

AGEP Alliances for Graduate Education and the Professoriate **Info Brief I**

Increases in the Annual Number and Percent of New Underrepresented Minority Graduate Student Enrollees in STEM at AGEP Institutions

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January, 2007

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SUMMARY

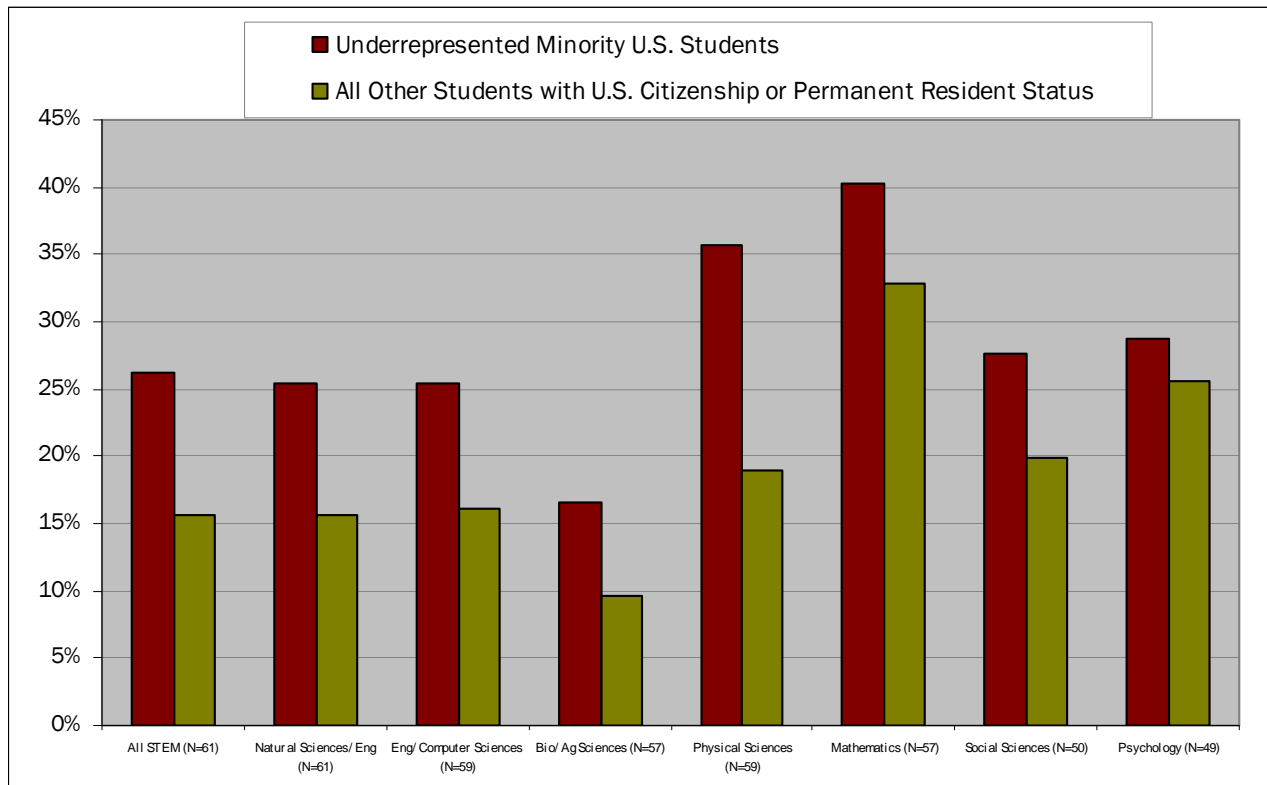
One of the goals of the National Science Foundation (NSF) Alliances for Graduate Education and the Professoriate (AGEP) Program, which began in 1998, is to increase the number of underrepresented minorities (URM) pursuing advanced degrees in science, technology, engineering, and mathematics (STEM) (See *program description at bottom of page*)¹. Analyses of new graduate student enrollee data from AGEP institutions indicate that the AGEP Program is achieving this goal.

