

Expanding Underrepresented Minority Participation:
America's Science and Technology
Talent at the Crossroads

**National Academies Summit on “Community Colleges in
the Evolving STEM Education Landscape “**

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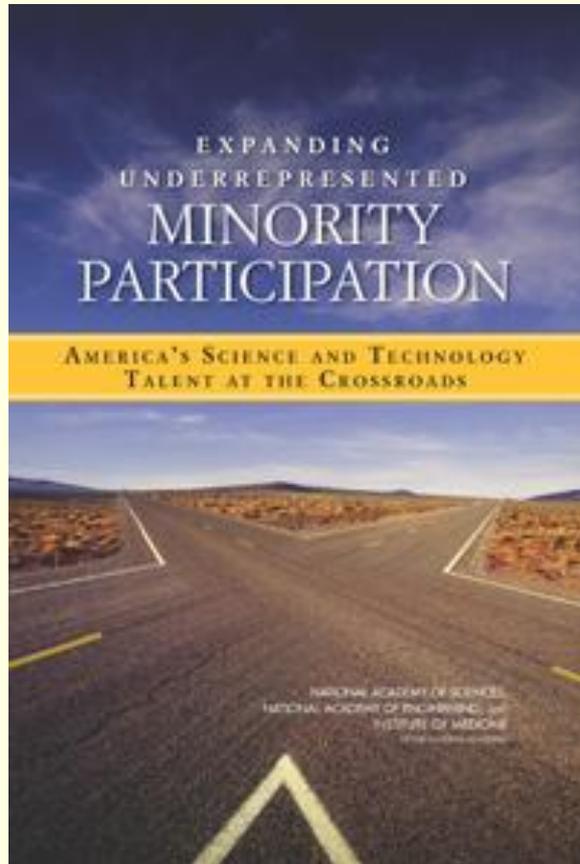
Charge to the Committee

- Examine the **role of diversity** in the science, technology, engineering, and mathematics workforce and its value in keeping America innovative and competitive.
- Analyze the **rate of change** and the challenge the nation currently faces in developing a strong and diverse workforce.
- Identify **best practices** and the **characteristics** of these practices that make them effective and sustainable.
- Write a **consensus report** that provides a prioritized list of actionable recommendations across stakeholder groups.

Committee Membership

- **Freeman Hrabowski**, Chair, University of Maryland, Baltimore County
- **James Ammons**, Florida A&M University
- **Sandra Begay-Campbell**, Sandia National Laboratories
- **Beatriz Chu Clewell**, The Urban Institute
- **Nancy Grasmick**, Maryland State Department of Education
- **Carlos Gutierrez**, California State University-Los Angeles
- **Evelyn Hammonds**, Harvard College
- **Wesley Harris** (NAE), Massachusetts Institute of Technology
- **Sylvia Hurtado**, Higher Education Research Institute, University of California Los Angeles
- **James S. Jackson** (IOM), Institute for Social Research, University of Michigan
- **Shirley McBay**, Quality for Minority Education Network
- **Diana Natalicio**, University of Texas El Paso
- **John Nemeth**, Oak Ridge Associated Universities
- **Eduardo Padron**, Miami Dade College
- **Willie Pearson**, Georgia Institute of Technology
- **Sidney Ribeau**, Howard University
- **John Slaughter** (NAE), NACME
- **Richard Tapia** (NAE), Rice University
- **Lydia Villa-Komaroff**, Cytonome, Inc.
- **Linda Sue Warner**, Haskell Indian Nations University

