

24th Annual Visitor Studies Association Conference

July 24-27, 2011
Chicago, Illinois

Sustaining a Community of Learners

Abstracts

VSA

Visitor Studies Association



Visitor Studies Association 2011 Conference Abstracts

Introduction

The VSA Conference Abstracts provide overviews of all poster, panel, paper, and interactive sessions presented at the conference and are written by the presenters themselves. Past conference evaluation has indicated that these abstracts serve multiple purposes. Before and during the conference, the information provided in the abstracts helps conference attendees select which session to attend. After the conference, abstracts serve as both reminders of sessions attended and references. In keeping with the association's efforts to be "green," the 2011 Abstracts publication is available only in electronic format, not as a printed handout. Abstracts from past conferences are maintained on the VSA website archive found at <http://www.visitorstudiesarchives.org/conference.php>.

The VSA 2011 Conference Abstracts were edited by Susan Foutz.

Table of Contents

<u>INDEX BY SESSION NAME</u>	iii
ABSTRACTS	
Monday, July 25	
10:15-11:30 a.m. <u>Concurrent Sessions—One</u>	1
1:15-2:30 p.m. <u>Concurrent Sessions—Two</u>	12
2:45-4:00 p.m. <u>Concurrent Sessions—Three</u>	25
Tuesday, July 26	
9:00-10:15 a.m. <u>Concurrent Sessions—Four</u>	34
10:30-11:30 a.m. <u>Concurrent Sessions—Five</u>	46
1:15-2:15 p.m. <u>Poster Session</u>	51
2:30-3:45 pm <u>Concurrent Sessions—Six</u>	71
Wednesday, July 27	
9:15-10:15 a.m. <u>Concurrent Sessions—Seven</u>	82

Index by Session Name

<u>Applying an Observational Framework in Exhibit Evaluation</u>	13
Heather Harkins	
<u>Appropriately Critical: How Can We Foster Critical Practice in Conference Sessions?</u>	82
Joe E. Heimlich, Jessica J. Luke, Eric Ledbetter, and Kris Morrissey	
<u>Are We There Yet? Building Shared Research and Evaluation Agendas</u>	48
Jessica J. Luke and Barbara J. Soren	
<u>Automated Analysis of Spatial Behavior at the London Zoo</u>	14
Theano Moussouri and George Roussos	
<u>Beyond Learning: A Discussion about How to Picture Success</u>	46
Jennifer Novak-Leonard, Joe E. Heimlich, Randi Korn, and Peter Linett	
<u>Building the Evaluation Capacity of Museum Staff through Participatory Evaluation Activities</u>	58
Gayra Ostgaard and Amy Grack Nelson	
<u>Calculating the “Distance Traveled”: Assessing the Impact of STEM Outreach Programs</u>	22
Natasha. C. Simons	
<u>Capturing the Visitor Experience: “Personality” Profiles of Five Museum Sites</u>	59
Jan Packer, Roy Ballantyne and Nigel Bond	
<u>Changing Teaching Materials through Evaluation and Collaboration with Teachers</u>	75
Nicole Stutzman and Sharisse Butler	
<u>Children as Interpreters of Their Own Experience</u>	21
Lorrie Beaumont	
<u>Climate Change the Musical: A Dramatic Format for Conveying Informal Science</u>	23
Ellen Giusti	
<u>A Conversation with Barbara Butler</u>	50
Stephen Bitgood and Barbara Butler	
<u>Creating Community through Learning Together</u>	7
Merilee Mostov, Joe E. Heimlich, Judy Koke, Missy Higgins-Linder, and Susan Anable	
<u>A Critical Look at Our Models of Exhibition Evaluation</u>	86
Stephen Bitgood and Ross J. Loomis	
<u>Designing for Museum-Teacher Communication: A Consideration of Epistemological and Positional Framing</u>	52
Lisa Brahms and Meghan Bathgate	
<u>Developing and Sustaining Internal Evaluation Capacity without Internal Evaluation Departments</u>	84
Marley Steele-Inama and Amber Christopher	
<u>Disturbing the Eternal Silence of the Gallery: Comment Books as Sites of Dialogue</u>	11
Kevin Coffee	
<u>Emerging Practices for the Use of Evaluation Findings in Museums</u>	45
Rena Youngs	
<u>Engaging Visitors in Using Evidence: Comparing Three Program Formats</u>	79
Maia Werner-Avidon	

<u>Evaluating Diverse Activities and Audiences: Oakland Museum of California’s Gallery of California Art</u>	37
Rachel Gita Schiff	
<u>Evaluating the Engagement of the Public in Nature Conservation</u>	70
Monae Verbeke	
<u>ExhibitFiles: Knowledge, Identity, and Networks in the Informal Learning Community</u>	42
Carey E. Tisdal and Wendy Pollock	
<u>An Exploration of Immersive Exhibits: How, Why and What Impact?</u>	25
Josh Gutwill, Eric Dimond, Kevin Boyd, Toni Dancu, Nina Hido, and Hallie Gilbert	
<u>Exploring Mobile Eye-Tracking in Visitor Studies</u>	16
Kira Eghbal-Azar	
<u>The Falk Visitor Identity Model: Study Results & Practical Applications</u>	26
Laureen Trainer, Marley Steele-Inama and Amber Christopher	
<u>First Six Years of Urban Advantage Collaborative: From Development and Evaluation to Impact and Policy Implications</u>	29
Jim Short, Hudson Roditi, and Meryle Weinstein	
<u>Fostering and Assessing Mathematical Reasoning with Immersive and Standard Exhibits</u>	5
Josh Gutwill, Toni Dancu, Deborah Perry, Eric Gyllenhaal, Scott Ewing, and Cecilia Garibay	
<u>From Nice to Necessary: How Visitor Studies Informs Experience Design</u>	30
Rita Deedrick, Joshua Sarver, Kate Storm, and Sharon Tinianow	
<u>High-Speed Evaluation: From Collection to Utilization in 24 Hours</u>	44
Sarah Cohn and Al Onkka	
<u>Holding Power of Seattle Aquarium Exhibits for the Toddler Audience</u>	62
Andrea Barber and Kaleen E. Povich	
<u>Including Learners Who Prefer Spanish through Culturally-Responsive Evaluation</u>	68
Hever Velázquez, Anita Kinney and Yesenia Carmolingo	
<u>Ingenuity Lab: Engaging Audiences through Design Challenges</u>	78
Scott Randol	
<u>Integrating Evaluation into Exhibition Development: A Case Study</u>	72
Swarupa Anila, Stephanie Downey, Eric Gyllenhaal, Amanda Krantz, Kenneth Morris, Deborah Perry, and Matt Sikora	
<u>It Takes a Community to Evaluate a Network</u>	74
Christine Reich, Marcie Benne and Marjorie Bequette	
<u>The Journey of Bilingual Evaluation Capacity: Three Institutions’ Perspectives</u>	19
Nelda Reyes, Veronica Garcia-Luis, Kathleen Tinworth, Marcie Benne, and Cecilia Garibay	
<u>Keeping Pace: Strategies for Effective Exhibit Evaluation on Tight Timeframes</u>	40
Elisa Israel, Scott Ewing, Anna Lindgren-Streicher, and Joyce Ma	
<u>Knowledge and Museum: Archive, Exhibit, Evidence</u>	57
Kira Eghbal-Azar	
<u>Learning History: A Case Study of an Inquiry-Based Museum Fieldtrip</u>	9
Amanda Krantz	

<u>Learning Impact as a Measure of Organizational Success</u>	81
Chantal Barriault, Jennifer Pink and Amy Henson	
<u>Lessons Learned about Visitor Attention from Simulation Studies</u>	51
Stephen Bitgood	
<u>Looking at Sustainability in the Front-End Evaluation of Digital Media Programming</u>	66
Edith Stevens, Helene Jennings and Pino Monaco	
<u>Meeting Learners Where They Are: Expanding Literacy Opportunities through Partnerships</u>	31
Molly Phipps, Cheryl Kessler and Jennifer Nelson	
<u>Mining User-Generated Flickr Data for Front-End Evaluation</u>	12
Joyce Ma	
<u>Motivations and Learning in Citizen Science: Lessons from Lost Ladybugs</u>	1
Jessica Sickler and Tammy Messick Cherry	
<u>Multi-Sensory Sense-Making: How Children Explore Objects and Ideas</u>	64
Nancy Owens Renner	
<u>The Museum and University Partnership: A Success Story!</u>	33
Martha Hill, Elee Wood, Kara Baldwin, and Stephanie Herrick	
<u>Museum Visitors' Impressions of Interacting with Scientists</u>	76
Susan Foutz	
<u>New Directions Project: Training Graduate Students in Audience Research & Evaluation within Informal Learning Settings</u>	41
Nick Visscher, Kris Morrissey and Kathryn Owen	
<u>New Frameworks Needed: Capturing Visitor Engagement with History</u>	47
Caren S. Oberg	
<u>Non-Visitor Studies: Researching the Needs and Experiences of New Audiences</u>	38
Peter Linett, Cecilia Garibay and Chloe Chittick Patton	
<u>A Participatory Evaluation Framework at the Oregon Zoo</u>	8
Kathayoon Khalil	
<u>"Pointing At" in Museum Exhibitions: Let's Get Meaning-Making Started!</u>	54
Dimitra Christidou	
<u>Research Experiences for Undergraduates: Fostering Diverse Talent in the Visitor Studies Field</u>	69
Hever Velázquez, Anita Kinney and Yesenia Carmolingo	
<u>Returning Visitors: Exploring Sustained Visitor-Museum Relationships</u>	3
Michele Claire Everett	
<u>Thirteen California Museums, One Learning Community & 10,000 Visitor Surveys</u>	28
Marianna Adams, Paige Simpson, Nancy Owens Renner, and Vivian Kung Haga	
<u>Traveling the Silk Road: A Journey into Collaborative Exhibition Development and Evaluation</u>	71
Bella Desai, Lauri Halderman, and Camellia Sanford	
<u>Tweaking Tweets and Perfecting Posts: Can Social Media Help Advance an Institution's Mission?</u>	83
Susan Kevin and Jennifer Matiasek	
<u>Understanding and Capturing the Visitor Experience</u>	34
Jan Packer, Roy Ballantyne and Nigel Bond	

<u>Understanding Visitor Motivation</u>	17
Ross J. Loomis, Robert Eisenberger, Steve Yalowitz, Joe E. Heimlich, and Julie Johnson	
<u>Using Animals to Communicate about Science that Advances Human Health</u>	61
Loran Carleton Parker, Omolola A. Adedokun, Wilella D. Burgess, Sandra F. Amass, and Jon R. Bricker	
<u>Using Keyword Analysis to Explore Qualitative Data</u>	65
Lisa Sindorf	
<u>Visitor Expectations and Satisfaction at Burke Museum Family Day Events</u>	55
Emily Craig, Betsy O'Brien and Renae Youngs	
<u>What's Going on in this School Tour? An Evaluation of Student Behavior and Dialogue in VTS-based Elementary School Tours</u>	52
Amanda Mae Bomar, Valerie Grabski and Lauren LeClaire	
<u>YardMap: Evaluating a Social Networking Site from the Ground Up</u>	2
Steven S. Yalowitz, Tammy Messick Cherry, and Angelina Ong	
<u>Zoo Members: Sustaining a Community of Core Learners</u>	36
Jerry Luebke and Jennifer Matiasek	

10:15-11:30 a.m. Concurrent Sessions—One

Motivations and Learning in Citizen Science: Lessons from Lost Ladybugs

Jessica Sickler, Institute for Learning Innovation

Tammy Messick Cherry, Institute for Learning Innovation

Purpose

The NSF-funded *Lost Ladybug Project* is designed to engage families, youth, and groups to participate in scientific research as citizen scientists. Participants conduct searches in their communities, photograph ladybugs found, and submit identifications, photos, and supporting data to scientists for verification and inclusion in the overall data set. Participation is facilitated through resources on the project website where participants are also able to view submitted photos, explore the data set, and read about findings from scientists' analysis. Evaluation sought to understand the usability of the website and assess the impacts achieved with this nationally dispersed network.

Perspectives

This project was developed with a scientific and an educational rationale. From the scientific perspective, it represented potential for citizen science to enhance research on ladybug populations in North America, which have experienced great changes in the last 20 years, with the decline of some native species and the increase of several exotic species (Harmon, Stephens, & Losey, 2007). It was believed that citizen science could be a mechanism to substantially increase the scale of data collection to help scientists increase the accuracy of estimates regarding species density and population viability (Shaffer, 1981). The educational potential of this contributory citizen science project was grounded in the literature of the qualities, strengths, and educational value of citizen science (or public participation in scientific research) projects (Bonney, et al., 2009).

