Wanted: Hispanics in STEM Careers

by Mary Ann Cooper

Analysts predict that in order for the United States to remain competitive worldwide in the field of science, technology, engineering and mathematics (STEM), it will have to train approximately one million more STEM professionals over the next 10 years. That means the U.S. will have to increase the number of students earning these degrees by about a third of the students in STEM training, according to the President's Council of Advisors on Science and Technology report released in 2012.

The reason the United States is playing catch-up with the rest of the world is due to the fact that we have one of the lowest rates of STEM to non-STEM bachelor's degree production worldwide. The roots to this low rate can be found in a 2008 study that showed that as recently as 10 years ago STEM accounted for 17 percent of all degrees awarded in the United States compared to the international average of 26 percent. This puts colleges and universities under enormous pressure to increase their STEM population and degree earners.

Now need has bumped up against demographics in academia. With an eye toward the burgeoning Hispanic population, colleges and universities are trying to understand why more Hispanics aren't attracted to STEM careers and what can be done to encourage them to enter these fields. In a white paper prepared and updated in 2012 for the Hispanic Association of Colleges and Universities (HACU) titled *Overview of Hispanics in Science, Mathematics, Engineering and Technology (STEM): K-16 Representation, Preparation and Participation*, University of Texas-San Antonio authors Gloria Crisp and Amaury Nora paint a picture of current Hispanic STEM career aspirants and what has to be overcome to encourage more Hispanics to pursue STEM training.

Crisp and Nora preface their white paper painting this compelling picture of what exists and what needs to change. They state, "The demand for skilled workers in STEM fields will be difficult, if not impossible, to meet if the nation's future mathematicians, scientists, engineers, information technologists, computer programmers, and health care workers do not reflect the diversity of the population (Institute for Higher Education Policy, IHEP, 2010). Hispanics are the fastest-growing and youngest group in the United States. It is estimated that Hispanics will comprise 30 percent of the U.S. population by 2040 and will be the majority group in several states (U.S. Census Bureau, 2008). At the same time however, Hispanic students are underrepresented in STEM fields (U.S. Commission on Civil Rights, 2010). Increasing the percentage of Hispanics and other traditionally underrepresented minorities in STEM occupations is not only ethically and morally correct, as these groups deserve equal access to STEM fields, but allows minority groups to serve as role models and mentors for younger members of their own ethnic/racial group."

What has masked the gap in Hispanic STEM career aspirants is deceptive enrollment figures. Hispanic students have been shown to be just as likely as White students to major in STEM, but their numbers drop dramatically when it comes to completing those degrees. The white paper explains, "According to data from the Higher Education Research Institute (2010), 16 percent of Hispanic students who began college in 2004 as STEM majors completed a STEM degree by 2009, compared to 25 percent of White students."

Academics and researchers see Minority-Serving Institutions (MSIs) as important vehicles to encourage Hispanics to not only choose STEM careers, but also complete their degrees. Crisp and Nora see Hispanic-Serving Institutions (HSIs) as particularly important in this regard stating that HSIs "have the potential to increase the number of STEM degrees awarded to Hispanic students, as about half of all Hispanic undergraduate students currently attend Hispanic-Serving Institutions (Dowd, Malcolm, & Bensimon, 2009) and 40 percent of the undergraduate degrees awarded to Hispanics are granted by HSIs (Dowd, Malcolm & Macias, 2010). Further, a fifth of all bachelor's degrees awarded to Hispanic students in STEM majors are from HSIs (Dowd, Malcolm & Macias, 2010). It should be noted that due to the large concentration of Hispanic students in community colleges, over half (53 percent) of all HSIs are community colleges."

