STEM Matters: Investigating the Confluence of Visitor and Institutional Learning Agendas

New Knowledge Organization Ltd
COSI’s Lifelong Learning Group
OSU Center for Research on Lifelong STEM Learning
Association of Zoos and Aquariums

This material is based upon work supported by the National Science Foundation under Grant No. 1612729 & 1612699. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
WZAM³ | Why Zoos & Aquariums Matter
Wave 3: STEM Matters
Why Zoos & Aquariums Matter
Wave 3: STEM Matters
WZAM3 | Why Zoos & Aquariums Matter
Wave 3: STEM Matters

Context

Individual Visit
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Societal
Context
Individual Visit
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ENTRY NARRATIVES AND VISIT BEHAVIORS

KELLY RIEDINGER
MARTIN STORKSDIECK
What are the entry characteristics of visitors and how do these characteristics play out in terms of behaviors during the Z/A visit?
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Theoretical Context

- Contextual model of learning (Falk & Dierking, 2000; Falk & Storksdieck, 2005)
- Integrated Experience Model (Storksdieck, 2006)
- Visitor based learning framework (Barriault & Pearson, 2010)
Study Design

Part 1 (Years 1 & 2):
• Characterizing Groups
• Video Tracking Study

Part 2: (Year 3)
• Interpretive In-Situ Experimental Study
Tracking Study

• Pre-Post Interviews:
  – Entry characteristics (pre-)
  – Plans for visit (pre-)
  – Visit details & behaviors (post-)
  – Decision-making processes (post-)

• Full visit experience with GoPro cameras
## This Study

<table>
<thead>
<tr>
<th>Pre-Visit Interview (n=62)</th>
<th>Z/A Observations (n=70)</th>
<th>Post-Interviews (n=61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Group Characteristics</td>
<td>• Time at exhibits</td>
<td>• Remembered visit behaviors</td>
</tr>
<tr>
<td>• Who do they typically visit with</td>
<td>• Time in transit</td>
<td>• Extent to which group adhered to visit plan</td>
</tr>
<tr>
<td>• Motivation for the visit</td>
<td>• Time engaged in meaning making talk</td>
<td>• How decisions were made</td>
</tr>
<tr>
<td>• Plans for the visit</td>
<td>• Decision-making conversations and behaviors</td>
<td>• Learning about group members and about self</td>
</tr>
<tr>
<td>• Perceived mission of zoos/aquariums</td>
<td></td>
<td>• Perceived mission of zoos/aquariums</td>
</tr>
</tbody>
</table>
Video-Based Tracking Data

• Allows us to understand how people make choices about what to experience
• Tells us how and where meaning-making happens
• Allows us to link visitors declared agenda to their actual behavior
What we hope to learn from our data:

• Entry Characteristics:
  – Demographics, visit motivation, plans for the visit, perceptions of Z/A mission

• Visit Behaviors:
  – Decision-making, conservation education talk, meaning-making talk

• Exit Narrative
  – Perceptions of Z/A mission, self-reported visit activities and decision-making behaviors
Contact Information

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Condition of the Visit

Joe Heimlich
Mary Ann Wojton
E. Elaine Horr

Center for Research and Evaluation
Lifelong Learning Group
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Question

What is the individual condition of the visit; how is the visit contextualized in the life stage and learning ecology of the individual and what are common entry themes and exit outcomes tied to those themes, and how dominant is each across the visiting population?
Condition of the visit

Life Stage
Condition of the visit

Social role
Individual’s learningscape

Condition of the visit

- Intraperisonal
  - Knowledge
  - Attitudes
  - Behavior
  - Self-concept
  - Skill
  - Developmental history

- Interpersonal Processes and Primary Groups
  - Formal and informal social network and social support systems, including family, work group and friendship networks

- Institutional Factors
  - Social Institutions and organization characteristics, and formal (and informal) rules and regulations for operations

- Community Factors
  - Relationships among organization, institutions and informal networks with defined boundaries

- Public Policy
  - Local, state and national laws and policies
Condition of the visit

