Partnering with the Informal Education Community: Outreach Opportunities

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A Question for You

- Can you recall your early memories that connect to your particular scientific research passion?

- Where were you, what were you doing?

Learning Opportunities

John Bransford at University of Washington did a study on how people's time is distributed among learning environments and found we spend:

- 18.5% of our time in formal learning situations in Grades 1-12.
- 7.7% of our time in formal learning situations as Undergraduates, and
- 5.1% of our time in formal learning situations as Post Graduate students.
- So, what kind of learning often takes place during the other hours of our day?

The Who, What, When and Where of Learning about Science

Formal Learning Environments:

- Pre-K-12 Schools, Undergraduate Colleges & Universities, Graduate Schools, Post-Doctorate appointments

Informal Learning Environments

- Museums/Science Centers
- Media and Distance Learning
- After School Programs
- University Outreach and
- Friends, family, home, and backyard . . .

Formal vs. Informal Learning

- In our society, we have traditionally differentiated learning in terms of the logistical environment in which it takes place.
- We think of learning that takes place in schools as “formal learning.”
- We think of learning that takes place outside of schools as “informal learning.”

Informal Learning

- But it's important to note that the term "informal learning" can get rather fuzzy and confusing.

- Sometimes it's interchanged with the term "**hands on learning**." This confusion often arises because it is differentiated from text book or lecture learning. Therefore, sometimes we think of active learning in classrooms as "informal learning activities."

Informal Learning

- For years people have tried to put labels on and define informal learning, and informal learning environments and organizations.

- Terms used include *non-formal learning*, *learning out-of-school*, *free choice learning,* etc.

Learning

- A way to clear this up, is to stop defining and looking at learning in terms of context, location, and style…

- Instead, what if we looked at the LEARNER as the point of focus?

Learning

- When it comes right down to it, learning is learning!
- Learning takes place within (and not outside) the LEARNER!
- And it can take place 24/7 across our entire lifetime!

A Landscape for Learning Science

- The learner moves across a rich landscape of learning opportunities in science, and as s/he does, s/he becomes engaged with and constructs understanding of scientific concepts.

- The learner connects “the dots” from his/her various learning opportunities.

Informal Learning Settings

- However, learning happens differently according to the variations in constraints and options among different learning opportunities and contexts.
- In terms of learning environments, some kinds of organizations and venues are set up to provide different kinds of resources and exploration time-frames.
- Often, they can provide authentic resources that are difficult or impossible to replicate in a classroom.

Informal Learning Settings

- **Science museums and centers** are often referred to as “informal learning settings” because of the active, object and phenomena-based learning opportunities they offer.
- There are other kinds of settings for informal learning such as those that take place through media. **Media learning opportunities** are often self-driven in terms of selection and engagement.
- After-school time can be opportunities for learning science. Participation in **after-school project and program opportunities** are also often voluntary and self selected.

Informal Learning Settings

- Decisions to visit and participate in informal learning opportunities are often self-selected or driven by family activities.
- Informal learning opportunities can also be folded into a formal education situation such as a school fieldtrip to an informal learning setting.

Reaching Out

- How can scientists/researchers take advantage of the many ways and places learning happens?
- One way is to make outreach a component of your projects.
- And a great way to do this is to collaborate with informal learning organizations and programs.

What are the Benefits of Collaboration with Informal Learning Environments?

- Collaboration can involve an investment of time and energy, so why bother?
- What does the researcher gain from such collaboration?

What's in it for the Scientist/Researcher?

- Reaching new audiences and building awareness of issues important in your research efforts/interests;
- New approaches and skill development for communicating your research;

What's in it for the Scientist/Researcher?

- Gaining a public support base for your research goals and interests, and in turn;
- Influencing policy makers toward supporting your scientific research; and
- Helping to stimulate the next generation of STEM professionals.

Collaboration has Challenges

- Many informal learning organizations have a mission to work with and serve public audiences.
- Many of these organizations, such as science centers are eager to work more closely with scientists beyond those on their own staff to help them fulfill their mission.
- Many scientists are eager to work with science centers, but often are uncomfortable working with the public.

Meeting the Challenges

- There are a number of projects and programs out there that are investigating ways to best meet the challenges that arise with such collaborations.

- One such outreach project is called “Portal to the Public.” It is being funded by NSF, and is being carried out at Pacific Science Center in Seattle, Washington and its partner institutions around the country.

