Communicating Climate Change Evaluation Webinar
June 15, 2010

C3 Evaluation Webinar

Overview

♦ Impact Evaluation – Background
♦ Development of C3 Evaluation Measures Document
♦ Discussion: Science Center Evaluation Questions & Needs
♦ Using the C3 Evaluation Measures
♦ Additional Q & A
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Background: Types of Evaluation

- Front-End evaluation
  
  What are common misconceptions about the science of climate change among visitors to science centers?

- Formative evaluation
  
  How does the experience enhance the visitor’s understanding of the climate change science content? -- What components are confusing?

- Summative evaluation/Impact evaluation
  
  Are visitors more likely to report that they understand the climate change science content after participating in the experience?

Background: Impact Evaluation

- Requires us to think about what impacts we want to achieve.

- Informs changes to our own programs/services and the larger field (strategic impact).

- Requires us to identify measures to assess impacts.
Background: Where Impacts Happen…

1. **Resources/Inputs**: Things dedicated or consumed by the program.
2. **Activities**: What the program does with the resources.
3. **Outputs**: The direct products of the activities stated (the results of the process).
4. **Outcomes/Impacts**: Benefits/changes to audience after participation.

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Background: Impact Evaluation & the ISE Field

*Framework for Evaluating Impacts of Informal Science Education Projects (NSF, 2008).*

- Expectations for ISE summative evaluations
- Examples of alternative evaluation approaches
- Categories for project impact
  - Awareness, knowledge, or understanding
  - Engagement or interest
  - Attitude
  - Behavior
  - Skills
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Background: Impact Evaluation

Words to Know/Differentiate.

- Impacts
- Indicators
- Measures
- Instruments

Development of C3 Measures Document

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Short-term Impacts</th>
<th>Long-term Impacts</th>
</tr>
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<tbody>
<tr>
<td><strong>National-level</strong></td>
<td></td>
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<tr>
<td>- Develop project specifications for local demonstration projects</td>
<td>- Increase knowledge of concepts, methods &amp; tools of climate change research</td>
<td>- Develop a model for national collaboration to support ISE educational practices</td>
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<tr>
<td>- Host opening, prototyping &amp; curating workshops for 12 participating science centers &amp; partners</td>
<td>- Improve understanding of how the public learns about climate change</td>
<td>- Identify methods for using publicly-collected data as a foundation for ISE programs</td>
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<td>- Facilitate professional development &amp; networking among 12 participating science centers</td>
<td>- Build capacity to communicate about climate change</td>
<td>- Implement citizen science programs as science center-LTER partnership</td>
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<td>- Develop an interactive climate change map &amp; Resource Database</td>
<td>- Increase prioritization of climate change programming</td>
<td>- Implement hands-on demonstrations, exhibits, experiments, databases, &amp; family events at the science center</td>
</tr>
<tr>
<td>- Publish one article on each demonstration project in Natural History Magazine</td>
<td>- Improve ability to apply C3 communication strategies to other STEM topics</td>
<td>- Develop graphic displays of local data, including exhibits, programs, website content, &amp; podcasts</td>
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<td>- Produce video content for distribution by ABC news</td>
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| **Local-level** | | |
| - Establish science center partnership | - Increase the public’s understanding of the essential principles and concepts about weather and climate | - Increase the public’s understanding of the scientific process |
| - Host launch event | - Increase the public’s ability to communicate about climate change in a meaningful way | - Increase the public’s skills related to using measurement instruments, following data collection protocols, and analyzing data |
| - Implement citizen science programs as science center-LTER partnership | - Increase the public’s motivation to take action to reduce climate change | - Increase the public’s motivation to take action to reduce climate change |
| - Implement hands-on demonstrations, exhibits, experiments, databases, & family events at the science center | | |
| - Develop graphic displays of local data, including exhibits, programs, website content, & podcasts | | |

Development of C3 Measures Document

C3 Public Audience Impacts:
Impact 1. Understanding of the scientific process
Impact 2. Skills for collecting & analyzing data
Impact 3. Understanding the essential principles & fundamental concepts of weather & climate
Impact 4. Understanding the impact of climate change
Impact 5. Ability to make scientifically informed decisions to reduce climate change.
Impact 6. Motivation to take action to reduce climate change.

Guidelines for Selecting Measures:
- Appropriate measure for the Impact
- Validity & reliability data available, where possible
- Comparison data available, where possible
Discussion: Science Center Evaluation Questions & Needs

Using the C3 Evaluation Measures

Steps:

I. Determine the impacts of interest
II. Identify a measure for each impact
III. Develop the instrument/tool
Using the C3 Evaluation Measures

I. Determine the Impacts of Interest

<table>
<thead>
<tr>
<th>ISE Category</th>
<th>C3 Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness, Knowledge, or Understanding</td>
<td>Impact 1. Understanding of the scientific process</td>
</tr>
<tr>
<td></td>
<td>Impact 3. Understanding the essential principles &amp; fundamental concepts of weather &amp; climate</td>
</tr>
<tr>
<td></td>
<td>Impact 4. Understanding the impact of climate change</td>
</tr>
<tr>
<td>Attitude</td>
<td>Impact 6. Motivation to take action to reduce climate change.</td>
</tr>
<tr>
<td>Skills</td>
<td>Impact 2. Skills for collecting &amp; analyzing data</td>
</tr>
<tr>
<td></td>
<td>Impact 5. Ability to make scientifically informed decisions to reduce climate change.</td>
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II. Identify a Measure for each Impact

Considerations:

- Program/Activity Type (e.g. exhibit, event, on-going program)
- Program Duration (e.g. one-time 2 hour, weekly program for 6 months)
- Logistics of Administering Survey (e.g. time allotted, environment)
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Using the C3 Evaluation Measures

III. Develop the Instrument/Tool

Considerations:

- Include items to describe the sample
- Minimize changes to wording
- Keep the survey as brief as possible
- Make adaptations to fit the survey strategy

Adaptations based on Survey Type

<table>
<thead>
<tr>
<th>Survey Type</th>
<th>Item Example</th>
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<tbody>
<tr>
<td>Post-Only</td>
<td>My participation in this program has improved my ability to... [strongly disagree... strongly agree] ...design scientific investigations</td>
</tr>
<tr>
<td>Pre-Post</td>
<td>Please rate your level of agreement with the following statements. [strongly disagree... strongly agree] I have the skills necessary to design scientific investigations.</td>
</tr>
<tr>
<td>Retrospective Post</td>
<td>Please think back to your level of ability before participating in this program and now that you have participated in the program. For each time-point, rate your level of agreement with the following statements. [strongly disagree... strongly agree] I have the skills necessary to design scientific investigations.</td>
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Additional Q & A

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