1

Why Broaden Perspectives on Broadening Participation in STEM?

By Bronwyn Bevan, Angela Calabrese Barton, and Cecilia Garibay

What Is the Issue?

There is widespread agreement about the urgent need to broaden the diversity of people who participate in, contribute to, and benefit from science, technology, engineering, and math (STEM). The persistent underrepresented of a large segment of our society in STEM academics, professions, and civic decision-making indicates a system-level failure to recognize, nurture, and channel all young people's early interests in STEM into longer-term pursuits or to adopt inclusive approaches for adults participating in STEM engagement activities.

Though many communities are now undertaking collective efforts to transform who participates in STEM, the informal science education and science communication sectors are largely peripheral to

these initiatives (for example, less than 10% of NSF INCLUDES projects focus on out-of-school STEM experiences). Rather than assuming the exclusion is an oversight, a task force assembled by the Center for the Advancement of Informal STEM Education (CAISE) spent 18 months examining how the public engagement with STEM sector typically presents and represents STEM, and deliberated on whether or not it does so in truly inclusive ways that can contribute to efforts to broaden participation. In this process, the task force identified five main issues that organizations and professionals in the field need to grapple with in order to truly contribute to broadening participation in STEM.

Why It Matters to You

- **Science communicators** and **STEM educators** can formally examine how they organize and implement their work to reflect on whether and how their efforts are challenging or reproducing who participates in STEM.

- **Professional development leaders** and **science communication trainers** can engage their audiences in processes of reflection to ensure that equity and inclusion is central to professional learning.

- **Funders** and other stakeholders can ask ISE and science communication professionals to place equity and inclusion at the center of their work, including by considering the issues raised in this brief.

Things to Consider

1. **The public engagement sector should, but currently does not, play a vital role in broadening participation in STEM.**

   - Informal science education and science communication have been shown to be critical for advancing lifelong engagement with STEM, but these experiences are not taken up equally across our communities.

   - Traditional approaches to "broadening participation" in STEM do not take a critical (an historical, political, or socio-cultural) view of the situation, and while there are wonderful exceptions, at scale the field has not yet "moved the needle."

   - Rather than simply doing "more" of what has failed to take at scale, the public engagement sector could benefit from reframing how it approaches broadening participation.

2. **The public engagement sector could advance more compelling reasons for why people historically underrepresented in STEM fields should choose STEM.**

   - Broadening participation efforts too often adopt narrow views—towards careers "pipelines"— of why people should do STEM, which leaves out many who might otherwise engage with and come to value STEM.

   - Pipeline models do not take into account the broad, meandering, and diverse ways in which people may "find STEM" especially through out-of-school opportunities.

   - Choosing to take up opportunities depends not only on access but on the perceived value of those opportunities for one's history, community, hopes, and desires.

3. **The public engagement sector could make a stronger effort to disrupt the dominant cultural norms of STEM (which are white, male, and western) to show how STEM relates to and can be advanced by other cultural ways of knowing and being .**

   - The cultural norms of STEM in academia and the professions are specific to the communities that have built those enterprises; as such, they can be alienating and unwelcoming to others.

   - Programs that seek to intertwine the cultural norms and practices of their audiences with those of STEM professionals can be seen as more welcoming, can bridge connections, and can deepen engagement.

4. **The public engagement sector could strive to be better integrated and connected with the broader local STEM learning ecosystem, and design programs that explicitly and intentionally help advance people's STEM activities within those ecosystems.**

   - Most of today's learning ecosystems are organized by and for members of dominant cultural groups. Broadening participation in STEM will require intentional engineering of new STEM learning ecosystems that help youth, adults, and families historically underrepresented in STEM to recognize, choose, and follow up on productive STEM engagement opportunities.

   - ISE and science communication professionals can play pivotal roles in helping to broker (connect) their audiences to future or ongoing opportunities to expand their engagement.

   - Developing programs with and in local communities is a productive way to develop relevant and connected STEM learning ecosystems.

Things to Consider (continued)

5. **Broadening participation, equity, and inclusion work needs to be positioned as core to the organization's mission and success, and not tacked on or siloed within an organization or program.**

   - Retrofitting equity and inclusion approaches onto organizations that were not designed for such purposes is challenging and requires extensive and extended attention.

   - Leaders of equity efforts often come from communities that have been historically marginalized. When equity is not deeply and comprehensively embraced by the organization, it is common for these leaders to feel marginalized within the organization even as they are seeking to better connect with and support marginalized communities for the organization.

   - Prioritizing broadening participation means addressing mission, staffing, support, stakeholders, and programming across the organization. Cultivating close relationships with community organizations, especially when these relationships are vertically integrated into the organization and not isolated within one division or person, can help cultural shifts within organizations.

Reflection Questions

+ **What is your program's/organization's vision of and goals for "broadening participation" efforts?**

+ **How well do your programs/ offerings align with your broadening participation vision? Is this true across the board?**

+ **In what ways do your organization and its programs/offerings consider the experiences of diverse groups?**

+ **What role does your organization play in the local or regional STEM learning ecosystem?**

Tools You Can Use

Use the *Broadening Perspectives on Broadening Participation in STEM* Toolkit to plan and lead reflective conversations with your colleagues, staff, or professional trainees.
informalscience.org/broadening-perspectives