Collaboration Models for K-12 STEM: How to Leverage Foundation Resources

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Role of Philanthropy in STEM Education Initiatives
What is STEM EDUCATION?

- **STEM Education** refers to the teaching and learning of these disciplines usually in a trans-disciplinary fashion to a level of rigor at least sufficient for college readiness *without remediation* and the “T & E” informs the “S & M”.

- A student's high school experience with STEM coursework has proven to be an important indicator for overall college readiness, postsecondary success, and preparation for STEM careers.

- But the numbers are cause for concern. Of the 1.9 million students who enrolled in college, only 1.3 million were ready for college-level STEM work without remediation, and less than 280,000 intended to major in STEM-related fields.
What is STEM EDUCATION?

The special significance of STEM education, and its challenges, has led to three primary areas of focus:

- **Student achievement in STEM** disciplines in high school is among the strongest predictors of success in college. Consequently, the effort to develop more effective teachers in math and science, as well as new STEM curricula and classroom assessments, will offer greater opportunity for youth.

- STEM disciplines pose some of the highest barriers to college readiness for students, especially students from disadvantaged and underserved backgrounds. And yet STEM study, when taught well, can be powerfully motivating for students, engaging and nurturing their natural curiosity about how their world works.

- The **STEM education challenge**—and the concerns it raises about U.S. economic competitiveness—has provoked the nation’s STEM experts, innovators, and leaders to get more directly involved in developing solutions. The STEM sector’s engagement on education reform issues and its efforts to help school systems incubate, pressure test, and adopt effective innovations are a critical factor in improving student achievement.

Source: Bill and Melinda Gates Foundation 2011
The Problem: A Leaky Pipeline

STEM Pipeline — Leaking Badly

In 2001, there were a bit more than 4 million 9th graders. Four years later, 2.8 million of them graduated and 1.9 million went on to two- or four-year college; only 1.3 million were actually ready for college work. Fewer than 300,000 are majoring in STEM fields and only about 167,000 are expected to be STEM college graduates by 2011.

Source: NCES Digest of Education Statistics; Science & Engineering Indicators 2008
The Problem: Being Shut Out of STEM Careers

Ethnic Percentage* of Students in STEM Education System

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>STEM Bachelor’s Degrees 2005</th>
<th>STEM Graduate Students 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary Resident</td>
<td>3.9%</td>
<td>25.2%</td>
</tr>
<tr>
<td>Other, Unknown</td>
<td>6.2%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Asian, Pacific Islander</td>
<td>9.2%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7.6%</td>
<td>18.1%</td>
</tr>
<tr>
<td>African American</td>
<td>8.4%</td>
<td>15.5%</td>
</tr>
<tr>
<td>White</td>
<td>64.6%</td>
<td>59.9%</td>
</tr>
</tbody>
</table>

% of Population

* Numbers do not add to exactly 100 percent because of rounding and variation in reporting ethnicity.
Source: Science and Engineering Indicators, 2008
Theory of Action: Scaling Innovation Through Managed Networks

Three key elements…

1. Investing in key states that can creatively apply their own intellectual and scientific, technical and corporate and financial to leverage and sustain multiple STEM approaches.

2. Connecting these states and other partners through active networking designed to learn, capture and distribute innovation and change behavior.

3. Funding national advocacy through a coalition of outstanding champions that range from corporate executives and political leaders to Nobel Laureates.
Theory of Action: Outcomes Aligned with College Ready and Post-Secondary Success

- College Readiness
- Equity
- Economic Competitiveness
- Teaching Effectiveness
- Knowledge Capture and Transfer
- “Real” Science, Technology, Engineering and Mathematics

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Many states across the U.S. have developed or are beginning to develop statewide networks that help create the architecture and infrastructure for advancing STEM policies, best practices, and industry alignment.
Examples of Philanthropic Involvement

Bill & Melinda Gates Foundation

Intel

Battelle

Samueli Foundation

Lockheed Martin

S. D. Bechtel, Jr. Foundation

Stephen Bechtel Fund

TIES

Teaching Institute for Excellence in STEM
Where do I get started?
Identifying a need at your school
Getting Started

- Start with a specific need and identify a realistic solution
- Develop a goal and key objectives for your project
- The need, solution, goal, project, and assessment must all match
Beginning with the Need
The “how” and “why” funders should invest

Strategies
Why do you believe your program will work?

Assumptions
Why will your approach be effective?

Influential Factors
What influential factors could influence change at your school?

Problem or Issue
What issues/problems are you striving to address?

Community Needs/Assets
What needs or assets led you to address this issue?

Desired Results
What are your desired results?

Source: Theory-of-Change Template from the Logic Model Development Guide developed by the W.K. Kellogg Foundation.
Defining your Project

Your Solution to the Issue

- Project Title
- Purpose
- Resources
- Target Audience
- Goals
- Objectives
- Desired Results
- Evaluation
- Budget Timeline

Once the “need” is identified, the project elements help organize and support your solution (i.e., project) to the issue.
I have an idea, now what?

Identifying funding sources that meet your goal
Getting to Know Foundations

- Look for a match between your project and the grants you seek by looking for consistency between the purpose and goals of your project and the funder
  - Review website
  - Review list of previously funded projects
  - Review annual report
  - Review 990s
Contact the Funders

- Think of the funder as a resource
- Some funders offer technical assistance, others do not. If it’s available, ask for technical assistance, including a review of proposal drafts
- Inquire about how proposals are reviewed and how decisions are made
- Remember, the contacts you make may prove invaluable in the future

A Few Places to Start Researching

**Broad Search**
- GuideStar [http://www2.guidestar.org/](http://www2.guidestar.org/)

In addition to foundations, research national or local professional organizations related to specific academic disciplines (National Science Teachers Association, National Council of Teachers of Mathematics, National Action Council for Minorities in Engineering, International Technology and Engineering Educators Association, etc.)

**Local Search**
- Contact your local Chamber of Commerce for information STEM related businesses in your area
- Contact your District for information on local educational groups in your area
- Start of list of non-profits who serve your area
I found a grant, now what?
Review guidelines and begin to write your proposal
Review Proposal Guidelines

- Read guidelines carefully
- Guidelines tell you all:
  - submission deadlines
  - eligibility
  - format: award levels forms, margins, spacing, evaluation process and restrictions on the number criteria of pages, etc.
  - review timetable
  - budgets
  - funding goals and priorities
  - award levels
  - evaluation process and criteria
  - whom to contact
  - other submission requirements
Application Exercise: Broadcom Foundation

Broadcom Foundation's mission is to advance education in science, technology, engineering and mathematics (STEM) by funding research, recognizing scholarship and increasing opportunity.

Broadcom Foundation funds on the following:
- STEM Education
- Health
- Human Services

http://www.broadcomfoundation.org/apply/#community_engagement
Group Reporting