Methods

During two years of formative evaluation, evaluators examined the two main modes of implementation: self-directed (participation via website) and group-facilitated (organized, instructor-led youth groups). Self-directed participants completed a post-participation, web-based questionnaire (n=490). For participating groups, methods included group interview with youth, telephone interviews with leaders, post-participation concept maps for youth, and post-participation questionnaires for youth and group leaders (n=22 youth; n=7 leaders).

Data & Analysis

Questionnaire data were analyzed quantitatively, with descriptive statistics presented and groups of participants compared statistically to identify differences based on characteristics of participation. Interviews were coded inductively and used to interpret questionnaire data. A rubric was developed for scoring concept maps according to extent, breadth, and depth of learning.

Results

Although envisioned as an opportunity for children and families, the project drew a large number of adults participating independent of children or groups (58% of respondents), pointing to a need to recalibrate outcomes and strategies. Both youth and adults demonstrated understanding about core content of ladybug ecology, particularly regarding the variety and shifting species populations. Youth participants similarly demonstrated ability to use science skills, while adult responses suggested some adults lacked understanding of concepts underlying the nature of science. The project was also notable in its affective and attitudinal domains. Interview data indicated it allowed children to feel that they “were scientists” and had meaningfully contributed to scientific research. In parallel, adults indicated the desire to contribute to authentic research was the main motivation for participation (74% of adults) and for satisfaction (82%). Finally, participants demonstrated strong, positive beliefs that their individual participation was meaningful to science research, with repeat participants having significantly more positive attitudes than first-time participants.

Importance

Findings pointed to a number of strategies to strengthen the program, including the need to adapt the program to meet needs of the unexpected lone-adult audience and to explicitly articulate concepts related to the nature of science. Most notably, the evaluation has led to changes in program communication to emphasize the important discoveries being made from participants’ data. In terms of the broader field of citizen science, it highlights the value of creating and tapping into a feedback loop between researchers and the public to create successful, sustained, and compelling citizen science projects that benefit the public and researchers.

References

- Bonney, R., Ballard, H., Jordan, R., McCallie, E., Phillips, T., Shirk, J., & Wilderman, C. C. (2009). *Public participation in scientific research: Defining the field and assessing its potential for informal science education. A CAISE inquiry group report*. Washington, D.C.: Center for Advancement of Informal Science Education (CAISE).
- Harmon, J. P., Stephens, E., & Losey, J. (2007). The decline of native coccinellids (Coleoptera: Coccinellidae) in the United States and Canada. *Beetle Conservation*, 11, 85-94.
- Shaffer, M. L. (1981). Minimum population sizes for species conservation. *BioScience*, 31(2), 131-134.

Additional Links

www.lostladybug.org

YardMap: Evaluating a Social Networking Site from the Ground Up

Steven S. Yalowitz, Institute for Learning Innovation (presenter)
Tammy Messick Cherry, Institute for Learning Innovation (presenter)
Angelina Ong, Pacific Science Center (co-author)

Purpose

The purpose of this session is to present the findings for the front-end study for the NSF-funded project titled *The Yardmap Network: Social Networking for Community Science* (DRL#0917487), helping understand the target audience of online birders and gardeners and testing *YardMap’s* conceptual model.

Methods

A mixed methods approach was used, including 1) focus groups (n=36), 2) an experimentally designed online survey with a national birder/gardener audience (n=3,469), 3) follow-up phone interviews with a subset from the online survey (n=22) and 4) stand-alone phone interviews (n=22).

Data & Analysis

Qualitative analysis included noting themes and general patterns that emerged. Analysis of the online survey data included chi-square, t-test, ANOVA and multiple regressions, among others. The large online survey sample size precluded complete coding of open-ended responses, so a subset of 150 respondents was randomly selected for open-ended coding.

Results

Front-end results to be highlighted including the following:

- Interest in participation – this was driven by a variety of reasons: an interest in birding (prior interest), being able to improve their yards (practical), enjoying participating in citizen science projects (prior experience) and connecting with others (social).
- Design feedback – participants provided valuable feedback about all major areas of design, including the overall look and feel, use of online tutorials, level of detail desired and major drawing features.
- Barriers to participation – the two main perceived barriers included concern about privacy as the site included information about their houses, and technology, especially around social networking
- Conservation information – participants were open to the idea of including environmental information, but wanted to know how it specifically tied to birds.

Importance

This study is relevant to the field in that it...

- Provides a model for evaluators to gather feedback about a proposed website, including tapping into local and national audiences
- Tests a model for engaging older audiences in social networking, which is of interest to many museums and educational programs.
- Includes information about which aspects of web-based programs are most interesting to older audiences

Additional Links

YardMap site: www.yardmap.org (launching early summer, 2011)

YardMap abstract on NSF site: <http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0917487>

Citizen Science programs at the Cornell Lab of Ornithology: <http://www.birds.cornell.edu/page.aspx?pid=1664>

The Institute for Learning Innovation: www.ilinet.org

Returning Visitors: Exploring Sustained Visitor-Museum Relationships

Michele Claire Everett (presenter)

Professor Margaret S. Barrett, Head of School of Music, The University of Queensland, Brisbane, Australia (PhD supervisor, co-author)

Purpose

This presentation reports findings from a study that employed narrative research to explore the life experiences seven individuals have with a single museum (Everett, 2009). This research extends our understanding of the museum experience by providing novel insights about returning visitors, an important audience segment and phenomenon that has received little attention in the research literature. The presentation also illustrates the use of narrative research in the field of visitor studies (Everett & Barrett, 2009).

Perspectives

Because this study sought to understand the individual's experience and meaning-making of museum visitation in life contexts, a narrative inquiry methodology was adopted (Clandinin & Connelly, 2000). Stemming from Schwab's idea of curriculum "commonplaces," and in conjunction with Dewey's qualities of experience, Clandinin and Connelly argue that in order to understand experience, one needs to examine the temporal, personal and social elements of experience as well as the context in which experience takes place (Ollerenshaw & Creswell, 2002). The study's methodological approach and design provided a unique opportunity to explore visitor-museum relationships over time, and to place museum visiting in the context of individuals' lives.

Methods, Data & Analysis

Data generation methods included individual interviews, observations and researcher notes. Data were analyzed in two stages. The first stage of analysis consisted of crafting individual narrative accounts (Clandinin & Connelly, 2000). During the second stage of analysis, narrative accounts were analyzed to identify thematic connections—similarities and differences within and between cases (Seidman, 1998).

Results

Findings from this research extend our understanding of the museum experience by providing novel insights about returning visitors and the ways in which they engage with a museum over time.

Importance

In the context of current challenges facing museums, returning visitors have been identified as a critically important segment of the visiting public (Goulding, 2000; Pitman, 1999; Vogel, 2009). Although the significance of the local audience has increased dramatically as a factor in museum sustainability, few museums have an understanding of who these individuals are, why they are there, what sorts of experiences they are seeking and having, and what they are taking away from these experiences. This information is critical for museums to shape experiences that better serve the needs of members of the local community.

The new understandings and novel insights about returning visitors shared in this presentation link directly to the conference theme, "Sustaining a Community of Learners." Such insights may assist museums in facilitating experiences that deepen levels of engagement and strengthen relationships with visitors.

References

- Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research* (1st ed.). San Francisco: Jossey-Bass Publishers.
- Everett, M. (2009). *Guided tour: A study of museums as sites for sustained engagement*. Unpublished doctoral dissertation. University of Tasmania, Australia.
- Everett, M., & Barrett, M. S. (2009). Investigating sustained visitor/museum relationships: Employing narrative research in the field of museum visitor studies. *Visitor Studies*, 12(1), 2-15.
- Goulding, C. (2000). The museum environment and the visitor experience. *European Journal of Marketing*, 34(3/4), 261-278.
- Ollerenshaw, J. A., & Creswell, J. W. (2002). Narrative research: A comparison of two restorying data analysis approaches. *Qualitative Inquiry*, 8(3), 329-347.
- Pitman, B. (1999). Muses, museums, and memories. *Daedalus*, 128(3), 1-31.
- Seidman, I. E. (1998). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (2nd ed.). New York: Teachers College Press.
- Vogel, C. (2009, March 19). Wish you were here. *New York Times*, pp. F1, F31.

Fostering and Assessing Mathematical Reasoning with Immersive and Standard Exhibits

Josh Gutwill, Exploratorium (chair and presenter)
Toni Dancu, Exploratorium (co-author)
Deborah Perry, Selinda Research Associates (presenter)
Eric Gyllenhaal, Selinda Research Associates (co-author)
Scott Ewing, Oregon Museum of Science and Industry (presenter)
Cecilia Garibay, Garibay Group (presenter)

Purpose

Mathematics has emerged as a central issue in the broader debate over student achievement and the nation's educational infrastructure (National Center for Educational Statistics, 2009). Despite the recognized importance of mathematics, science centers have only begun to explore their role in supporting informal math learning. In this session, we will present results from two projects promoting and studying math learning at interactive exhibits. The driving question for both projects has been: What exhibit design characteristics appeared to contribute in meaningful ways to the practice and development of everyday mathematical reasoning (specifically defined for this presentation as spatial reasoning and algebraic thinking)? The primary goals of the session are:

- Raise awareness of the potential for science centers to support informal math learning.
- Describe different strategies for promoting mathematical reasoning, including placing visitors inside geometric experiences and engaging them in algebraic design challenges.
- Share with session participants evidence of mathematical reasoning at exhibits, and link design strategies to study results.

Perspectives

Both *Geometry Playground* and *Design Zone* build on research in formal and informal learning contexts to understand how visitors engage in mathematical thinking in science centers. The *Geometry Playground* project developed and studied immersive exhibits that were designed to foster spatial reasoning in visitors. Spatial reasoning skills are “those mental skills concerned with understanding, manipulating, reorganizing, or interpreting relationships visually” (Tartre, 1990, p. 216). In practice, this means visualizing objects from multiple perspectives; rotating, flipping or inverting mental objects; recognizing spatial relationships among objects; and perceiving spaces and their properties. Research has shown that spatial reasoning itself is a necessary skill for learning science and mathematics in general, and geometry in particular (Battista, 2003; Ben-Chaim et al., 1989; Tartre, 1990; Tracy, 1987).

Similarly, *Design Zone* reflects an emerging focus on algebra as a process of mathematical inquiry (National Council of Teachers of Mathematics, 2008). The educational approach for the exhibition builds on studies of algebraic thinking in classrooms (e.g., NCTM, 2008) and everyday contexts (e.g., Civil, 2002). The exhibition draws from research on designing exhibits to encourage active, prolonged engagement (Humphrey & Gutwill, 2005) and social learning (Borun et al., 1998). Based on this research, the team chose to emphasize mathematical learning as a process, rather than the communication of facts or concepts, and to explore exhibit design characteristics that foster algebraic thinking via talk and engagement among visitors.

Methods

Geometry Playground includes two studies with different goals and methods. In a naturalistic inquiry summative evaluation of the exhibition conducted by Selinda Research Associates, we used unobtrusive and participant observations to explore the range of experiences for adults and children, focusing on spatial reasoning, social interactions, physical engagement and affective responses. A separate research study conducted by the Exploratorium employed a quasi-experimental design, in which we videotaped and compared visitors' spatial reasoning at a set of immersive, non-immersive (tabletop) and mixed exhibits.

Design Zone also includes two research studies—the first led by OMSI and the second led by Garibay Group. Following an experimental design, the first study examined the effect of computer-based challenges on visitor engagement, and used observation and follow-up interviews with family groups at one of two versions of an exhibit unit: (1) the current version, with the computer challenges available to visitors (treatment), and (2) a modified version, with the computer challenges covered and only the explanatory label available (control). The second research study focused on three exhibit units and examined evidence of and features that foster algebraic thinking. Using purposive sampling, adult-child dyads (with children 10-12 years old) were observed to capture algebraic reasoning behaviors and then interviewed to determine recognition of algebraic ideas.

Data Analysis

For *Geometry Playground*, both quantitative and qualitative measures were used. The naturalistic evaluation study employed a modified inductive constant comparison technique. In the comparative research study, audio/video data were coded by theory-blind research assistants for frequency, duration and type of spatial reasoning utterance.