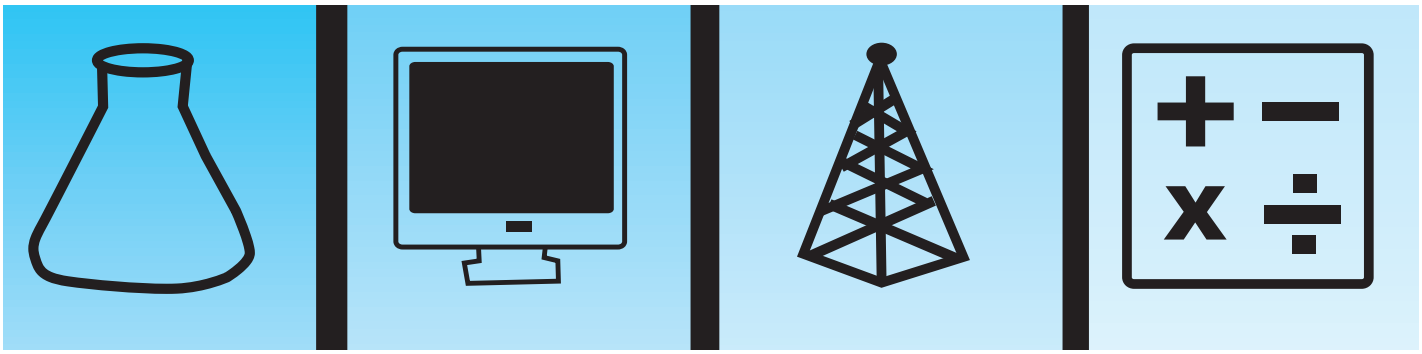
There are many external factors that affect the choices Hispanic students make when they choose a career path. Early interest in science, math, technology or engineering needs to be recognized, cultivated and encouraged in K-12 schools, or HSIs aren't nearly as effective in nurturing STEM career choices. But that is only one consideration. Money can also be a factor in the decision to choose a STEM career or not. Crisp and Nora explain, "Financial concerns, family responsibilities and full-time work commitments have all been shown to be factors external to the college that 'pull' Hispanic students away from STEM fields. Because science, engineering and mathematics degrees often take longer to complete than other college majors, financial aid takes on added importance in retaining students in those programs. Furthermore, working full-time may serve to decrease the likelihood that Hispanic and African American students will persist in a STEM major as undergraduates."

Once Hispanics choose a STEM career, it's up to the college to provide the type of experience that will make that choice successful for the student in their charge. The authors of the HACU white paper point to the following college experiences as ones that increase the odds of successful completion of a degree: 1) participating in an undergraduate research program, 2) participating in a club related to students' major, 3) time spent studying alone or with others, 4) engagement with faculty, 5) academic advising from upper-classmen, 6) enrolling in key gatekeeper courses during the first year, and 7) aspirations toward attending medical school.

All STEM Degrees – 2010

	Institution Name	State	Total	Hispanic	Latino	Latina	Hispanics
1.	Florida International University	FL	1,149	563	371	192	49%
2.	The University of Texas at El Paso	TX	670	400	245	155	60%
3.	Texas A & M University-College Station	TX	3,524	329	204	125	9%
4.	The University of Texas-Pan American	TX	425	328	189	139	77%
5.	The University of Texas at Austin	TX	3,058	323	218	105	11%
6.	The University of Texas at San Antonio	TX	856	320	173	147	37%
7.	University of Florida	FL	3,047	297	228	69	10%
8.	South Texas College	TX	228	209	131	78	92%
9.	Arizona State University	AZ	2,253	205	124	81	9%
10.	University of Central Florida	FL	1,501	196	118	78	13%
11.	University of Arizona	AZ	1,821	192	107	85	11%
	University of California-San Diego	CA	2,782	192	115	77	7%
12.	California State Poly University-Pomona	CA	1,105	191	149	42	17%
13.	New Mexico State University-Main Campus	NM	618	189	136	53	31%
14.	University of California-Irvine	CA	2,213	183	113	70	8%
15.	University of Houston	TX	1,244	177	115	62	14%
16.	University of California-Davis	CA	2,537	169	88	81	7%
17.	University of California-Los Angeles	CA	2,373	167	99	68	7%
18.	University of South Florida-Main Campus	FL	1,494	163	100	63	11%
19.	University of California-Berkeley	CA	3,239	162	107	55	5%
20.	University of New Mexico-Main Campus	NM	810	159	94	65	20%
21.	University of Miami	FL	684	150	86	64	22%
22.	Georgia Institute of Tech-Main Campus	GA	3,623	143	109	34	4%
23.	San Diego State University	CA	919	142	87	55	15%
24.	ITT Technical Institute-San Bernardino	CA	274	135	124	11	49%
25.	California State University-Long Beach	CA	979	126	90	36	13%
	Florida State University	FL	1,113	126	82	44	11%
	Technical Career Institutes	NY	373	126	119	7	34%
	The University of Texas at Brownsville	TX	158	126	79	47	80%

