STEM Learning Ecosystems Initiative Overview

Gerald Solomon
Executive Director, Samueli Foundation
Co-Chair, STEM Funders Network

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Call Agenda

- Welcome
- Overview of the STEM Funders Network
  - STEM Learning Ecosystems Initiative
    - History
- Questions and Answers

This initiative is supported by the STEM Funders Network.
Reminder...

WHY ARE WE HERE

Global Societal Challenge

- Level 1
  - Climate Change
  - Water Scarcity
  - Energy Security
  - Cyber Security
  - Biodiversity and Ecosystem loss
  - Fisheries Depletion
  - Deforestation
  - Infectious Disease

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

Unfortunately, little to no connection between education and real world

Eliminate our way of life

Disruptive to our way of life

Attribution: Gregory Washington, PhD, Dean, Samueli School of Engineering, University of California, Irvine
Unprecedented Global Competitors

Are we educating students to truly compete globally?

Singapore 1965

Singapore 2015

Shanghai 1987

Shanghai 2015

Attribution: Gregory Washington, PhD, Dean, Samueli School of Engineering, University of California, Irvine

Equity Challenge...

Women have seen no improvement in STEM since 2001

<table>
<thead>
<tr>
<th>Women as a percentage of the</th>
<th>2001</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Workforce</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Computing Workforce</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>Advanced Manufacturing Workforce</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

African Americans and Latinos have lost ground in STEM

Whites and Asians still dominate the STEM workforce

Between 2001 and 2014, whites and Asians declined from 39 to 29 percent of the workforce population. Yet their dominance in critical STEM occupations continues unabated.

Source: Change the Equation, “The Diversity Dilemma,” 2015

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**Employment Challenge...**

**Figure 1: Sustained Growth is Projected for STEM Occupations**

Employment as a Percentage of 2000 Employment, by Occupation

Source: Chairman’s staff of the Joint Economic Committee based on data from the Bureau of Labor Statistics. The R&A does not project employment for individual years from 2010-20. For the purposes of this chart, Life Sciences exclude Medical Sciences.

Attribution: Ellen Lettvin, US Department of Education

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**Skills Gap Challenge...**

**Trends in Routine and Nonroutine Task Input in U.S. Occupations: 1980 to 2002**


Attribution: Ellen Lettvin, US Department of Education
Opportunity...

Middle skill jobs that require technology grew 2.5 times faster between 2003 and 2013 than middle skills jobs that don’t.

The demand for STEM talent is growing.

Between 2014 and 2024, growth in computing, advanced manufacturing, and engineering will meet or greatly exceed growth in non-STEM jobs.

$2.5$ TRILLION

The U.S. would gain an extra $2.5$ trillion in Gross Domestic Product between now and 2050 if its students scored at the international average on math and science tests.

Source: Change the Equation
Who Are We?

STEM Funders Network Membership History
Underlying Premise
When does learning occur?

LIFELONG AND LIFEWIDE LEARNING

- 9.25%
- 18.5%
- 7.7%
- 1.1%

0-5 K GR 1-12 UG GRAD WORK RETIREMENT

1990s
1990s-2009
2011-2013
2010

STEM Learning Ecosystem

Cultivating a STEM Learning Ecosystem to meet the needs of all young people requires intentional and strategic action toward shared goals.
Ongoing Assessment

Guiding Questions:
• What factors influence the development of effective STEM Ecosystems?
• What factors influence the sustainability of effective STEM Ecosystems?

External
- Center for Education, Policy and Law, University of San Diego
- The PEAR Institute: Partnerships in Education and Resilience at Harvard University

Internal
- Community Assets Survey
- STEM Learning Ecosystems Indicators Tool
- National Community of Practice Surveys

Participating STEM Learning Ecosystems

- 37 Communities Representing 22 States plus District of Columbia
- Nearly 16 Million PK-12 Students
- Over 1,000 Out-of-School and Informal Partners
- 665 School Districts Representing Rural, Urban and Suburban Areas
- Over 3,600 Business and Industry Partners
- 600,000 PK-12 Teachers and Informal Educators
- Nearly 100 Local/Regional Philanthropic Organizations
Year One - Milestones & Accomplishments

Goal #1: Identify STEM Learning Ecosystems
- 187 communities on outreach webinars
- 69 communities invited to submit a RFQ
- 50 communities submitted RFQs
- 27 Ecosystems selected

