

Climate, Environmental Justice, Sustainability, Resilience and Science Education

BOSE 20th Anniversary

19 September 2024





Systems
Scale
Complexity
Convergence
Uncertainty
Risk
Dis-mis-mal-
information

How do we help people learn and apply systems thinking?

How do we help people conceptualize and operationalize the time and spatial scales involved in thinking about Earth systems?

How do learners synthesize and transfer? What do we know about the process of linking and transferring knowledge across domains and disciplines?

How do people learn about and apply thinking about risk, decision making under uncertainty, and scientific uncertainty and the Nature(s) of Science?

How do prepare people learn to deal well with mis-, mal-, and disinformation?

Community

Community and Citizen science can be valuable educational experiences – we have a lot to learn about how to best realize and extend those benefits.

Community Science is a way of extending the right to "to share in scientific advancement and its benefits" by inviting communities to help frame scientific questions that address their priorities

What can we learn from and do with emerging research on Community Science Literacy and Collective Agency?

In the context of sustainability, communities of place have special salience

Shared Sustainability

Exploitation of resources and people have been and still are tightly coupled.

- Can science education help us imagine and build a future where equity and sustainability are intertwined?
- How do we help people learn and practice a shared sustainability?



Cobalt Mining Pit, Photo by Siddharth Kara

Relationship with Nature

“You behave very differently when you think of natural relations instead of natural resources”

– Dan Wildcat

Yuchi Member of the Muscogee Nation of Oklahoma
Professor, Haskell Indian Nations University

- How can we define and describe positive relationships with nature?
- How can science education help support positive relationships between people, communities, and nature?



Haskell-Baker Wetlands, photo by Dan Davis

A background image of green foliage, likely trees, is visible at the top and bottom of the slide.

Values

“Western Science asks how nature works. Indigenous science asks what is the right way to be in relation to Nature”

– **Kat Vandy-Gardner**

Member of the Choctaw Nation of Oklahoma

Professor of Aviation at Oklahoma State University

- How do we help people, including practicing scientists, learn about and navigate the connections between our sciences and our values?
- How can learning about values help with collaborative decision-making and action-taking?

Systems and Equity

- What can we learn from nature?

“Move from leadership as gatekeeping to groundskeeping.”

-**Beronda Montgomery** in *Lessons from Plants*

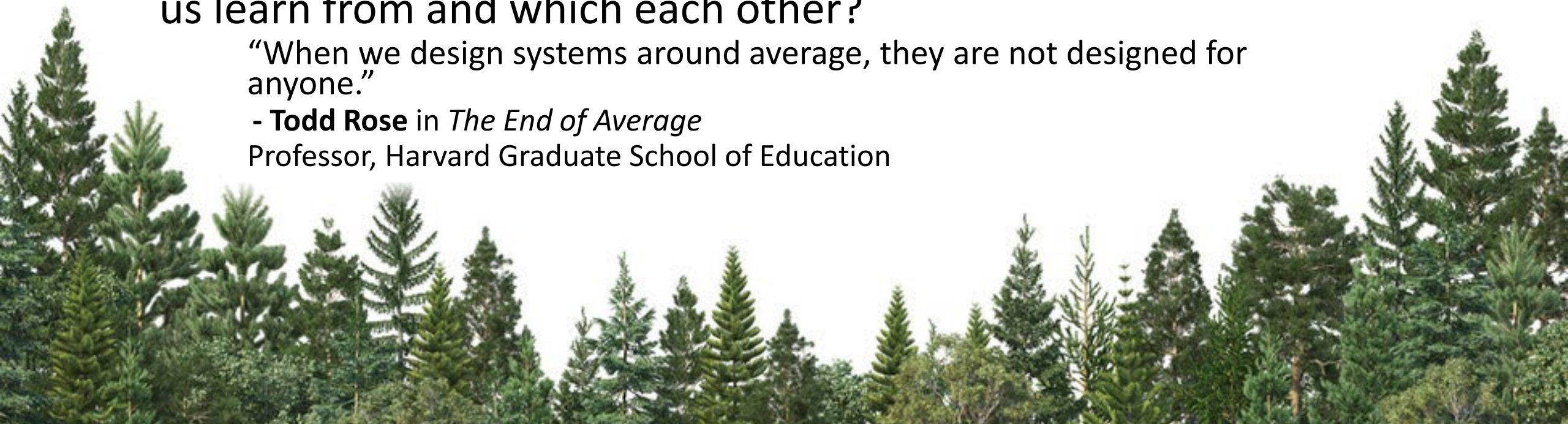
VP for Academic Affairs and Dean, Grinnell College

- How do we design systems that support all learners and help us learn from and which each other?

“When we design systems around average, they are not designed for anyone.”

- **Todd Rose** in *The End of Average*

Professor, Harvard Graduate School of Education



Learning to Learn

Climate, Environmental Justice, Sustainability, Resilience are iterative and adaptive processes, which require constant learning.

- How do we help people up to learn to learn?
- What do we know about metacognition?
- What about knowledge transfer?



Structural Change

“More of the same kind of education will only compound our problems...education is no guarantee of decency, prudence, or wisdom”

– David Orr in *Earth in Mind*

Professor of Environmental Studies and Politics Emeritus at Oberlin College

We have good evidence of strategies that work for sustainability (e.g. action-oriented, agentic, local and contextual, multi-generational, whole community, whole child)

- What kind of structures are necessary to support strategies that work?
- What are the roadmaps and metrics for systems change?”



Thank you

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Professor of Indigenous & American Indian
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Haskell-Baker Wetlands, Dan Davis

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