For the first *Design Zone* study, the primary dependent variables were engagement time, level of mathematical behavior, and awareness of mathematical learning goals. The primary independent variables were experimental condition and cueing. The second study used video and audio data. A coding scheme was developed and video data were coded for types and frequency of instances of algebraic reasoning. Interview data were coded for recognition of algebraic ideas.

Results

The summative study of *Geometry Playground* found that visitors engaged in a range of spatial reasoning skills while in the exhibition and that the designs of different exhibit units contributed in unique ways to the physical manipulation of real objects, as well as the construction and manipulation of mental objects. Whereas most visitors did not make the connection between immersive and non-immersive exhibits, when these connections were made, they were powerful and memorable. The findings also indicated the importance of interpretive materials to help visitor social groups make the connection between math and their everyday lives. Preliminary results for *Geometry Playground's* research study indicated that visitors engaged in various forms of spatial reasoning at both immersive and non-immersive exhibits, including reasoning about static, dynamic and causal relationships. Additional results comparing visitors' spatial reasoning at immersive and non-immersive exhibits will be presented.

The two research studies for *Design Zone* are still in process as of the writing of this abstract. We anticipate that we will be able to share results at the conference on the impact of computer-guided challenges (study one) and evidence of ways visitors engage in algebraic thinking in the exhibits (study two).

Importance

Visitor studies research on informal science learning has resulted in broad recognition that science centers can successfully support science learning and literacy (NRC, 2009), and has produced evidence-based guidelines for designing effective science exhibits (e.g., Borun, et al., 1998; Humphrey & Gutwill, 2005). A similar effort – to define important math learning outcomes, develop valid and reliable measures of math learning, and test the effectiveness of various approaches to supporting math learning – is needed to make the case for the importance of informal math learning and the critical role that science centers can play in promoting it.

References

- Battista, M. T. (2003). *Shape makers: Developing geometric reasoning in middle school with the geometer's sketchpad* (4 ed.). Emeryville, CA: Key Curriculum Press.
- Ben-Chaim, D., Lappan, G., & Houang, R. (1989). The role of visualization in the middle school mathematics curriculum. *Focus on Learning Problems in Mathematics*, 11(1), 49–60.

- Borun, M., Dristas, J., Fadigan, K., Jangaard, A., Johnson, J., Peter N., Stroup, E., Wagner, K., & Wenger, A. (1998). *Family learning in museums: The PISEC perspective*. Philadelphia, PA: The Franklin Institute.
- Civil, M. (2002). Everyday mathematics, mathematicians' mathematics, and school mathematics: Can we bring them together? In M. Brenner and J. Moschkovich (Eds.), *Everyday and academic mathematics in the classroom*. Journal of Research in Mathematics Education Monograph #11 (pp. 40–62). Reston, VA: NCTM.
- Humphrey, T. & Gutwill, J. P. (Eds.). (2005). *Fostering active prolonged engagement: The art of creating APE exhibits*. San Francisco: The Exploratorium.
- National Council of Teachers of Mathematics. (2008). *Algebra and algebraic thinking in school mathematics*. Reston, VA: National Council of Teachers of Mathematics.
- Tartre, L. (1990). Spatial orientation skill and mathematical problem solving. *Journal for Research in Mathematics Education*, 21(3), 216-229.
- Tracy, D. (1987). Toys, spatial ability, and science and mathematics achievement: Are they related? *Sex Roles*, 17(3/4), 115–138.

Additional Links

Geometry Playground website: <http://www.exploratorium.edu/geometryplayground/>

Research & Evaluation Reports for Geometry Playground:

http://www.exploratorium.edu/partner/visitor_research/reports_search.php?Projects=Geometry+Playground&BrowseSubmit=Browse&Authors=Any&Type=Any

Creating Community through Learning Together

Merilee Mostov, Columbus Museum of Art (presenter)

Joe E. Heimlich, Ohio State University Extension/Institute for Learning Innovation (presenter)

Judy Koke, Art Gallery of Ontario (presenter)

Missy Higgins-Linder, Dayton Institute of Art (co-author)

Susan Anable, Akron Art Museum (co-author)

Purpose

This session will present the development and implementation process of a visitor study of three regional art museums. The goal of this session is to reveal and delve into the motivations to engage by the museums, and the motivations to facilitate this study by the academic. One hope is to reveal how differing needs can meet and increase value for all participants in evaluation and research.

Perspectives

Imagine being a mid-sized art museum when within three hours drive, there are five major art museums. What is the identity of the museum? And when the museum has determined its “niche,” does its audience understand the niche? This was the situation for three art museums. When one of the three decided to do an audience study, and to try to determine the comfort of its visitors in being in an art museum, the Extension specialist in museums with whom the museum was working asked if the study could be conducted concurrently in two other museums. This idea then expanded into using the process for building capacity within the three museums for doing visitor studies.

Merilee Mostov, the study initiator will present from the perspective of the art museums themselves. She will discuss what motivated these museums to engage in this uncomfortable and different process, and what it took to do this work together. She will also share key learnings from the study for each museum and across the museums. Joe E. Heimlich, an Extension specialist, will present a very different motivation in working with the museum. Judy Koke is offering the dual perspectives of moderator and provocateur for the session.

Methods

This session, though based on research, is focused on outcomes of the process of research more than the research itself. To obtain this understanding, some discussion on the research will be shared. The emergent research process will be presented briefly: through face-to-face meetings, a group brainstorm, and e-mail exchanges, concepts for measurement were determined. Scales were created for a pencil and paper questionnaire to be distributed to visitors to each museum. The three museums created the conditions of study, set N targets, and determined the study period (one year). The data analyzed for central tendencies, correlations, and tests of significance. The three museum educators met twice to work through the data in order to make them meaningful. The similarities and the differences between the participating museums will be presented. The finding the team named “regional museum syndrome” will be discussed. The third component of the session includes a discussion about the desired and obtained results: how well did the study and the process meet the needs and achieve the objectives of each of the participants. The panelists will share how the process and the study fulfilled and fell short of their desired expectations. The fourth component of the panel discussion will involve the moderator leading the panel and audience in a discussion on the implications of the findings and of the process.

Importance

This study has importance to each museum for the findings about its visitors. Across the museums, this presentation is about the importance of capacity building in visitor studies and collaborative research to both inform institutions and to contribute to larger bodies of knowledge.

Additional Links

www.columbusmuseum.org

www.akronartmuseum.org

www.daytonartinstitute.org

A Participatory Evaluation Framework at the Oregon Zoo

Kathayoon Khalil, Stanford University/Oregon Zoo

Purpose

This proposal describes a participatory evaluation framework for measuring learning outcomes in informal education settings.

Perspectives

Informal institutions – such as zoos, aquariums, museums, and other science centers, among others – are increasingly looking for evaluation methods that are contextually appropriate and produce meaningful data. There is tremendous potential to improve the quantity and quality of evaluation that focuses on visitor impact in informal education settings, and also in developing better techniques for integrating evaluation data into education programs.

Methods

The Oregon Zoo in Portland, Oregon runs one of the largest ZooCamp programs in the nation, serving over 4,000 children over ten weeks. The children participate in week-long, age-specific camps, each centered on a unique theme ranging from animal adaptations to exhibit design. The Oregon Zoo’s camp staff includes more than 50 seasonal staff members. The large size of the staff makes this camp an ideal program in which to pilot evaluation techniques. During the summer of 2010, a participatory evaluation system based on pre-written curricular

learning objectives was piloted in the camp program. For this evaluation, staff members identified the primary learning objective for each day of the week. These learning objectives, created by the camp staff based on their curriculum, were recorded on a camp-specific Assessment Data Record (ADR) that was distributed to each of eleven camps on the first day of each week and collected at the end of the week. Learning objectives were tested within the camp using embedded assessment activities written by staff into the curriculum. Each day, the staff members individually recorded their estimation of the percentage of their campers who understood the learning objective on the ADR. Staff members indicated this by circling a minus, check, or plus on the sheet. A minus sign indicated that the staff member believed that 0 to 50% of their campers understood the concept or developed the skill; a check indicated 51 to 75%; and a plus indicated 75 to 100%. At the end of the week, these data were collected and analyzed to indicate the percentage of campers in that camp who met the learning objectives.

Results

At the end of the summer, the zoo staff had included approximately 2,600 participants in the evaluation. Staff members reported that 68% of the participants were meeting the camp's learning objectives. Additionally, staff members reported feeling more involved and invested in the evaluation process because they were actively involved in its administration and because they received feedback expediently. Most counselors reported making adjustments to their curricula based on evaluation results; many of which appeared to lead to an increase in camper comprehension.

Importance

This research introduces an evaluation method that increases the participation of staff members, providing feedback that can easily be incorporated into programming efforts in the short term. Moreover, the participatory nature defuses concerns about evaluation being external and about accountability – concerns that plague many evaluation efforts. Furthermore, this model minimizes the amount of staff time and/or funding that an institution must invest in evaluation; instead, it fits into the already-existing framework of many educational programs, making it highly desirable especially for smaller institutions. This method can easily be tailored to fit the specific needs of many institutions or programs, and provides critical information about the ability of an educational program to convey the desired messages in a way that visitors understand. These evaluation methods can be used within structured educational programs such as camps as well as with the broader population of zoo or museum visitors, and administered by on-grounds staff.

Learning History: Case Study of an Inquiry-Based Museum Fieldtrip

Amanda Krantz, Randi Korn & Associates, Inc.

Purpose

Through a presentation of findings from an evaluation of the inquiry-based fieldtrip *Traveling Through Time (TTT)*, a program of the Museum of the City of New York (MCNY), this session will explore:

- The effects of a one-time fieldtrip experience on elementary students, particularly on students' achievement of history-related skills.
- Aspects of the fieldtrip program that contributed to students' achievement of history-related skills.
- Recommendations for further enhancing students' achievement of history-related skills.

Perspectives

Traveling Through Time is a 90-minute program that takes place at MCNY and is facilitated by a MCNY educator. In the program, MCNY educators employ inquiry and object-based education strategies to teach the early history of New York City. Over its long history, the *TTT* program has undergone much remediation. In 2007, Randi Korn & Associates, Inc. (RK&A) conducted an evaluation to identify the successes and challenges of MCNY programs

overall. In 2010, MCNY contracted RK&A for an in-depth study to explore the effects of *TTT* on students' attitudes, learning, and thinking.

The effects of one-time museum fieldtrips have long been a topic of discussion and probably will continue to be discussed given the current economic climate and accountability required by schools. While this study is by no means the only or most definitive evaluation of fieldtrip outcomes, it contributes to our greater understanding of fieldtrip experiences and their ability to impart knowledge and skills.

Methods

RK&A administered questionnaires and interviews to a treatment group and control group totaling 154 fourth-grade students in New York City public schools; questionnaires collected attitudinal information about history and museums, while interviews, which incorporated pictures and objects related to New York City history, explored student achievement of historical thinking. Instruments were administered to treatment students one to two weeks following the fieldtrip. RK&A also administered questionnaires to teachers of participating students in order to collect contextual data, such as the amount of hours teachers spend on history and other fieldtrips taken that school year.

Data & Analysis

Student interviews were audio recorded and transcribed to facilitate analysis. The interviews were scored on rubrics by two scorers and compared for inter-rater reliability. The resulting scores, along with the questionnaire data, were analyzed statistically using SPSS.

Results

RK&A explored four historical thinking skills: knowledge, inquiry, perspective, and reasoning. Treatment students, those who received the *Traveling Through Time* program, outscored control students in many aspects of the four historical thinking areas. Yet, while treatment students outscored control students, their overall achievement was modest. Students scored well in knowledge, but struggled in the other historical thinking areas. For instance, in perspective and reasoning, the majority of students scored at the bottom half of the rubric.

Importance

This study is significant because it shows that one-time fieldtrips can have positive effects on students' learning and attitudes. However, it also indicates that students have not reached their full potential in the classroom and at the Museum in terms of historical thinking skills. Thus, it prompts many questions for museum educators:

- Why did students have difficulty applying their knowledge to reasoning? How can museum educators more effectively help students build their ability to reason?
- How might repeated exposure to programs like *TTT* and inquiry-based teaching methods have helped develop skills like historical reasoning and perspective?
- What are the long term effects of fieldtrip programs—what if the study was conducted a few weeks, months, or even years after the fieldtrip?

