Models for Science Centers as STEM Conveners Proceedings

At the Models for Science Centers as STEM Conveners workshop, the Carnegie Science Center opened its doors to science center and museum leaders from around the country, showcasing the Carnegie Science Center Chevron STEM Center as a model for other institutions looking to become STEM conveners in their own communities.

The workshop was in three parts and featured presentations from Carnegie staff, a panel with the Chevron STEM Center community partners, and a period of reflection and discussion that allowed participants to share their reactions to the Carnegie model.

All materials from the workshop, including recordings of Carnegie staff presentations and electronic copies of handouts and supplemental materials, are available online. For more information, please contact the ASTC professional development team at profdev@astc.org.

The Carnegie Model

Carnegie Science Center co-directors Ron Bailie and Ann Metzger offered an overview of the science center and of the strategic planning process that went into the creation of the Chevron STEM Center. The process included identifying a regional need; an internal assessment of capabilities, opportunities, and priorities; identifying stakeholders and partners; and articulating a vision for the STEM center.

![Figure 1. The process for establishing a STEM center.](image-url)
Regional Need
- Growth in regional STEM employment opportunities
- Lower unemployment in STEM sector
- Teachers are ill-equipped to inspire students about STEM
- Students opt out of math and science
- Students and parents are unaware of STEM careers

Internal Capabilities, Opportunities, and Priorities
- Strong onsite attendance
- Far-reaching external impact
- Great established educational programs and partnerships
- Ability to serve as a neutral convener and regional safe haven
- Strong community support and funding
- Strong positive identity
- Growing community awareness of the need for effective STEM education
- Outreach to women and minorities, who are underrepresented in STEM careers
- STEM programs focusing on workforce development

Stakeholders and Partners
- Existing partnerships around National Engineers Week, Pittsburgh Regional Science & Engineering Fair, Girls, Math & Science Partnership, SciTech Festival
- Science center already at the intersection of formal education, the community (including parents), students, and industry.
- Founding partners included California University of Pennsylvania, Duquesne Light, Eaton Corporation, Kennametal, LANXESS Corporation, NOVA Chemicals, PPG Industries Foundation

Vision – Four Pillars
- Collaboration
- Great Teaching
- Inspired Learners
- Committed Community

The co-directors also identified several of the defining attributes that have contributed to the center’s success:
- The STEM Center is a concept, not a place.
- It is a cross-department initiative with its own funding sources.
- The initiative is supported by a comprehensive branding campaign.
- STEM means workforce pipeline.
- The center has a strong relationship with area teachers and teacher educators and a focus on relating programming to standards.
- The STEM center is supported by a dedicated advisory board of community partners, with a focus on a collaborative effort to tackle programs that are beyond any one organization, minimizing competition. The board includes representatives from corporate, foundations, preK-12 education, higher education, and other STEM education initiatives.
Presentations from Linda Ortenzo (Director, STEM Programs) and John Radzilowicz (Director, Science & Education) followed, detailing the work the Chevron STEM Center has undertaken, building on each of its four pillars.

**Figure 2. The four pillars of the Carnegie Science Center Chevron STEM Center**

- **Collaboration**
  - Many regional partners to plan and implement programming
  - New STEM advisory sets direction and focus

- **Great Teaching**
  - Teacher Excellence Academy
  - STEM education endorsements for schools

- **Inspired Learners**
  - Wide range of student-focused programs
  - Intensive career-focused experiences
  - Special focus on girls, minorities, and early learners

- **Committed Community**
  - STEM resources mapping
  - Science Impact Newsletter
  - Public awareness campaign

**Community Partners**
The Chevron STEM Center’s community partners were also present and shared their motivations for working with Carnegie Science Center. Although the panelists represented a diverse array of partner organizations, there were several points of agreement on the benefits of the partnership, including opportunities for community engagement that are highly valued by their current workforce and access to diverse audiences through science centers.

**Bruce Niemeyer**
Vice President, Appalachian/Michigan Strategic Business Unit, Chevron American Exploration Production

> “In our case, it came through [the policy, government, and public affairs department]. It got started with [a different program], but that’s not what we were looking for, so we started talking to the science center and things went from there. We started in our place and went somewhere else.”

**Audrey Russo**
President & CEO, Pittsburgh Technology Council

> “It’s part of our fiber; [the value of what we’re doing] never gets questioned. Every time we do something by bringing in thought leaders or provide pathways for talking about the gap or the next generation of skills and what it means to be committed, no one disputes that and everyone wants to do more.”

**Winifred V. Torbert**
Program Director, Educational Partnerships, UPMC Center for Inclusion in Health Care

> “We’re providing experiential learning opportunities for students who otherwise don’t have the opportunities.”

**Judith Hallinen**
Assistant Provost for Educational Outreach, Carnegie Mellon University

> “We’re also guaranteed to get a diverse audience at the science center... [in considering Broader Impacts for NSF proposals], we can put a letter of support from the science center in our faculty’s proposal and know that audience will include underserved populations.”

**Charles Kahle**
Chief Technology Officer, PPG Industries

> “Our workforce loves working with the science center. When we put out a request for volunteers, it’s filled in minutes. It’s a great motivational tool. I require 24 hours a year of volunteerism, and the majority goes to the science center.”

**Participant Reflections**
During the afternoon, participants were given time to reflect on the morning’s presentations and share their thoughts on strengths of and concerns about the model (both as presented and as they might implement it in their own institutions). They were then encouraged to brainstorm potential solutions to the concerns they identified, drawing on the model’s perceived strengths.

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<thead>
<tr>
<th>Strengths</th>
<th>Concerns</th>
<th>Solutions</th>
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<tbody>
<tr>
<td><strong>Science Center Operations</strong></td>
<td>Synergies among existing programs, leveraging existing relationships and reputation to form new partnerships, expertise and enthusiasm of staff</td>
<td>Fundraising challenges, staff capacity and training</td>
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<tr>
<td><strong>Partnerships</strong></td>
<td>New opportunities for collaboration rather than competition among stakeholders</td>
<td>Maintaining partnerships and collaborative spirit, lack of government involvement and support</td>
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<td><strong>Evaluation</strong></td>
<td>Relationships with university researchers</td>
<td>Quantitative measures for hard-to-quantify impacts, resources for longitudinal studies, consistent definition of STEM</td>
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<td><strong>Formal Education</strong></td>
<td>Providing students exposure to “real world” learning</td>
<td>Emphasis on high-stakes testing, connecting STEM programming to standards</td>
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