The Missing Millions:
Democratizing Computation and Data to Bridge Digital Divides and Increase Access to Science for Underrepresented Communities

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We acknowledge the traditional owners of the lands where Washington, Maryland and Virginia now stand -- the Pamunkey, Chickahominy, Upper Mattaponi, Rappahannock, Monacan, and Nansemond. We pay respect to their Elders past, present and emerging.

The Missing Millions

NSF has made "broadening impact" a requirement for all proposals for more than 25 years and has funded thousands of grants.

However, there are still millions of researchers, students, staff, and citizens who are not involved in research or STEM activities.

The issue is why?

Long-term motivating question

How can we significantly expand, diversify, and support the development of new cohorts and communities of scientists and researchers to address pressing research, social, and global issues in 2030 and beyond?

There is urgency in addressing these matters.

We are in a post-industrial, digital era in which the pace of change with technologies is accelerating.

Engagement and participation of diverse faculty, students, and institutions, are not keeping pace with advances in technology and science, and the digital gap continues to widen

The Myth of Access

- Access -- everyone agrees that access is essential, and indeed, many NSF projects (as well as other agencies) encourage and require access

- However, access without the ability and expertise to use these resources is largely a waste of time and money.

The Trap of Training

- Training is recognized as critical component for many efforts. however, training typically focuses on those who already know how to play

- What about those that don't know how to play?

- How do you support people who are at different stages?

- Power issues: sharing and teaching is often not collaborative

- Need to focus on the transfer of expertise and knowledge- creating self-sufficiency and new colleagues

The Culture of Science

- We have inherent and unconscious biases about science that essentially supports the status quo

- We tend to have a hierarchical model for science which limits our ability to look at science broadly

- The efforts to create diversity can quickly become a numbers game

- We need to look at the stakeholders who make science successful

- We need to recognize the value different communities bring to the table f

- Engagement means engagement; intellectual, passion, peering

Importance of developing science communities

It takes multiple communities to support the conduct of science

We need to develop science communities that provide a home for the underrepresented

Identify key stakeholders needed to build and sustain viable communities

Identify opportunities to encourage and support early engagement

AT THE END OF THE DAY – WE NEED EVERYONE UNDER THE TENT

Some Key Takeaways - 1

- Access is essential, but not sufficient ---

- Programs and projects assume a level playing field, but how can we help people to get ready to play the game?

  - A general systemic shift in the importance of "pre-engagement" programs

- We need to identify and support new ways for underrepresented students and faculty to engage in science

  - Providing "real" opportunities through apprenticeships, internships, invitations to participate in science or education projects, conferences, webinars, etc

- While the term Broader Impact is a move in the right direction, it is too narrowly prescribed.

  - We need to expand, accelerate, and explore options outside of the box including best practices, metrics, engagement, evaluation, and scale

Some Key Takeaways - 2

- Recognize the value of local science and community data and expertise from underrepresented communities that can be applied to science

- Need to build science communities that support a sense of welcoming as well as providing a sense of belonging, building expertise, working with others

- Efforts require sustained investment and support; social and institutional change takes more than a 3-year project or initiative – much more "hands-on" than usual

- A sense of urgency and call to action

Questions and Discussion