Efforts to Diversify the STEM Workforce

Clemencia Cosentino

Mathematica Policy Research

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Presentation Roadmap

- Context
- NSF projects
- Methods
- Evidence
- Concluding remarks
Goals
- To build a STEM workforce
- To build a more “diverse” STEM workforce

National needs (competitiveness, national security)

Changing demographics (January 2003)

Stubborn disparities in STEM representation

NSF goals
- To foster science
- To build a diverse scientific STEM workforce (major funding source in computer science)
NSF STEM Projects

- Student training (target individuals) v. institutional capacity-building (target institutions)
- Undergraduate v. graduate
- Target
  - Fields (e.g., computer science or STEM)
  - Institutions (e.g., HBCUs, TCUs)
  - Etc.
Examples

- **LSAMP—Louis Stokes Alliances for Minority Participation**
  Targets minority students; all STEM fields; focuses on undergraduates

- **HBCU-UP—Historically Black Colleges and Universities Undergraduate Program**
  Targets institutions (HBCUs); all STEM; focuses on institutional capacity building

- **BD—Bridge to the Doctorate**
  Targets minority students; all STEM fields; focuses on graduate students
Methods

Quasi-experimental designs

- LSAMP
- HBCU-UP
- BD

- NSRCG (longitudinal file)
- SESTAT
- Matched comparison
Evidence: LSAMP

- Student-focused project
- Targets minorities
- Measured ultimate STUDENT outcomes
Evidence: LSAMP (cont’d.)

Graduate School Enrollment and Completion

**LSAMP Participants**

- **STEM: 100%**
  - 1,426 Graduates
  - 79% Took Further Coursework
  - 66% Pursued Grad Degrees
  - 45% Completed Grad Degrees

**National Underrepresented Minority**

- **STEM: 100%**
  - 36,234 Graduates
  - 62% Took Further Coursework
  - 46% Pursued Grad Degrees
  - 20% Completed Grad Degrees

**National White and Asian**

- **STEM: 100%**
  - 272,964 Graduates
  - 62% Took Further Coursework
  - 44% Pursued Grad Degrees
  - 18% Completed Grad Degrees

Sources: LSAMP Graduate Survey (UI) and NSRCG longitudinal file (NSF).

*National comparison group statistic is not significantly different from LSAMP.*
Evidence: LSAMP (cont’d.)

Field of Study Pursued at Graduate Level: LSAMP Participants

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Percent of those pursuing graduate degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>26%</td>
</tr>
<tr>
<td>Life and Related Sciences</td>
<td>17%</td>
</tr>
<tr>
<td>Physical and Related Sciences</td>
<td>9%</td>
</tr>
<tr>
<td>Computer and Math Sciences</td>
<td>8%</td>
</tr>
<tr>
<td>TOTAL: S&amp;E Fields</td>
<td>59%</td>
</tr>
<tr>
<td>Health Professions (inc. MD)</td>
<td>19%</td>
</tr>
<tr>
<td>Business</td>
<td>11%</td>
</tr>
<tr>
<td>Social and Related Sciences</td>
<td>1%</td>
</tr>
<tr>
<td>Other Non-S&amp;E Fields</td>
<td>10%</td>
</tr>
<tr>
<td>TOTAL: Non-S&amp;E Fields</td>
<td>41%</td>
</tr>
</tbody>
</table>

Source: UI LSAMP Graduate Survey, 2002. See Table F-2C for full data table.
Evidence: HBCU-UP

- Capacity-building project
- Targets HBCUs
- Measured ultimate STUDENT outcomes
Cumulative Probability of Completing a Graduate Degree

Note: Figure 4-5 in Final Report.
# Graduate Employment: HBCU-UP v. Nation

<table>
<thead>
<tr>
<th>All Ethnicities</th>
<th>African American</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HBCU-UP</strong></td>
<td><strong>Nation</strong></td>
</tr>
<tr>
<td>Employed FT</td>
<td>Employed FT</td>
</tr>
<tr>
<td>* 76.0%</td>
<td>* 75.5%</td>
</tr>
<tr>
<td>Nation</td>
<td>Nation</td>
</tr>
<tr>
<td>77.5%</td>
<td>78.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employed FT in STEM</th>
<th>Employed FT &amp; Hold Grad Degree</th>
<th>Employed FT in STEM &amp; Hold Grad Degree</th>
<th>Employed FT in STEM &amp; Hold Grad Degree in STEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBCU-UP</td>
<td>Nation</td>
<td>HBCU-UP</td>
<td>Nation</td>
</tr>
<tr>
<td>* 35.0%</td>
<td>37.5%</td>
<td>* 25.5%</td>
<td>19.6%</td>
</tr>
<tr>
<td>* 25.5%</td>
<td>19.6%</td>
<td>* 24.6%</td>
<td>16.6%</td>
</tr>
<tr>
<td>11.9%</td>
<td>8.4%</td>
<td>11.1%</td>
<td>4.0%</td>
</tr>
<tr>
<td>* 8.5%</td>
<td>* 7.5%</td>
<td>* 7.4%</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

* Not significantly different from national estimate. Figure 4-8 in Final Report.

Graduate-level funding (M.S. and Ph.D.)

Students from LSAMP programs

All STEM fields
Concluding Remarks

Goal: Build and diversify the STEM workforce

- Education efforts are the first step to addressing disparities
- Workforce insertion and retention is the next step
Thank You

Clemencia Cosentino de Cohen

ccosentino@mathematica-mpr.com
Publicly Available Sources

- LSAMP
  - Brief: http://www.urban.org/publications/412231.html

- HBCU-UP

- BD