STEM Funders Network
STEM Learning Ecosystems Initiative

Opportunities for CS3

This initiative is supported by the STEM Funders Network.
Why Are We Here?
Global Societal Challenge

Level 1
- Climate Change
- Water Scarcity
- Energy Security
- Cyber Security
- Global financial structure
- Biodiversity and Ecosystem losses
- Fisheries Depletion
- Deforestation
- Infectious Disease

Level 2
- Poverty
- Education
- The Digital Divide
- Urbanization
- Intellectual property
- International labor and migration
- E-Commerce rules
- Biotechnology rules
- Maritime Safety and Pollution

Eliminate our way of life
Disruptive to our way of life
SKILLS GAP CHALLENGE...

Trends in Routine and Nonroutine Task Input in U.S. Occupations: 1960 to 2002

- Expert Thinking
- Complex Communication
- Nonroutine Manual Tasks
- Routine Cognitive Tasks
- Routine Manual Tasks

What is The STEM Funders Network?
STEM Funders Network Membership History
2011
Nashville, TN
OC STEM

2012
Raleigh, NC
Indianapolis, IN

2013
Irvine, CA
Pittsburgh, PA
Portland, OR
Charlotte, NC
Denver, CO

2014
Boston, MA

TULSA
Based on 20 Years of Research & Evidence…

What is a STEM Learning Ecosystem?
STEM Learning Ecosystems

STEM-Rich Institutions

Business Community

Institutes of Higher Education

Learner Centric

Family

Formal PK-12 Education

Out-of-School Programs

Source: Ellen Lettvin, US Department of Education
STEM Funders Network (SFN): STEM Learning Ecosystem Initiative

Launched at Clinton Global (CGI)
National Community of Practice Kickoff: November 11-12

- 27 communities
- 150+ participants
- Drs. Etienne and Bev Wenger-Trayner and Dr. William Snyder, leading researchers on design and buildout of Community of Practice for Social Learning.
- Partnership with White House OSTP, DOE, CNCS, CGI
Communities of Practice

- STEM-Focused professional learning through the development of a peer-to-peer learning network for national and regional impact
- Access to STEM and cross-systems collaboration knowledge and research
- Specific topics including but not limited: CCSS, NGSS; assessing and evaluating STEM Learning Ecosystems; and using the design process
- Monthly Communities of Practice calls/webinars to learn and share information and resources
- Access to a website for on-line communication and information sharing
- Registration, meals, travel and hotel for two Ecosystem members per site provided to attend Communities of Practice

Technical Assistance

- All sites will have access to a team of STEM and cross-sector collaboration experts
- Each site will be assigned a TA Coach who will act as primary contact for the site
- TA Coach will work with each site through design and implementation
- TA Coach maintain monthly contact with sites and conduct site visits (either individually or regionally)
- TA Coach will assist in creation of peer-to-peer/mentorship relationships amongst the selected cohort
Design Studios

INNOVATION BY DESIGN: The System

LEADING AND LEARNING BY DESIGN: Teaching and Learning

STEM DESIGN STUDIOS

COLLABORATION BY DESIGN: Partnerships

ACCOUNTABILITY BY DESIGN: Outcomes and Metrics

The Design Process

STEM ecosystems
Cultivate. Learn. Innovate.
Impact...

- 27 communities
- 576 school districts
- 15,122,133 K-12 students
- 1,029 out-of-school informal partners
- 3,617 business/industry partners
- 600,000 educators
### Networking
- Coalesce like-minded partners
- Exchange funding information
- Share grant-making information
- Identifying resources

### Cooperation
- Share vision and goals
- Discuss common strategies and objectives
- Begin to build trust among partners
- Provide opportunities for program support and professional development

### Coordination
- Increase number of effective STEM programs
- Provide more opportunities for program support and PD
- Begin to think about network infrastructure
- Commit to some common goals and objectives

### Collaboration
- Develop network infrastructure
- Shared funding
- Shared goals and objectives
- Increase number of effective STEM programs
- Provide more opportunities for program support and PD
- Begin linkages between in & out of school learning platforms

### Synergy
- Agreed upon goals and objectives
- Respect for all enlightened self-interests
- Established and sustainable network infrastructure
- Funding done with conscious impact on others and the system itself
- Communities of Practice operate independently
- Established linkages between in & out of school
### Key Partners

1. PreK-12 school system receptive to external partnerships
2. High-quality out-of-school time/youth development system and programs
3. STEM-expert museums, science centers, professional associations, and businesses
4. Institutions of higher education
5. Private sector STEM-focused businesses
6. Parent and community-based organizations

