Relationships, Partnerships, and Asset Thinking:

Learning from STEM Learning Ecosystems

ASTC Annual Conference Charlotte, NC October 10, 2023

Today's goals:

- Hear stories from STEM learning ecosystems, connecting practice to research
- Learn about findings from our research studying STEM learning ecosystems
- Reflect on your own practices

Who we are

Our Project

- A collaborative researcher/practitioner study, focused on learning about practices for working with local communities through a learning ecosystem structure
- Funded by the NASA Science Activation project to learn about practices used by STEM learning ecosystems, to expand the use of NASA data and experts.
- Exploring structures and practices that support broadening participation in STEM through authentic learning experiences



Investigators:

Rae Ostman Arizona State University
Paul Martin Arizona State University
Matt Cass Southwestern Community College
Elena Sparrow University of Alaska Fairbanks

Researchers / evaluators:

Liz Kollmann Museum of Science, Boston Allison Anderson Museum of Science, Boston Ann Atwood Museum of Science, Boston

SciAct STEM Ecosystems Team



Elena Sparrow University of Alaska Fairbanks **Christi Buffington** University of Alaska Fairbanks







Leigh Peake Gulf of Maine Research Institute Sarah VanDenbergh Gulf of Maine Research Institute

Matt Cass Southwestern Community College Randi Neff Southwestern Community College

Kalman Mannis Arizona Science Center

STEM learning ecosystems in our project



Raise your hand / stand up if you are from...



Raise your hand / stand up if you are from...



Raise your hand / stand up if your role is...

- Ecosystem leader, backbone organization
- Leader of a key ecosystem partner
- Educator or education specialist
- Program manager
- Community leader at a nonprofit
- Researcher or evaluator
- Funder
- Something else!

Background

Project activities

What we're sharing today

- 1. Complete three inquiry cycles that investigate learning ecosystems
 - Topics: definition/function, broadening participation, authentic STEM
 - → Sources: lit review, interviews with experts and practitioners, team discussions
 - 1. Study exemplary STEM learning ecosystems within SciAct
- 2. Document principles and practices + case studies

3. Provide professional development and resources for SciAct community

¹ 4. Share findings with the broader STEM engagement community

Today's session!

Our Process



5 min - pick one question to answer and share with your table

- What are some characteristics of STEM learning ecosystems?
- What distinguishes them from other kinds of partnerships?
- How do you communicate what you do for your community?

Findings:

Describing STEM learning ecosystems' practices, relationships, and context

Elements for describing STEM learning ecosystems

- Who is involved?
- What is the context?
- What does the project do?
- How do they do their work?
- Where is the project in their journey?

- Relationships First and Always
- Community Based Partners
- Co-Develop Goals and Vision
- Center Community Knowledge
- Long term sustainability





Key finding 1:

STEM learning ecosystems are **intentional** partnerships for lifelong learning and engagement, which are grounded in strong community **relationships** and **responsive** to their context.

Findings:

Understanding STEM learning ecosystem design that supports diversity, equity, accessibility, inclusion, and belonging (DEAIB)

Key finding 2:

Ecosystems that are designed to broaden STEM participation center diversity, equity, accessibility, inclusion, and belonging; prioritize a **flexible and transparent culture**; build **genuine relationships** among both individuals and organizations; and **cultivate sharing** of programming and resources.

Place-Based STEM Learning Experiences

RAIN

SAL P

EXPERIMENTAL @





COCHISE COUNTY STEM SNAPSHOT WEEK

end photos and info to AMADEE.RICKETTSCOUTLOOK.COM or share on Facebook with the tags #4AZRAIN and #4SEAZRAIN to see your work featured at 4arrain.org and on the Rural Activation and Innovation Network Facebook page.

f facebook.com/NSFRAIN/



Key Finding #2 Considerations for structure and design

- The **organizational structures and culture** that a project team cultivates impacts their work with partners and public audiences.
- Healthy relationships are important for any partnership. When centering diversity, equity, accessibility, inclusion, and belonging it is important to build genuine connections and support people in feeling they belong.
- Working openly and sharing access to people, organizations, information, programming, and other resources helps support ecosystems at an organizational level and in building mutually beneficial relationships.
- **Sustained funding** and commitment of personnel enables ecosystems to maintain activities and community relationships, building momentum and continuity for providing STEM engagement opportunities for learners.



Quick Write:

Think about your work and jot down some notes about strategies that support:

- a flexible and transparent culture;
- genuine relationships among both individuals and organizations; or
- sharing of programming and resources.

Findings:

Considerations for developing relevant experiences to engage learners

Key finding 3:

Providing opportunities for authentic STEM engagement starts with understanding what is relevant to learners and their community, then connecting content and experts through experiences that actively engage those learners.

Key Finding 3 Perspectives for developing authentic STEM engagement

- What content is shared (and Who is sharing it)
- Why the content is shared
- How the content is shared



SNAPSHOT The Smoky Mountains STEM Collaborative

A SciAct partner in western North Carolina since 2016, they collaborate with formal and informal education partners ranging from public school systems to the Pisgah Astronomical Research Institute. Identifies and supports champions with stipends and supplies to make an impact and build capacity at schools through connections with NASA and regional partners.







Quick Write:

Think about your work and jot down some notes about strategies that support:

- Learning what is relevant or interesting to your community, or
- Connecting content and/or experts to community priorities

Wrap up

Interdependent strategies to connect with communities



Map source: US Fish & Wildlife Service

Arctic and Earth SIGNs Objectives

- Increase engagement of underrepresented youth and adults in STEM, particularly rural and indigenous educators and youth
- Increase capacity for communities to respond to climate change issues through youth, educator, and community member education



Designing for generational and cultural diversity: A culturally sustaining learning framework

CTIC & EARTA

STEW INTEGRATING

GLO



Figure modified from Stephens 2003 and OLCG 2002; published in Spellman et al. 2018

Arctic & Earth SIGNs is **intentional** in their work by:

- Braiding Indigenous knowledge with western science
- Honoring and giving precedence to Indigenous perspectives

They center **relationships** in their work through:

- Thoughtful collaboration and co-creation
- Incorporating audience voices at all structural levels

They are **responsive** to their context by:

- Building relationships with their community
- Starting with community priorities

Reflect on the session and use the Action Plan worksheet to:

- Note down three ideas or priorities for your ecosystem that you want to follow up on.
- For each one, note any ideas you have about how you might approach it.
- Then identify at least one concrete thing you will do to follow up on that priority.

Thank you!



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Center for Innovation in Informal STEM Learning

Arizona State University

