Efforts to Diversify the STEM Workforce

Clemencia Cosentino

Mathematica Policy Research

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Presentation Roadmap

- Context
- NSF projects
- Methods
- Evidence
- Concluding remarks
Context

- **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

<table>
<thead>
<tr>
<th>STEM: 100%</th>
<th>1,426 Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM: 58%</td>
<td>79%</td>
</tr>
<tr>
<td>1,122 Took Further Coursework</td>
<td></td>
</tr>
</tbody>
</table>

| STEM: 38%  | 66%            |
| 937 Pursued Grad Degrees |

| STEM: 25%  | 45%            |
| 635 Completed Grad Degrees |

National Underrepresented Minority

<table>
<thead>
<tr>
<th>STEM: 100%</th>
<th>36,234 Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM: 43%</td>
<td>62%</td>
</tr>
<tr>
<td>22,501 Took Further Coursework</td>
<td></td>
</tr>
</tbody>
</table>

| STEM: 20%  | 46%            |
| 16,529 Pursued Grad Degrees |

| STEM: 9%   | 20%            |
| 7,139 Completed Grad Degrees |

National White and Asian

<table>
<thead>
<tr>
<th>STEM: 100%</th>
<th>272,964 Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM: 54%*</td>
<td>62%</td>
</tr>
<tr>
<td>168,145 Took Further Coursework</td>
<td></td>
</tr>
</tbody>
</table>

| STEM: 22%  | 44%             |
| 120,273 Pursued Grad Degrees |

| STEM: 9%   | 18%             |
| 48,315 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

- Engineering: 26%
- Life and Related Sciences: 17%
- Physical and Related Sciences: 9%
- Computer and Math Sciences: 8%
- Health Professions (inc. MD): 19%
- Business: 11%
- Social and Related Sciences: 1%
- Other Non-S&E Fields: 10%
- TOTAL: Non-S&E Fields: 41%
- TOTAL: S&E Fields: 59%

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
Evidence: HBCU-UP (cont’d.)

Cumulative Probability of Completing a Graduate Degree

Note: Figure 4-5 in Final Report.
### Evidence: HBCU-UP (cont’d.)

#### Graduate Employment: HBCU-UP v. Nation

<table>
<thead>
<tr>
<th></th>
<th>All Ethnicities</th>
<th>African American</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HBCU-UP</strong></td>
<td>76.0%</td>
<td>75.5%</td>
</tr>
<tr>
<td><strong>Nation</strong></td>
<td>77.5%</td>
<td>78.4%</td>
</tr>
<tr>
<td><strong>Employed FT</strong></td>
<td>* 35.0%</td>
<td>* 32.8%</td>
</tr>
<tr>
<td></td>
<td>* 37.5%</td>
<td></td>
</tr>
<tr>
<td><strong>Employed FT in STEM</strong></td>
<td>25.5%</td>
<td>24.6%</td>
</tr>
<tr>
<td></td>
<td>19.6%</td>
<td>16.6%</td>
</tr>
<tr>
<td><strong>Employed FT &amp; Hold Grad Degree</strong></td>
<td>11.9%</td>
<td>11.1%</td>
</tr>
<tr>
<td></td>
<td>8.4%</td>
<td>4.0%</td>
</tr>
<tr>
<td><strong>Employed FT in STEM &amp; Hold Grad Degree in STEM</strong></td>
<td>8.5% *</td>
<td>7.4% *</td>
</tr>
<tr>
<td></td>
<td>7.5%</td>
<td>3.7% *</td>
</tr>
</tbody>
</table>

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

BD: in Progress

- 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**