References

- Barton, K. C., & Levstik, L. S. (2003). Why don't more history teachers engage students in interpretation? *Social Education*, 67(6), 358-361.
- Brophy, J. E., & VanSledright, B. (1997). *Teaching and learning history in elementary schools*. New York, NY: Teachers College, Columbia University.
- DeWitt, J., & Storksdieck, M. (2008). A short review of school field trips: Key findings from the past and implications for the future. *Visitor Studies*, 11(2), 181-197.
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.

- Paris, S. G., & Mercer, M. G. (2002). Finding self in objects: Identity exploration in museums. In G. Leinhardt, K. Crowley, & K. Knutson (Eds.), *Learning Conversations in Museums* (pp. 401-423). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Randi Korn & Associates, Inc. (2007). *Program evaluation: School programs of the Frederick A.O. Schwarz Children's Center at the Museum of the City of New York*. Alexandria, VA: Randi Korn & Associates, Inc.

Additional Links

See <http://informalscience.org/evaluation/show/294> for the full report by Randi Korn & Associates, Inc. for the Museum of the City of New York.

Disturbing the Eternal Silence of the Gallery: Comment Books as Sites of Dialogue

Kevin Coffee, M.A.

Purpose

An analysis that examines the dialogic events taking place as audiences engage gallery narratives specifically through the form of visitor comment books. The social quality of the gallery narrative is perceived to reinforce the visitor's interest and willingness to actively participate in ongoing conversation about specific topics suggested in the gallery display as well as to engage broader socio-ethical problems raised by the public dialogue engendered by the gallery programming.

Perspective

The photography exhibition *Table of Contents: Portraits of Hunger and Resilience* presented first-person stories of people in America struggling with food insecurity and foregrounded the importance of museums to the public discourse of social and ethical issues. Museum programming for the exhibition drew on work by Vygotsky and Bakhtin to promote interactive audience engagement with the exhibition narratives as dialogic events and to involve gallery audiences as co-creators of narratives in the gallery space through the specific use of a visitor comment book. The comment book, and the public posting of excerpts from it, makes legible the dialogism of the visitor experience and enacts new threads of discussion, extending the breadth and focus of the narratives presented by the exhibit subjects and/or scripted by the exhibit organizers. Consequently, the gallery exhibition becomes a more diverse, and perhaps more authentic, social practice.

While some findings (e.g., Livingston, Pedretti and Soren 2001; Macdonald 2005) have been published regarding qualitative data found in visitor comment books or cards, they have generally focused on using that information to evaluate public programming. In the case of *Table of Contents*, the visitor comment book was intended as an enabling device for dialogic activity. The material captured in the comment book was analyzed as exhibit narratives-in-themselves and as dialogue-at-large rather than as measures of the communicative function of the curated exhibition.

Method

Narrative information was analyzed using methods recommended for inductive analysis of qualitative data (Patton, 1990; Strauss, 1987; McCracken, 1988). An index was compiled of the word patterns and types of statements that appeared among the comments. Major threads were identified in which visitors explored ethical relationships and socio-cultural situations relevant to either the narratives of portrait subjects or those of other visitors.

Results

Visitors entered into what they perceived to be a collective discussion in progress, grounded in their affinity for

specific narratives presented in the gallery and contextualized by the presentation format. Some writers shared personal experiences with portrait subjects. For others, the immediate socio-economic reality of the deep recession provided an interpretive frame for discussing hunger as a societal issue. The comment book enabled dialogue among visitors, exhibition subjects and Bakhtin's ethical "super-addressee."

Importance

This investigation represents new work in the area of visitor comments as qualitative data, which is under-theorized in visitor studies and in museology generally. Also of note, it examines dialogicism in the museum taking place well beyond the mediating hand of the curator or public programmer. It should be of interest to a range of practitioners including public programming planners, audience researchers and program evaluators, all of whom may be in attendance at this combined conference.

Selected References

- Bakhtin, M.M. (1986). *Speech genres and other late essays*. Austin: University of Texas Press.
- Bruner, J. (1991). The narrative construction of reality. *Critical Inquiry*, 18(1): 1-21.
- Coffee, K. (2008). Cultural inclusion, exclusion and the formative roles of museums. *Museum Management and Curatorship*, 23(3): 261 - 279.
- Livingstone, P., Pedretti, E., & Soren, B.J. (2001). Visitor comments and the socio-cultural context of science: Public perceptions and the exhibition "A Question of Truth." *Museum Management and Curatorship*, 19(4): 355-369.
- Macdonald, S. (2005). Accessing audiences: Visiting visitor books. *Museum and Society*, 3(3): 119-136.
- McCracken, G. (1988). *The long interview*. Thousand Oaks: Sage.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. Newbury Park: Sage.
- Shotter, J. (1995). In Conversation: Joint Action, Shared Intentionality and Ethics. *Theory & Psychology*, 5(1): 49-73.
- Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.
- Wertsch, J.V. (1985). *Vygotsky and the social formation of mind*. Cambridge and London, Harvard University Press.
- Vygotsky, L. (1986). *Thought and language*. Cambridge, MIT Press.

1:15-2:30 p.m. Concurrent Sessions—Two

Mining User-Generated Flickr Data for Front-End Evaluation

Joyce Ma, Exploratorium

Purpose

This presentation describes ways of using large datasets of geotagged photographs in Flickr to help understand people's perceptions of and experiences in the neighborhoods around a museum. Using examples from a front-end study about the Exploratorium's new site by the San Francisco Bay, the talk describes the types of data available from Flickr and ways to analyze the information retrieved, including the spatial analysis techniques and the visualization tools used to address the questions: 1) What do people find meaningful at and near the new Exploratorium location? 2) Where do people find meaning? 3) What times of the year are they in the area? 4) How do people traverse the surrounding neighborhood?

Perspectives

The availability of digital capture and GPS devices, coupled with the popularity of digital photography and online photo sharing services, has produced large datasets of geotagged photographs, generated and shared by and with the public. These data contain a wealth of information about not only what the photographers see, but also who they are, where they have been, and when they were there. The data from Flickr can be used to complement more traditional front-end interviews with information about the area's visitors, their habits, and points of interest in the local landscape. This, in turn, can inform the planning of a museum collection that aims to foster a strong connection between visitors and the local environment.

Importance

This presentation describes how to access and use geotagged data to better understand a subset of the potential visitors at and around museums and their experiences in those areas. It is intended for audience researchers and evaluators who are interested in exploring the large corpus of user-generated data already available on websites such as Flickr.

Additional Links

Flickr API can be found at <http://www.flickr.com/services/api/>

Applying an Observational Framework in Exhibit Evaluation

Heather Harkins, Connecticut Science Center

Purpose

This presentation reports on a process used by an internal evaluator to train staff members from both visitor services and education departments to conduct exhibit evaluation. Discussion will focus on methods of the evaluation, lessons learned during the process, and findings that are relevant to the practice of visitor research.

Perspectives

Three months after opening, staff at a new science center identified exhibits for systemic evaluation using an observational framework based on Falk and Dierking's Contextual Model of Learning in informal settings (2000). Staff members from across the institution (educational programs, visitor services, exhibits) were trained by an in-house evaluator to conduct data collection, entry and analysis.

This presentation reports on the process used to train this diverse group and lessons learned regarding application of a relatively unknown observation-based method. Specifically, this paper reports on the implementation of a "noninterventionist observational framework" (Rennie, 2007) known previously as the Depth of Learning Framework (Barriault, 1999), and currently as the Visitor Engagement and Exhibit Assessment Model (Barriault and Pearson, 2010). This method was used to evaluate six individual exhibits located within a science center in the Northeast United States. The lead evaluator, a staff member at the science center, trained a diverse group of staff from multiple departments (visitor services, exhibits and educational programs) to understand and apply the Depth of Learning Framework. The training began with an introduction to learning theory, including the Contextual Model of Learning (Falk and Dierking, 2000) on which the Depth of Learning Framework is based. After practice sessions with the framework, training was conducted on data collection and entry procedures. A method of capturing recommendations for exhibit improvement was a questionnaire which staff members completed at various intervals during their data collection. The results of this evaluation illustrate how the Depth of Learning framework has been effectively applied in a new science center. In addition, the study illustrates how to coordinate a systemic evaluation with a team of staff who were expected to benefit from both the process of conducting research and applying the findings in their ongoing work. Finally, the paper includes the lessons

learned by the internal evaluator as she trained this team, scaffolded their research, and negotiated institutional demands.

Importance

This presentation contributes to visitor research in three ways. First, it tests and presents the results of applying a promising, yet relatively unknown, method of exhibit evaluation known as the Depth of Learning Framework. A modified version of this framework proved to be an effective and efficient method of conducting exhibit evaluation at a new science center. Second, it illustrates one way in which to conduct an internal evaluation which includes a diverse group of staff members, instead of just trained internal or external evaluators. Internal and external evaluators will benefit from the methods, successes, and lessons learned at the science center. Finally, the paper describes how research was purposefully conducted to nurture a culture of evaluation within the institution, necessary to perpetuate the ongoing professional learning of staff. It is in the interest of all evaluators to understand ways by which to empower clients in their project endeavors.

References

- Barriault, C. (1999, March/April). The science center learning experience: A visitor-based framework. *The Informal Learning Review*, 35, 1, 14-16.
- Barriault, C. & Pearson, D. (2010). Assessing exhibits for learning in science centers: A practical tool. *Visitor Studies*, 13, 1, 90-106.
- Falk, J. H. & Dierking, L.D. (2000). *Learning from museums: Visitor experiences and the making of meaning*. Walnut Creek, CA: Altamira Press.
- Rennie, L. J. (2007) Learning Science Outside of School. In S. K. Abell & N. G. Lederman (Eds.), *Handbook of research on science education* (pp. 125-167). Mahwah, NJ: Erlbaum.

Additional Links

www.ctsciencecenter.org

Automated Analysis of Spatial Behavior at the London Zoo

Theano Moussouri, University College London
George Roussos, Birkbeck College, University of London

Purpose

This paper reports on a full-scale experiment in visitor research and evaluation using the Experience Recorder, a mobile pervasive computing platform to capture, replay and analyze visitor experiences. It will discuss the costs and benefits of this approach and report findings from a study conducted with families at the London Zoo, UK.

Perspectives

Research and evaluation professionals regularly use information and communication technologies (ICT) for data processing, analysis and presentation. Today, growing maturity of the so-called mobile and ubiquitous computing technologies offer novel opportunities for automated visitor tracking and the reconstruction of visitor experiences, and thus new opportunities for ICT-supported research and evaluation. This study represents a full-scale experiment with such technology building on previous pilots undertaken by the authors that built confidence in the feasibility of this approach. Specifically, we used the Experience Recorder (ER), a pervasive computing platform developed at Birkbeck College, University of London, UK, to capture, replay and analyse visitor experiences. The ER is a hardware and software prototype that allows the continuous capture, archival and reconstruction of personal experiences. It can employ a variety of sensors, either embedded in the environment

or on the body and clothing garments of the user, to continuously capture the situation of a particular individual. The captured data are automatically archived and reconstructed to provide a detailed record of specific aspects of the visitor experience. In this case, we used specially modified smartphones to record fine resolution location information of families during their visit to the London Zoo and in some cases additional parameters such as spatial density. From these we are able to infer their spatial behavior and their interaction with physical objects in general and specific exhibits in particular.

We used ER to capture patterns of visitor spatial navigation which we used to explore how they relate to the family agenda and specifically to their understanding of the subject matter, their motivations and expectations, using the London Zoo as a case study. To do so, we asked visitors at the beginning of the visit to construct their Personal Meaning Map (PMM) related to the exhibition. Then, we recorded their visit with the ER and repeated the PMM at the end of the visit. The pre- and post-PMMs were compared and cross-related with patterns of spatial navigation. To extract these patterns from the raw location data we used machine-learning techniques to discover specific characteristic behaviors. For example, the observed visit trails correspond to a so-called Levy flight, which is frequently encountered in biological systems and is often related to efficient strategies for foraging. Moreover, the parameter of the related power law distribution of displacements recorded for a particular family appears to be related to their agenda for the visit. Note that following this approach it is also elementary to calculate standard descriptive statistics such as average duration of a visit or the mean dwell time at specific exhibits, but our interest is to go far beyond that.

Importance

In this presentation, we will first describe the technology employed and show how it that can be utilized for research. We will also discuss how findings were used by the Zoo interpretation staff to redevelop the wayfinding system. Since this is state-of-the-art technology it is important to identify its costs and benefits and the critical issues that success of such projects depends upon, advise on what works in practice and identify best approaches to developing successful research and evaluation projects.

