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Excelencia in Education is dedicated to bringing attention to practices that work for Latino students through [Examples of Excelencia](#); the only national effort to recognize evidence based-practices serving Latino students in higher education. Programs from Examples of Excelencia populate our [Growing What Works database](#) – a national database that shares evidence-based programs that serve Latino students. We aim to inform policy and practice by sharing models and strategies of what works for Latinos and other post-traditional students

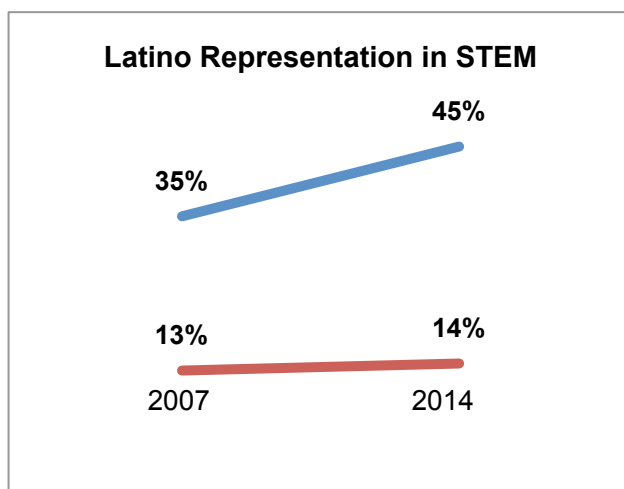
We have consistently received submissions from [STEM programs](#) and have featured them in the Growing What Works database.

Increasing Latino Student Success in STEM

Occupations in Science, Technology, Engineering, and Mathematics (STEM) fields have increased in recent years. The U.S. Bureau of Labor Statistics (BLS) projects continued STEM employment growth, estimating a 13 percent increase between 2012 and 2022, or about 1 million new jobs.¹ Latinos currently represent a small percentage of employees in STEM fields and tend to work in jobs with lower wages. Without the skills to enter the STEM workforce, Latinos will continue to be underrepresented in the field. *Excelencia* in Education’s “Finding Your Workforce: Latinos in Science, Technology, Engineering, and Math” report found that Latinos earned only nine percent of all STEM degrees and certificates awarded in 2013². To increase Latino representation in STEM jobs, colleges need to recruit, retain, and graduate more Latino STEM students. This brief provides an overview of the current state of Latino students in STEM, practices that meet students’ needs, and examples of STEM programs that effectively retain Latino students.

Latino Students in STEM

Latino student interest in STEM degrees has increased but graduation rates remain low. A 2014 report, “The American Freshmen: National Norms,” showed a growing interest in STEM degrees among Latino students. In 2007, 35 percent of Latino freshmen indicated they wanted to pursue a STEM degree; by 2014, the number had grown to 45 percent³. However, the latest National Center for Education Statistics data show only 14 percent of total bachelor’s degrees awarded to Latinos were in a STEM field⁴.



Math and science coursework requirements can create obstacles to recruiting and retaining STEM students. Students often test into remedial courses—classes students must take to strengthen skills before taking regular college courses—leaving students unable to earn credits towards their degree right away. The extra classes increase students’ time to completion or can discourage students from pursuing a STEM major altogether. Only 17 percent of students in a remediation course at 2-year colleges enroll and complete the associated introductory course⁵. Forty-five percent of Latinos enrolled in a remediation course. Among Latino students in 2- and 4-year colleges, 76 percent and 65 percent, respectively, did not complete remediation and the associated college level courses within two years.

Growth in STEM degrees occurred at the certificate and associates degree level. *Excelencia* found that between 2009-2010 and 2012-2013, the number of certificates Latinos earned grew 160 percent and the number of associates degrees earned grew 138 percent. In comparison, bachelor and graduate degrees in STEM grew 44 and 74 percent, respectively. Growth in completions is promising, but the majority new STEM jobs are concentrated in professional fields, leaving Latino students out of reach.

STEM Practices Meeting Latino Students' Needs

Increasing Latino representation in the STEM workforce requires supporting students at multiple points in their educational careers. Effective programs can serve students at the pre-college, undergraduate, or graduate school levels. At every level, programs that successfully support Latino students provide academic support, student support services, and simplify access to the program.