Portal to the Public

PSSC describes Portal to the Public as:

"a proven, scalable guiding framework for Informal Science Educators to engage scientists and public audiences in face-to-face interactions that promote appreciation and understanding of current scientific research and its application."

http://www.pacsci.org/portal/

Portal to the Public

- Pacific Science Center has created a video on YouTube to help describe and build awareness of this program at:

http://www.youtube.com/watch?v=BLJGrKx8LY4

Another Example of University-Science Center Collaboration: C3

- ***Communicating Climate Change (C3)*** is another NSF funded project involving 12 science centers across the US.
- The New Mexico Museum of Natural History and Science is one of those participating science centers
- Friday 10:00-11:45 AM session G2, Communicating Climate Change: Science to Non-Scientists

Citizen Science Projects

- Many of the C3 science centers have chosen to do Citizen Science projects, where they involve the public in investigating local issues that may be related to climate change.

- Citizen Science are projects that encourage the public to help support the work of scientists, but it requires buy in on both sides.

Citizen Science Projects

- One example of this is the C3 related work happening at the Chabot Science Center, in Oakland California.
- Chabot has a current exhibition on Climate Change, and additionally, for their C3 Citizen Science work, they are focusing on issues around redwood trees and climate change.
- In order to take on related research with their public, Chabot sought to work with scientists at UC Berkeley

Citizen Science Projects

- Challenges arose such as issues of time or incentive for the senior scientists to work directly with this group.

- However, when the senior scientists’ agreed to make their graduate students available for this, this proved to be most successful all around.

Challenges to Partnerships

- *Portal to the Public* and *C3* are both exciting and meaningful in nature; but they also highlight that partnerships among scientists and informal organizations such as science museums can meet challenges.

- Partnerships of any kind (including those with the formal education community) also face potential challenges.

Challenges to Partnership

- What are the issues when partnering across different kinds of organizations and cultures?
- Do we speak the same language? What are the differences in organizational culture, systems, and agenda?
- How do we find the common denominator so that it will be a win-win situation?

Challenges to Partnership

- Have any of you ever partnered with an informal learning organization?
- Can you identify the benefits?
- Did any issues arise that you needed to resolve?

Creating a Check-list for Entering an Outreach Partnership

- We have developed a couple of hypothetical scenarios for outreach and collaborations.
- As we've talked about collaborations with both the formal and informal communities today, we invite you to chose one of these groups on which to focus for a group brainstorming process.
- We'd like you to take some time to brainstorm around one of these projects and discuss the areas that need to be explored with your outreach audience to maximize a successful achievement of your project goals.
- What questions should be asked up front? What do you need to know about your audience? What do they need to know about you?

Creating a Check-list for Entering an Outreach Partnership

- We'd like you to take some time to brainstorm around one of these projects and discuss the areas that need to be explored with your outreach audience to maximize a successful achievement of your project goals.

- What should be on your check-list? What questions should be asked up front? What do you need to know about your audience? What do they need to know about you?

Questions to Address when Entering a Partnership

Issues to consider include:

- (1) Time and resource expectations and responsibilities;
- (2) Financial systems and how money gets managed;
- (3) Perception and understanding of cultural traditions and values;
- (4) Commonalities (and differences) in language, vocabulary, and meanings;
- (5) Possible differences in understanding of project requirements such as assessment and evaluation;
- (6) Relationships that need to be developed;
- (7) Communications systems in place or needing to create; and
- (8) Possible differences in follow-up expectations and investments (such as time, resources, intellectual capital, etc.)

You may think of more that should be added to this list.

Scenario #1

Scenario for Collaboration with Formal Education

- Researcher with grant focused on water quality has included in the proposal, an intent to do outreach to students in local school district.
- The outreach component of the grant has the stated goal of increasing interest in chemistry among high school students.
- Researcher believes that an effective form of engaging students in chemistry is to get students to outdoor field sites for water quality testing where they can take part in hands-on experiences with water testing.

Scenario #2

Scenario for Collaboration with Formal Education

- The researcher has a grant in which the investigations yield large quantities of data about snow melt.
- The goal of the proposed outreach work is to increase students' familiarity and facility with using data to solve real problems.
- Researcher would like to work directly with the students but is ultimately impacted by his/her limited, valuable time. A solution would be to work with teachers to do this, and thus increase the numbers of students doing activities that incorporate the use of real data.
- Researcher feels that it would be useful to develop an educational module for incorporating the use of real data into science classes, and have teachers implement that module.

Scenario #3

Scenario for Collaboration with Informal Education

- Researcher wants to get elementary school aged kids involved in after-school science activities in his/her field of interest.
- Researcher is not sure how to access students during out of school time, but is considering working with the local science center.
- Researcher is also not sure of what kinds of activities to conduct, but is looking for help with this from the science center education staff.
- At present there is no funding to do this, but an RFP that encourages outreach and partnership with informal organizations is available in his/her research area, and development of that proposal would provide an opportunity for funding.