Conditions - Specific

Attraction

Attention
Study Design

Year 1:
- Pre & Post Interviews with Members

Year 2:
- Analyzed interview data, constructed questionnaire

Year 3
- Administer Pre- and Post-Questionnaire at 25 zoos and aquariums
Year 1

158 Pre- and Post-Interviews completed at 7 sites
• Columbus Zoo & Aquarium
• North Carolina Aquarium at Fort Fisher
• Cleveland Metroparks Zoo
• Mystic Aquarium
• Naples Zoo and Botanical Garden
• Phoenix Zoo
• Seattle Aquarium
Tell me about yourself?
And they did . . . .
They told us about who they visit with

I come to the zoo primarily because the girlfriend and I enjoy animals.
Adults who came alone

I would actually come here sometimes during lunch and just do the outer loop around Africa Trail
They told us about their intent for the visit.

it's always interesting, the landscaping, how they incorporate the zoo into the – kind of what you were just saying – the natural environment.
It's calming for me

So we started a routine on Tuesdays they would do toddler Tuesdays here.
About Technology

- get him away from video games and computers and TV and all that fun things that kids grow up with today
- we’ll be Pokémon hunting
Factor Construction & Reduction

- Used literature and interviews
- Created lists of items
- Tested 142 items with panel, reduced to 60 items on questionnaires
Demographics

- Questions were developed based on interview data and literature
- Questions tested with visitors to COSI, a science museum
- 22 demographic variables, such as career stage, hobbies, political viewpoint
Current Work

We collaborated with 25 zoos and aquariums

• Zoo/Aquarium staff is collecting pre- and post-questionnaires data
• 50 guests
• Three times (busy season—either summer or winter, fall, spring)
If you are interested contact
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Society

Public Perceptions of Z/As

Rupu Gupta, John Fraser, John Voiklis, & Shuli Rank
Research Question

What aspects of Z/As foster public trust in these institutions?

National Survey 1
<table>
<thead>
<tr>
<th>Framing</th>
<th>Ways in which we asked about perceptions vs. trust</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceptions</strong></td>
<td><strong>Trust</strong></td>
</tr>
<tr>
<td>How much do you agree / disagree: Z/As are . . .</td>
<td>How important is _____ for you to trust a Z/A?</td>
</tr>
<tr>
<td>Ethical integrity</td>
<td>Ethics</td>
</tr>
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<td>------------------</td>
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<tr>
<td></td>
<td>Inform about specific animals</td>
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<tr>
<td>Conservation Leadership</td>
<td>Wildlife Agent, Informant, Activator</td>
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<td></td>
<td>Collaborator in conservation</td>
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<tr>
<td>Guidance on Sustainability</td>
<td>Advise on sustainability practices</td>
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<tr>
<td>Quality visit</td>
<td>Quality attraction</td>
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<td></td>
<td>Quality experience</td>
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</tbody>
</table>
Overall | Average for all questions

Expectation > Perception

5.60 : 5.25
Largest discrepancies between expectations and perceptions

1. Appropriate diets
2. Medical care
3. Keepers' compassion
4. Z/A cares about wellbeing
5. Meets animal emotional needs
6. Appropriate facilities
7. Enough space
Research Question

How does the public perceive Z/A within the STEM learning ecology?

National Study 2
STEM Learning Ecology

Settings

Zoos
Aquariums
Restaurants
Science Centers
Parks
STEM Learning Ecology

STEM Topics

Water Quality
Construction
Climate Change
Animal Behavior
Nutrition
STEM Learning Ecology

Modes of Learning

Using Senses
Reading Signs
Conversations
Digital Media
STEM Learning Ecology
How frequency of encountering STEM sets apart Z/As
How STEM topics set apart Z/As
<table>
<thead>
<tr>
<th>Topic</th>
<th>Science Center</th>
<th>Back/Front Yard</th>
<th>Aquarium</th>
<th>Zoo</th>
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<tbody>
<tr>
<td>Water Quality</td>
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<td>Sustainability</td>
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<td>Statistics</td>
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<td>Species Names</td>
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<td>Reproduction</td>
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<td>Medicine</td>
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<td>Geography</td>
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<td>Food Nutrition</td>
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<td>Ecosystems</td>
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<td>Conservation</td>
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<td>Climate Change</td>
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<td>Architectural Design</td>
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<td>Animal Behavior</td>
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How STEM learning modes set apart Z/A
Thank You |
Thank You |

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Thank You |

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