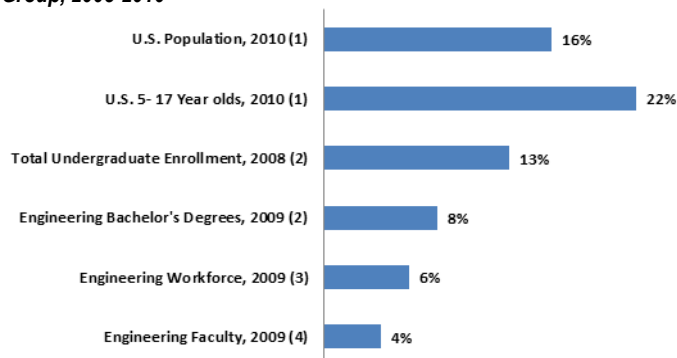


Latinos in Engineering

INTRODUCTION

Latinos are the fastest growing population in the United States, representing 22 percent of all U.S. children aged 17 or younger and 16 percent of the total U.S. population. Despite this growth pattern, Latino representation in engineering remains in stark contrast to their demographic representation in the country. In 2009, just 6 percent of the engineering workforce, 8 percent of all engineering bachelor's degree recipients, and 4 percent of engineering faculty were Latino (Figure 1). This brief details the growth and attainment that Latinos are achieving in engineering, and how these figures are changing with the nation's demographics.

Figure 1. Latino Representation in Engineering as a Percent of Each Group, 2008-2010



Source: Table prepared for NACME Data Book 2011 based on analysis of (1) U.S. Census Bureau, (2) IPEDS data accessed via NSFWebCASPAR database (percent of U.S. Citizens and permanent residents), (3) American Community Survey, analysis by NACME Research and Evaluation, October 2010, (4) American Society for Engineering Education, 2010 "By the numbers, 2009".

The underrepresentation of Latinos in engineering begins at the educational level, where the success of students and their ability to attain an engineering degree precedes success in the workforce. According to the U.S. Census Bureau, 302,000 Latino high school completers enrolled in a 2- or 4- year college or university in fall 2010, representing just 9.5 percent of all high school completers in the country. Comparatively, 16 percent of all high school completers are Latino.¹ At the postsecondary level 135,846 engineering and engineering-related degrees were awarded in 2010; inclusive from bachelor's to doctoral degrees. Latinos earned 6 percent of all engineering and engineering-related degrees across all levels, with 6.9 percent of the awarded bachelor's, 3.7 percent of master's, and 2.7 percent of doctoral degrees (Figure 2). Latino degree attainment remains second to Asians across all levels, and outpaced non-resident aliens² at the bachelor's level. Professional degree attainment, at the master's and doctoral level, remains dominated by

¹"Non-resident aliens", as defined by the U.S. Census Bureau, are non-national individuals holding registered visas, such as the F-1 visa for students, or the B-1 visa for employed persons.

Figure 2. Engineering and Engineering Related Degree Attainment

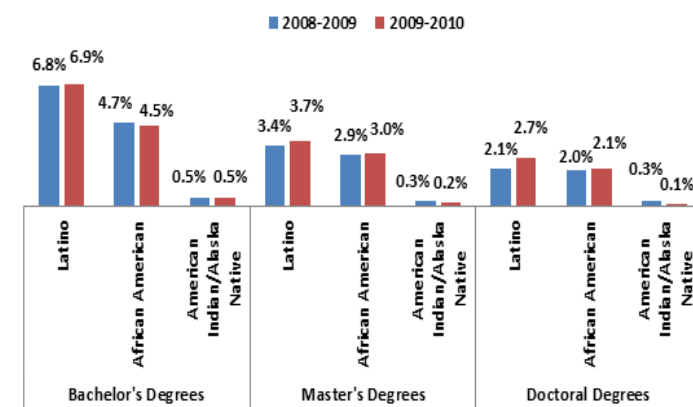
Engineering Degrees Attained by Group, 2010			
	Bachelor's	Master's	PhD's
White	62,314	15,424	2,505
Asian	9,667	4,301	569
Latino	6,105	1,573	210
African American	4,688	1,385	163
American Indian/Alaska Native	525	114	10
Non-Resident Alien	4,951	16,549	4,314