Why Broad Participation Matters

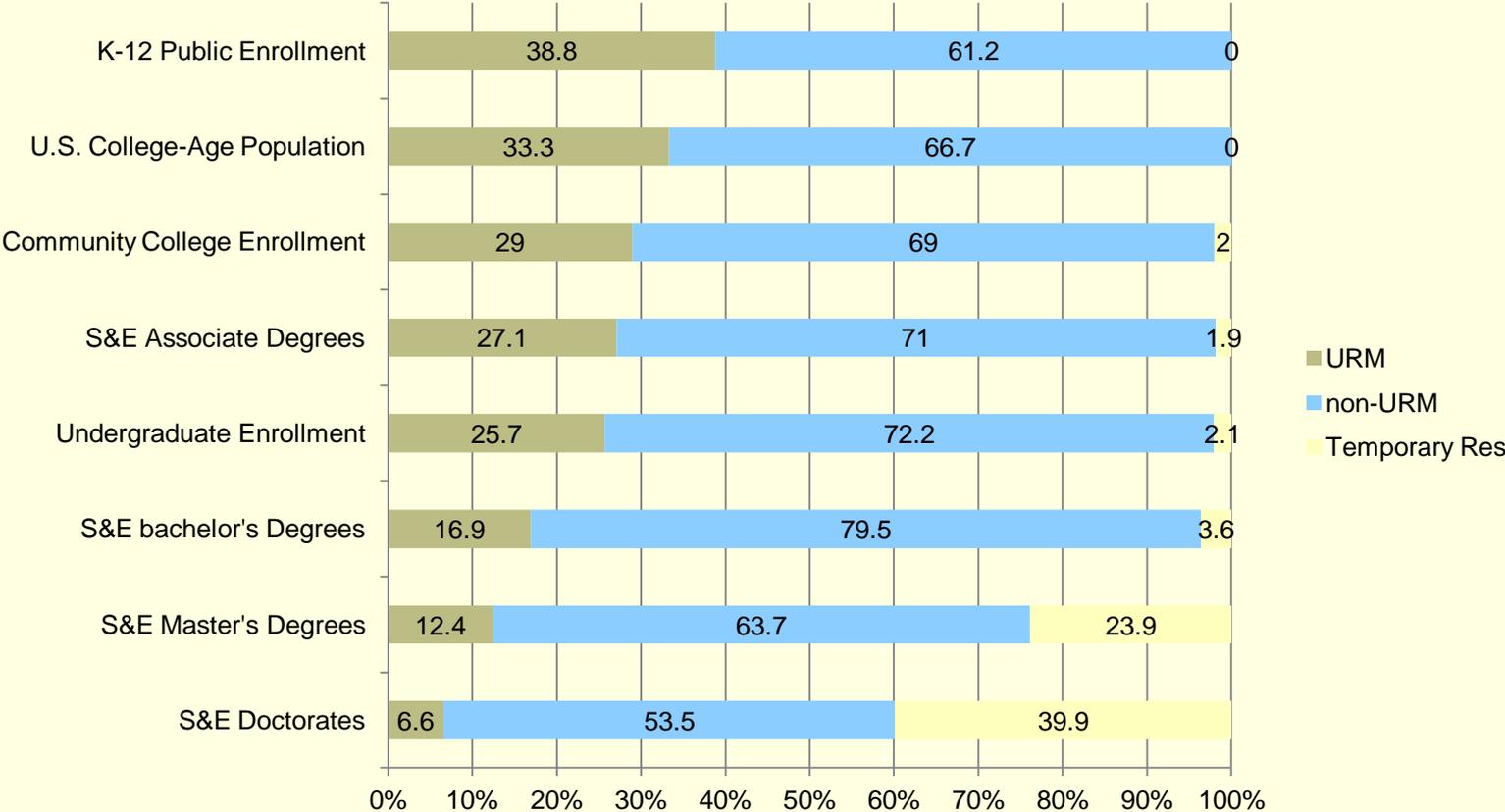


- Our sources for the S&E workforce are uncertain.
- The demographics of our domestic population are shifting dramatically.
- Diversity is an asset and an opportunity.

We start from a challenging position

- The proportion of underrepresented minorities in S&E was less than a third of their share of the overall population in 2006.
- Suggests the proportion of underrepresented minorities in S&E would need to triple to match their share in the overall U.S. population
- Underrepresentation of this magnitude in the S&E workforce stems from the underproduction of minorities in S&E at every level of the pathway.

