Smithsonian Science On A Sphere Evaluation
Executive Summary

Audience:

- Internal
    - Ocean education team
    - E&O department chiefs
    - Q? Method specialist
    - Ocean Hall curators
- External
    - NOAA Fisheries, Kate N.
    - SOS community
    - NOAA Office of Education

Introduction:

In alliance with the Smithsonian Natural History Museum Education and Outreach department's FY17 priority to "Expand messaging, experiences, and educational offerings that help audiences comprehend and communicate the science and stories of global change, and become responsible stewards of the planet" Ellen Spooner, with the support of the ocean education team, NOAA, and the Sant Ocean Hall curators, developed and tested public programing on global change using the Science On A Sphere's new capabilities in the Sant Ocean Hall. In addition to NMNH E&O FY17 priorities, the public also finds climate change the environmental issue of most concern (The Ocean Project, 2009; Fraser and Sickler, 2009; Miller, 2010; Luebke et al., 2011). Therefore, this program was developed to meet our department's priorities and provide our visitors with explanations and solutions to the environmental issues of most concern to them.

The goal of the program is to engage museum visitors with dynamic visuals while introducing them to new and unexpected information and solutions to environmental issues in order to teach them that the ocean is essential to all life on earth including theirs.

A summative evaluation done by the Institute for Learning Innovation on Science On A Sphere programs found that while visitors who saw facilitated and unfacilitated presentations both report learning new information, facilitation correlates strongly with visitors' perception of learning. Those visitors who saw a facilitated presentation were substantially more likely to state they had learned something new. Facilitation also correlated with specific outcomes, including: increased
understanding of time and scale, increased understanding of constant change of the Earth and increased perception of the sacredness of the Earth and need to take care of it. They recommended that SOS facilities further investigate facilitated programing.

Therefore, throughout the development of this program an evaluation was done during the summer of 2016 when visitation at NMNH is at its peak. **The goal of the evaluation was to evaluate the impact of a facilitator present on the visitors as compared to visitors watching a video on the sphere.**

According to a study done by Slover Linett an ideal museum experience has the following elements:

1. Relevant to their lives outside the museum
2. Fully immerses visitors in content
3. Allows visitors to see or experience action, movement and change
4. Visitors experience something that is unique and can't see elsewhere
5. Visitors experience something unexpected

Therefore it follows that the higher visitors rate their experience in each of these categories the larger the impact.

Project goal and objectives

SOS goal from NOAA's Office of Education:

- increase public understanding of the environment
- Audience/visitors develop the ability to formulate and conduct independent scientific investigations to explore relationships within Earth's natural systems

Project goal: Implement regular programing for museum visitors that is engaging, relevant to their lives, dynamic and introduces visitors to new and unexpected information and ideas

Strategies for addressing those goals

The original script was developed through the support of a grant from the National Oceanic and Atmospheric Administration, and builds on research sponsored by a grant from the National Science Foundation. The script was developed and tested by different aquariums across the United States and the Frame Works Institute. The ocean education team here at NMNH kept the essential elements of the script, but revised it to better serve our museum audience and align with our method of developing successful programs and activities (Q?method). The revisions were tested and further refined using visitor observations and surveys, input from NOAA education staff and comments from the Sant Ocean Hall curators. These revisions incorporated interactive dialogue and references to nearby exhibits into the script, but maintained the effective communication elements including; opening with a value statement (protection of the ocean), using metaphors (heat trapping blanket) and explanatory chains (connection between fossil fuel use and climate change), closing with solutions (clean energy), maintaining a society-level view of the issue and solutions, and a reasonable, explanatory tone. More information on the background of this script and its strategic framing can be found here.

Findings

- Limited data or graphics shown

Visitor observations:

Length of stay	Presentation	Video	Informal facilitation
<1min	28.5%	36%	25%
1-5min	28.5%	36%	75%
Over 5min	43%	14%	0%

Visitor survey:

Format	Number of surveys collected
Facilitated presentation	35
Video	26

- 90% of visitors who watched a facilitated presentation said they appreciate the opportunity to participate in the presentation
- 85% of visitors said the facilitator helped them understand the information presented

Survey question	Presentation	Video
Based on other museums and exhibits they have seen, rated the experience 5 (scale 1=the worst - 5=the best)	52%	46%
Had previous knowledge of the topic	91%	92%
Learned something new from the video/presentation	65%	92%
Previously interested in the topic before presentation	91%	81%

Want to learn more about what they heard in the presentation/video	71%	88%
Found the information in the video/presentation relevant to their life	80%	81%
Have better understanding of the topic that was presented because of the video/presentation	66%	100%

Comments from visitors on presentation:

- “Discussion is really effective for spectators”
- “Well I know what she explained but the way she did it was perfect”
- “The transition from fossil fuel to alternative fuel would greatly hurt our economy”
- “clear and engaging”
- “Well I know what she explained but the way she did it was perfect”
- “Presented on a 5th grade level”
- “Everything was well presented, easy to understand and extremely interactive”
- “Need for more details about the circulation of water and its dynamic”
- “Learned things I didn’t know, easy to understand for all ages”
- “Presenter hesitated while speaking, lots of “ums” and “ands” wish she talked more about what individuals can do”
- “Clear well presented”
- “Good use of technology, included all areas of hall”
- “Globe view was an awesome way to portray the topics discussed. Kept all the children interested”
- “Informative, good building block for more learning but Im personally not a global warming believer. Need more studies both ways”
- “How many animals survive?”
- “Can you show more examples”
- “The presenter was captivating and friendly”
- “Great presentation! The engagement with the audience was excellent and the topic was interesting. I also liked how you had an action at the end, or way to get more involved”

Comments from visitors on video:

- “Could be more research. Let people know what is research”
- “I knew the atmosphere and global warming was happening, just not sure what to do about it”
- “I am aware of global warming but gave me a better understanding”
- Many visitors mentioned that this video taught them that the ozone layer is expected to recover

Outcome/Impact

- 90% of visitors appreciated the opportunity to interact with a facilitator
- Video is great for consistency and requires few resources
- Facilitated presentation allows for interaction, flexibility and visitors overall enjoy the experience and are more engaged

Actions needed or suggestions for future or next steps

- Add details about how costs of renewable energy is decreasing and more accessible
- Train volunteers
- Provide some higher level details to engage older audiences
- Ask higher level questions to make audience think more and engage older audience when appropriate