Source: U.S. Department of Education, National Center for Education Statistics, Integrated Post-secondary Education System (IPEDS), Completions Component, 2009-2010 (persons of two or more races excluded)

non-resident alien students. A full 42 percent of all master's and 56 percent of all doctoral degrees in engineering and engineering-related fields were awarded to non-resident aliens in 2010. It is important to note that this category includes many Latino graduates. The U.S. Census Bureau estimates that up to 11 percent of all F-1 visa holders enrolled in education in the United States are of Latino descent.² Many apply for citizenship once they have been accepted into the workforce.

A closer look at the degree attainment rates from 2009-2012 indicates a promising trend for Latino engineering students. Figure 3 shows how Latinos are increasing their attainment of more advanced degrees in engineering and engineering-related fields, in comparison to other underrepresented groups. Master's degree attainment by Latinos grew 9 percent from 2009 to 2010, while African American master's achievement grew by 3.4 percent. The greatest increase in percentage of engineering doctoral degrees awarded from 2009 to 2010 was also by Latinos.

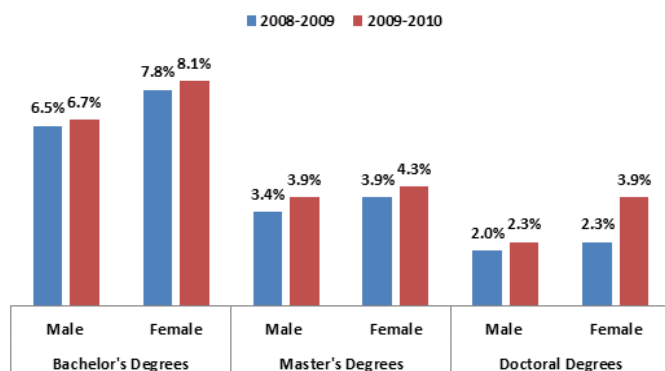
Figure 3. Percentage of Engineering and Engineering-Related Degree Attainment by Group and Level, 2009 and 2010



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Post-secondary Education System (IPEDS), Completions Component, 2006-2010, released Nov 2011

The National Action Council for Minorities in Engineering, Inc. (NACME) was founded in 1974 to ensure American competitiveness in a flat world by leading and supporting the national effort to expand U.S. capability through increasing the number of successful African American, American Indian, and Latino women and men in science, technology, engineering and mathematics (STEM) education and careers. NACME Alumni hold leadership positions in industry, medicine, law, education and government. With funding from corporate and individual donors, NACME has supported over 24,000 students with more than \$124 million in scholarships and other support. Currently NACME provides scholarship support to more than 1,300 college engineering students through a national network of 50 partner universities. NACME's STEM education strategy incorporates a continuum of programs and activities from middle school through workforce entry. Visit us at www.nacme.org.

Figure 4. Percentage of Latino Engineering Degree Attainment by Level and Gender, 2009 and 2010



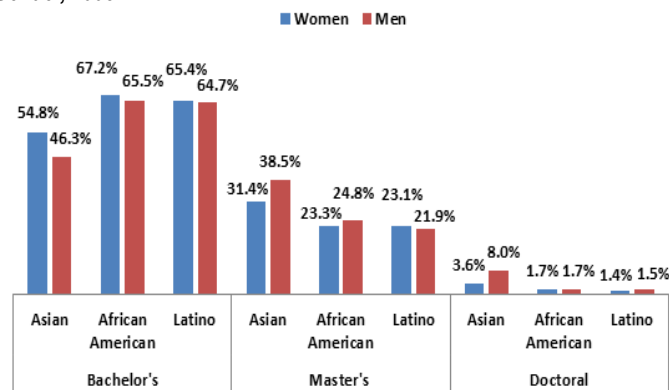
Source: U.S. Department of Education, National Center for Education Statistics, Integrated Post-secondary Education System (IPEDS), Completions Component, 2006-2010, released Nov 2011

Additionally, the representation of women is growing in engineering degree attainment, and Latinas are increasingly achieving higher degrees in these fields. In 2010, 8.1 percent of all bachelor's degrees in engineering earned by women were by Latinas, as compared to 6.7 percent of all male engineering degrees earned by Latino men. The same year, Latinas achieved 70 doctorates in engineering, up from 39 doctorates awarded in 2009, an increase of 79 percent (Figure 4).

