

College Graduation Goals and Latina/o STEM Success

by Angela Provitera McGlynn

In these times, can America remain a super-power without producing a more highly educated populace? Probably not. America is falling behind other countries, including Canada, Japan, Korea, Norway, Ireland, Belgium, Denmark, Spain and France, in the proportion of 25- to 34-year-olds with college degrees.

Most educators now agree that if the United States is to remain a competitive economic global power, it must produce more college graduates and must increase STEM (Science, Technology, Engineering and Mathematics) graduates, in particular.

It is now generally understood that, given the current and projected demographics, we cannot achieve these goals unless we promote Hispanic academic success. Hispanics are the fastest-growing demographic group throughout the United States and are projected to make up 29 percent of the U.S. population by 2050, up from 15 percent in 2007.

In a paper presented before the Association for the Study of Higher Education (2008), Lindsey E. Malcolm offered compelling data on the need for dramatic increases in the proportion of Hispanics earning STEM bachelor's and graduate degrees and entering the STEM work force. For the American economy to flourish, new STEM workers are needed, in large part to replace baby boomers retiring from STEM fields.

A newly released study (December 2009) from the University of Southern California's Center for Urban Education proposes a set of metrics institutions can use to measure their success in getting students from Hispanic backgrounds interested in STEM subjects and in graduating them.

The study, *Benchmarking the Success of Latina and Latino Students in STEM to Achieve National Graduation Goals* by Malcolm, Alicia C. Dowd and Estela Mara Bensimon, is the first in a series of a three-year project and was financed by the National Science Foundation.

The center's work concentrates on equity issues, specifically, "creating opportunities for equal access and success among historically underrepresented student populations, such as racial and ethnic minority and low-income students."

The report identifies 25 Hispanic-Serving Institutions (HSIs), Hispanic-serving in that at least 25 percent of their students are Hispanic, which could be exemplars of best practices for other institutions. The 25 were selected based on their success in graduating more Latinos in STEM fields than might be expected, based on general enrollments of Latinos. Dowd, associate professor, co-director of the Center for Urban Education and report co-author, said that the researchers wanted to focus on how well colleges and universities are educating Latinos compared to other students. The intent was to see what the most successful colleges and universities were doing, in the hope that other institutions could follow suit.

The researchers began by examining 200 Hispanic-serving colleges and universities. They

focused on six states with large Hispanic populations – Arizona, California, Florida, New Mexico, New York and Texas. They limited their research to four-year HSIs in order to focus on bachelor degree completion rates.

Finally, they narrowed the 200 colleges to 25, based on proportional production of Latino STEM graduates. The 25 had the highest numbers of Hispanic STEM graduates based on their enrollments, selectivity and other criteria. According to Dowd, the goal was to identify those institutions that graduate more Latino STEM students than peer institutions with similar characteristics. Of course, the assumption was and is that those institutions must be proactively doing so.

According to Dowd, "The analysis directs us to these as ones that may provide a benchmark, a starting point, for understanding what are the

Benchmark Equity Indicators of STEM Degrees Awarded to Latinos

Institution	% Hispanic STEM Enrollment	% STEM Degrees Awarded to Hispanics	Equity Indicator 2 STEM Degrees Awarded (% Hispanic STEM Degrees – % Hispanic STEM Enrollment)
College of Mount Saint Vincent, NY	30.40%	42.50%	12.10%
Southwestern Adventist University, TX	19.60%	31.30%	11.70%
Texas A&M International University, TX	92.30%	96.80%	4.50%
Barry University, FL	31.50%	35.90%	4.40%
Nova Southeastern University, FL	22.10%	25.60%	3.50%
Mount St. Mary's College, CA	43.50%	46.90%	3.40%
College of the Southwest, NM	47.60%	50.00%	2.40%
La Sierra University, CA	20.80%	22.70%	1.90%
Saint Thomas University, FL	46.20%	47.50%	1.30%
University of New Mexico Main, NM	32.00%	33.00%	1.00%
Western New Mexico University, NM	36.00%	36.70%	0.70%
University of Texas at San Antonio, TX	45.50%	43.80%	-1.70%
Our Lady of the Lake University, TX	80.10%	78.20%	-1.90%
University of La Verne, CA	39.10%	36.90%	-2.20%
University of Texas at El Paso, TX	72.90%	70.40%	-2.50%
St. Mary's University, TX	72.60%	69.80%	-2.80%
California State University-Bakersfield, CA	33.80%	30.90%	-2.90%
University of Texas at Brownsville, TX	88.60%	85.40%	-3.20%
University of Texas-Pan American, TX	82.60%	78.40%	-4.20%
Florida International University, FL	62.80%	57.80%	-5.00%
University of the Incarnate Word, TX	62.60%	55.80%	-6.80%
Texas A&M University-Kingsville, TX	60.60%	52.50%	-8.10%
Saint Edward's University, TX	37.70%	29.00%	-8.70%
University of Texas of the Permian Basin, TX	42.60%	32.70%	-9.90%
New Mexico State University Main, NM	43.90%	32.50%	-11.40%

Source: Institutional Postsecondary Education Data System (IPEDS)

kinds of innovations that have been tested to bring Latinos to graduation in their fields.”

The 25 institutions selected through regression analysis as potential exemplars include both large public research universities and small private colleges. There was variation among the institutions of Latino enrollment in general, Latino STEM enrollment and Latino baccalaureate graduates.

The first benchmark equity indicator shows institutions that seem to be doing a great job of getting Hispanic students into STEM fields. By comparing each college’s overall proportion of Hispanic students with the proportion of their Hispanic STEM students, it is possible to identify institutions at which Hispanic students are disproportionately represented in STEM disciplines.