- Analysis of new URM graduate student enrollee data from 1997/98 to 2005/06 for 61 AGEP institutions from 20 Alliances indicates that the annual percent and number of new URM graduate students increased in STEM by 26.2% from 2,105 to 2,657. This change represents an annual increase of 552 new URM graduate student enrollees in STEM, after seven years of AGEP implementation. During this same period, the annual percent and number of new URM graduate student enrollees in Natural Sciences and Engineering (NS&E) increased by 25.4% or from 1,410 to 1,768, representing an increase of 358 new URM enrollees in NS&E per year. Changes in the percents of increase ranged from 16.5% (67) in Biological and Agricultural Sciences to 40.2% (33) in Mathematics (*Table 1*). A third (33.2% or 183 of the 552) of the average annual increases in the number of new URM graduate student enrollees in STEM between 1997/98 and 2005/06 was due to increases at the nine campuses of the University of California (UC) (*Tables 2 & 3*).
- The annual percent change in new graduate school enrollment from 1997/98 to 2005/06 in STEM was much higher for URM than for all other students with U.S. citizenship or permanent resident status (26.2% vs 16.9%). The annual percent change of new graduate student enrollees was higher for URM than for all other students with U.S. citizenship or permanent resident status in NS&E (25.4% vs 15.6%), Social Sciences (27.7% vs 19.8%)

¹**Program Description:** The goal of the National Science Foundation (NSF) Alliances for Graduate Education and the Professoriate (AGEP) Program is to increase the number of underrepresented minority students pursuing advanced study, obtaining doctoral degrees, and entering the professoriate in STEM disciplines (including social Sciences). Alliances participating in this program are expected to engage in comprehensive institutional cultural changes that will lead to sustained increases in the conferral of STEM doctoral degrees, significantly exceeding historic levels of performance. Specific objectives of AGEP are: (1) to develop and implement innovative models for recruiting, mentoring, and advancing minority students in STEM doctoral programs and (2) to develop effective strategies for identifying and supporting underrepresented minorities who want to pursue academic careers.

and Psychology (28.7% vs 25.6%) (Figure 1 and Table 4). At UC the average annual percent change of new graduate student enrollees from 1997/98 to 2005/06 in all STEM fields was much higher for URM than for all other U.S. students or permanent residents 49.6% vs 34.4%) (Table 5).

Figure 1: Percent Changes in New STEM Graduate Student Enrollees for URM* and All Other Students with U.S. Citizenship or Permanent Resident Status by Broad STEM Categories in AGEP Institutions between Pre-AGEP (1997/98-1999/00) and Mid-AGEP (2003/04-2005/06) Year (N = 61 Institutions)**



*URM students include African Americans, Hispanic Americans, and Native Americans.
**See Table 4 for numbers and percentages.

Analysis of New STEM Graduate School Enrollee Data from 1997/98 to 2005/06 at AGEP Institutions

To examine changes in the number of new graduate student enrollees in broad STEM categories from 1997/98 to 2005/06, data from 61 AGEP institutions representing 20 Alliances were analyzed. The 61 institutions submitted data on URM and other students with U.S. citizenship or

permanent resident status for at least one broad category of STEM fields. (To reduce the volatility of annual new enrollee data, the data were grouped into three categories: the Pre-AGEP Years (1997/98 to 1999/00); the Early AGEP Years (2000/01 to 2002/03); and the Mid-AGEP years (2003/04 to 2005/06).

As indicated in Table 1, data analyzed for the 61 institutions from 1997/98 to 2005/06, indicate that the average annual percent and number of new URM graduate student enrollees:

- In all STEM fields increased by 26.2%, from 2,105 to 2,657. This change represents an increase of 552 new URM graduate student enrollees per year in STEM.
- In NS&E increased by 25.4%, from 1,410 to 1,768. This change represents an increase of 358 new URM graduate student enrollees in NS&E per year.
- In Social Sciences increased by 27.7%, from 545 to 696. This change represents an increase of 151 new URM graduate student enrollees per year in the Social Sciences .
- In Psychology increased by 28.7%, from 150 to 193. This represents an increase of 43 new URM graduate student enrollees per year in Psychology.

Of the average annual number and percent of new URM graduate student enrollees (2,657) in STEM fields for 2003/04 to 2005/06:

- 1,768 or 66.5% were in NS&E.
- 696 or 26.2% were in the Social Sciences.
- 193 or 7.2% were in Psychology (*Table 1*).

Of the average annual number (1,768), the number and percent of new URM graduate student enrollees in NS&E for 2003/04 to 2005/06 :

- 868 or 49.1% were in Engineering and Computer Sciences.
- 473 or 26.8% were in the Biological and Agricultural Sciences.
- 312 or 17.6% were in the Physical Sciences.
- 115 or 6.5% were in Mathematics (*Table 1*).

