

THE MISSING MILLIONS PROJECT

DISCUSSION POINTS

1. What do diversity, inclusion and representation look like in your school or college? How effective is your institution in 'reaching' the whole student population? What successes have you had? Who are you yet to 'reach'?
2. What computing resources are available to you and your students?
3. How are data and computation incorporated into your curriculum? How can use of data be developed to aid teaching and learning in your school or college?
4. The project notes that 'access + ability = capability.' In your experience and local community, in what ways are access and ability affecting the capability of students, especially those from marginalised demographics?
5. The Missing Millions report advises that research communities focus on local issues that matter to them. What are some of the issues in your community? How can young people be engaged to tackle the challenges these issues pose?
6. How can you help to facilitate a community research group? What support would you need and from whom?
7. What support does your institution offer students looking to explore internships and apprenticeships? How can you help facilitate such opportunities?

USEFUL LINKS

- The Missing Millions report, which explains in detail the project's methodology, its findings and its conclusions for society, can be found here: www.rti.org/publication/missing-millions/fulltext.pdf
- Learn more about the College of Menominee Nation Sustainable Development Institute's theoretical model (SDI model): www.link.springer.com/article/10.1007/s11625-015-0304-x
- This article from the National Park Service explains more about citizen science (science at the community level) and provides a directory of citizen science projects across the U.S.: www.nps.gov/subjects/citizenscience/citizen-science.htm
- This *Nature* article explores examples of the democratisation of science around the world, including training in using open-access data and DIY scientific equipment: www.nature.com/articles/d41586-020-03193-5

KEY MESSAGES

BUILD COMMUNITY RESEARCH GROUPS

Educators can form the backbone of the community research groups that are advocated in the Missing Millions report. "You can engage with students to address local community issues through science," says Alan Blatecky. "Your support can help build these teams, providing the structure to work together on these issues and ultimately communicate these efforts beyond the classroom."

DATA AND COMPUTATION ARE IMPORTANT

Despite being potentially more daunting than typical 'traditional' classroom science projects, data and computation shape the modern world, and their influence is only growing. "I believe strongly in the importance of data and computation as critical tools for research," says Lauren Michael. "Experience with these tools can create more opportunities for a wider range of careers for potential researchers."

CHOOSE TOPICS STUDENTS CARE ABOUT

Joel E. Cutcher Gershenfeld emphasises the importance of choosing the right subject matter, something that students genuinely care about. "Focus on data that are relevant to issues at the top of students' minds," he says. "Topics could include community safety, the local environment or community health and well-being." Lauren adds, "The topic determines what tools and practices you can teach, including data and methods for working with data. If applied to local issues, students will be more engaged to learn these methods." Research could even address similar subject matter as the Missing Millions report: the presence of diversity alongside disparity, and the effect this has on society.

EXPERIMENT WITH APPROACHES

Depending on local characteristics, different techniques may work better in different communities. "The best advice is to experiment with different approaches to build small communities in the classroom, to address issues specific to the area," says Alan.

IT'S NOT JUST ABOUT SCIENCE

"STEM depends on a social construct that is often overlooked," says Alan. "Efforts to address this social construct are more important than STEM activities for students who are new to STEM. Students need to see people like themselves doing the work, and they need to feel welcome and part of the group."