



Recalculating Latino STEM Success

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How do you know if a college is doing well by its Latino students interested in careers in science and technology? One might look at the institutions that have the most Latino students majoring in those fields, or that graduate the most students with degrees in those fields.

But a new report from the University of Southern California's Center for Urban Education proposes another set of metrics that institutional and other leaders can use to measure their own success -- or lack of it -- in getting students from Latino backgrounds interested in science, technology, engineering and mathematics (or STEM) disciplines and, ultimately, to degrees.

Like many recent analyses, the center's report embraces the idea that the United States must -- for competitive, economic and other reasons -- draw more, and more qualified, young people into STEM fields to help ensure that it has skilled workers for the information age.

But like most of the USC center's own work, the newly released study -- part of a three-year project financed by the National Science Foundation -- views the issue through the prism of an "equity" framework, which it defines as "creating opportunities for equal access and success among historically underrepresented student populations, such as racial and ethnic minority and low-income students."

In other words, says Alicia C. Dowd, the center's co-director and a co-author of the report, the study aims both to recognize the central role that Latinos (given their growing share of the U.S. population) will have to play if the country is to achieve the college completion goals set out by President Obama, and to focus on how well colleges and universities are educating Latinos compared to other students. The researchers' goal, says Dowd, was to identify 25 colleges that could be "potential exemplars" of good practices -- because not only do they have significant proportions of Latino students, but they "graduate more Latinos in STEM fields than might be expected."

To come up with their list, the researchers began by examining the more than 200 colleges and universities deemed to be "Hispanic serving" because at least 25 percent of their students are Latino. The study examines Hispanic-serving institutions specifically, Dowd says, to try to look beyond the mere fact that they enroll significant proportions of Latino students and "take the lid off" to see which institutions are not just enrolling such students, but actually *servicing* them.

The researchers then focused on six states with large Latino populations (Arizona, California, Florida, New Mexico, New York and Texas) and on four-year Hispanic-serving institutions in those states, to try to zero in on bachelor's degree production.

From there, the USC scholars applied to the list of institutions a formula that accounted for such factors as their proportion of Hispanic enrollment, proportional enrollment in STEM fields, and selectivity, in order to develop a list of 25 colleges that had produced more Latino STEM graduates than would have been predicted based on their enrollments, selectivity and other criteria.

The list includes colleges that awarded as many as 613 STEM degrees to Latino students in 2006 (Florida International University) and as few as 5 (College of the Southwest), and it excludes some institutions, like the University of Miami and numerous institutions in the California State University System, that graduate large numbers of Latino students in STEM fields.

The goal, Dowd wrote in an e-mail, is to identify those institutions that "produce a greater number of Latino STEM graduates than peer institutions with similar characteristics ... because the underlying assumption is that they may be doing things (e.g., special programs, curricular innovations, smart administrative policies, culturally responsive pedagogy, focused counseling and advising, outreach to community colleges and Latino communities, Latino-targeted scholarships) that allow them" to do so. (Future analyses, she says, will examine those practices.)

Using the 25 chosen institutions, the researchers then produce two "benchmark equity indicators" against which other institutions might measure themselves. The first shows those institutions that appear to do an unexpectedly good job of getting Hispanic students into STEM fields. As seen in the table below, the study compares each college's overall proportion of Latino students with the proportion of their STEM students who are Latino, to identify institutions where Latino students are disproportionately represented in science fields.

Benchmark Equity Indicators of Latino Participation in STEM Fields

	% Hispanic Enrollment	% Hispanic STEM Enrollment	% Hispanic STEM Enrollment Minus % Hispanic Enrollment
College of the Southwest	36.9%	47.6%	10.7%
Saint Edward's U.	31.4	37.7	6.3
U. of Texas-Permian Basin	37.5	42.6	5.1
St. Mary's U.	69.3	72.6	3.3
U. of the Incarnate Word	59.3	62.6	3.3
U. of La Verne	35.8	39.1	3.3
Our Lady of the Lake U.	77.1	80.1	3.0
U. of Texas at San Antonio	42.6	45.5	2.9
Florida International U.	60.4	62.8	2.4
Texas A&M International U.	90.4	92.3	1.9
Barry U.	30.8	31.5	0.7
Saint Thomas U.	45.6	46.2	0.6
College of Mount Saint Vincent	30.4	30.4	0.0
New Mexico State U.	44.0	43.9	-0.1
U. of Texas at Brownsville	89.1	88.6	-0.3
U. of Texas at El Paso	74.1	72.9	-1.2
U. of New Mexico (Main)	34.9	32.0	-2.9
Texas A&M U. Kingsville	64.1	60.6	-3.5
California State U. at Bakersfield	37.4	33.8	-3.6
U. of Texas Pan American	87.5	82.6	-4.9
Nova Southeastern U.	27.4	22.1	-5.3
Mount St. Mary's College	49.0	43.5	-5.5
Southwestern Adventist U.	26.0	19.6	-6.4
Western New Mexico U.	44.9	36.0	-8.9
La Sierra U.	37.4	20.8	-16.6

At about half of the institutions, the proportion of students enrolled in STEM fields who are Latino exceeded the percent of all students at the institutions who are Latino. About two-thirds of the institutions have Latino STEM enrollments that are within +5 to -5 percentage points of their overall enrollments of Hispanics -- a band toward which other institutions might aim, Dowd says.