The intended learning outcomes of this presentation is to illustrate how new mobile and ubiquitous computing technologies can be employed for visitor data collection in the context of evaluation studies. As such, this presentation is relevant to evaluators and exhibition and program developers.

References

- Angus, A., G. Lane, K. Martin, D. Papadogkonas, G. Papamarkos, G. Roussos, S. Thelwall, R. Silverstone, Z. Sujon & N. West. (2008). Urban Social Tapestries, *IEEE Pervasive Computing*, Vol. 7(4), pp. 44-51.
- Bryan-Kinns, N., D. Airantzis, A. Angus, R. Fencott, G. Lane, F. Lesage, J. Marshall, K. Martin, G. Roussos, J. Taylor, L. Warren & O. Woods. (2009). Sensory Threads: Perceiving the Imperceptible, in *Intelligent Environments 2009 (IE09)*, July 20-21, Barcelona, Spain, pp. 404-410.
- Kostakos, V., E. O'Neill, A. Penn, G. Roussos & D. Papadogkonas. (2010). Making sense of urban mobility and encounter data, *ACM Trans. CHI*, 17(1):1-38.
- Peterson, D. & Levene, M. (2003). Trail records and navigational learning. *London Review of Education*, 1, 207-216.

Exploring Mobile Eye-Tracking in Visitor Studies

Kira Eghbal-Azar, Knowledge Media Research Center, Tuebingen, Germany

Purpose

This individual presentation has three goals: first, introducing a new method in visitor studies, mobile eye-tracking; second, explaining shortly the technique itself; and third, exploring in detail its usability for visitor studies compared to traditional research methods, thereby giving some practical advice.

Perspectives

In their article "Timing and Tracking: Unlocking Visitor Behavior," Yalowitz and Bronnenkant (2009) provide an excellent summary and overview of tracking studies that are conducted mainly by observation and focus on pathways, stops and other behavioral patterns of museum visitors. They also provide the reader with a detailed description of methods and new technologies for such visitor studies. But although this article was published recently, Yalowitz and Bronnenkant did not mention mobile eye-tracking as a new technological option.

Mobile eye-tracking has many advantages compared to traditional tracking studies. Not only does it give insights in body movements, it also gives insights into eye movements that are unconscious and therefore cannot be manipulated by the participant (that needs to be considered for ethical concerns; Mayr et al. 2009). These eye movements can hardly be observed or can be missed by observers. Mobile eye-tracking produces rich and conservable data that are more reliable and much more exact and sophisticated than observation data (Mayr et al. 2009), such as the paper-and-pencil-method, the videotaping method, or a tracking technology that is worn by visitors as Yalowitz and Bronnenkant (2009) mentioned in their review.

Hence mobile eye-tracking in visitor studies marks the next level for tracking visitors' eye and body movements. As we cannot draw simple connections from eye or body movements (especially stops at particular exhibits) to attention and cognitive processing, we always should combine any tracking methods with other methods to figure out visitors' attention and cognitive processes (compare Just & Carpenter, 1980; Potter, 1983; Land & Tatler, 2009).

Therefore this presentation stresses the need for triangulating different research methods in visitor studies that apply mobile eye-tracking technology much as George Hein (1998) already recommended generally for visitor studies. Mobile eye-tracking can be combined with various methods like interviews and questionnaires. The presentation will provide conference participants with an overview about possible combinations and will mainly focus on three different kinds of verbalisations (compare van Gog et al. 2005).

Although there are many advantages to conducting visitor studies with mobile eye-tracking technology, there are of course also many limitations. The presentation will provide an overview of the technical limitations and limitations of applying mobile eye-tracking in explorative and experimental visitor studies. Therefore some practical advice will be given by the presenter. The possibilities and also the time and effort needed to analyse mobile eye-tracking data quantitatively and qualitatively will be presented briefly. Videos examples and photos will be shown during the presentation for illustration and in order to provide research examples from visitor studies in German museums.

Importance

This presentation explores comprehensively the new method of mobile eye-tracking in visitor studies. Thereby its potential and (technical) limitations compared to traditional methods in visitor studies will be presented. After this presentation the conference participants should be able to decide if and how they can apply mobile eye-tracking technology in visitor studies.

References

- Hein, G. E. (1998). *Learning in the Museum*. London: Routledge.
- Just, M. A., & Carpenter, P.A. (1980). A Theory of Reading: From Eye Fixations to Comprehension. *Psychological Review*, 87 (4), 329-354.
- Land, M. F., & Tatler, B. W. (2009). *Looking and Acting: Vision and Eye Movements in Natural Behaviour*. Oxford: Oxford University Press.
- Mayr, E., Knipfer, K., & Wessel, D. (2009). In-sights into mobile learning: An exploration of mobile eye tracking methodology for learning in museums. In G. Vavoula, N. Pachler, & A. Kukulska-Hulme (Eds.), *Researching mobile learning: Frameworks, tools and research designs* (pp. 189-204). Oxford: Peter Lang.
- Potter, M. C. (1983). Representational buffers: the eye-mind-hypothesis in picture perception, reading, and visual research. In K. Rayner (Ed.), *Eye-movements in reading: Perceptual and language processes* (pp. 413-437). New York: Academic Press.
- Van Gog, T. et al. (2005). Uncovering the Problem-Solving Process: Cued Retrospective Reporting Versus Concurrent and Retrospective Reporting. *Journal of Experimental Psychology*, 11 (4), 237-244.
- Yalowitz, S. S., & Bronnenkant, K. (2009). Timing and Tracking: Unlocking Visitor Behavior. *Visitor Studies*, 12 (1), 47-64.

Additional Links

- <http://www.iwm-kmrc.de/www/en/projekte/projekt.html?name=AneignungErfahrungMuseum&dispname=AneignungErfahrungMuseum>
- <http://www.iwm-kmrc.de/www/en/projekte/projekt.html?name=WissenundMuseum&dispname=WissenundMuseum>
- <http://www.iwm-kmrc.de/www/en/projekte/projekt.html?name=TrainingvisuellerFaehigkeitenKunst&dispname=TrainingvisuellerFaehigkeitenKunst>
- <http://www.iwm-kmrc.de/www/en/projekte/projekt.html?name=KonfliktiveSachverhalteMuseum&dispname=KonfliktiveSachverhalteMuseum>

Understanding Visitor Motivation

Ross J. Loomis, Colorado State University (presenter)

Robert Eisenberger, University of Houston (presenter)

Steve Yalowitz, Institute for Learning Innovation (presenter)

Joe E. Heimlich, Ohio State University Extension/Institute for Learning Innovation (chair)

Julie Johnson, Science Museum of Minnesota (discussant)

Purpose

To present and discuss visitor motivation as a basic topic in visitor studies. A presentation of recent motivational concepts related to visitor motivation will be followed by two presentations concerning the field's newest entry, the Motive for Sensory Pleasure (MSP), which concerns enjoyment of nature and its representation in painting, music, and literature.

Perspectives

Ross Loomis will describe research on what motivates visitors to make the choices they do as they move through exhibits, what motivates visitors to learn, and the values and benefits that result from visiting museums. He will review works by Rounds (2004), Bitgood (2010), Csikszentmihalyi and Hermanson, (1995), Packer (2008), Cacioppo, Petty, Feinstein, and Jarvis, (1996), Packer and Ballantyne (2002), Packer and Bond (2010), and Falk (2009).

Robert Eisenberger will describe the new concept of Motive for Sensory Pleasure (MSP), which refers to the extent of individuals' general disposition to enjoy and pursue pleasant nature-related experiences and their

representations in painting, music, and literature (Eisenberger, Sucharski, Yalowitz, Kent, Loomis, Jones, Paylor, Aselage, Steiger Mueller, & McLaughlin 2010). Humans across cultures show a high, medium, or low distinctive tendency to enjoy nature-related experiences. Such MSP can be readily assessed by the extent of agreement with statements on the Motive for Sensory Pleasure Scale. Four general principles about MSP are especially relevant to visitor studies:

1. Differences across individuals in MSP have a major impact on the motivation to pursue, and the enjoyment of, nature-related experiences.
2. The enjoyment of nature, music, and art by high MSP individuals is strongly influenced by the sensory quality of displays.
3. High MSP individuals are strong visualizers. They very much enjoy imagery evoked by textual descriptions.
4. High MSP individuals are primarily motivated by sensory enjoyment but they also want to develop a cognitive understanding of their favorable sensory experiences in nature, art, and music.

Steve Yalowitz will present evidence indicating that high MSP individuals show increased enjoyment of textual descriptions of natural settings. The study showed that high MSP persons enjoyed the descriptions more when it was written to evoke a high degree of imagery. Thus, one way to increase attention to textual information in exhibits, especially among high MSP individuals, is to provide more descriptive language. In addition, while high MSP individuals are motivated to visit museums more for pleasant stimulation than to learn, they are also motivated to develop a cognitive understanding of their experiences. Yalowitz will present evidence that high MSP individuals show greater learning both about both the sensory details of their experiences and accompanying information. In fact, pleasant sensory stimulation may be used as a way to peak their curiosity and interest. One implication for exhibit design is that rather than consistently having information temporally precede sensory experience, in terms of learning it would be useful to have information follow the sensory experience, of once they become engaged by the pleasant sensory experience.

Importance

This presentation will be meaningful to conference attendees in a number of ways. First, it will consolidate the most recent theories of motivation that have been applied to museums and discuss how they are similar to and distinct from each other. Second, the new theory of MSP and its practical applications will be presented so that attendees can understand how it is currently being used and how it might be applied to their own work. This presentation will be most relevant to those who are looking for ways of segmenting and describing their audiences, providing not only demographic information, but also a better understanding of why visitors are coming and the kinds of experiences they are expecting. The presentation will be particularly useful for exhibit developers and designers, educators and those in charge of programs; it will also be helpful for those in marketing, public relations and communications.

References

- Bitgood, S. (2010). *An attention-value model of museum visitors*. The Center for the Advancement of Informal Science Education
- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, 119, 197-253.
- Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper Collins.
- Csikszentmihalyi, M., & Hermanson, K. (1995). Intrinsic motivation in museums: Why does one want to learn? In J. Falk and L. Dierking (eds.), *Public institutions for Personal Learning*. Washington D. C.: American Association of Museums.
- Eisenberger, R., Sucharski, I. L., Yalowitz, S., Kent, R. J., Loomis, R. J., Jones, J. R., Paylor, S., Aselage, J., Steiger Mueller, M., & McLaughlin, J. P. (2010). The motive for sensory pleasure: Enjoyment of nature and its representation in painting, music, and literature. *Journal of Personality*, 599-638.
- Falk, J. H. (2009). *Identity and the Museum Visitor Experience*. Walnut Creek, CA: Left Coast Press. .

- Packer, J. (2008). Beyond learning: Exploring visitors' perceptions of the value and benefits of museum experiences. *Curator: The Museum Journal*, 51 (1), 33-54.
- Packer, J., & Ballantyne, R. (2002). Motivational factors and the visitor experience: A comparison of three sites. *Curator: The Museum Journal*, 45 (3), 183-198.
- Packer, J., & Bond, N. (2010). Museums as restorative environments. *Curator: The Museum Journal*, 53 (4), 421-436.
- Rounds, J. (2004). Strategies for the curiosity-driven museum visitor. *Curator: The Museum Journal*, 47(4), 389-411.

The Journey of Bilingual Evaluation Capacity: Three Institutions' Perspectives

Nelda Reyes, Oregon Museum of Science and Industry (presenter)
Veronica Garcia-Luis, Exploratorium (presenter)
Kathleen Tinworth, Denver Museum of Nature & Science (presenter)
Marcie Benne, Oregon Museum of Science and Industry (co-author)
Cecilia Garibay, Garibay Group (session chair)

Purpose

This panel addresses the struggles, successes, and absolute necessities that are inherent in the stages of preparation, recruitment, hiring, and sustaining a successful bilingual evaluation team. The session will showcase three institutions at various stages of this challenging work in order to illustrate the resources and techniques available to other evaluation professionals in the field.