Enrollment and Degrees, by Educational Level and Race/Ethnicity/Citizenship, 2008



Postsecondary Attainment

- Strong connection between increasing educational attainment in the US and the global leadership of our economy
- Calls -- from the College Board, the Lumina and Gates Foundations, and the Administration—to increase U.S. postsecondary completion rate from 39 to 55 or 60 percent.
- The challenge is greatest for underrepresented minorities. In 2006, percent of 25-34-year old cohort w/ at least AA degree:
 - 26 percent of African Americans
 - 24 percent of Native Americans/Pacific Islanders, and
 - 18 percent of Hispanics ... with at least AA degree

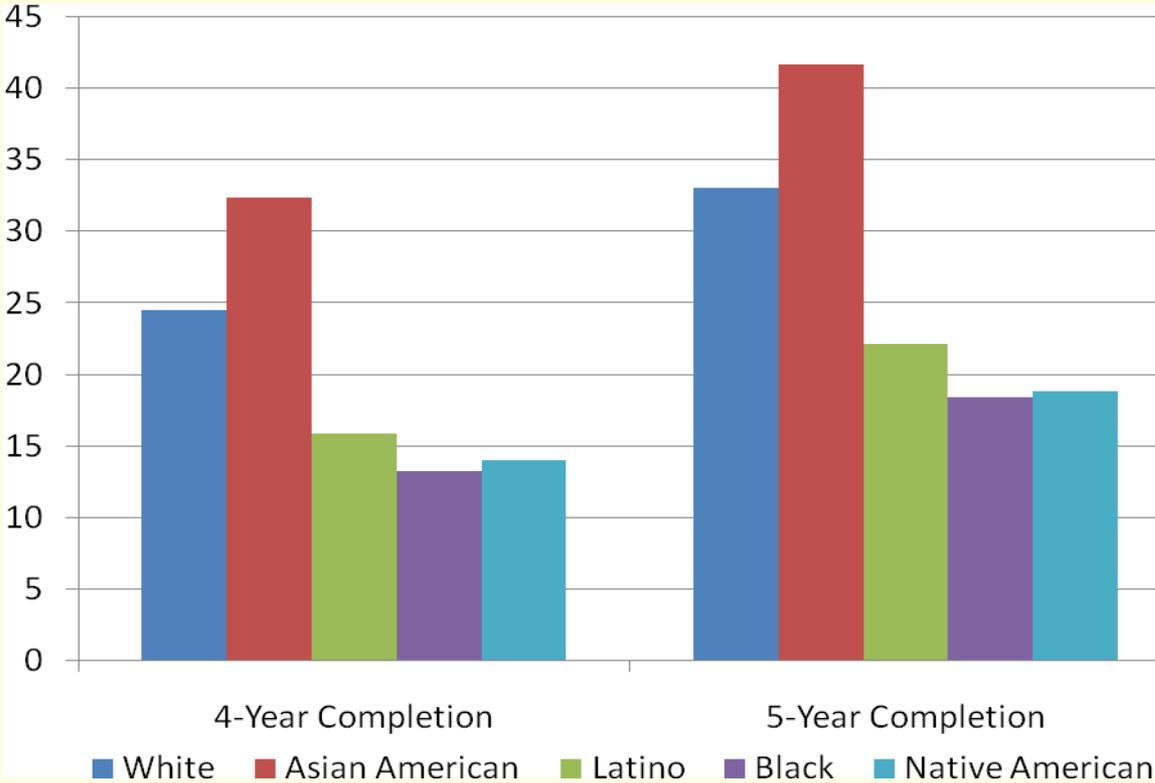
News is Worse for STEM

- In 2000, the U.S. ranked 20th in the percent of 24-year olds who had earned a first degree in NS&E
- Gathering Storm says increase U.S. percentage of 24-year olds who earn a first degree in NS&E from 6 to at least 10 percent.
- Underrepresented minorities would need to triple, quadruple, or even quintuple their proportions in order to achieve this 10 percent goal:
 - 2.7 percent of African Americans
 - 3.3 percent of Native Americans
 - 2.2 percent of Hispanics and Latinos

Why the problem?

