

4 What Are the Cultural Norms of STEM and Why Do They Matter?

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What Is the Issue?

Current trends in broadening participation tend to emphasize the importance of increasing the number and diversity of people who participate in STEM programs and experiences. However, attention needs to be paid to how people are asked to engage with STEM. The “cultural norms of STEM”—that is, the accepted patterns of practice that make up the standard ways of speaking participating, learning, and working in STEM—can diminish engagement among those who don’t fit the “norm.”

The dominant cultural norms of STEM are established by the populations that have historically participated in and institutionalized STEM—that is, male, white, western, and privileged.

These dominant norms are characterized by competition, individualism, verbal debate, objectivity, and nature/culture dualities (e.g., animate/inanimate, mind/body, reason/emotion). The norms shape how STEM is practiced, understood, and communicated.

When everybody engaging in STEM is expected to adhere to these dominant cultural norms, some may feel like outsiders, even though others will find them familiar and comfortable. This can shape perceptions about who has expertise and/or belongs in STEM fields. For example, if someone talks and acts in a way that aligns with the cultural norms of STEM, they might be viewed as more “scientific” than someone who does not.

Why It Matters to You

- **Science communicators** and **STEM educators** can consider how the cultural norms reflected in their programs and events include or exclude people (e.g., topics highlighted, experiences provided, and images shared; and stories, examples, languages, and terms used).
- **Journalists** and other **science communicators** can play a powerful role in either maintaining or expanding the cultural norms of STEM. Approaching STEM stories with language and examples from non-dominant groups can expand engagement in STEM to a wider range of people.
- **Funders** can start deliberately rewarding programs that include the knowledge and achievements of non-dominant cultures.
- **Evaluators** can use tools and insights for measuring program successes in ways that extend beyond the dominant cultural norms of STEM.

What is the Issue? (continued)

The dominant cultural norms of STEM are reflected and reinforced in many ways, including through the design of programs or exhibits as well as the common communication approaches of STEM professionals. Well-intentioned STEM professionals who engage in outreach activities to minority groups are often unaware of what can be the alienating effects of using and privileging dominant cultural norms.

Things to Consider

Whether people feel comfortable engaging in STEM is partly a result of their personal experiences and their family and communities' cultural practices. STEM programs and activities must encourage and support participation by leveraging these experiences.

STEM communication plays an important role in the perpetuation (or disruption) of dominant cultural norms. The text, images, and data visualizations all reflect cultural orientations and even biases. Attention should be paid to how STEM is represented in all forms of communication.

Pathways into STEM are often built around implicit dominant cultural norms, but they can and should include entry points, experiences, and directions that incorporate more diverse ways of knowing and being. The inclusion of relevant, real-world themes, incentives for collaboration, representation of multiple perspectives, and examples of cultural knowledge can broaden the cultural norms of STEM in ways that resonate with a wider spectrum of people.

Recommended Actions You Can Take

- Examine the cultural norms that frame participation in your organization's events and programs.
- Monitor the perspectives reflected in your organization's communication documents. What words, images, photographs, and data representations are used, and what do they communicate?
- Implement a process to review the cultural norms expressed in documents before they are released to the public.

Reflection Questions

- + How do events, experiences, exhibits, and displays at your organization represent the lives, experiences, and languages of a diverse audience?
- + What does it mean to be successful in a STEM experience at your organization? What criteria matter, and how do these criteria align with and/or challenge dominant narratives?
- + Does your organization employ people from a wide variety of backgrounds who can help expand the cultural norms for STEM education?
- + What processes does your organization have in place to document the ways in which the dominant cultural norms of STEM drive or frame events, experiences, exhibits, and displays?

Tools You Can Use

- The [Creating a "We" Culture](#) model is a tool for creating a more inclusive culture, and is described in *Science and Children* (vol. 53, no. 3).
- Two research briefs from *Relating Research to Practice* may be helpful:
 - This [research brief](#) summarizes a study that challenges readers to identify effective ways of communicating information to culturally diverse groups in ways that avoid polarization, particularly in regards to how science and nature are presented in relationship with humans (brief #431).
 - This [research brief](#) describes a study of a community-based summer science program with a Native American tribe in order to provide a conceptual framework for addressing culturally based ways of knowing, and supporting students in their navigation of multiple and perhaps conflicting epistemologies (brief #211).

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