Perspectives

At VSA 2010, OMSI's Evaluation and Visitor Studies Manager, Marcie Benne, presented a poster about how to assess language skills when hiring bilingual evaluation staff. Exploratorium learned about the framework and adapted it to meet the specific needs of its institution. The Denver Museum of Nature & Science contacted OMSI's evaluation team and asked for assistance in assessing candidates for a new bilingual position for their evaluation department. During the last year, OMSI has continued to use this framework and also has begun developing processes and guidelines to support the day to day activities of its bilingual team. After several months of experience and lessons learned across three different institutions in three different cities, the organizations will share their models and reflect on their processes with the hope that other informal institutions looking to build bilingual capacity in their evaluation departments can both learn from this journey as well as share their own paths.

Panelists' Perspectives

Nelda Reyes (OMSI) will focus on OMSI's nine years of experience creating job descriptions, recruiting candidates, assessing language skills in a consistent and practical way, managing team members with complementary linguistic strengths and developing the visitor studies competencies of a bilingual Spanish and English team.

Veronica Garcia-Luis will share a set of assessment activities to vet bilingual candidates based on the needs of a trilingual exhibit label project. Also discussed will be some of the challenges associated with striking a balance between assessing desired language skills and research and evaluation skills as well as some strategies on how to get help in assessing language skills when the language capability may not exist internally.

Kathleen Tinworth (DMNS) will discuss the hiring process for DMNS' first bilingual research associate, as well as the important institutional, departmental, and cultural issues that the hiring process helped raise to the surface.

Notably, she will share the importance of addressing historical power and privilege differences and how to incorporate ongoing anti-oppression work and practices into your evaluation team.

Importance

Sustainable practices are in part a result of consciously looking for strategies and resources that can allow individuals and institutions to operate effectively and responsibly. In the current state of informal education, where there's an imperative need to be inclusive and become institutions that reflect our diverse communities, it is of major importance to build evaluation capacity that can reflect those communities. Bilingual evaluation capacity building is one of vehicle by which institutions can both advocate for equitable access to learning and at the same time stay relevant and competitive within the evaluation field.

References

- Frierson, H., Hood, S., and Hughes, G. (2002). Strategies that address culturally responsive evaluation. In *The 2002 User-Friendly Handbook for Project Evaluation*, edited by J. Frechtling. Arlington, VA: National Science Foundation.
- Hopson, R. (2003). Overview of multicultural and culturally competent program evaluation: Issues, challenges and opportunities. California Endowment, Diversity in Health Evaluation Project. Woodland Hills, CA: California Endowment.
- Irvine, F., Roberts, G., and Bradbury-Jones, C. (2008). The researcher as insider versus the researcher as outsider: Enhancing rigour through language and cultural sensitivity. In Liamputtong, P. (Ed.), *Doing cross-cultural research: Ethical and methodological perspectives*. Springer: Netherlands.
<http://www.springerlink.com/content/mt08743478g8l261/>
- Larose, P. and Proulx, D. (1997). Determining the linguistic profile and the communication requirements of positions. Canadian Museum of Civilization Corporation, Human Resources Division. Gatinaeu, Quebec.
- Lopez, T. & Thomas, B. (2006). *Dancing on Live Embers: Challenging Racism in Organizations*. Between the Lines: California.
- Montiel, M. and Benne, M. (2008). OMSI. Portland, OR. 2008.
- Parker, L. (2008). Determining linguistic profiles and selecting bilingual staff. OMSI. Portland, OR. 2008.
- Rothenberg, P.S. (2008, 3rd Ed.). *White Privilege: Essential Readings on the Other Side of Racism*. Worth Publishers: New York.

Additional Links

- American Evaluation Association (AEA) Multi-Ethnic Issues in Evaluation TIG, <http://comm.eval.org/EVAL/MultiethnicissuesinEvaluation/Home/Default.aspx>
- American Association of Museums (AAM) Latino Network Professional Interest Committee, <http://www.lnpicaam.org/static/>
- Pew Research Center's Hispanic Center, <http://pewhispanic.org/>
- Hispanic Trending Blog (Juan Guillermo Tornoe), <http://juantornoe.blogspot.com/>
- Association of Children's Museums Diversity in Action Initiative, <http://www.childrensmuseums.org/programs/diversity.htm#aam>

Children as Interpreters of Their Own Experience

Lorrie Beaumont, Evergreene Research & Evaluation

Purpose

The purpose of this session is to describe the technique of having children interpret an exhibit as an evaluation method, the necessary IRB application and approval process and to discuss the technique's successes and challenges.

Perspectives

Adler Planetarium's *Planet Explorers* exhibition was designed for young children, so it was a good opportunity to include children as active participants in the evaluation. Dr. Beaumont was inspired by work out of the United Kingdom called the "mosaic approach" developed by Alison Clark and Peter Moss (Clark 2004). In this approach, multiple methods are used, including children taking photographs and using their drawings to interpret spaces that are either being developed or being evaluated. Clark and Moss combine these types of methods with talking to the children and observing their behavior, to gain a deeper understanding of their perspectives. The "mosaic approach" project showed that children from a very young age were able to take on the roles of researcher and informant about their own lives and thoughts.

Methods

As part of the *Planet Explorers* summative evaluation study children in the target age range (3-8) were sampled for age, gender, and racial diversity. Dr. Beaumont looked for families with children in the target age range. Once she was relatively certain they were nearing the end of their exploration of the entire exhibition she approached the adult caregiver and explained the study. She asked them to read the consent form, and to ask their child if she or he would like to participate. If the parents and child agreed, the caregiver was asked to sign a written consent form allowing their child to participate as a researcher and to be videotaped. Dr. Beaumont also explained the study very simply to the child and asked for their verbal assent. If willing, the child put on one of the "oxygen backpacks" (an exhibition prop) that was fitted with a wireless microphone. To preserve their anonymity, children were asked to make up an astronaut name. Dr. Beaumont called them by this name throughout the tour. These were the only names used in the final report.

Once they had a name and were fitted with the microphone Dr. Beaumont asked the child to pretend she was a visitor, and take her through the exhibition acting as a tour guide, She used prompts such as, "Where did you go first?" "What did you do here?" "What else should I make sure to see during my visit?" A videographer accompanied Dr. Beaumont and the child through the exhibition. Along the way the child described the exhibition and possible experiences one could have. This method was successful in revealing children's constructed knowledge about the exhibition, their preferences, and the areas that most intrigued them. The videotaped "tours" were later transcribed for analysis and the complete transcripts were included in the final report as an appendix. As a thank you each family an edited DVD copy of their child's session was mailed to them.

Data & Analysis

The videotaped "tours" were analyzed to identify the path the child took through the exhibit, the areas they focused on and the ways in which they talked about each area. These findings were triangulated with other study data (observations and interviews of family groups) to reveal common themes and behaviors.

Results

While the main goal of this session is to discuss the methodology of "child tours" findings will be briefly described in order to demonstrate how consistent the child tour findings were with findings from the other methods used in the study. For example the areas of the exhibition that were most popular with the overall sample of visitors were the same most visited areas in the "child tours."

Importance

Younger children are rarely interviewed or videotaped due to the challenges of negotiating the Institutional Review Board protocol. This method was an effective way of using children as primary informants in the exhibit experience.

References

Clark, A. (2004). "The Mosaic Approach and Research with Young Children." In V. Lewis, M. Kellett, C. Robinson, S. Fraser and S. Ding, eds. *The Reality of Research with Children and Young People*. London: Sage.

Calculating the "Distance Traveled": Assessing the Impact of STEM Outreach Programs

Natasha. C. Simons, The University of Salford, UK and Techniquet Science Discovery Centre, Wales, UK

Purpose

This paper will discuss the implications of adopting the evaluative method of 'distance traveled' when assessing the impact of (STEM) outreach activities designed, developed and delivered by Techniquet, a science discovery centre in Cardiff, South Wales.

Perspectives

Reach the Heights is a new 27 million pound initiative (funded by European Social Fund and The Welsh Assembly Government) which aims at providing disadvantaged communities with support and encouragement to enable young people aged 11-19 across Wales to acquire practical skills and develop career opportunities (a similar scheme in the US is the Youth Inspired project run by ASTC). Techniquet's role in this project has been to design, develop and deliver a new Science, Technology, Engineering and Maths (STEM)-based engagement programme. The project is designed to increase young people's engagement in STEM-based subjects through interactive workshops (using problem-based learning), a programme of work-related experience (opportunity to meet and talk to a STEM professional) and contemporary science debates. Its aims are to motivate and enthuse young people to be engaged in STEM-based education, training and employment. The project has both 'soft' (attitudinal, motivational, confidence building, participation) and 'hard' outcomes (knowledge and understanding).

Methods

The evaluation of this project therefore had to take into account differences in pupils' personal ability, social background and educational ability. A purely summative evaluation would not enable us to ascertain whether pupils gained anything *new* from the workshop both in terms of soft or hard outcomes. A method of 'distance traveled' using key constructs based around Falk and Dierking's contextual method of learning and Hooper Greenhill's Generic Learning Outcomes was adopted for this project (distance traveled developed by the Institute of Employment studies in the UK). Using a sample group of 30 pupils (aged between 13-18), pre (one week before) and post (one month after) interviews were conducted with the selected pupils. Each interview looks closely at what teenage pupils 'start off with' before the workshop and compares this directly with what they 'finish with' once they have completed the workshop (after a time gap of one month). Responses are then converted into a numerical value and a pre- and post - intervention score is calculated. Rather like rungs on a ladder it is hoped that the pupil will climb up the rungs rather than down (although either or neither is possible). In order to check the validity of the method observations were also carried out during some of the workshops.

Results

Preliminary results show improvements in key skills (especially solving problems, following instructions, arguing a point, asking questions and working as a team). The other significant finding, so far, is the increase in verbal

fluency of the pupils when asked more descriptive questions about the topic covered in the workshop. Every pupil interviewed showed an increased ability to talk about and reflect on the topic covered in the workshop when interviewed, even one month after the workshop. Pupils have not, so far, demonstrated any significant improvement on fact-type questions.

Importance

These preliminary results show that although using ‘distance traveled’ is time-consuming, organizationally difficult and qualitative in nature, it allows for the emergence of a truer ‘picture’ of the impact of STEM outreach programmes has, not only on ‘hard’ outcomes but also on ‘soft’ outcomes which have traditionally been more difficult to measure. As it measures pupil’s performance, based upon their own targets rather than set targets, the evaluation is transferable to all schools, ages and abilities of pupil. It is expected that this method will follow the 30 pupils through the three year Reach the Heights project in order to get an idea of the long-term impact that science centres outreach programmes have on teenage pupils.

The findings presented here are the result of a research collaboration between the University of Salford, UK and Techniquest Science Discovery Centre, Cardiff, UK and funded by the Arts and Humanities Research Council, UK. Research is ongoing and completion is due September 2011.

Climate Change the Musical: A Dramatic Format for Conveying Informal Science

Ellen Giusti, Consultant, Exhibition and Program Evaluator

Purpose

The presentation will delve into the development of a theatrical performance piece that aims to convey STEM content to audiences that might not otherwise be open to it. *The Great Immensity*, a play created by the New York-based theater company The Civilians, is about humanity’s relationship to the environment with original music and songs, focusing on critical issues of conservation and climate change. Working in two discrete locations that represent two extremes of climatic ecosystems, both under threat—the tropical rainforest and arctic Canada—scientists and laypersons grapple with questions essential to the fate of the planet. The title of the piece comes from the name of one of the enormous Panamax ships that pass through the Panama Canal and also docks at the port in Churchill, Manitoba.

Importance

The project is a Full-Scale Development Project under the NSF’s Informal Science Education Program focusing on STEM communication goals, promoting the public understanding of science using a new medium. From an ISE standpoint, the project will provide research findings about using an unconventional method (the performing arts) to convey scientific information. It will examine the impact of a theatrical presentation on the public’s awareness of and attitudes toward critical environmental and social issues. The Civilians’ creative method—building the piece from interviews and public discourse, revising and rewriting based on audience input and evolving current events—mirrors the iterative process inherent in formative evaluation. As the public is involved in the creative process from the very beginning, it supports dialogue between play and audience. *The Great Immensity* aims to create a live communal experience that provides a point of access to complicated and far-reaching ideas.

The play supports the strands of informal science learning outlined in the NRC’s *Surrounded by Science: Sparking interest and excitement by using an unconventional format for conveying information about the natural world; Understanding scientific content and knowledge presented in an engaging and entertaining medium; Engaging in scientific reasoning while making sense of the threats to the natural world; Reflecting on science as a way of understanding the biosphere and our place in it.*

The Civilians began the front-end evaluation process while in residence at Princeton University in 2009-2010. Working with several departments, they conducted research into the target audience's attitudes towards environmental crises, providing material for the development of the play.

