Introduction to Analyzing Open-Ended Visitor Data: Impact Beyond the Numbers

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AGENDA

• Introductions & scope
• Data analysis basics & context
• Qualitative data analysis
• Practice & discussion of two analytic approaches
• Questions & reflection
• Further learning
Introducing Ourselves & the Workshop

Who we are

What this is – and isn’t
Research/Evaluation Steps

• Guiding research question/s
• Literature review
• Study design
• Data collection
• Data analysis
• Reporting
Data Types

- Qualitative
- Quantitative
- Other: Images, Videos, Artworks, etc.
Data Analysis Basics

• Organize your data to answer your research question

• Qualitative data can be analyzed:
  - Quantitatively
  - Qualitatively
Some Qualitative Data Analytic Methods

- Case Study or Portraiture
- Visual Analysis
- Discourse Analysis
- Grounded Theory
- Thematic Analysis
Thematic Analysis

- Develop and identify codes
- Two approaches to coding
  - Emic/Inductive: Codes emerge from the data
  - Etic/Deductive: Codes come from a pre-existing theory, framework, hypothesis
Thematic Analysis: Existing Framework Example

Bloom’s Taxonomy

- **Remember**: Recall facts and basic concepts
  - define, duplicate, list, memorize, repeat, state

- **Understand**: Explain ideas or concepts
  - classify, describe, discuss, explain, identify, locate, recognize, report, select, translate

- **Apply**: Use information in new situations
  - execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch

- **Analyze**: Draw connections among ideas
  - differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test

- **Evaluate**: Justify a stand or decision
  - appraise, argue, defend, judge, select, support, value, critique, weigh

- **Create**: Produce new or original work
  - design, assemble, construct, conjecture, develop, formulate, author, investigate

Coding Tips & Process

• Initial codes can be identified after examining some or all of the data while looking for recurring themes.
• Codes should be explicitly defined (in a codebook / coding guide).
• Emic/inductive codes may change after repeated reading to see how well proposed codes fit the data.
• Don’t do it alone; be sure to work with someone else so you can make sure your findings are reproducible.
• Team members often code individually, then compare their results and refine codes/definitions accordingly.
• Once team members feel confident that the codes accurately capture the themes present in the data, coding can be considered complete.
But How Do You Actually Do It?

However you want!

• Physically
  - Use a highlighter
  - Underline or use brackets and write abbreviations for codes
  - Cut data into strips and sort

• Digitally
  - Highlight or change the font color (or both)
  - Use comment function
  - Use rows & columns in Excel for participants & categories
  - Use a qualitative data analysis software program like Atlas.ti, NVivo, Dedoose, or TAMS Analyzer
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey Question:</td>
<td>What interests you about climate change?</td>
<td>How to change/improve</td>
<td>8</td>
<td>Otherwise raising awareness</td>
<td>6</td>
<td>Otherwise learning about the topic</td>
</tr>
<tr>
<td>2</td>
<td>Visitor ID</td>
<td>Categories/Themes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_2DTeV0</td>
<td></td>
<td>how can design help us lessen the impact of it</td>
<td>conveying the urgency of the situation visually and publicly</td>
<td></td>
<td></td>
<td>cost impact</td>
</tr>
<tr>
<td>R_12BY0u</td>
<td></td>
<td>can it be reversed and how</td>
<td></td>
<td></td>
<td></td>
<td>global warming</td>
</tr>
<tr>
<td>R_O9iuIyC</td>
<td></td>
<td>working with others to reverse it. even if that means having to e work with republicans.</td>
<td>everything from natural systems and disasters through the whole gamut of human interference. I've been looking a these issues for about 50 years now, global warming is REAL (irrespective of what politicians say)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_2qaNOv</td>
<td></td>
<td>the current rate of climate change seems to be accelerating. More information for public consumption will hopefully lead to better decisions on how to slow down this acceleration.</td>
<td>I feel it is happening although many people do not</td>
<td></td>
<td></td>
<td>how we can save the planet. How we will exist in this changing world.</td>
</tr>
<tr>
<td>R_1rVzmG</td>
<td></td>
<td>what are our options</td>
<td>Its extremely important for museums to provide engaging exhibits on the changing climate and global systems.</td>
<td></td>
<td></td>
<td>Global Warming and its impact on the environment.</td>
</tr>
<tr>
<td>R_3FBijfvu</td>
<td></td>
<td>the Earth is dying and vast, rapid advancements must be made</td>
<td>the current rate of climate change seems to be accelerating. More information for public consumption will hopefully lead to better decisions on how to slow down this acceleration.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_R00019</td>
<td></td>
<td>learning what can be done to reverse the effects and prevent further damage to our environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_8egNnRi</td>
<td></td>
<td>how we can save the planet. How we will exist in this changing world.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General questions about qualitative data analysis before we practice some examples?
Etic (Deductive) Coding Example

- **Context:** Summative evaluation of a museum’s teacher PD program on new standards related to evolution
- **Participants:** Middle school teachers who cover science
- **Data:** Responses to survey item: “Do you feel this PD addressed any of your challenges with teaching evolution? If so, how?”
- **Guiding question:** What did teachers feel they gained from the PD program that helped them address their challenges teaching evolution?
What did teachers feel they gained from the PD program that helped them address their challenges teaching evolution?

- Activities, resources, and lessons: *Tools that could be incorporated into classroom practice*
- Knowledge gain: *Additional or new information*
- Connections to the standards: *Insights into the new science standards and how they could be addressed*
- Examples of and strategies for talking about evidence
- Better terminology for addressing creationist concerns
From the provided data, answer the question: What did teachers feel they gained from the PD program that helped them address their challenges teaching evolution?

Using an etic/deductive approach, code for (find mentions of):
- Activities, resources, and lessons
- Knowledge gain
- Learning about connections to the standards
- Examples and strategies for talking about evidence
- Better terminology for addressing creationist concerns
Etic (Deductive) Coding

Questions?
Guiding question: What topics or concepts do visitors connect with biotechnology/bioengineering?

Data: Survey responses from visitors, who were asked “What topics, connections, or words does “biotechnology/bioengineering” make you think of?”

In pairs, create a list of preliminary codes based on recurring themes you see as you read the data

Mark instances of these possible themes (code the data) by highlighting, underlining, and or writing phrases by sections of data
Connections Visitors Made to Biotechnology/Bioengineering

- Medicine/Human Health: 27%
- AI/Robotics: 14%
- Specific Topics: 14%
- Genetics/Genetic Engineering: 8%
- Future Advancement/Innovations: 8%
- Environment/Nature: 7%
- General Topics: 7%
- Other: 7%
- Life Science + Engineering: 5%
- Negative Connections: 2%
Questions & Reflection

• What questions do you have?
• What surprised you?
• What are you taking away?
Further Learning

- Practice with colleagues who have experience
- Read empirical studies to see how others have analyzed their data (journals like Visitor Studies, Journal of Museum Education, and Journal of Zoo and Aquarium Research are especially useful)
- Attend other professional development events
- Refer to the resources on our handout (online)
- Always refer back to your guiding research question/s!