Source: NCES-IPEDS DATABASE ALL DEGREES ONLY STEM 2010



Overall Degrees Compared to Science, Technology,

Sex and race/ethnicity	Total Number	Associate Number	Associate Percent of total	Associate Number of STEM	Associate Percent STEM	Bachelor's Number	Bachelor's Percent of total	Bachelor's Number of STEM
Total [1]	3,351,049	849,452	25	258,259	30	1,650,014	49	409,618
Sex								
Male	1,381,351	322,916	23	88,232	27	706,633	51	197,423
Female	1,969,698	526,536	27	170,027	32	943,381	48	212,195
Race/ethnicity								
White	2,269,826	552,863	24	179,132	32	1,167,499	51	288,974
Black	365,624	113,905	31	34,107	30	164,844	45	33,986
Hispanic	304,147	112,211	37	25,756	23	140,316	46	27,791
Race/ethnicity by sex								
Male								
White	950,697	216,072	23	60,251	28	513,717	54	141,227
Black	118,049	36,136	31	10,193	28	56,171	48	12,127
Hispanic	116,490	42,232	36	10,009	24	55,092	47	13,344
Female								
White	1,319,129	336,791	26	118,881	35	653,782	50	147,747
Black	247,575	77,769	31	23,914	31	108,673	44	21,859
Hispanic	187,657	69,979	37	15,747	23	85,224	45	14,447

[1]Includes other racial/ethnic groups not shown separately in the table.

NOTE: STEM degrees, as defined here, include mathematics; natural sciences (including physical sciences and ences; and computer/information sciences. Degree-granting institutions grant associate's or higher degrees and field of degree, and sex were used to estimate race/ethnicity for students whose race/ethnicity was not reported. U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data

Engineering, and Mathematics (STEM) Degrees

Master's					Doctor's			
Percent STEM	Number	Percent of total	Number of STEM	Percent STEM	Number	Percent of total	Number of STEM	Percent STEM
25	693,025	21	154,016	22	158,558	5	82,584	52
28	275,197	20	70,557	26	76,605	6	39,925	52
22	417,828	21	83,459	20	81,953	4	42,659	52
25	445,038	20	86,129	19	104,426	5	51,200	49
21	76,458	21	11,693	15	10,417	3	4,053	39
20	43,535	14	7,304	17	8,085	3	3,412	42
27	170,203	18	33,999	20	50,705	5	23,839	47
22	22,120	19	3,438	16	3,622	3	1,394	38
24	15,525	13	3,059	20	3,641	3	1,524	42
23	274,835	21	52,130	19	53,721	4	27,361	51
20	54,338	22	8,255	15	6,795	3	2,659	39
17	28,010	15	4,245	15	4,444	2	1,888	42

biological/agricultural sciences); engineering/engineering technologies; health professions and related clinical sci-
participate in Title IV federal financial aid programs. Reported racial/ethnic distributions of students by level of degree,
Race categories exclude persons of Hispanic ethnicity.
System (IPEDS), Fall 2010, Completions component.