The Civilians' development process includes several iterative stages in which works-in-progress are performed in front of an audience. A survey was distributed at a reading in a Manhattan theater to assess audience engagement and comprehension. Questions explored the play's impact on people's knowledge about, interest in, or attitude towards environmental issues. The results suggested that while communication goals are being met to an impressive degree, audience input could help to refine the script and presentation.

Summative evaluation will use a mixed methods strategy to measure the play's impact on audiences, as outlined in the Framework for Evaluating Impacts of Informal Science Education Projects (Friedman, 2008). We hope to find increased interest in, awareness and understanding of how scientists study climate change and biodiversity; and evidence of attitude toward the environment and behaviors that express the intent to care for the natural world.

The Civilians are working on an outreach project at an inner city high school, helping students to develop a play using their creative method. Students are researching environmental issues, conducting interviews within their neighborhood to develop and perform a play for their peers. The project's impact on the students and their audience is being evaluated.

References

- Cosson, S. (2010). *The Great Immensity*. Music and Lyrics by Michael Freidman. Connecticut College Reading draft.
- Fenichel, M., & Schweingruber, M. (2010). *Surrounded by Science: Learning Science in Informal Environments*. Washington, DC: National Academies Press.
- Friedman, A., Ed. (2008). *Framework for Evaluating Impacts of Informal Science Education Projects*. The National Science Foundation The Directorate for Education and Human Resources The Division of Research on Learning in Formal and Informal Settings (DRL). Available at http://insci.org/resources/Eval_Framework.pdf
- Grack Nelson, A. (2007). *Touring Theater Program Feasibility Study Report*. SMM Department of Evaluation & Research in Learning.
- Hughes, C. (2008). *Performance For Learning: How Emotions Play a Part*. Dissertation. Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University.
- Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2008). *Climate change in the American mind: Americans' climate change beliefs, attitudes, policy preferences, and actions*. A study conducted by the Yale Project on Climate Change and the George Mason University Center for Climate Change Communication,
- McCracken, K. (2009). *Communicating Climate Change, 2009 Audience Research Results*. Prepared for the Association of Science- Technology Centers with Funding from the National Science Foundation.
- Pidgeon, N., & Fischhoff, B. (2011). The Role of Social and Decision Sciences in Communicating Uncertain Climate Risks. *Nature Climate Change*. Published online: 29 March 2011; DOI: 10.1038/NCLIMATE1080.

Additional Links

- http://scienceblogs.com/art_of_science_learning/2011/03/helping_students_relate_to_sci_1.php
- http://scienceblogs.com/art_of_science_learning/2011/04/stem_or_steam.php

2:45-4:00 p.m. Concurrent Sessions—Three

An Exploration of Immersive Exhibits: How, Why and What Impact?

Josh Gutwill, Exploratorium
Eric Dimond, Exploratorium
Kevin Boyd, Exploratorium
Toni Dancu, Exploratorium
Nina Hido, Exploratorium
Hallie Gilbert, Brookline Public Schools

Purpose

Immersive exhibits are increasingly common in science centers; however, little is known about their development and relative impact. This session will address three main questions about immersives: Why and how do exhibit developers create interactive immersives? What does research reveal about how visitor experiences differ at immersive and non-immersive exhibits? And (with audience participation) how can we integrate these findings into the field's current thinking on immersive exhibits?

Perspectives

The Exploratorium has recently completed a project funded by NSF to develop a traveling geometry exhibition (Geometry Playground) where visitors explore and experiment on multiple geometric scales by manipulating shapes with their hands as well as by climbing over and getting inside large-scale immersives. In addition, the project provided an important laboratory for research into visitor experiences at immersive exhibits relative to tabletops.

Many museums devote significant resources to large-scale immersive elements, reflecting a common belief that immersives provide attractive educational opportunities. Unfortunately, with a few notable exceptions (Anderson & Roe, 1993; Borun, 2004; Gilbert, 2002; Gyllenhall, 2006; Korn & Jones, 2000) scant research exists on the impact of immersive elements as a genre. In our project, we defined an immersive exhibit as one in which the phenomenon or experience at least partially surrounds the visitor(s). We focused on a subtype that we call whole-body interactive immersives, which require one to engage the torso during use and have “physical, adjustable and relevant interactive features” (Allen & Gutwill, 2004, 201). Our aim was to contribute to the museum field's small knowledge base on immersive exhibits by learning as much as we could about this subtype.

Josh Gutwill, co-PI on the project, will begin the session with an overview of the goals of the project, and will introduce the notion of whole-body interactive immersives using images of Geometry Playground exhibits.

Eric Dimond, the exhibit developer responsible for many of the immersive exhibits, will discuss design challenges along with our process for developing, formatively evaluating and reworking our immersive exhibits.

Kevin Boyd, the label writer for the project, will talk about various methods of using labels to facilitate group interactions and address challenges unique to immersives.

Nina Hido and Toni Dancu, researchers on the project, will briefly describe findings from our study investigating the differences in visitors' experiences at interactive immersive and tabletop exhibits. We studied conceptually linked pairs of immersive and tabletop exhibits, meaning that they both demonstrated the same phenomenon,

but at different size scales (in ways keeping with the strengths of each exhibit type). Our study audio/videotaped 120 adult-child dyads as they used immersive or tabletop exhibits, interviewed them about their experience and, six weeks later, asked the adults to complete an online survey. We are currently coding our data, and will present the analyzed results during this session.

Finally, Hallie Gilbert, an educator and former exhibit developer who wrote a seminal review of immersive exhibits (Gilbert, 2002), will act as discussant for the session. Her role will be to reflect on the goals, processes and findings presented in the session, and facilitate a discussion to situate them within the larger context of immersive museum experiences.

Importance

Three years of exhibit development along with a quasi-experimental research study have produced new knowledge about the challenges and impacts of creating whole-body interactive immersive exhibits. This session provides concrete examples of immersive exhibit development and visitor experiences that we hope will inform future decisions about whether and how to build immersive exhibits.

References

- Allen, S., & Gutwill, J. P. (2004). Designing with multiple interactives: Five common pitfalls. *Curator*, 47(2), 199-212.
- Anderson, P., & Roe, B. C. (1993). The museum impact and evaluation study (MIES): Roles of affect in the museum visit and ways of assessing them. Chicago: Museum of Science and Industry.
- Borun, M. (2004). Messing with Mother Nature: Upgrading Icon Exhibits. Paper presented at the Visitor Studies Association, Albuquerque, NM.
- Gilbert, H. (2002). Immersive Exhibitions: What's the Big Deal? *Visitor Studies Today*, 5(3), 10-13.
- Gyllenhaal, E. D. (2006). Memories of math: Visitors' experiences in an exhibition about calculus. *Curator: The Museum Journal*, 49(3), 345-364.
- Korn, R., & Jones, J. (2000). Visitor behavior and experiences in the four permanent galleries at the Tech Museum of Innovation. *Curator*, 43(3), 261-281.

Additional Links

Geometry Playground website: <http://www.exploratorium.edu/geometryplayground/>

Research & Evaluation Reports for Geometry Playground:

http://www.exploratorium.edu/partner/visitor_research/reports_search.php?Projects=Geometry+Playground&BrowseSubmit=Browse&Authors=Any&Type=Any

The Falk Visitor Identity Model: Study Results & Practical Applications

Lauren Trainer, Denver Museum of Nature & Science

Marley Steele-Inama, Denver Zoo

Amber Christopher, Denver Zoo

Purpose

This session will present the Falk Identity Model, including the instrument, methodology, and an overview of the findings from Denver. It will explore how the Denver Zoo has utilized the results to engage staff and visitors in a more tailored experience.

Perspectives

The first part of the session will outline the Falk Identity Model, our research questions, the instrument, methodology, and findings. The second part of the session will highlight how the Denver Zoo has utilized the results of the Falk study to understand its visitors in order to engage them in a more relevant, personalized experience.

In 2009, John Falk released *Identity and the Museum Visitor Experience* and introduced a predictive model of visitor experience. He posited that understanding a person's motivation for visiting a museum allows for an increased level of personal connection, meaningfulness, and ultimately attendance and revenue. Some museum professionals have expressed admiration for Falk's ideas. However, a larger segment of the field has focused on the shortcomings of the book (Bickford, 2010; McCray, 2010).

Staff at the Denver Museum of Nature & Science agreed with many of the commentaries surrounding the murky methodology but also saw his book as a call to action. Over the course of two months, the Falk instrument was deployed at eight diverse cultural institutions in Denver. The questions: what motivated people to visit a particular institution and did motivations differ at each individual institution. The goal was for each institution to use the data to develop innovative and personalized ways of engaging with their visitors in an effort to refine the visitor experience.

Panelists from Denver Zoo will explain how the Falk Identity Model has informed the Zoo staff and enabled them to create specialized trainings, as well as how understanding visitor identities on unique events like free days has impacted programming.

Panelists' Perspectives

Denver Zoo staff is using the visitor identity data to inform education programming delivered on unique days. Marley Steele-Inama, Denver Zoo's Research and Evaluation Manager, will share the results of the data collection on two Free Days and two Sundays in 2011; including how visitor identity will impact future programming during these unique "events" and how it is triggering discussions of new methods of researching Zoo visitor identity. Steele-Inama will discuss how the instrument can be used by every institution to gather data that will allow staff to learn as a community about visitors and how that new knowledge can influence program delivery.

Amber Christopher, Denver Zoo's Director of Guest Services, will explain how the Falk Identity Model has informed professional development for Zoo staff. Christopher developed a specialized training for Zoo staff to introduce them to identity motivation and illustrate how staff can customize their interactions with visitors based on visitor motivation. The class is designed to encourage staff to use visitor motivation to create informal programs and give them the tools to identify motivation in the Zoo at large.

Importance

Panelists intend to invite institutions to think about and share what programs and decisions can be impacted by visitor motivation. The session will end by inviting the audience to add their own ideas of how the Model could be used in their institution. For example, how could marketing, education, exhibition, curatorial, and development departments use the model as a new way of thinking about how to create and sustain positive and meaningful visitor experiences?

References

- Bickford, A. (2010). Identity and the Museum Visitor Experience [Review of the book *Identity and the Museum Visitor Experience*, by J.H. Falk]. *Curator*, 53(2). 247-255.
- Falk, J.H. (2009). *Identity and the museum visitor experience*. Walnut Creek, CA: Left Coast press, Inc.
- McCray, K. (2010). Identity and the Museum Visitor Experience [Review of the book *Identity and the Museum Visitor Experience*, by J.H. Falk]. *Visitor Studies*,

Thirteen California Museums, One Learning Community & 10,000 Visitor Surveys

Marianna Adams, Audience Focus Inc.

Paige Simpson, Balboa Park Learning Institute, Balboa Park Cultural Partnership

Nancy Owens Renner, San Diego Natural History Museum & University of California San Diego, Cognitive Science
Doctoral Candidate

Vivian Kung Haga, Museum of Photographic Arts

Purpose

The Balboa Park Learning Institute created a learning community around visitor research to encourage practitioners to think creatively and collectively about the various dimensions that define the visitor experience. The structure of the learning community was based on an apprenticeship model where the emphasis was on learning by doing. Practitioners participated in workshops with experts who guided the process and provided information and techniques to empower practitioners to create, implement, and analyze a visitor experience survey across 12 diverse museums (4 art, 2 science, 5 history museums, 1 garden) and the Balboa Park Visitor Center, San Diego, collecting over 10,000 surveys.

Perspectives

The Balboa Park Cultural Partnership, a collaborative of 26 arts, science, and cultural institutions in San Diego's historic Balboa Park, created the Balboa Park Learning Institute (BPLI) dedicated to providing professional development to staff and volunteers working in Balboa Park cultural institutions. As a result of a needs assessment study indicating practitioner's interest in better understanding the visitor experience, BPLI created a laboratory in which practitioners from 12 diverse museums (4 art, 2 science, 5 history museums, 1 garden) and the Balboa Park Visitor Center could work together to learn new strategies for audience evaluation. This interdisciplinary team created and implemented a Park-wide exit survey (n=10107) with a post-visit online survey (n=428) on ways in which visitors benefitted from their museum experience. The results surprised practitioners, leading them to question their assumptions about visitors, motivating them to reflect on their practice. For many institutions, this was their first formal evaluation of the audience experience and it was the first time the Balboa Park community collaboratively conducted formal audience research on this scale.

