National AGEP Evaluation

Alliance for Graduate Education and the Professoriate National Conference
Chicago, March 19-21, 2009

Carlos Rodriguez
Charles Storey
Rita Kirshstein
Cynthia Overton
AMERICAN INSTITUTES FOR RESEARCH
Today’s Presentation

- The Context for a National Evaluation
- Research Questions
- Preliminary Findings
- Evaluation Tasks and Timetable
Persons from U.S. minority groups increasingly the workforce of the future
- Across all fields
- Currently underrepresented in STEM

STEM PhDs
- Source of future faculty
- STEM knowledge production, innovation and invention

First national evaluation of the program
Context for the National Evaluation

Previous Evaluation Activities include:
- Individual alliance/institution evaluation reports
- AAAS
  - Campbell-Kibler Associates
- AIR Pilot Studies
  - 2005 study of Colorado PEAKS Alliance
  - 2008 Pilot Study of Michigan AGEP and N.C. OptEd
Approach to National Evaluation

- Review of relevant literature on URM STEM Ph.D. production
- Analyze PhD enrollment and completion trends
- Analyze AGEP implementation at several Alliances
- Surveys of AGEP faculty, administrators and participants
1. Between 1990 and 2005, what are the national trends at non-AGEP and AGEP institutions in the enrollment of URM students in STEM master’s and doctoral programs? How do trends in enrollment at AGEP institutions compare to the trends at similar non-AGEP institutions?

2. Between 1990 and 2005, what are the national trends at non-AGEP and AGEP institutions in URM students’ graduation numbers from master’s and doctoral programs in the STEM disciplines? And, how do completion trends in AGEP institutions compare to trends in similar non-AGEP institutions?

*Data Source: Survey of Earned Doctorates*
Data Description and Sources

- Sources: Survey of Earned Doctorates (SED) and agep.us
- SED is a census: does not require any sampling; weighting is not used to adjust for non-response
- SED average response rate 2002-2005: 91.5% (2006 was not reported)
- AGEP institutions compiled from agep.us; alliances and their participating institutions which focus on a subject area other than STEM were not included
- Underrepresented Minorities include U.S. citizens and permanent residents: Black, Non Hispanic; American Indian or Alaskan Native; Native Hawaiian or Other Pacific Islander; Hispanic
- STEM disciplines include: Engineering, Math and Statistics, Physical Sciences, Biological Sciences, and Computer Sciences
Institutional Level Data
All Institutions Awarding PhDs

- 322 Institutions awarded PhDs in any STEM Discipline (2002–2006)
- 269 (84%) awarded PhDs to URMs in any STEM Discipline (2002–2006)
- 53 (16%) did not award PhDs to URMs in any STEM Discipline (2002–2006)
Institutions Awarding PhDs to Underrepresented Minorities by Discipline (2002–2006)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Total Number of Institutions</th>
<th>Total Number of AGEP Institutions</th>
<th>% AGEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STEM Discipline</td>
<td>269</td>
<td>104</td>
<td>39%</td>
</tr>
<tr>
<td>Engineering</td>
<td>158</td>
<td>73</td>
<td>46%</td>
</tr>
<tr>
<td>Math and Statistics</td>
<td>86</td>
<td>39</td>
<td>45%</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>174</td>
<td>81</td>
<td>47%</td>
</tr>
</tbody>
</table>

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
Student Level Data
PhDs Awarded In Any STEM Discipline (2002–2006)—All Institutions

All Underrepresented Minorities
\( n = 3998 \)

- Black
  \( n = 1632 \)
  - 55% from 89 AGEPs
  - 45% from 139 Non-AGEPs

- Hispanic
  \( n = 2083 \)
  - 58% from 83 AGEPs
  - 42% from 130 Non-AGEPs

44% from 165 Non-AGEPs
56% from 104 AGEPs

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Engineering (2002–2006)—All Institutions

All Underrepresented Minorities
n = 1002

Black
n = 459
66% from 62 AGEPs
34% from 67 Non-AGEPs

Hispanic
n = 491
63% from 56 AGEPs
37% from 58 Non-AGEPs

64% from 73 AGEPs
36% from 85 Non-AGEPs

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Math and Statistics (2002–2006)—All Institutions

All Underrepresented Minorities
n = 196

- Black
  n = 82
  70% from 29 AGEPs
  30% from 21 Non-AGEPs

- Hispanic
  n = 104
  62% from 29 AGEPs
  38% from 32 Non-AGEPs

64% from 39 AGEPs
36% from 47 Non-AGEPs

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Physical Sciences (2002–2006)—All Institutions

All Underrepresented Minorities
n = 807

- Black
  n = 321
  60% from 61 AGEPs
  40% from 64 Non-AGEPs

- Hispanic
  n = 429
  66% from 58 AGEPs
  34% from 70 Non-AGEPs

37% from 93 Non-AGEPs

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded to American Indians or Alaskan Natives In Any STEM Discipline (2002–2006)—All Institutions

<table>
<thead>
<tr>
<th>Number of Institutions Awarding PhDs</th>
<th>Number of AGEP Institutions Awarding PhDs</th>
<th>% AGEP</th>
<th>Number of PhDs Awarded</th>
<th>Number of PhDs Awarded by AGEP Institutions</th>
<th>% AGEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>87</td>
<td>42</td>
<td>48%</td>
<td>139</td>
<td>67</td>
<td>48%</td>
</tr>
</tbody>
</table>

PhDs Awarded (n = 139)

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
Institutional Level Data

Top 20 Institutions Awarding PhDs to Underrepresented Minorities
Top 20 Institutions Awarding PhDs to Underrepresented Minorities

- 269 Institutions awarded 3,998 PhDs to URMs in any STEM discipline (2002–2006)