- Underrepresented minorities aspire to major in STEM in college at the same rates as their white and Asian-American peers and have done so since the late 1980s.
- Yet they have lower four- and five-year undergraduate STEM completion rates relative to whites and Asian-Americans
- We have been aware of this problem for a long time but we as a nation have made little collective progress in addressing it.

Percentage of 2004 STEM Aspirants Who Completed STEM Degrees in Four and Five Years, by Race/Ethnicity



SOURCE: University of California Los Angeles Higher Education Research Institute

Policy Principles

1. The problem is urgent and will continue to be for the foreseeable future.
2. A successful national effort to address underrepresented minority participation and success in STEM will be sustained.
3. The potential for losing students along all segments of the pathway from pre-school through graduate school necessitates a comprehensive approach that focuses on all segments of the pathway, all stakeholders, and the potential of all programs, targeted or non-targeted.

Policy Principles - 2

4. Students who have not had the same level of exposure to STEM and to postsecondary education require more intensive efforts at each level to provide adequate preparation, financial support, mentoring, social integration, and professional development.
5. A coordinated approach to existing federal STEM programs can leverage resources while supporting programs targeting institutions (esp. MSIs) with demonstrated success in preparing and advancing URM students in STEM.
6. Evaluation of STEM programs and increased research on the many dimensions of underrepresented minorities' experience in STEM help insure that programs are well informed, well designed, and successful.

Recommendations: Preparation

- **1. Pre-School through Grade 3 Education:** *Develop reading readiness, provide early mathematics skills, and introduce concepts of creativity and discovery.*
- **2. K to 12 Mathematics and Science:** *Vastly improve K-12 mathematics and science education for URMs.*
- **3. K-12 Teacher Preparation and Retention:** *Improve the preparedness of K-12 mathematics and science teachers.*

Recommendations: Postsecondary Success

- 4. Access and Motivation: *Improve access to postsecondary education and technical training and increase URM student awareness of and motivation for STEM education and careers.*
- 5. Affordability: *Provide adequate financial support to URM undergraduate and graduate students.*
- 6. Academic and Social Support: *Transform the nation's higher education institutions to increase inclusiveness and college completion and success in STEM for URM students.*

Priority 1

Undergraduate Retention and Completion

- We propose, as a near-term focus for increasing the participation and success of underrepresented minorities in STEM, programs that increase undergraduate completion through strong academic, social, and financial support.
- Financial support for underrepresented minorities that allows them to focus on and succeed in STEM will increase completion and better prepare them for the path ahead.
- This financial assistance should be provided through higher education institutions along with programs that simultaneously integrate academic, social, and professional development.