### Critical Attributes

1. Anchored by a passionate leader(s) with a collaborative vision and practice
2. Attentive to the enlightened self-interest of all partners
3. Philanthropic and public sector support and in-kind resources

### Focus Areas

1. Building the capacity of educators in all sectors.
2. Equipping educators with tools and structures to enable sustained collaboration.
4. Creating learning progressions that connect and deepen STEM experiences over time.
5. Focusing instruction on inquiry, project-based learning and real-world connections to increase relevance.
7. Exposing young people to potential STEM careers.
### 3rd: The Ecosystem Logic Model

**Resources**
- Local Initiative (Members, community partners, network connections and infrastructure)
- Implementation Partners
- Steering Committee (Members, network, expertise)
- Formal Ed
- Science Centers
- Youth Development Entities
- Afterschool and Summer STEM Programs
- Leveraging Existing networks
- State STEM Network
- State Afterschool Network
- Higher Ed
- Business
- Community

**Activities**
- Develop Technical Support (PL/PD) (infrastructure, capacity, key partners, communication, project management)
- Develop and implement program support and professional development (program support and professional development delivery model based on three levels of technical assistance)
- Develop and implement Communities of Practice
- Develop STEM resource menu
- Assist in defining effective STEM programs for program implementation/ improvement and evaluation purposes

**Outputs**
- Number of partners in network
- Number of STEM learning opportunities across counties
- Number of educators engaged in professional development
- Number of members in each Communities of Practice
- Types of STEM resources introduced to counties
- Number of effective STEM programs
- Evaluation findings

**Short-Term and Intermediate Outcomes**
- **Program outcomes**: An increase in the intensity, duration and quality of STEM learning opportunities.
- **Staff outcomes**: An increase in the confidence, competence, and motivation in offering STEM learning opportunities.
- **Student outcomes**: An increase in engagement, interest, and applied knowledge of STEM content and processes.
- **Initiative outcomes**: The documentation of promising practices, linking of results to specific STEM in OST models, and the sharing of this information with the field in ways that can effectively guide program improvement and expansion efforts.

**Impact**
- All students possess the requisite STEM skills to be competitive for 21st century jobs
- All educators and teachers are provided the tools and support to ensure their students are STEM competent and STEM literate
- Community is a leader in STEM workforce competitiveness in State and the United States
Curriculum Pathways, Career Pathways, Educator PL/PD, Workforce Development, Equity & Access, After School Programming, etc...

Whatever YOUR community decides as its focus!!
STEM Ecosystem Structures
**Gov’t Top-down**
- Stakeholders are "selected"
- Operational Funding dependent on legislative support.
- Programmatic funding may be mix of public and private.
- Prescriptive
- Political

Example: DE, OR, WA, CO

**Funder/Business**
- Stakeholders are invited
- Respects enlightened self-interest
- Broad focus, often workforce outcome goals
- Partners with nonprofits to deliver programming

Example: OC, TRSA, SFN, Great Lakes, LA

**Higher Ed**
- Think Tank approach
- Career pathway & workforce focus
- Mix of public and private funding
- Narrower focus
- Challenge in bringing in OST, PK12

Example: OSLN, Empire STEM, Tampa, STEM-X sites

**Intermediary**
- OST often leads
- Stakeholders are invited
- Group consensus
- Primarily grant funding
- Distributed leadership model often with hubs.
- Challenge bringing K12 & workforce

Example: NC, Indiana, PASA, NYC, BOS
STEM Drives Community & Economic Development

“The Boston region is an ecosystem that shares our aspirations.”
Mr. Jeffrey Immelt/CEO of GE

“The area is crowded with 55 colleges and universities, including research centers like the Massachusetts Institute of Technology, Harvard and Northeastern University. G.E. said it was also attracted by the area’s thriving venture capital and start-up community... Only about 200 will be corporate staff, G.E. said, while the remaining 600 will be mainly “digital industrial product managers, designers and developers” in a variety of disciplines including data analysis, life sciences and robotics.”

From the NY Times 1/14/16

Fortune 100 Companies increasingly prefer proximity to higher ed than Wall Street.
Opportunity for CS3?

- Engage with Local/State Ecosystem Effort
- Share Expertise
- Support Cultivation of a Community of Practice
- Provide TA
  - NGSS
  - PL/PD
  - Pathways
- Inform Workforce Pipeline