Conquering Complexity with Active Engagement

ASTC 2019
Room 701B (3:15-4:30PM)

https://www.epiqc.cs.uchicago.edu/astc2019
Presenters:

Randall H. Landsberg
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Donna Francis
Ontario Science Centre

Katherine Culp
New York Hall of Science

Danielle Harlow
University of California, Santa Barbara

Mark SubbaRao
The Adler Planetarium
The Plan

Introduction

Three (3) Case Studies:
- Quantum Computing Activities @ MOXI & OSC
- Connected Worlds Exhibit @ NYSCI
- “Astronomy Conversations” @ Adler Planetarium

Panel Discussion (Q&A)

Workshop w/ Report Out

Wrap Up
Session Goals

- **Inspire ideas** for your institution
- **Increase your toolkit:**
  - Examples, **best/worst practices**, resources
  - Designing for **visitor engagement**: responsive, active, visitor-centered, & appealing
  - Working with **external experts**: how to partner, what motivates scientists, situations to avoid, and how to build sustainable relationships
  - Strategies for **overcoming barriers**: internal, external, and visitor centered
Why:
- Interest (in the news)
- Impact people’s lives

How:
- Agency
- Engagement
- Social/Fun
Case Study 1: OSC/MOXI
Quantum Computing
Prepare, prepare, prepare
Real, Engaging, People
Facilitated Interactive Activities
Case Study 2: New York Hall of Science - Connected Worlds

Video
https://vimeo.com/141069989
**Key Design Decision:** Use active play and a fantasy context to engage visitors directly with the target concept.

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Opportunities</th>
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<tbody>
<tr>
<td>Complex, emergent systems are difficult to understand</td>
<td>Manipulating complex emergent systems is fun!</td>
</tr>
<tr>
<td>Unique features of specific ecosystems</td>
<td>Common underlying dynamics across settings</td>
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<tr>
<td>Real datasets have too much of the wrong kind of detail</td>
<td>Simulations can be modified and can support non-realistic skins</td>
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<tr>
<td>Real ecosystems are emergent and dynamic</td>
<td>Multiuser interfaces allow for exploration at multiple scales</td>
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Case Study 3: Adler Planetarium

Astronomy Conversations

- Daily Program, running for 12 years
- 500 1hr long programs - 50 scientist presenters - 50,000 visitors per year

Direct interaction with experts facilitated by library of visualizations and multiple displays

Training of experts

Future/Current Directions
SVL > visualization difficulty . expressiveness . embodiment
Skill building > body language, storytelling, empathy and engagement
Future Directions > Interactive simulations . emergence . intelligence
The Panel:

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Panel Discussion

Opportunities & Challenges

Missteps made?

Key components of the solution?

What do visitors think about it?

Evaluation?

Value of External experts?
Workshop - group by content area

**Workshopping** (we need a set of seed challenges - initial list: LEAD(Donna/Danielle)
- ALL (20 min) Break into groups based on topics

**10 min Talk about:**
Strengths: Why is this complex idea appealing to tackle?
Weaknesses: Why is this complex topic problematic or worrisome to tackle?
Opportunities - What would the benefit be to your visitors if you did this successfully?
Threats: What risks are you taking on by trying to do this successfully?

**10 min Talk about:**
Come up with **audacious** ideas to address your topic.

Some big ideas you might use to imagine your design approach:
- Eliciting curiosity: What's compelling about this topic (not just important, but provocative?
- What outside experts could help identify appealing, innovative ways into the topic?
- Relevance for visitors - Why should they care? How does this topic intersect with visitors’ everyday lives?
- What makes this topic complex? What’s hard to grasp about it? How can you keep your focus on making that core, difficult idea more accessible to visitors?
Workshop – Seed Topics

- Climate Change
- Cosmology/astro
- Genetic Engineering
- AI
- Brain
- Mental health
Got a complex concept to explore? Try these tips:

Why share it with your visitors?

What are the strengths of the topic?

What are the opportunities?

What are the challenges?

Get creative

Engage with Experts

Make it Tangible, Engaging, Exciting and Personal
Acknowledgements

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Track: Content and Design  
Title: Conquering Complexity with Active Engagement

Session Description: How do you engage visitors with topics that are complex, unfamiliar, or intimidating? This is an important question for the informal science education field as rapid progress in technology and scientific research are impacting visitors’ everyday lives. This session is designed to inspire participants to begin thinking about what might be possible at their home institutions and to provide them with resources for incorporating emergent content. We will first examine three approaches for tackling three very different complex topics: (i) delving into the interdependent ecology of an imaginary world via an immersive, digital, interactive at NYSCI's Connected Worlds (ii) demystifying Quantum Computers with staff facilitated activities and games at MOXI and the Ontario Science Centre, and (iii) exploring the universe with real data and real scientists via inviting visualizations and dialogs at Adler Planetarium’s Astronomy Conversations. The panel will then discuss lessons learned, missteps made, how evaluations informed, and key components of the visitor experiences including: the importance of active engagement and social interactions, the costs and benefits of partnerships with external experts, and the value of audience appeal. The second half of the session will be an opportunity for work shopping solutions to specific challenges participants face and general questions about introducing complex topics (e.g., how can we engage and train staff who themselves may be uncomfortable with the topic?). Working groups will have the opportunity to report out, followed by a brief wrap up.

Diverse Perspectives: Diverse perspectives are integral to this session. Size: small, medium and large science centers. Geography: East Coast, West Coast, Midwest and Canada. Career level of the presenters: students to senior management. Areas of expertise: education research, quantum computing, astrophysics, environmental science, evaluation, and volunteer management.

Tag(s): Making the Case for Science Centers, Partnerships, Visitor Experience

My format idea description: Panel + Solution Room: panel presents & small group work on solutions & strategies for their institutions

Audience Takeaway(s):
- Session participants will consider how to design experiences that contain the key components that we have learned are important for visitor engagement: responsive experiences, active experiences, visitor-centered, & appealing
- Toolkit for working with external experts including tips on how to partner, insights into what motivates scientists, situations to avoid, and how to build sustainable relationships
- Strategies for overcoming barriers (internal, external, and visitor centered)