At about half the institutions, the proportion of Hispanic students enrolled in STEM fields exceeds the percent of the overall Hispanic student population. Approximately two-thirds of the colleges and universities studied have Hispanic enrollments that are within plus-five to minus-five percentage points of their overall Latino student enrollments. Dowd says that other institutions can work toward being in that band, aspiring to eliminate any gap between Latino student enrollment and their enrollment in STEM fields.

The second benchmark indicator looks at bachelor’s degrees awarded, measuring whether colleges and universities are giving Hispanic students equal educational opportunity in STEM fields.

At 11 of the 25 institutions, the share of Latino STEM bachelor’s awardees exceeded the share of STEM Latino enrollment. This demonstrates a high degree of success in supporting Latino STEM degree completion. Where the difference between graduates and enrollments was negative, most of those institutions had a gap of about five percentage points or less. Only seven institutions were outside the band of plus or minus five percentage points, so most are doing a good job of getting STEM students who are Hispanic to advance successfully to a four-year STEM degree.

The researchers say that for colleges and universities to achieve President Obama’s American Graduation Initiative goals, they must find new approaches to help students succeed academically. They suggest that colleges and universities across the nation should begin “diagnostic benchmarking,” comparing the practices of one’s own institution with the exemplary practices identified at the selected institutions.

Further, they suggest that colleges then engage in “process benchmarking,” the analysis of what it would take to adopt new programs, learning communities, peer tutoring, supplemental instruction, and any other strategies shown to promote student success.

Twenty-Five Potential Exemplars for Latino STEM Education

Institution	# STEM Degrees Awarded to Hispanics	% Hispanic* Enrollment	% Hispanic STEM Enrollment	% STEM Degrees Awarded to Hispanics
Florida International University, FL	613	60.40%	62.80%	57.80%
University of Texas at El Paso, TX	404	74.10%	72.90%	70.40%
University of Texas at San Antonio, TX	357	42.60%	45.50%	43.80%
University of Texas-Pan American, TX	319	87.50%	82.60%	78.40%
New Mexico State University Main, NM	217	44.00%	43.90%	32.50%
University of New Mexico Main, NM	217	34.90%	32.00%	33.00%
Texas A&M University-Kingsville, TX	185	64.10%	60.60%	52.50%
University of Texas at Brownsville, TX	131	89.10%	88.60%	85.40%
St. Mary’s University, TX	118	69.30%	72.60%	69.80%
Texas A&M International University, TX	90	90.40%	92.30%	96.80%
Nova Southeastern University, FL	79	27.40%	22.10%	25.60%
Barry University, FL	78	30.80%	31.50%	35.90%
California State University-Bakersfield, CA	73	37.40%	33.80%	30.90%
Our Lady of the Lake University, TX	68	77.10%	80.10%	78.20%
University of the Incarnate Word, TX	43	59.30%	62.60%	55.80%
Saint Edward’s University, TX	40	31.40%	37.70%	29.00%
University of La Verne, CA	38	35.80%	39.10%	36.90%
University of Texas of the Permian Basin, TX	32	37.50%	42.60%	32.70%
Mount St. Mary’s College, CA	23	49.00%	43.50%	46.90%
Saint Thomas University, FL	19	45.60%	46.20%	47.50%
College of Mount Saint Vincent, NY	17	30.40%	30.40%	42.50%
Western New Mexico University, NM	11	44.90%	36.00%	36.70%
Southwestern Adventist University, TX	10	26.00%	19.60%	31.30%
La Sierra University, CA	10	37.40%	20.80%	22.70%
College of the Southwest, NM	5	36.90%	47.60%	50.00%

Data source: Institutional Postsecondary Education Data System (IPEDS)

*Note: In reporting results in these tables, we use the term Hispanic to be consistent with the IPEDS data.

“Evidence is needed not only on ‘best practices,’” the report says, “but also on how faculty members, counselors and administrators become ‘best practitioners’ to bring about the envisioned improvements.”

Most researchers who have studied Hispanic student participation in STEM fields were receptive to the center’s study as a useful system for discussion and analysis at other institutions, although some questioned some of the underlying assumptions of the research methodology.

Deborah Santiago, vice president for policy and research at *Excelencia* in Education, had both critical and positive comments about the report. She questioned limiting the research to four-year nonprofit colleges, excluding four-year for-profit colleges and two-year colleges that enroll large numbers of Hispanic students. Indeed, as Malcolm points out, “the role of the community college in serving as an entry point and pathway to STEM has been largely absent from the discourse, despite the pivotal role of these institutions in educating Latinos.”

Santiago also questioned the exclusion of colleges in Puerto Rico, given that they receive large sums of money from the National Science Foundation.

But she praised the center for creating simple and straightforward ways of constructing performance benchmarks for enrollment and completion that other colleges can use to assess

their own performance.

In 2001, Maricel Quintana-Baker, associate director for academic affairs and planning at the State Council of Higher Education in Virginia, studied exemplary practices at HSIs that produced students who went on to get doctoral degrees in STEM disciplines.

Baker praised the center’s focus on how colleges with large proportions of Latino STEM students are educating them rather than focusing on elite institutions. She noted that elite institutions might have high numbers of Latino STEM graduates because they are more highly selective in their enrollments. Getting Latino STEM students with stellar academic preparation to graduate is not the same achievement as getting students who are bright and motivated but who haven’t achieved stellar high school grades and SATs and who might not even have command of the language. While the former might not need institutional proactive support, the latter undoubtedly do.

This report by the University of Southern California’s Center for Urban Education provides an effective set of tools for other institutions to use to assess where they are in promoting Hispanic students’ academic success and to take the steps necessary to be more productive in achieving equity.

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