Pre-college programs work with high school students, typically through summer institutes. Students can take classes beyond their regular high school math and science classes to prepare them for the next level course. By targeting students early and preparing them for college-level course work, pre-college programs can alleviate the need for remediation. Students can progress through their degrees faster by moving into credit-bearing courses earlier. Colleges often host these summer programs on their campuses, providing students an opportunity to gain familiarity with a college campus and can raise awareness of resources of available. Successful programs are often free, minimizing barriers to participation for Latino students.

For Latino students who pursue undergraduate education, obstacles still arise along the way. Successful programs provide support in community college through intensive sessions. These sessions prepare students for entry- or higher-level math courses so students can progress through their degree faster. Programs also academically support students through tutoring. Together, additional instruction and tutoring can address the issue of low completion rates in college-level STEM coursework.

Programs that meet Latino students' needs simplify access by providing multiple opportunities for participation. For example, math preparation programs can be offered during the day and night to meet student work schedules. Latino students also tend to start in community college, but by making it easier to transfer credits, 4-year programs can help students move from an associate's degree to a bachelor's degree. Finally, successful undergraduate programs support students by providing advising and connecting students to peer and faculty mentors.

Graduate programs that have successfully met Latino students' needs provide extensive academic and social support. Students can access tutoring and academic skills workshops to prepare them for the rigor of graduate level coursework. Mentoring and advising from faculty provides students social support and helps them navigate their graduate program. For students who choose not to use these services, programs that improve campus climate for Latino students allow all students to benefit, directly or indirectly. Through support at multiple points of an educational career, students can access and succeed in STEM education.

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STEM Programs in Action

Every year, *Excelencia* in Education recognizes programs at the associate, baccalaureate, graduate, and community-based levels through Examples of *Excelencia*, the only national initiative to identify and promote programs and departments at the forefront of advancing educational achievement for Latino students in higher education. The programs selected as the Example in each category use evidence-based practices that advance Latino student success. Past Examples of *Excelencia* and other programs are featured in *Excelencia's* Growing What Works database, which includes evidence-based practices that serve Latino students and accelerate Latino student success. Since 2005, *Excelencia* in Education has received 1,500 nominations for Examples of *Excelencia* and has recognized 28 STEM programs.

The following four programs are some examples of effective programs that have increased retention and graduation rates for Latino students in STEM majors at various points of a student's educational career. The 1) **Mathematics Intensive Summer Session** works with high school students to prepare them for college-level math courses. 2) **Math Jam** and the 3) **School of Natural Sciences, Mathematics, and Engineering** work with undergraduate students and help them make progress towards a degree. The 4) **Enhancing Post-baccalaureate Opportunities at CSUF for Hispanic Students** program supports graduate students through degree completion. The highlighted programs meet student needs by providing academic support, student support services, and flexibility. The four selected STEM programs are briefly summarized below. For more information, please visit the Growing What Works database at <http://www.edexcelencia.org/growing-what-works>.

Math Jam (Redwood City, CA)

Math Jam is a campus-wide math success program that serves students in Pre-Algebra through Advanced Calculus to increase readiness for college level math courses and reduce time to a degree. The program connects students with faculty, tutors, peers, and the STEM Center to improve student engagement and course success rates. Cañada College offers Math Jam three times per year with daytime and evening sessions to accommodate student work schedules and family obligations.

Evidence of effectiveness: Math Jam has served over 1000 students since it began in 2009. An average of 62 percent of participants who retook the math placement exam moved up to the next level math course or higher. Students have higher retention (93 percent versus 77 percent) and success (77 percent versus 53 percent) rates in the next semester math courses compared to non-participants. For Hispanic participants versus Hispanic non-participants, retention rates are 94 percent versus 75 percent, respectively, and success rates are 74 percent versus 47 percent, respectively. Math Jam students remain enrolled at higher rates than other students at 78 percent versus 32 percent of all first-time students. Engineering and math classes have both seen over a 200 percent increase of minority student enrollment.

Mathematics Intensive Summer Session (Fullerton, CA)

The Mathematics Intensive Summer Session (MISS) was designed to serve females from underrepresented groups through an intensive mathematics summer program at Cal State University (CSU) Fullerton. Girls from local high schools attend MISS courses for four weeks during the summer at the Algebra II level and above. The program is free to students.

