Recruiting and Retaining Hispanics in Physics

Jorge Lopez
University of Texas at El Paso
OUTLINE

• Do we have a problem?
  • Some stats
• Origin of the problem
• A Solution of the problem
• An institutional example
• Recommendations
An Issue of Equity

“Young Hispanic undergraduates are half as likely as their white peers to finish a bachelor’s degree, a disparity at least as large as the disparity in finishing High School.”

Richard Fry, November 2005, Pew Hispanic Center

15 years ago: 1995
Workforce: 2005 and 2050

Distribution of U.S. Labor Force by Race/Ethnicity, 2005 and 2050

- 2005:
  - White non-Hispanic: 69.6%
  - Hispanic: 13.3%
  - Other non-Hispanic: 17.1%

- 2050*:
  - White non-Hispanic: 51.4%
  - Hispanic: 24.3%
  - Other non-Hispanic: 24.3%

U.S. Labor Force Trends
by Marlene A. Lee and Mark Mather

Population Reference Bureau
June 2008

Cal Poly – San Luis Obispo – June 27, 2010
Employed doctoral scientists and engineers by ethnicity: 2006

15 years ago: 1995
Ethnicity of Physics Faculty

Number of African-American and Hispanic Physics Faculty by Highest Degree Awarded by Department, 2008

Race and Ethnicity of Physics Faculty, 1996 and 2000.

http://www.aip.org/statistics

1 Revised since the 1996 report.

2 Source: National Center for Education Statistics.
Beginning of pipeline: all areas
Middle of pipeline: S&E

Graduate Enrollment in S&E

White

Asian

Black

Hispanic

Cal Poly – San Luis Obispo – June 27, 2010
End of pipeline: S&E


White

Minorities
End of pipeline: Physics

Physics Degrees Conferred to Hispanics

M.S.

Ph.D.


Cal Poly – San Luis Obispo – June 27, 2010

3.16% !!
THE SCALE OF THE PROBLEM

Hispanics are:

- Population (all ages): 15.1 %
- Population (ages 18-24): 17.2 %
- Labor Force: 13.3 %
- Expected Labor Force in 2050: 24.3 %
- Employed Doctoral Scientists: 3.1 %
- Physics Faculty: 2.03 %
- Physics PhD Degrees: 3.16 %
- S&E BS Degrees (2006): 7.7 %

INDEED WE DO HAVE A PROBLEM!
ORIGIN OF THE PROBLEM

Hispanic Characteristics

• Disconnected to science
• 1st in family to attend university
• Need to help support family
• Reduced travel experience
• Culture shock
ELEMENTS TO SOLVE THE PROBLEM

- Disconnected to science
  - Educate parents
    - Newspaper articles
    - Radio: Universo (radiouniverso.org), Star Date
    - Science Fests
  - Educate teachers and students
    - High School newsletter
    - Physics circus
    - Summer workshops
    - Summer bridge programs
    - Physics Department open house
    - Visits to high schools
RADIO PROGRAM UNIVERSO

HIGH SCHOOL NEWSLETTER
ELEMENTS TO SOLVE THE PROBLEM

• 1st in family to attend university
  • Entering Student Program
  • Faculty Mentors: APS’s COM, NSHP
  • Tutoring programs
  • Partnerships with high schools and community colleges

• Need to help support family
  • Hire them as RA, TA, Grader
  • Scholarships/Fellowships
  • SPS
A PARTIAL LIST OF FELLOWSHIPS

AAUW Selected Professions Fellowship
Bunting Fellowship Program
Community Colleges of Connecticut Minority Fellowship
Cooperative Research Fellowship Program
Cornell University Graduate School Fellowships for Women
EPA - Minority Academic Institutions Fellowships for Environmental Study
Fellowship Programs - The National GEM Center
Ford Foundation Predoctoral & Dissertation
Ford Foundation Predoctoral Fellowship Program for Minorities
Freda A. DeKnight Memorial Fellowship
GEM M.S. Engineering Fellowship Program
GEM Ph.D. Engineering Fellowship Program
GEM Ph.D. Science Fellowship Program
Diversifying Higher Education Faculty in Illinois
Mellon Minority Fellowship
Minority Geoscience Graduate Scholarships
Minority Institution Assistance Fellowships
National Academies (Science, Medicine, Engineering Research)
National Consortium for Graduate Degrees for Minorities in...
ELEMENTS TO SOLVE THE PROBLEM

• Reduced Travel Experience/Culture Shock
  • APS Sectional Meetings
  • NSHP/SACNAS Meetings
  • Summer REU
  • SPS trips
  • COM’s Minorities Speaker List
AN INSTITUTIONAL EXAMPLE

Recruitment
Orientation
Retention

THE MODEL INSTITUTIONS FOR EXCELLENCE PROGRAM
AT THE UNIVERSITY OF TEXAS AT EL PASO

Cal Poly – San Luis Obispo – June 27, 2010
CircLES Entering Students
Retention of SEM students via learning communities in freshman year

- Week long summer orientation
- Placement exams in Math and English
- Course clustering (Math)
- Proactive advising and scheduling
CircLES Middle Years

Retention of SEM students via learning communities in freshman year

- Tutoring
- Peer Led Instruction
- Workshops
- Faculty Training
BS STEM DEGREES AWARDED 99-08

<table>
<thead>
<tr>
<th>Year</th>
<th>Latino</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>99-00</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>00-01</td>
<td>211</td>
<td></td>
</tr>
<tr>
<td>01-02</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td>02-03</td>
<td>241</td>
<td></td>
</tr>
<tr>
<td>03-04</td>
<td>234</td>
<td></td>
</tr>
<tr>
<td>04-05</td>
<td>302</td>
<td></td>
</tr>
<tr>
<td>05-06</td>
<td>334</td>
<td></td>
</tr>
<tr>
<td>06-07</td>
<td>361</td>
<td></td>
</tr>
<tr>
<td>07-08</td>
<td>431</td>
<td></td>
</tr>
</tbody>
</table>
CLOSING REMARKS

Problem exists and is growing

Problem is simple to understand

Little funds with lots of work will help

RECOMMENDATIONS

• Recruitment:
  • HS, Bridge programs, Scholarships

• Retention:
  • Tutoring, Networking, Campus jobs, Peer Leaders, REUs, RA/TA, Mentors, SPS

• Exposure:
  • APS meetings, PASI, SACNAS/NSHP, etc.

• Connection to graduate school
  • Networking, NSF-GRF, etc.

¡Gracias!