- The Top 20 awarded 1,296 (32%) PhDs to URMs in any STEM discipline (2002–2006)
Percent of Top 20 Institutions that are AGEP (2002–2006)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Top 20 Producers of All Underrepresented Minority PhDs (% AGEP)</th>
<th>Top 20 Producers of Black PhDs (% AGEP)</th>
<th>Top 20 Producers of Hispanic PhDs (% AGEP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STEM Discipline</td>
<td>85%</td>
<td>77%</td>
<td>81%</td>
</tr>
<tr>
<td>Engineering</td>
<td>71%</td>
<td>68%</td>
<td>71%</td>
</tr>
<tr>
<td>Math and Statistics</td>
<td>77%</td>
<td>89%</td>
<td>88%</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>82%</td>
<td>67%</td>
<td>81%</td>
</tr>
</tbody>
</table>

* All institutions awarding the same amount of PhDs as the 20th ranked institution are included in the top 20. Minimum of three PhDs awarded.

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
Student Level Data

Top 20 Institutions Awarding PhDs to Underrepresented Minorities
PhDs Awarded In Any STEM Discipline (2002–2006)—Top 20 Institutions

All Underrepresented Minorities
n = 1296

Black
n = 645
79% from 17 AGEPs
21% from 5 Non-AGEPs

Hispanic
n = 818
81% from 17 AGEPs
19% from 4 Non-AGEPs

84% from 17 AGEPs
16% from 3 Non-AGEPs

* All institutions awarding the same amount of PhDs as the 20th ranked institution are included in the top 20. Minimum of three PhDs awarded.

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Engineering (2002–2006)—Top 20 Institutions

All Underrepresented Minorities  
$n = 469$

- **Black**  
  $n = 268$  
  - 78% from 17 AGEPs  
  - 22% from 8 Non-AGEPs  

- **Hispanic**  
  $n = 253$  
  - 77% from 15 AGEPs  
  - 23% from 6 Non-AGEPs  

* All institutions awarding the same amount of PhDs as the 20th ranked institution are included in the top 20. Minimum of three PhDs awarded.

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Math and Statistics (2002–2006)—Top 20 Institutions

All Underrepresented Minorities
n = 117

Black
n = 34
- 91% from 8 AGEPs
- 9% from 1 Non-AGEP

Hispanic
n = 33
- 88% from 7 AGEPs
- 12% from 1 Non-AGEP

- 18% from 6 Non-AGEPs

* All institutions awarding the same amount of PhDs as the 20th ranked institution are included in the top 20. Minimum of three PhDs awarded.

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PhDs Awarded in Physical Sciences (2002–2006)—Top 20 Institutions

*All institutions awarding the same amount of PhDs as the 20th ranked institution are included in the top 20. Minimum of three PhDs awarded.

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
Research Questions—Student Level

3. Between 1990 and 2006, what are trends in STEM PhD recipients’ racial/ethnic, gender, and marital status compositions nationally?

How do these trends vary...
- Between AGEP and non-AGEP institutions?
- Within AGEP, between the pre-AGEP and post-AGEP periods?

_Data Source: Survey of Earned Doctorates (public and private use data)_
4. In terms of “time to completion” for the STEM PhD degree:

- How do URM students as a group and, as discrete groups, differ from non-URM students (white and Asians) within AGEP institutions?
- Among the AGEP schools, do differences in time to completion change between pre- and post-AGEP years?
- How do URM students as a group and, as discrete groups, in AGEP institutions differ from the same URM students in non-AGEP institutions?

*Data Source: Survey of Earned Doctorates (public and private use data)*
5. What are the trends in career plans and choice of employment for persons who earned doctorates in the STEM disciplines?
   - In AGEP and non-AGEP institutions?
   - Between URM PhDs and non-URM PhDs?

Data Source: Survey of Earned Doctorates and Survey of Doctoral Recipients (public and private use data)
Comparison Group Considerations

- Compare non-AGEP institutions to AGEP institutions over time
- Compare non-URM PhD recipients to URM PhD recipients in AGEP institutions over time
- Compare URM PhD recipients to URM PhD recipients in non-AGEP institutions over time
Challenges in Forming Comparison Groups

- AGEP institutions and students not randomly assigned

- Study will use student background & academic characteristics in the SED/SDR to identify comparable non-URM students in AGEP institutions and URM students in non-AGEP institutions
Qualitative Considerations

1. What explains the variation in trends among AGEP alliances, institutions, and departments?

2. How do socio-historical and contextual factors influence application and completion trends?
Site visits to a sample of AGEP-supported alliances
Spring and Fall 2009
- Across geographical regions
- Across institution type (MSI, Research 1, urban, rural)
- Spring 2009 site visits to include:

Howard/UTEP AGEP
- Howard University (4/21)
- University of Texas at El Paso (4/8)

FACES
- Emory University (5/12)
- Georgia Institute of Technology (5/11)
- Morehouse College (5/13)
- Spelman College (5/14)

University of California AGEP
- UC Berkeley (5/5)
- UC Davis (5/6)
- UC Irvine (5/7)
- UC Los Angeles (5/8)
- UC Riverside (5/6)
Qualitative Data Collection (cont.)

- Interviews and focus groups with AGEP stakeholders such as students, faculty and administrators.
- Questions about perception of programs and practices that can be attributed to AGEP.
- Data used to describe patterns in practices across different institutions and different alliances.
  - Can rates of admission, retention, and completion can be attributed to organizational, institutional and/or social features at the different alliances, institutions and departments?
Surveys

Starting in November 2009 we will survey

- Faculty members in STEM departments at AGEP institutions
- Graduate students in STEM departments at AGEP institutions
- Former AGEP students
Successful implementation of the survey will require:

- Contact information from AGEP participating schools on current STEM doctoral candidates
- Contact information for program graduates