Goal #2: Support cultivation through technical assistance
- 12 TA Leads plus 7 content experts
- 3,100 hours of individualized TA provided
- Over 900 stakeholder responses to community asset surveys
- 12 communities awarded planning grants
- 24 funder engagement meetings

Goal #3: Develop National Community of Practice
- 145 attendees at Fall CoP
- 143 attendees at Spring CoP
- 8 content specific webinars
- Plan Leadership Institute for Summer 2016
  (124 attended)

Goal #4: Inform the STEM Field
- Launched public facing website
- Monthly newsletters
- Launched internal Google Platform for CoP
- Launched social media

Brief History of Initiative

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**Timeline and Activities**

**2015**
- **6|15** Launch at Clinton Global Initiative
- **7|15** Open Request for Qualifications
- **8|15** Selection of 27 STEM ecosystems
- **11|15** CoP Kick-off at the White House

**2016**
- **3|16** 2nd CoP Chicago, IL
- **4|16** Solicitation for Year 2
- **5|19** Announce at U.S. News STEM Solutions
- **7|13** Leadership Institute Newport Beach, CA
- **10|17** 3rd CoP Denver, CO

**2017**
- **1|3** Solicitation for Year 3
- **4|24** 4th CoP Tampa, FL
- **5|24** Announce at U.S. News STEM Solutions
  - **Summer** LEAD STEM
  - **Fall** 5th CoP TBD

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**STEM Learning Ecosystems for 2016**

37 Communities…and Counting

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Year One
LESSONS LEARNED

What It Takes- Checklist

1st Stage: (Threshold)
- Anchor/project leader
- Do they have capacity...Admin support/funding
- It’s all about the Architecture/System!!

2nd Stage: (Demonstrate Success)
- Start Small
- Identify defined area/region to start
- Enlist the right Key Partners onto the bus
- Engage in “community design”...build buy-in, consensus & commitment
- Create Logic Model/Implementation Plan

3rd Stage: (The Work)
- Launch the ecosystem work (demonstration)
- Have a SMART Focus
- Recognize it’s a “slog”
- Share successes and challenges, internally & externally

4th Stage: Replicate/Expand
1st: “THE SLOG”

The Evolution of a STEM Learning Ecosystem

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 learning platforms

2nd: “The Focus”

STEM Ecosystem Elements

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 (Barriers, interventions, outcomes, connections)
- Implementation Partners
- Steering Committee
- Formal Ed
- National Centers
- Youth Development Entities
- After-school and Summer STEM Programs
- Leveraging Existing networks
- State STEM Network
- State After-school Network
- Higher Ed
- Business
- Community

**Activities**
- Develop Technical Support (PL/PD)
- Develop and implement program support and professional development
- Develop and implement program support and professional development matrix based on three levels of technical assistance
- Develop and Implement Communities of Practice
- Develop effective STEM resources
- Assist in defining effective STEM programs for programs, policies, supports, training and evaluation programs

**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 Community of Practice
- Types of STEM resources introduced by communities
- Number of effective STEM programs
- Evaluation findings

**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 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

4th: Strategies - Third Rail!

- **EVERY Ecosystem wants to decide what it wants and needs**
- **Bottom up...NOT prescriptive top-down**

Curriculum Pathways, Career Pathways, Educator PL/PD, Workforce Development, Equity & Access, After School Programming, etc...
How to Cultivate a STEM Learning Ecosystem

APPROACH

Key Building Blocks
How We Cultivate the Ecosystem

1. National Community of Practice
2. Technical Assistance/Community Coach
Participation Benefits

National Community of Practice
- 37 communities from across the country

Technical Assistance

National Convenings

Community Website

Peer Developed Resources

Monthly Webinars

Coaching

Peer Mentoring

Tools & Assessments

Resources

Initiative Timeline

Year One
- Become member of the National Community of Practice. Attend 2 convenings, monthly webinars, online community, and practice groups.
- Receive coach and onsite technical assistance customized to your community.

Year Two
- Continue membership of the National Community of Practice. Attend 2 convenings, monthly webinars, online community, and practice groups.
- Continue coaching via calls and webinars.

