Toward a Successful, Sustainable, Just Future: The Role of Geoscience Education and Geoscience Education Research

Cathryn A Manduca
Education Section

Like medicine, geoscience education is a practice informed by research. Educators in formal and informal settings around the globe practice geoscience education by teaching individuals from early childhood through their lifespans about the Earth system and its history. This is one of the paths bringing Earth and Space research into use in society. Because this understanding of the Earth and Space system is critical to the development and management of resources, the mitigation of natural and human caused hazards, and the prediction of natural response to human activities, this knowledge is powerful. Who has an opportunity to learn, as well as what, and how well they are taught makes a difference in the quality of life of individuals, communities and societies today and in the future.

Geoscience education research studies all aspects of education focusing on how students learn geoscience as well as the structures and practices that support or impede this learning. Like medical research, geoscience education research has basic, applied, and translational components that support continuous improvement in geoscience teaching and learning. This research looks not only at what is needed but how to bring that knowledge into practice at scale.

Today, geoscience education is more available in some parts of the world than in others, and it is more accessible to some people than others. Because geoscience understanding is powerful, particularly as we respond to a rapidly changing climate, important questions in geoscience education include:

- What knowledge and skills are important for civic participation? How do we develop this capacity for all?
- What is the role of geoscience education in creating the workforce needed for a successful, sustainable and just future? How is this carried out in equitable ways that support a just society?
- What forms of geoscience education and learning support individuals and communities in recognizing and responding to environmental and resource needs?
- How can educators support geoscience learning by individuals from all backgrounds and identities? How can this diversity enhance learning and enrich the practice of geoscience and geoscience education research?
- What conditions and practices support positive change in education?

Through the lens of my experience, dominantly in the US, this talk will explore our current understanding with examples of successful action, and discuss the challenges and opportunities awaiting the next generation of geoscience education practitioners and researchers.