The Committee on Women in Sciences, Engineering, and Medicine

A Scoping Workshop on Addressing the Underrepresentation of Women of Color in STEM: Overview and Key Takeaways

November 10. 2017

Improving the representation of women of color in science, technology, engineering, and mathematics (STEM) is a national imperative. A 2011 report from the President's Council of Advisors on Science and Technology projected that 1 million more STEM professionals are needed *this decade* to maintain our nation's global competitiveness, but to meet this goal the nation needs to draw upon all available talent and recruit and retain more women and people of color in STEM. Unfortunately, we are far from reaching this goal.

Despite the fact that the share of science and engineering degrees earned by underrepresented minority women – African Americans, Hispanics, Latinas, American Indians, Alaska Natives, Native Hawaiians, and other Pacific Islanders— has more than doubled over the past two decades at all levels of education (Bachelor's, Master's, and Doctorate), women of color remain grossly underrepresented in these fields. According to data from the National Science Foundation, women of color earned less than 12% of science and engineering degrees in 2014 and made up less than 7% of the scientific and engineering workforce. Similarly, data from the American Association of Medical Colleges demonstrates that the participation of women of color in academic medicine is very low, especially in leadership roles—there are currently only 10 medical school chairs who are women of color in the United States.

These numbers do not bode well for the likelihood of meeting the national goal of producing 1 million new STEM professionals by 2020. As the nation struggles to confront this issue and remove the institutional and cultural barriers to women and people of color in STEM, it is important to acknowledge and work to address the unique challenges faced by the women of color as they experience the negative consequences of both racial and gender biases—what is often to referred to as the "double bind."

To advance this critical conversation, the Committee on Women in Sciences, Engineering, and Medicine (CWSEM) held a scoping workshop on November 10, 2017 focused on addressing the underrepresentation of women of color in science, engineering, and medicine. The event featured presentations by leaders and scholars who spoke to the factors that contribute to the underrepresentation of women of color in STEM and, importantly, offered input on steps that academic institutions, employers, and individuals can take *today* to work to improve the participation, retention, and advancement of women of color in science, engineering, and medicine.

Among the points made by the panelists and audience at the workshop were following*:

- Given that students of color are often "non-traditional students" who tend to live off campus, work 30 hours or more while in school, take more than 4 years to graduate, are often the first in their family to enroll, are usually older than a typical 18 year old college freshman, and make decisions about where to enroll for practical reasons, academic institutions can better support students of color in STEM by adopting policies

and practices focused on ensuring the academic success of "non-traditional" students. Institutions should recognize that non-traditional students approach their education with zeal, but they approach it differently from more traditional undergraduates. Institutions that are working to better serve non-traditional students can look to successful existing programs as models. See, for example, the work of [Excelencia in Education](#) for examples of programs and institutions that have successfully graduated large numbers of women of color in STEM fields.

- When hiring, employers often attribute a lack of diversity among their employees to difficulty in finding women and people of color in their applicant pools. To overcome this barrier to the participation of women of color in STEM, employers and academic institutions can seek candidates through existing resources and networks that highlight a talent pool of underrepresented minorities in STEM. For instance, employers should consider seeking talented candidates through the National Institutes of Health's "[Network of Minority Health Research Investigators](#)" and *Excelencia in Education*'s "[Finding Your Workforce](#)".

- Research has shown that women of color commonly experience feelings of isolation, feelings of invisibility or hypervisibility, macro- and microaggressions, and a sense of "not belonging" in STEM. If we look at the strategies adopted by the subset of women of color who remain in STEM, we see that they have succeeded in developed a sense of agency and belonging in STEM and have benefited from the existence of "counterspaces" on campus where they can vent frustrations, have their experiences validated, engage in activism, and build positive racial identities within a supportive community ([see Ong et al. 2017](#)). Academic institutions and employers can support students and employees of color by ensuring that they provide such counterspaces.

- Tolerance of certain pervasive cultural norms and biases can create an unwelcoming and discriminatory environment that drives women of color out of STEM fields. Academic institutions and employers can work to combat this by taking steps to educate students, faculty, and employees about issues of stereotype threat, tokenism, isolation and exclusion, microaggression, and bias.

- Additional, robust data on women of color in STEM is needed. To be most informative, this data should be disaggregated. For example, data should be broken out to show the numbers for specific racial and ethnic groups, to distinguish between domestic and international students and employees of color, and it should examine the participation of women of color at all levels of education and career.

- Ultimately, to significantly improve the participation, retention, and advancement of women of color in STEM will require a sustained commitment to culture change driven by a systemic, synchronous, multi-stakeholder approach. This will depend on a

coordinated, long-term commitment by academic institutions and employers and the support of the federal government, it will benefit from strong partnerships between academia, industry, and national organization (e.g. professional societies), as well as between STEM professionals, policymakers and legal experts, and it will require serious and sustained commitments from organizational leadership. Finally, it will depend on the voices and actions of individuals who advocate for change and insist that their organizations and colleagues take steps to improve equity and diversity in their institutions and endeavors. Further, the issue should not be framed as one aimed at "fixing the women", but rather as one that requires systemic, structural reform in our institutions. Efforts underway by the American Association of the Advancement of Science to adopt a model similar to the Athena SWAN effort in the United Kingdom offers one promising avenue for change.

CWSEM would like to sincerely thank the following distinguished panelists for sharing their research, insights, experiences, and passion:

- Akua Asa-Awuku, Associate Professor, University of Maryland, College Park, Department of Chemical and Biomolecular Engineering
- Gilda Barabino, Dean of Engineering at City College of New York
- Sandra Begay, Principal Member of Technical Staff, Sandia National Laboratories
- Sarita Brown, President, Excelencia in Education
- Shawndra Hill, Senior Researcher in the Computational Social Science Group at Microsoft Research NYC
- Shirley Malcom, Head of Education and Human Resources Programs at AAAS
- Yolanda Moses, Professor at UC Riverside and former president, City College
- Maria (Mia) Ong, Ph.D., Senior Research Scientist and Evaluator at the Technical Education Research Centers, Inc. (TERC)
- Joan Reede, Dean for Diversity and Community Partnership, and Professor in the Department of Social & Behavioral Sciences, Harvard University

We would also like to thank the over 200 in-person and virtual attendees of the scoping workshop for contributing to this important discussion.

Finally, CWSEM would like to recognize that this scoping workshop was only one small step and that much more action and discussion will be needed to improve the participation, retention, and advancement of women of color in STEM. The Committee plans to pursue additional efforts aimed at addressing this important national issue.

* Although the key takeaways from the workshop include advice from the panelists on steps institutions, employers, and individuals can take to improve the representation of women of color in STEM, it is important to emphasize that this advice should not be considered akin to official National Academies "recommendations" since this input has not been subject to the National Academies external review process.