Year Three and Beyond
- Continue membership of the National Community of Practice. Attend 2 convenings, monthly webinars, online community, and practice groups at membership cost ($2,000).
- Graduate from Technical Assistance. (No coaching or technical assistance unless requested and paid for by the community.)
Application Process

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Application Timeline

January 3, 2017
- Launch Online Interest and Application Process

February 21, 2017
- Webinar: Application Technical Assistance

May 24-25, 2017
- Announce awards at US News STEM Solutions Conference

January 31, 2017
- Webinar: Overview of the Initiative

March 15, 2017
- Applications due via Online Portal
Application Process

• Complete the brief Online Interest Form at www.stemecosystems.org.

• Participate in two webinars about Initiative: (All webinars will be posted at www.stemecosystems.org.)
  ◦ Initiative and Application Process Overview Webinar #1 – Tuesday, January 31, 2017 at 10:00am PT | 11:00am MT | 12:00pm CT | 1:00pm ET. The webinar will be approximately 60 minutes.
  ◦ Application Process Technical Assistance Webinar #2 – Tuesday, February 21, 2017 at 10:00am PT | 11:00am MT | 12:00pm CT | 1:00pm ET. The webinar will be approximately 60 minutes.

• Complete and submit application, including all supplemental materials via the online form by 5:00pm PT on Wednesday, March 15, 2017.

Application

• The application process is designed to:
  ◦ (1) be collaborative in nature and
  ◦ (2) provide an opportunity for you and your partners to understand your community’s level of readiness for potential inclusion into STEM Funders Network STEM Learning Ecosystems Initiative

The STEM Funders Network is seeking to understand your community’s interest and honest assessment regarding your level of readiness in cultivating a STEM Learning Ecosystem.

We encourage communities in all stages of ecosystem development to apply.
Application Checklist

• Pre-Application
  ◦ Submit online interest form on www.stemecosystems.org.
  ◦ Attend both technical assistance webinars (See Webinars for more information).
    ◦ Tuesday, January 31, 2017: Initiative and Application Process Overview Webinar #1
      10:00am PT | 11:00am MT | 12:00pm CT | 1:00pm ET
    ◦ Tuesday, February 21, 2017: Application Process Technical Assistance Webinar #2
      10:00am PT | 11:00am MT | 12:00pm CT | 1:00pm ET

• Application Process
  ◦ Create Account for Online Application at www.stemecosystems.org
  ◦ Complete and Submit Online Application Components:
    ◦ Applicant Summary
    ◦ Your STEM Learning Ecosystem Snapshot
    ◦ Readiness Assessment
    ◦ Key Partners
    ◦ Elements
    ◦ Focus Areas
    ◦ Priority Areas
    ◦ Initiative Expectations

Frequently Asked Questions

• Who Can Apply?
  ◦ A Community (p. 10, Applicant Criteria)

• Who is eligible to apply on behalf of the Community?
  ◦ “The lead applicant shall be determined by the community-based ecosystem, and there shall be only one
    application per community” (p. 10, Applicant Criteria, Type of Organization)

• What is a “Community”?
  ◦ “At a minimum, Formal PreK-12, Out of school, stem based organizations, business, higher ed, local or reg’l
    funder, and community/family” (p. 10, Applicant Criteria, Type of Organization)

• Is this a grant program?
  ◦ “This is not a grant program but an opportunity for communities to join nearly 40 other STEM Learning
    Ecosystems in a National Community of Practice and two years of individualized technical assistance and
    coaching. (p. 8, Part III Participation Requirements)

• What happens after two years of participation?
  ◦ “Beginning in Year Three, communities will remain members of the National Community of Practice with all
    participants’ benefits at membership cost, $2,000. (p. 7, Initiative Approach)

• Who can I contact if I have a question?
  ◦ “Questions? Email info@stemecosystems.org. We will return your email within 24 hours.”
Participation Requirements

Administration:
- Completion of an annual letter of expectation outlining participation benefits and expectations of sites.
- Provide and maintain contact information for all identified leads.
- Send out information to Ecosystem members, when necessary

Coaching:
- Actively engage with the assigned coach and the technical assistance team throughout the course of the initiative period.

Active Participation:
- Attend the two National Community of Practice convenings.
- Participate on the monthly Community of Practice Webinars.
- Sign-up on the internal online community website and actively engage including participating in online Community of Practice discussions and practice groups as relevant to your work.

Deliverables:
- Administration of the STEM Learning Ecosystems Indicators Tool virtually within the first 60 days and again in month 10 and a brief final narrative of the results due by June 1.
- Completion of a draft STEM Ecosystem Planning Template by June 1.

The Why?

(IMPACT)
**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.

**Questions & Answers**