"If I'm at an HSI, or not at an HSI, I could be looking at this and saying, 'I should be in that band.... I shouldn't be seeing an enrollment gap in STEM fields,' " she says.

The second benchmark indicator the study uses to measure whether institutions are equitably giving Latino students educational opportunity in science fields focuses on STEM degrees awarded, as seen in the table below:

Benchmark Equity Indicators of STEM Degrees Awarded to Latinos

	% Hispanic STEM Enrollment	% STEM Degrees Awarded to Hispanics	% Hispanic STEM Degrees Minus % STEM Degrees Awarded to Hispanics
College of Mount Saint Vincent	30.4	42.5	12.1
Southwestern Adventist U.	19.6	31.3	11.7
Texas A&M International U.	92.3	96.8	4.5
Barry U.	31.5	35.9	4.4
Nova Southeastern U.	22.1	25.6	3.5
Mount St. Mary's College	43.5	46.9	3.4
College of the Southwest	47.6	50.0	2.4
La Sierra U.	20.8	22.7	1.9
Saint Thomas U.	46.2	47.5	1.3
U. of New Mexico (Main)	32.0	33.0	1.0
Western New Mexico U.	36.0	36.7	0.7
U. of Texas at San Antonio	45.5	43.8	-1.7
Our Lady of the Lake U.	80.1	78.2	-1.9
U. of La Verne	39.1	36.9	-2.2
U. of Texas at El Paso	72.9	70.4	-2.5
St. Mary's U. (Texas)	72.6	69.8	-2.8
California State U. at Bakersfield	33.8	30.9	-2.9
U. of Texas at Brownsville	88.6	85.4	-3.2
U. of Texas Pan American	82.6	78.4	-4.2
Florida International U.	62.8	57.8	-5.0
U. of the Incarnate Word	62.6	55.8	-6.8
Texas A&M U. Kingsville	60.6	52.5	-8.1
Saint Edward's U.	37.7	29.0	-8.7
U. of Texas Permian Basin	42.6	32.7	-9.9
New Mexico State U. (Main)	43.9	32.5	-11.4

In this table, all but seven of the institutions award STEM degrees to Latino students roughly (plus or minus 5 percentage points) in proportion to their STEM enrollments, meaning that they appear to be keeping Latino students who enter STEM fields on track to degrees.

"The analysis directs us to these [colleges] as ones that may provide a benchmark, a starting point, for understanding what are the kinds of innovations that have been tested to bring Latinos to graduation in their fields," Dowd says.

Other researchers who have written about Latino participation in science said they welcomed the USC center's analysis as a useful way to stimulate discussion, though several took issue with some of its assumptions.

Deborah A. Santiago, vice president for policy and research at *Excelencia* in Education, questioned the decision to exclude Puerto Rico (given the large sums of National Science Foundation money that flows to universities there) and focus only on four-year nonprofit colleges, excluding two-year and for-profit colleges that enroll large numbers of Latino students in many scientific and technical fields.

But she applauded the center for identifying "very simple and straightforward ways of constructing performance benchmarks for enrollment and completion" against which colleges can compare themselves.

Maricel Quintana-Baker, associate director for academic affairs and planning at the State Council of Higher Education for Virginia, in 2001 studied "exemplary practices" at Hispanic-serving institutions for producing students who went on to get doctoral degrees in STEM fields. She said she welcomed the center's focus on how successfully colleges with large *proportions* of their students in STEM fields are educating them, since those institutions -- unlike more elite institutions that might have high graduation rates for the Latino students they enroll -- are unlikely to have skimmed off only those students with stellar academic backgrounds.

"We don't need to worry as much about la crème de la crème of Latino students who are going to go wherever they want -- the highly selective institutions are going to be fighting over them," Quintana-Baker said. "I'm more concerned about the next layer of student who is bright, who is eager, but who just doesn't have either the brilliant [high school] grades, the command of the language, or maybe doesn't have social capital to be able to get over that difficulty.

"This approach is a very interesting and logical way to begin to get at that set of questions."

— Doug Lederman

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