Priority 2

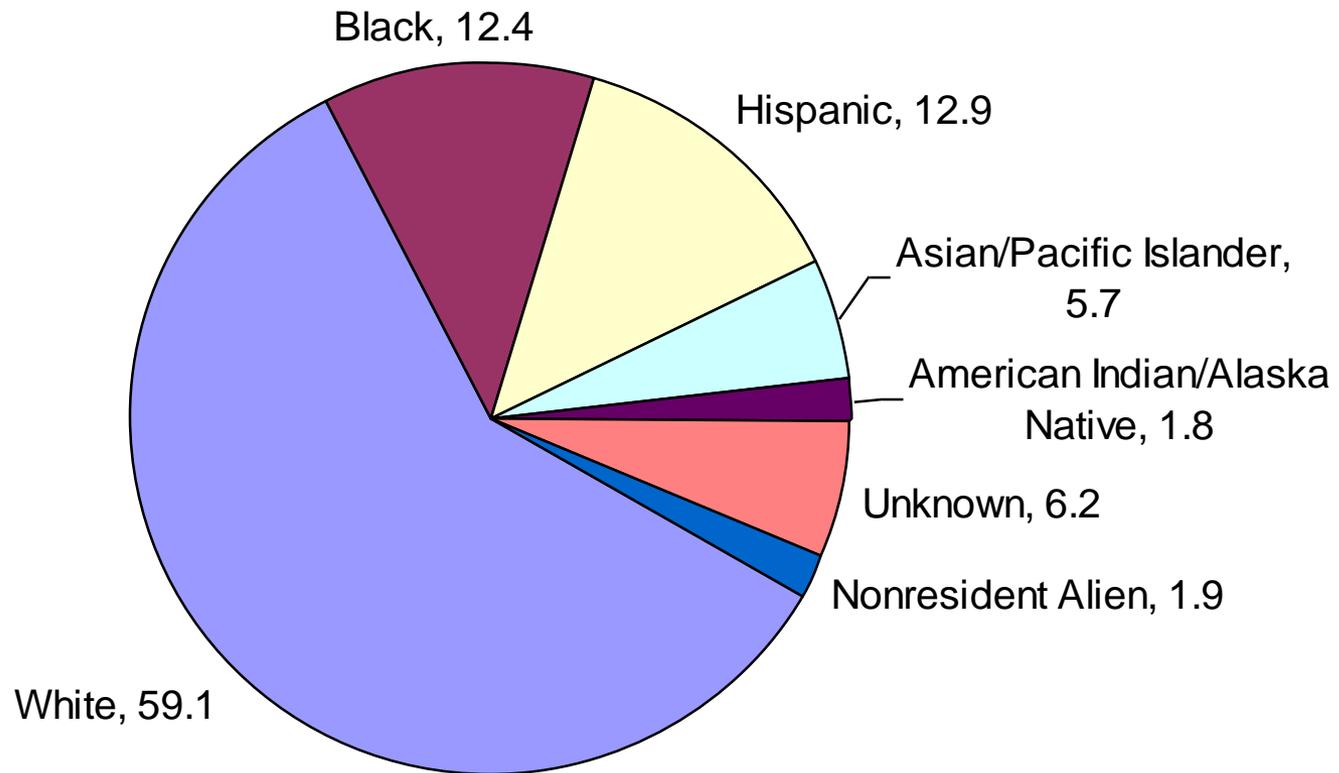
Teacher Preparation, College Preparatory Programs, and Transitions to Graduate Study

- We propose an emphasis on teacher preparation and secondary school programs that support preparation for college STEM education.
- We encourage programs that facilitate the transition from undergraduate to graduate education and provide support in graduate programs.

Institutional Roles

- **Predominantly-White Institutions:** The best way to increase the **retention** of underrepresented minorities in STEM is to replicate programs of the successful PWIs at **a very large number** of similar institutions, especially large state flagships.
- **Minority-Serving Institutions:** MSIs have a legacy of recruiting, retaining, and graduating a disproportionate number of minorities, especially at the undergraduate level. With additional support, MSIs can expand their effectiveness in recruiting, retaining, and graduating an increased number of minorities, especially at the baccalaureate level.
- **Community Colleges:** To facilitate and increase the successful transfer of underrepresented minorities in STEM to four-year institutions, an increased emphasis on and support for articulation agreements, summer bridge programs, mentoring, academic and career counseling, peer support, and undergraduate research at two-year institutions is recommended.

Community Colleges: And obtain a sizable proportion of S&E Associate Degrees



Minority community college enrollment

- Affordability
- Proximity to community
- More balanced faculty demographics
- Class size and faculty interactions
- Group work and collaborative environment
- Flexibility

Facilitating transition of URM's in STEM from community colleges to 4-year institutions

■ FEDERAL PROGRAMS:

- National Institutes of Health: Bridges to the Baccalaureate; Community College Summer Enrichment Program.

■ COMMUNITY COLLEGE PROGRAMS:

- Miami Dade College, Windows of Opportunity program: assists academically promising, low-income students in obtaining the associate in arts or associate in STEM disciplines.

Facilitating transition of URM students in STEM from community colleges to 4-year institutions

■ STRATEGIES:

- Grant aid allowing CC students to work less and complete their associate degrees within a three-year time frame and successfully transfer to complete their four-year degrees (College Board Latino 2011 report)
- Summer programs and research experiences
- Academic and career counseling
- Tutoring, peer mentoring, and study groups
- Social integration activities and programs
- Track student progress

Report and Contact

- REPORT:

- Order report or download pdf
- www.nap.edu

- Contact:

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