One-third (33.2% or 183 of the 552) of the average annual increases in the number of new URM graduate student enrollees in STEM between 1997/98 and 2005/06 was due to increases at the

nine campuses of the University of California (UC). New URM graduate student enrollees at the UC campuses account for nearly three-quarters of the increases in the Biological and Agricultural Sciences (73.1% or 49 of 67), and two-thirds of the increases in the Physical Sciences (67.1% or 55 of 82) (Tables 2&3).

As indicated in Table 4 and Figure 1, from 1997/98 to 2005/06 the average annual percent change in new graduate student enrollees in STEM at all AGEP institutions was higher for URM than for all other new enrollee students with U.S. citizenship or permanent resident status (26.2% vs 16.9%). The average annual percent change from 1997/98 to 2005/06 of new graduate student enrollees was higher for URM than for all other new student enrollees with U.S. or permanent resident status in NS&E (25.4% vs 15.6%) and the Social Sciences (27.7% vs 19.8%) and about the same in Psychology (28.7% vs 25.6%). During this same time period, in NS&E the average annual percent change of new URM graduate student enrollees versus all other new student enrollees with U.S. citizenship or permanent resident status was:

- Much higher in the Physical Sciences (35.7% vs 19.0%).
- Higher in the Biological and Agricultural Sciences (16.5% vs 9.7%).
- Higher in Engineering and Computer Sciences (25.4% vs 16.1%).
- Higher in Mathematics (40.2% vs 32.9%).

As indicated in Table 5, the average annual percent change of new graduate student enrollees at UC from 1997/98 to 2005/06 in all STEM fields was much higher for URM than all other students with U.S. citizenship or permanent resident status (49.6% vs 34.4%). The average annual percent change of new enrollees from 1997/98 to 2005/06 was much higher for URM than for all other students with U.S. citizenship or permanent resident status at UC campuses in NS&E (58.6% vs 35.4%) and Psychology (46.2% vs 34.3%) and about the same in the Social Sciences (30.4% vs 29.5%).

In NS&E fields, the average annual percent change of new graduate enrollees at UC from 1997/98 to 2005/06 was much higher for URM as compared to all other students with U.S. citizenship or permanent resident status in the Physical Sciences (148.6% vs 59.6%) and in the Biological and Agricultural Sciences (37.7% vs 14.6%); about the same in Engineering and Computer Sciences (56.3% vs 54.1%); and lower in Mathematics (23.1% vs 29.3%).

Table 1 -- Changes in the Average Annual Number and Percent of New URM Graduate Student Enrollees in Broad STEM Categories from 1997/98 to 2005/06 (N= 61 Institutions, including the nine campuses of the University of California)

Broad STEM Categories (Number of Institutions with Usable Data)	Pre-AGEP Years 1997/98 to 1999/00	Early AGEP Years 2000/01 to 2002/03	Mid-AGEP Years 2003/04 to 2005/06	Pre/Mid- Years Change (Mid- AGEP- Pre-AGEP)	Pre/Mid- Years Percent Change (Mid- AGEP-Pre- AGEP)/ Pre-AGEP
All Natural Sciences & Engineering (61)	1,410	1,596	1,768	358	25.4%
Engineering/Computer Sciences (59)	692	789	868	176	25.4%
Biological/Agricultural Sciences (57)	406	423	473	67	16.5%
Physical Sciences (59)	230	294	312	82	35.7%
Mathematics (57)	82	90	115	33	40.2%
Social Sciences (50)	545	607	696	151	27.7%
Psychology (49)	150	174	193	43	28.7%
All STEM Fields (61)	2,105	2,377	2,657	552	26.2%

Table 2 -- Changes in the Average Annual Number and Percent of New URM Graduate Student Enrollees in Broad STEM Categories from 1997/98 to 2005/06 at the Nine Campuses of the University of California