Evidence of effectiveness: Between 1990 and 2014, 1,575 students completed the MISS program, and 65 percent of those students were Hispanic. Over 98 percent of participants go to college and about 20 percent of them enroll in a STEM major. Of MISS participants who enroll at CSU Fullerton, over 90 percent of them have completed college. Students showed a 105 percent gain in test score averages on the Mathematical Analysis Readiness Test.

School of Natural Sciences, Mathematics, and Engineering (Bakersfield, CA)

The School of Natural Sciences, Mathematics, and Engineering (NSME) at California State University, Bakersfield, set a goal to increase the number of students earning a STEM degree. NSME placed a specific focus on increasing the number of underrepresented minority, and particularly Latino, students. The school implemented new transfer and articulation efforts with Bakersfield College. NSME's degree pathways include student support services.

Evidence of effectiveness: Between 2006 and 2012, Latino enrollment in STEM increased 88 percent. The number of Latino transfer students also grew after transfer efforts with Bakersfield College. In 2006, Latinos made up 22 percent of all transfer students enrolling in STEM; in 2011, 50 percent of transfer students in STEM were Latino. The first-year retention rate for Latino STEM students grew from 72 percent in 2006 to 78 percent in 2012, which exceeds the overall first-year retention rate of 70 percent. In 2010, the 6-year graduation rate for first-time, full-time Latinos in STEM was 41 percent, which was higher than 38 percent graduation rate for White students.

Enhancing Post-baccalaureate Opportunities at CSUF for Hispanic Students (EPOCHS)

(Fullerton, CA)

EPOCHS seeks to improve Latino students' retention and graduation rates. Before EPOCHS began, Hispanic graduate students had lower graduation rates and disproportionately high academic probation and disqualification rates. EPOCHS provides students with a new graduate student orientation with Spanish workshops for families, a graduate student handbook, bilingual English/Spanish newsletters, tutoring and academic skills workshops, graduate student assistant program, faculty mentoring, and grants to support research. EPOCHS also works to improve campus climate through faculty advisor workshops on cultural competency and outreach activities with community groups.

Evidence of effectiveness: Hispanic graduate student enrollment increased by 57 percent from 2010 to 2015. The two- and three-graduation rates increased by 14 and 15 percent, respectively. Hispanic students are less likely to be on probation or academically disqualified. In 2009, Hispanics were 15 percent of graduate students but 18 percent of those on probation and 19 percent of those disqualified; in 2014, Hispanics were 20 percent of graduate students and 14 and 15 percent of students of probation and academically disqualified, respectively.

Compiled by Janette Martinez, graduate intern, Examples of *Excelencia*

¹ Bureau of Labor Statistics. US Department of Labor. STEM 101: Intro to Tomorrow's Jobs. Occupational Outlook Quarterly Spring 2014. <http://www.bls.gov/careeroutlook/2014/spring/art01.pdf>

² *Excelencia* in Education. (2015). *Finding Your Workforce: Latinos in Science, Technology, Engineering, and Math (STEM)*. Washington, D.C.: *Excelencia* in Education

³ Eagan, K., Stolzenberg, E. B., Ramirez, J. J., Aragon, M. C., Suchard, M. R., & Hurtado, S. (2014). *The American freshman: National norms fall 2014*. Los Angeles: Higher Education Research Institute, UCLA.

⁴ National Center for Education Statistics. (2016). *Indicator 24: Stem Degrees* [Data file]. Retrieved from https://nces.ed.gov/programs/raceindicators/indicator_reg.asp

⁵ Complete College America. (2016). *Remediation: Higher Education's Bridget to Nowhere*. Retrieved from <http://www.completecollege.org/docs/CCA-Remediation-final.pdf>

Excelencia in Education accelerates Latino student success in higher education by promoting Latino student achievement, conducting analysis to inform educational policies, and advancing institutional practices while collaborating with those committed and ready to meet the mission. Launched in 2004 in the nation's capital, *Excelencia* is building a network of results-oriented educators and policymakers to address the U.S. economy's need for a highly educated workforce and engaged civic leadership. For more information, visit: www.EdExcelencia.org.

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