Evaluation 101

Everything You Need to Know to Get Started Evaluating Informal Science Education Media

Saul Rockman and Jennifer Borse - Rockman et al
This presentation is largely based on:

And our website:
http://evaluationspringboard.org/science
Two perspectives:

The P.I.  

The Evaluator
Why do an evaluation?

• Ensure that your product/program is successful…and…

• Prove that it is successful!
What you used to think was a necessary evil....

still is!
What is an evaluation?

- Ensure that your product/program is successful...and...

- Prove that it is successful!
“Evaluation is not just for preparing good proposals, it is also an integral part of running good projects.”

Chapter 1: Intro to Evaluation

Formative Evaluation

Focused on development and improvement of a project

• Are components of the project being carried out as intended? If not, what has changed and why?

• Is the project moving according to the projected timeline?

• What is working well? What are the challenges?

• Is the budget on track?

• What needs to be done to ensure progress according to plan?
Summative Evaluation

Measures the outcomes and impacts of a project:

• Were the project’s goals met?

• What components of the project were most effective?

• What specific impacts did the project have on intended audiences (as well as secondary audiences)?
## Summative Evaluation: Informal Education and Outreach Framework

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Public Audiences</th>
<th>Professional Audiences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awareness</strong>, knowledge or understanding (of)</td>
<td>STEM concepts, processes, or careers</td>
<td>Informal STEM education/outreach research or practice.</td>
</tr>
<tr>
<td><strong>Engagement</strong> or interest (in)</td>
<td>STEM concepts, processes, or careers</td>
<td>Advancing informal STEM education/outreach field</td>
</tr>
<tr>
<td><strong>Attitude</strong> (towards)</td>
<td>STEM-related topic or capabilities</td>
<td>Informal STEM education/outreach research or practice.</td>
</tr>
<tr>
<td><strong>Behavior</strong> (related to)</td>
<td>STEM concepts, processes, or careers</td>
<td>Informal STEM education/outreach research or practice.</td>
</tr>
<tr>
<td><strong>Skills</strong> (based on)</td>
<td>STEM concepts, processes, or careers</td>
<td>Informal STEM education/outreach research or practice.</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Project specific</td>
<td>Project specific</td>
</tr>
</tbody>
</table>

Three Big Questions:

1. Are you doing what you said you were going to do?

2. How well is it (the project, program, or initiative) going?

3. Does what you are doing have an impact?

See NSF Framework Chapter 3
For more info about “impact.”
Now you’re ready to start!
Chapter 2: Doing an Evaluation

Step 1: Prepare

- Set the stage
- Gather background information
- Develop a Logic Model

And don’t forget your Stakeholders!

Background

Logic Model: What’s going to happen and why?
Logic Model for the ISE Program

**INPUTS**
- NSF
- Grant recipient
- Collaborators and consultants
- Other stakeholders

**ACTIVITIES**
- Activities that Target Public Audiences
  - Mass Media Exhibits Learning Technologies
  - Youth/Community Programs
- Activities that Target Professional Audiences
  - Seminars/Conferences
  - Professional Development Materials/Publications

**OUTPUTS**
- Number of viewers
- Number of visitors
- Number of users
- Number of participants
- Number of attendees
- Number of members
- Number of users

**OUTCOMES**
- Awareness, knowledge or understanding of STEM concepts, processes or careers
- Engagement or Interest in STEM concepts, processes or careers
- Attitude towards STEM-related topics
- Behavior resulting From engagement
- New skills based on engagement

**STRATEGIC IMPACTS**
- New knowledge practices that advance the informal education field
Chapter 2: Doing an Evaluation

Step 2: Design Plan

• Framing questions
  Identify key questions that will guide the evaluation -
  What do you want to know (Remember the 3 Big ?’s)
  Consider: Audience, Resources, and Time

• Organizing tools
  **Constructs:** concepts that can be measured
  **Indicators:** examples of success that can be measured
Intended Impacts, Indicators and Evidence
### Alignment of Research Questions, Constructs, and Data Sources for a Youth Media Program (NSF)

<table>
<thead>
<tr>
<th><strong>Research Questions</strong></th>
<th><strong>Constructs</strong></th>
<th><strong>Data Sources</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formative assessment</strong></td>
<td>Are the program components and activities of the Science and Technology Program (STP) being implemented as planned?</td>
<td>Integrity of implementation, supports, barriers, intended vs. enacted curriculum</td>
</tr>
<tr>
<td>What is the impact of participating in the STP Digital Technology Institute on participant media and technology engineering craft skills and competence?</td>
<td>21st Century Skills as applied to production and media literacy</td>
<td></td>
</tr>
<tr>
<td>What is the impact of STP Science Desk on the development of participant journalistic skills, deepened understanding of science issues, and broader community awareness?</td>
<td>Media literacy, science content knowledge, social responsibility/community awareness, science-in-society knowledge</td>
<td></td>
</tr>
<tr>
<td>What is the impact of the STP peer-mentoring program on the development of mentoring skills and responsibility of peer mentors?</td>
<td>Pedagogical content knowledge, interpersonal skills, empathy</td>
<td></td>
</tr>
<tr>
<td>What is the impact of the STP program on the interest and engagement of participants in STEM activities, courses-of-study, and careers?</td>
<td>Attitudes toward science and technology, awareness of and interest in science careers</td>
<td></td>
</tr>
<tr>
<td>What is the impact of all of the aforementioned features (i.e., skills, knowledge, mentoring and interest) over time? For instance, are there different levels of interest that emerge among students and different tracks that they take? What does attention to STEM issues look like over the course of the program?</td>
<td>Change over time, behaviors related to exposure to science (e.g., course of study choices, career interests, attention to science in the news, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

