Developing a Social Science of Institutional Support to Increase Latina and Latino STEM Degrees

Alicia C. Dowd, Associate Professor & Co-Director
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RISING ABOVE THE GATHERING STORM

Energizing and Employing America for a Brighter Economic Future

NATIONAL ACADEMY OF SCIENCES
NATIONAL ACADEMY OF ENGINEERING
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES
Bachelor's Degrees Awarded to Hispanics in Science & Engineering and Non-Science & Engineering Fields, 2000-2008

Bachelor’s Degrees Awarded to Hispanics in Science and Engineering Fields, 2000-2008

<table>
<thead>
<tr>
<th>Field</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tbody>
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<td>Social Sciences</td>
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<td>8,966</td>
<td>9,628</td>
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<td>4,358</td>
<td>4,483</td>
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<td>5,234</td>
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<td>3,529</td>
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<tr>
<td>Earth, Atmospheric, &amp; Ocean Sciences</td>
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Degrees Awarded to Hispanics in Science and Engineering Fields, 2000-2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Associate</th>
<th>Bachelor</th>
<th>Master</th>
<th>Doctorate</th>
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<td>2000</td>
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<td>27,980</td>
<td>3,762</td>
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<td>2001</td>
<td>5,105</td>
<td>28,361</td>
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<td>2002</td>
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<td>29,935</td>
<td>4,106</td>
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<td>2003</td>
<td>6,994</td>
<td>32,533</td>
<td>4,384</td>
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<td>2004</td>
<td>6,910</td>
<td>33,748</td>
<td>5,111</td>
<td>916</td>
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<tr>
<td>2005</td>
<td>6,615</td>
<td>35,662</td>
<td>5,380</td>
<td>973</td>
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<tr>
<td>2006</td>
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<td>37,049</td>
<td>5,681</td>
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<tr>
<td>2007</td>
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<td>38,546</td>
<td>6,041</td>
<td>1,071</td>
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<td>2008</td>
<td>6,376</td>
<td>40,877</td>
<td>6,216</td>
<td>1,162</td>
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</tbody>
</table>

Science and Engineering Doctoral Degrees Awarded By Ethnicity and Citizenship, 2000-2008

Community Colleges as a Route to STEM Degrees

- Nearly 60% of Latinos in higher education are in community colleges.
- 44% of all STEM Bachelor’s degree holders attend community college at some point in their career.
- 20% of Latino STEM bachelor’s degree holders also have an associate’s degree.

Sources: DoE, NSF, CUE
Most STEM Transfer Students Major in the Social and Behavioral Sciences

Source: NSRCG 2003
HSIs Do Best at Graduating Students in Computer Science and Mathematics

Figure 6. Field of Study of Latino STEM Baccalaureates of HSIs (No Associate’s Degree)

- Computer Science/Mathematics: 27%
- Social and Behavioral Science: 35%
- Biological, Agricultural, and Environmental Science: 16%
- Engineering: 14%
- Physical Science: 3%
- Science and Engineering (S&E)-Related: 5%

Figure 7. Field of Study of Latino STEM Baccalaureates of Non-HSIs (No Associate’s Degree)

- Social and Behavioral Science: 58%
- Computer Science/Mathematics: 7%
- Biological, Agricultural, and Environmental Science: 13%
- Engineering: 11%
- Physical Science: 3%
- Science and Engineering (S&E)-Related: 8%

Source: NSRCG 2003
Collaborating Researchers

- Estela Mara Bensimon, USC Professor and CUE Co-Director, Co-PI
- Ricardo Stanton Salazar, USC Associate Professor
- Lindsey Malcom, UCRiverside Assistant Professor
- Roseanne Macias
- Brianne Davila
- Linda Taing Shieh

- High-status
- Non-kin individuals
- Provide key forms of social and institutional support
- Negotiate institutional support, in the form of highly valued resources, opportunities, privileges, and services
- Have a critical consciousness
# Types of Institutional Support

<table>
<thead>
<tr>
<th>Direct Support</th>
<th>Integrative Support</th>
<th>Systems Developer</th>
<th>System Linkage &amp; Networking Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Agent</td>
<td>Integrative Agent</td>
<td>Program Developer</td>
<td>Recruiter</td>
</tr>
<tr>
<td>Advisor</td>
<td>Cultural Guide</td>
<td>Lobbyist</td>
<td>Bridging Agent</td>
</tr>
<tr>
<td>Advocate</td>
<td></td>
<td>Political Advocate</td>
<td>Institutional Broker</td>
</tr>
<tr>
<td>Networking Coach</td>
<td></td>
<td></td>
<td>Coordinator</td>
</tr>
</tbody>
</table>

Preparing the Next Generation of STEM Innovators

Keystone Recommendations:

I. Provide opportunities for excellence

II. Cast a wide net

III. Foster a supportive ecosystem
A Social Scientist’s Dilemma

How do individuals become motivated to change practices and policies in which they are embedded, which may be invisible to them? To become a “change agent”?
Theoretical Approaches

- Sociology
- Action Research/Action Science
- Practice Theory
- Organizational Learning
- Critical Theory
- Psychology
Contact Information

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http://cue.usc.edu

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The Center for Urban Education (CUE) conducts socially conscious research and develops tools needed for institutions of higher education to produce equity in student outcomes.