Broad STEM Categories (Number of Institutions with Usable Data)	Pre-AGEP Years 1997/98 to 1999/00	Early AGEP Years 2000/01 to 2002/03	Mid- AGEP Years 2003/04 to 2005/06	Pre/Mid- Years Change (Mid- AGEP- Pre-AGEP)	Pre/Mid-Years Percent Change (Mid- AGEP-Pre- AGEP)/ Pre- AGEP
All Natural Sciences & Engineering (9)	244	328	387	143	58.6%
Engineering/Computer Sciences (9)	64	82	100	36	56.3%
Biological/Agricultural Sciences (9)	130	153	179	49	37.7%
Physical Sciences (9)	37	78	92	55	148.6%
Mathematics (9)	13	15	16	3	23.1%
Social Sciences (9)	112	128	146	34	30.4%
Psychology (9)	13	15	19	6	46.2%
All STEM Fields (9)	369	471	552	183	49.6%

Table 3 -- Percent Change in New URM Graduate Student Enrollees in Broad STEM Categories from 1997/98 to 2005/06 Due to the Nine Campuses of the University of California

Broad STEM Categories	Number Pre/Mid-Change at UC	Percent Pre/Mid-Change at UC	Number Pre/ Mid-Change at All AGEP Institutions	Percent Pre/ Mid-Years Change at All AGEP Institutions	Percent Change Due to UC
All Natural Sciences & Engineering	143	58.6%	358	25.4%	39.9%
Engineering/Computer Sciences	36	56.3%	176	25.4%	20.5%
Biological/Agricultural Sciences	49	37.7%	67	16.5%	73.1%
Physical Sciences	55	148.6%	82	35.7%	67.1%
Mathematics	3	23.1%	33	40.2%	9.1%
Social Sciences	34	30.4%	151	27.7%	22.5%
Psychology	6	46.2%	43	28.7%	14.0%
All STEM Fields	183	49.6%	552	26.2%	33.2%

Table 4 -- Changes in the Average Annual Number and Percent of All Other New Graduate Student Enrollees with U.S. Citizenship or Permanent Resident Status in Broad STEM Categories and Percent Change of New URM Graduate Student Enrollees from 1997/98 to 2005/06 (N= 61 Institutions)

Broad STEM Categories (Number of Institutions with Usable Data)	Pre-AGEP Years 1997/98 to 1999/00	Early AGEP Years 2000/01 to 2002/03	Mid-AGEP Years 2003/04 to 2005/06	Pre/Mid-Years Change All Other U.S. students or permanent residents	Pre/Mid-Years Percent Change All Other U.S. students or permanent residents	Pre/Mid-Years Percent Change URM
All Natural Sciences & Engineering (61)	11,528	12,434	13,321	1,793	15.6%	25.4%
Engineering/Computer Sciences (59)	5,518	5,925	6,404	886	16.1%	25.4%
Biological/Agricultural (57)	3,376	3,615	3,702	326	9.7%	16.5%
Physical Sciences (59)	2,050	2,248	2,439	389	19.0%	35.7%
Mathematics (57)	584	646	776	192	32.9%	40.2%
Social Sciences (50)	2,999	3,103	3,594	595	19.8%	27.7%
Psychology (49)	780	838	980	200	25.6%	28.7%
All STEM Fields (61)	15,307	16,375	17,895	2,588	16.9%	26.2%

Table 5 -- Changes in the Average Annual Number and Percent of All Other New U.S. Graduate Student or Permanent Resident Enrollees in Broad STEM Categories & Percent Change in New URM Graduate Student Enrollees at the Nine Campuses of the University of California from 1997/98 to 2005/06

New Graduate Student Enrollees in Broad STEM Categories at UC (Number of Institutions with Usable Data)	Pre-AGEP Years 1997/98 to 1999/00	Early AGEP Years 2000/01 to 2002/03	Mid-AGEP Years 2003/04 to 2005/06	Pre/Mid-Years Change All Other U.S. students or permanent residents	Pre/Mid-Years Percent Change All Other U.S. students or permanent residents	Pre/Mid-Years Percent Change URM
All Natural Sciences & Engineering (9)	2,773	3,371	3,755	982	35.4%	58.6%
Engineering/Computer Sciences (9)	822	1,046	1,267	445	54.1%	56.3%
Biological/Agricultural (9)	1,308	1,418	1,499	191	14.6%	37.7%
Physical Sciences (9)	520	741	830	310	59.6%	148.6%
Mathematics (9)	123	166	159	36	29.3%	23.1%
Social Sciences (9)	570	619	738	168	29.5%	30.4%
Psychology (9)	102	118	137	35	34.3%	46.2%
All STEM Fields (9)	3,445	4,108	4,630	1,185	34.4%	49.6%