This positive trend continues into the science and engineering workforce (Figure 5). At the bachelor degree level, 65.4 percent of women and 64.7 percent of Latino men were employed in the field of their degree-related content area. At the master's level, women were employed at a rate of 23.1 percent over 21.9 percent for Latino men.

However, the career placement rate on the professional level remains lower for Latinos than other groups. According to Excelencia in Education, a Latino advocacy and research group, although as a group Latinos earned more science and engineering degrees in 2010 out of all the science, technology, engineering, and mathematics (STEM) degree options, 60 percent of these were at the BA level. This has limited Latino representation in professional engineering positions. In 2011, Latinos employed in their degree-related content area were more likely to be employed in lower-paying service occupations.³

Figure 5. Employed Scientists and Engineers by Degree Attainment and Gender, 2008



Source: National Science Foundation, Scientists and Engineers employed by Industry, 2008 from: Report on Diversity in Science and Engineering Employment in Industry, March 2012

NACME stresses the need for continued support for Latinos to achieve more adequate representation in this field, especially through professional degree attainment and career placement. Figure 6 illustrates the top institutional support provided to Latino engineering NACME scholars through NACME scholarships, and the universities graduating the most Latino engineering students in 2012.

Figure 6. Top Institutional Support of Latino Students in Engineering, 2011

Top Institutional Support of Latino Students in Engineering 2011	
Most NACME Scholarship Recipients, 2011-2012	
University of Texas at El Paso	40
Georgia Institute of Technology	35
University of Colorado at Boulder	35
Drexel University	30
Most Engineering Bachelor's Degrees Awarded, 2011	
Florida International University	215
University of Florida	142
University of Texas at El Paso	153
University of Texas at Austin	135

Source: NACME Data Book 2011 and NACME Scholarship 2011-2012 Demographic Report

POLICY CONSIDERATIONS

It is vital for federal and state policies to provide opportunities for underrepresented minorities to increase their representation and achievement in STEM fields. Latinos, as a group, are making great achievements toward increasing representation, yet challenges remain. To increase the ability for this group to achieve adequate academic and career attainment, we encourage policymakers, educators, and business and industry leaders to pursue the following policies and practices:

- 1. K-12 EDUCATION.** STEM education and career options must be introduced on the K-12 level through STEM integrated curriculum and academic support for young Latino students. Emphasis should be placed on graduating more students college-ready, and prepared for the rigor the STEM disciplines require. School district funding needs to provide access to academic support programs, after school tutoring, SAT/ACT and college preparatory courses.
- 2. HIGHER EDUCATION.** To increase participation beyond the bachelor's degree level, support Latino students by providing mentorship, internship, and junior and senior research opportunities to prepare students for the rigor of master's and Ph.D. level programs. Additional focus must be made on increasing the representation of STEM faculty who are Latino.
- 3. BUSINESS.** Latino and non-Latino business groups can directly support promising students by providing scholarships, tuition reimbursement, and job placement for Latinos pursuing STEM degrees. Recruit and hire Latino graduates, and provide opportunities for further professional development.

¹ U.S. Census Bureau, Current Population Survey, 2011—"high school completers" includes GED recipients; data excludes persons of two or more races.

² US Census Bureau, Evaluating Components of International Migration, Legal Temporary Migrants 2001

³ Excelencia in Education, Finding your Workforce, 2012: http://edexcelencia.org/sites/default/files/exc2012fyw_stem_final_web_2.pdf