 14% of the underrepresented minority students seeking doctorates in 2003-04 were in STEM fields, compared with 19% of White non-Hispanics and 33% of Asian/Pacific Islanders (these figures are based on students who were US citizens and permanent resident aliens only). Among master's degree candidates, just 8% of underrepresented minority attendees were pursuing degrees in STEM fields, versus 10% of White non-Hispanics and 26% of Asians.

Despite their relatively lower shares of enrollees at the master's and doctoral levels, STEM students from underrepresented groups collectively were slightly less likely to receive grants/fellowships and teaching or research assistantships, but somewhat more likely to

receive student loans. According to the NPSAS data, just 14% of master's degree minority candidates in STEM fields received grants, scholarships, and fellowships, compared with 20% of Whites and 17% of Asians (see Table 1). Conversely, 40% of underrepresented minority students received loans, compared with just 19% of Asians and 36% of Whites. In doctoral programs, the results are somewhat similar. Just 57% of those from underrepresented groups received assistantships, compared with 60% of White students and 63% of Asians. Nearly 70% of Asians received grants or fellowships, while only 63% of all

other non-White students received this aid. At the same time, about 18% of Whites and underrepresented minorities received loans, versus 14% of Asians.

One reason lower shares of underrepresented minority students received fellowship and assistantship aid is that these students were much less likely to be enrolled in colleges and universities considered Research Extensive in the new Carnegie classification system (these institutions were classified as Research I under the previous Carnegie system). Research Extensive institutions tend to have greater resources for fellowship and assistantship aid. In 2003-04, just 30% of the underrepresented students in master's STEM programs were attending Research Extensive institutions, versus 43% of Whites and 37% of Asians. At the doctoral level, just 70% of underrepresented minority group students were enrolled at Research Extensive institutions, compared with 88% of Asians and 83% of Whites.

Only 6% of underrepresented minority master's degree STEM candidates at non-Research

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Table 1. Financial Aid for Students in STEM Fields By Race/Ethnicity* and Degree Program, 2003 -2004

	Master's Degree Percentage of STEM Students Receiving:			
	Any Student Aid	Grants, Fellowships, or Scholarships	Assistantships**	Student Loans
White, non-Hispanic	83%	20%	29%	36%
Asian/Pacific Islander	66%	17%	24%	19%
Other Racial/Ethnic Groups***	83%	14%	19%	40%
Total (All Students)	80%	19%	26%	34%
	Doctoral Degree Percentage of STEM Students Receiving:			
	Any Student Aid	Grants, Fellowships, or Scholarships	Assistantships**	Student Loans
White, non-Hispanic	89%	62%	60%	18%
Asian/Pacific Islander	94%	70%	63%	14%
Other Racial/Ethnic Groups***	89%	63%	57%	18%
Total (All Students)	90%	63%	60%	17%

*Includes U.S. citizens or permanent resident aliens only.
 **Includes research and teaching assistantships.
 ***Includes African Americans, Hispanics/Latinos, Native Americans/Alaska Natives, and persons of more than one racial/ethnic group.
 Source: National Center for Education Statistics, 2004 National Postsecondary Student Aid Study, Graduate/Professional Data Analysis System, April 2006.

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Extensive colleges and universities received fellowships, compared with 14% of White students. However, at Research Extensive schools, the percentage of minority candidates in master's degree programs who received fellowships and grants was about the same (31% for underrepresented students of color versus 28% of Whites). Only half the minority doctoral students at non-Research Extensive institutions received fellowships, compared with 45% of Whites. At Research Extensive schools, the percentage of doctoral candidates who received fellowships and grants was about the same for underrepresented minority and majority students (68% versus 66%).

The overall lower levels of grant/fellowship and assistantship aid and higher prevalence of borrowing among minority students is a concern because it could discourage enrollment of these students and negatively affect their ability to complete degree programs. A 2006 study from the American Council on Education² found that receipt of grant aid was a positive predictor of African American students' successful completion of bachelor's degrees in STEM fields. The relatively higher incidence of loans among these and other non-White students in science and technology fields may inhibit their success at the graduate level. Increasing the share of underrepresented minority students at Research Extensive

institutions may lead to greater success among these students in STEM fields.

The need to support more students of color in science, technology, engineering, and mathematics fields of study is more important now than ever before. America's population is changing rapidly; the US Census Bureau predicts that between 2000 and 2030 the Latino population will jump 105% and the African American population will rise 41%. In the same period, the number of White, non-Hispanic residents will grow just 7%.³ If America is to remain competitive in the global economy, grant funding and other non-loan support to students of color who wish to enter STEM fields must be increased.

¹St. John, E. 2001. "The Impact of Aid Packages on Educational Choice: High Tuition-High Educational Opportunity." *Journal of Student Financial Aid*, 31(2): 34-54

²Anderson, E. and Kim, D. 2006. *Increasing the Success of Minority Students in Science and Technology*. Washington, DC: American Council on Education.

³U.S. Census Bureau. 2004. U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin. Available on-line at <http://www.census.gov/ipc/www/usinterimproj/natprojtab01a.pdf>

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CGS New Deans Institute and Summer Workshop a Great Success!

The 2006 New Deans Institute and Summer Workshop in Cambridge, Massachusetts proved to be a highly successful meeting. A record crowd of 108 attendees was recorded at the New Deans Institute, while the Summer Workshop realized over 220 attendees. The meeting featured three plenary sessions, four Dean Dialogues and twelve Hot Topic sessions covering topics ranging from entrepreneurship to distance graduate education 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, Northeastern University, ProQuest/UMI Dissertations Publishing and Peterson's. We would also like to thank the following member institutions for their support in sponsoring the refreshment breaks: Binghamton University-State University of New York; Boston College Graduate School of Arts and Sciences; Boston University, Graduate School of Arts and Sciences; Brown University; Cornell University; The Graduate Center/CUNY; Lesley University; New Haven University; Princeton University; Rowan University; Rutgers-New Brunswick; Salem State College; Sarah Lawrence College; Stevens Institute of Technology; Stony Brook University; SUNY College at Brockport; Tufts University; University of Albany, SUNY; University of Hartford; University of Maine; University of Massachusetts; University of New Hampshire; University of Rhode Island; University of Southern Maine; Yale University.