** Existing instrument in use by the youth media program
Step 3: Select Methods

What you measure with depends on what you are measuring.
Step 3: Select Methods

**Quantitative**
- Surveys or questionnaires
- Objective tests of comprehension
- Gate counts, television ratings, website hits
- Time spent in exhibits
- Number of posts to a website or comments/questions

**Qualitative**
- In-depth interviews
- Focus Groups
- Observations
- Analysis of authentic data, user/visitor created products

- Analyze a large quantity of data
- Findings are more generalizable
- Get a more in-depth understanding
- Helps with interpretation of quantitative data
Chapter 2: Doing an Evaluation

Tips

Think about what you want to know and be able to say at the end of your evaluation.
Chapter 2: Doing an Evaluation

Tips

Consider what data you may already have access to, i.e., Existing Data:

• Gate counts
• Website hits and tracking data
• Television ratings
• User-created products
• Data from past research or evaluation efforts
Chapter 2: Doing an Evaluation

Tips

Don’t limit yourself to one method - consider using Multiple Methods

Mixed Methods Evaluations
Chapter 2: Doing an Evaluation

Step 4: Collect Data

Surveys

- Types of questions
- Word Choice
- Sampling
- Pilot!
- Anonymity
- Personal questions
- Keep it short
- Strategies for collection
Types of Survey Questions
Step 4: Collect Data

Assessments

A    B   C   D    E

Get your #2 pencils ready!

Objective assessment: only one right answer

Subjective assessment: more than one correct answer
Step 4: Collect Data

Interviews & Focus Groups

- Structured vs. In-Depth
- One-on-one or pairs
- Small group (8-12)
- Find group consensus
- Encourage diversity in responses
Chapter 2: Doing an Evaluation

Step 3: Collect Data

Observations

• Who, What, Where, When, How?
• Use a rubric or structured protocol to ensure consistent data collection
Chapter 2: Doing an Evaluation

Step 5: Analyze Data

• Quantitative
  • Prepare the data: code, enter, and check for errors
  • Run analyses: what differences and patterns do you see?

• Qualitative
  • Coding - start general...then get more specific
  • Use instruments and goals to guide analysis

• Integrate/Synthesize
  • Use data from different sources to get the big picture and draw conclusions
Step 6: Take Action!

• Report
  • Clear and concise; provides adequate evidence for claims and enough explanation to make sure readers understand your interpretation of the data
  • You don’t have to report on every piece of data or every finding: Know when to say when!

• Make Recommendations/Changes
  • Be specific
  • Plan for further evaluation after changes are made
**Evaluation Springboard** responds to the need for knowledge and skills in evaluation for those who want to undertake or commission evaluations of informal science education projects.

While evaluation is about "doing something, it is important to understand what happens in real life. Often it is the case that decisions have to be made under pressure of time and need, where the project is so new that there is no past experience to gather information that can be used for the implementation of the improved evaluation.

We hope that this website provides a starting point for launching your own evaluation efforts. A basic understanding of the evaluation process is the key to determining the future of science projects.

**Getting Started**

**What is an Evaluation?**

As greater demands are placed on evaluation—check on progress, make changes, build powerful projects, you will need a basic understanding of the evaluation process that helps you and your project.

**THREE BIG QUESTIONS**

To simplify the concept of evaluation, but there are many labels used to describe the process of evaluation, but there are some key concepts that are worth knowing about.

1. What are the goals of your project?
2. How well are the goals being met?
3. What are you doing to meet these goals?

**Lab 1: Building a Logic Model**

A logic model is a visual way of showing how you believe (or your theory behind how) your project will work to solve a problem.

**Key Information:**

In a logic model, you describe and depict the relationship among these project factors:

**Inputs / Resources**

What materials, money, staff, and other assets are available and necessary for the project’s operation?

**Actions / Activities**

What needs to be done to achieve the project goals?

**Outputs**

The benefits of using a logic model include:

- Identifying missing or unclear factors
- Clarifying the project’s assumptions
- Understanding the project’s target audience

**Think About**

Think about a project that you would be interested in evaluating (or use one of the Case Studies you read). What are the goals or objectives of this project?

**Question 2**

What data and information already exist? What are the sources?

**Question 3**

Is a logic model needed for this project? Why?