Importance

The session explores the intent of the learning community laboratory—to push practitioners to think creatively and collectively about the various dimensions that define the visitor experience. Therefore the structure of the learning community was based on an apprenticeship model where the emphasis was on learning by doing. Practitioners participated in workshops with experts who guided the process and provided information and techniques for evaluating the visitor experience and interpreting findings. The expert leaders monitored the group's progress, noting where they were stuck or became frustrated, and created multiple scaffolds to support their progress through the experience.

Participating museums have built on the learning community experience in a variety of ways including:

- Increased cross-departmental discussions about the nature of the visitor experience;
- Rethinking the museum's marketing approach, making it more reflective of visitors' interest in spending quality time with friends and family or the desire to engage in unique and interesting experiences;
- Conducting focus studies on a variety of visitor issues, such as the optimum number and placement for visitor seating areas for reflection and relaxation;
- Development of quarterly marketing surveys;
- Creation of interpretive plans for exhibitions and collections;
- Testing label design and content for exhibitions;
- Exploring ways to collaborate with other Balboa Park organizations in meaningful ways.

This project was unique in how it brought together museums of different sizes and disciplines and gathered staff from a variety of positions including marketing, education, administration, visitor services, and membership – people who do not normally work together across museums. Participants recognized that the project provided an opportunity to work together for a common goal while, at the same time, collected and analyzed important data on their visitors for their own museum. Participants acknowledged the value of learning from each other’s experiences and that the ability to talk with each other and share ideas was unusual.

References

Conley, C. (2007) *Peak: How Great Companies Get Their Mojo from Maslow*. New York: Jossey-Bass.
Maslow, Abraham (1954). *Motivation and Personality*. New York: Harper.

Additional Links

www.bpcp.org/program/bpli

First Six Years of Urban Advantage Collaborative: From Development and Evaluation to Impact and Policy Implications

Jim Short, Gottesman Center for Science Teaching and Learning, American Museum of Natural History
Hudson Roditi, Urban Advantage, American Museum of Natural History
Meryle Weinstein, Institute for Education and Social Policy, New York University

Purpose

We present a case study of a partnership of eight informal science institutions (ISIs) and the NYC public schools. Discussion centers on questions that guided the formative and impact evaluation of the program.

Perspectives

UA’s primary goal is to improve students’ understanding of scientific inquiry as defined in the NYS Core Curriculum through collaborations between the NYC Department of Education (NYCDOE) and eight NYC ISIs. Initiated in 2004, UA combines the expertise and resources of these ISIs to enhance teachers’ skills and students’ performance on long-term scientific investigations (“exit projects”) required as part of the NYC K-8 Science Scope and Sequence. After a formative evaluation and a growing demand for the program, we conducted an impact evaluation to assess UA’s impact on student learning.

Panelists’ Perspectives

Short and Roditi will discuss the history of the program and its components. Weinstein will discuss findings from the impact evaluation.

Methods

We use a quasi-experimental research design and administrative data on NYC public middle students to conduct the impact evaluation. A set of models links a student’s performance on the ILS exam to variables capturing student socio-demographic and educational characteristics and a dummy variable indicating whether a student attends a UA or non-UA school. The estimated coefficient on the UA dummy indicates whether UA adds education value to its students, controlling for other sources of variation in student achievement.

Data & Analysis

Our analysis draws on a rich longitudinal database containing student- and school-level data for all NYC public middle schools and students from 2003-04 through 2009-10. Student data include socio-demographic characteristics, educational needs and standardized test scores, as well as school-level data on school and teacher characteristics. Our analysis involves estimating a series of OLS regression models that compare performance among 8th grade students attending UA and non-UA schools after *controlling for* observable differences between these students. We include only those schools that have participated in UA for at least two years.

Results

Students at UA schools perform .047sd higher than students at non-UA schools. When controlling for the year prior to becoming UA and for first year of participating in UA, students at UA schools do even better in the years' post-UA entry, with those students performing .065sd higher than students at non-UA schools. Female students at UA schools do significantly worse compared to their non-UA counterparts. There are no statistically significant differences in achievement for black, Hispanic and Asian, Special Education or LEP students.

Importance

This analysis provides the first estimates of UA's impact on ILS scores. Findings indicate that students at UA schools do better than students at non-UA schools in science but not ELA or math and give support for an increased role of ISIs for students and teachers. Strong partnerships between the institutions and between the institutions and the district(s) in which they work must exist to enable these programs to grow and provide students with the resources to develop as scientists. This work also highlights the strength of building a program around existing components of the curriculum. Also of note is the program's strong professional development model and school-wide approach to implementation. Finally, it is important to highlight the role of NYC's local government and the NYCDOE, which fund the program and partner in its implementation.

Additional Links

<http://www.urbanadvantagenyc.org/>
www.steinhardt.nyu.edu/iesp

From Nice to Necessary: How Visitor Studies Informs Experience Design

Rita Deedrick, Sr. Director of Evaluation, Planning & Research, COSI
Joshua Sarver, Sr. Director for Experience Design & Production, COSI
Kate Storm, Director of Strategic Initiatives, COSI
Sharon Tinianow, Director of Sustainability Initiatives, COSI

Purpose

The purpose of this session is to relay a story of critical change at COSI in how guests experiences (exhibits and programs) are developed and how visitor studies informs this new, still evolving process. COSI moved away from an experience development model driven by "enhancing the guest experience" to a model driven by mission and accountability by teaching for change.

Perspectives

Science centers and other informal learning environments excel at generating wonder and delight in visitors. But creating a "wow" moment is not always enough. If the goal of a visitor experience is a learning outcome or a behavior change, we need a development process that incorporates the full cycle of evaluation and makes use of what visitor studies research knows about how people learn in free-choice learning environments – all while preserving our power to engage visitors.

Panelists' Perspectives

Rita Deedrick will address the changing face of research and evaluation at COSI and how the evolution of this experience development process is contributing to capacity building for research and evaluation work.

Sharon Tinianow will address the process of conceptual planning – the first step in the experience design process. COSI has struggled with knowing who to involve at this stage, which often precedes funding and demands the ability to think at a conceptual level. Front-end evaluation plays a critical role at this stage in shaping the key messages and identifying behavioral outcomes for the targeted audiences.

Josh Sarver will address how COSI approached this new design process and the use of various forms of evaluation. Among the most vibrant discussions has been the balance between the “wow” factor and the educational message. It is here that quality evaluation, experience, and sometimes just plain luck lead to finding a balance between these two viewpoints.

Kate Storm will speak from a project manager perspective addressing how exhibit development and design teams approached the move to a more visitor-centric model. The experience development team has struggled to understand the language and methods of evaluation and to learn how best to use evaluation to inform decisions as they strive to create a great visitor experience.

Importance

As informal learning environments seek to be real and relevant 21st century learning institutions, new experience development models, approaches, and processes that challenge traditional notions of exhibit design are necessary. Integrating visitor studies throughout experience development supports creation of experiences that teach for change. Introducing new processes is never simple, easy, or fast; this session is intended to share one story of change and to spark dialogue among exhibit designers, program developers, evaluators, and others to reveal and share best practices in relevancy and experience design.

References

“Ideas, Objects, or People? A Smithsonian Exhibition Team Views Visitors Anew”

Andrew J. Pekarik & Barbara Mogel in *Curator*, Vol. 53, No. 4, October 2010

“COSI’s Experience Testing Station” Rita Deedrick in *The Informal Learning Review*, No. 97. July-August 2009

“The Four Conversations: Daily Communication that Gets Results” Jeffrey Ford & Laurie Ford, Berrett-Koehler Publishers, 2009

Watson, B., Werb S., Mason M., Potts R., Pobiner, B. and Munley, M. *Measuring the Success of the Human Origins Program at the National Museum of Natural History*

Meeting Learners Where They Are: Expanding Literacy Opportunities through Partnerships

Molly Phipps, Science Museum of Minnesota

Cheryl Kessler, Blue Scarf Consulting

Jennifer Nelson, Project for Pride in Living

Purpose

We will discuss the results from three evaluation studies involving partnerships among libraries, museums, and communities. The first two programs, Media MashUp and Teen Tech Squad, focused on helping youth develop

21st Century Literacies, and helping libraries develop the necessary programming; the third program Supporting Early Literacy Learning (SELL) focused on the development of family spaces in libraries.

Perspectives

Museums and libraries share many similarities. Both institutions are about learning, exploration, and sparking the imagination. A key point of intersection between children's museums and public libraries is discovery while a key point of divergence is visitor intention. We will discuss three examples of institutional collaborations that aim to capitalize on the strengths of all partners to offer high quality programming.

Panelists' Perspectives

Phipps and Kessler are evaluators on the three projects discussed, and Nelson was the PI on one of the projects.

Results

Evaluation findings from Teen Tech Squad showed that the teenaged employees benefited greatly from participating in the program. Youth gained confidence in their own abilities, growing as teachers and computer-programmers. Participating librarians felt they benefited from the program by in having a cadre of willing workers who could help run programs for other youth.

Evaluation findings from Media MashUp focused on the professional audience of librarians. In earlier grant efforts (Game Studio), structural barriers within libraries proved to be the largest obstacles to successful programming. Knowing this, the Media MashUp team focused on helping libraries build institutional capacity for technology-based programming. Participating librarians identified seven main barriers to successful implementation: technical support, program development and marketing requirements, staff funding and allocation, equipment availability, teen investment, staff professional development, and fear of change in profession. Despite the success of this program, when grant funding goes away, some of these programs will stop because teen librarians are expected to run programs in their 'spare' time. Without a shift in library priorities to value teen programming more highly, these fledgling communities of Scratchers will founder.

Evaluation of SELL focused on the ways in which children and adults used these spaces, how training for museum and library staff around literacy and play helped to support engagement in the environments, and the collaborative process. Findings from observations of 27 families (29 adults, 55 children) and interviews with 10 adults after spending 15 minutes or more in the space revealed moderate levels of interaction between adults and children, instances of adults playing key roles in play with their children, and children demonstrating all six pre-reading skills. Participant response (n=28) to a post training online survey reflected strong agreement with the literacy and play concepts presented in the reciprocal training sessions as well as immediate ideas from staff for integrating those concepts into their daily interactions with children and adults. The survey data also indicated the need for additional "in the trenches" training. Collaborative process was assessed using the Wilder Collaborative Factor Inventory, which revealed a generally strong partnership with some real or perceived unevenness between museum and library staff involvement.

Importance

Libraries are centrally located organizations that already offer free access to information, computers, and tools for traditional literacy. While libraries are good at traditional literacy, many libraries are struggling to develop programs to cater to 21st century skills and adapting to collaborative family learning. Libraries and museums have much in common, but the two organizations have not always seen their missions as compatible. We will explore the similarities and differences between these two institutions of informal education. Each has resources the other lacks, making solid partnerships fruitful endeavors.

The Museum and University Partnership: A Success Story!

Martha Hill, Eiteljorg Museum of American Indians and Western Art
Elee Wood, Indiana University-Purdue University Indianapolis
Kara Baldwin, Eiteljorg Museum of American Indians and Western Art
Stephanie Herrick, Indiana University-Purdue University Indianapolis and Eiteljorg Museum

Purpose

Museums and universities can be invaluable resources for one another. Four panelists—faculty member, master’s student, director of visitor experience and vice president explore a collaborative audience research endeavor where success comes from building a learning partnership for capacity building through mission-focus, collaborative values, and focus on visitor experience.

Perspectives

The process and experience of the current Eiteljorg-IUPUI Museum Studies partnership is best framed by the idea of Evaluation Capacity Building which is defined as, *“a context-dependent, intentional action system of guided processes and practices for bringing about and sustaining a state of affairs in which quality program evaluation and its appropriate uses are ordinary and ongoing practices within and/or between one or more organizations/programs/sites”*(Stockdill, Baizerman, & Compton, 2002, p. 8, italics in original). Throughout the last several years, the progression of purpose and intent of evaluation work has simultaneously evolved and taken root in everyday practice. The contributions of all members of the core team as well as the role of the evaluator work to co-create and envision potential uses and effects of evaluation work across the institution. The slow, but steady pace, the development of meaningful interactions and relationships, as well as coaching and mentoring on implementation and use of evaluation all leads toward greater, more effective evaluation within the institution.

Panelists bring a depth of background in education, anthropology, programming, visitor studies and museums to this collaboration; a collaboration which is an outgrowth of 15 years of joint efforts of university faculty and administrators and museum professionals. Each panelist will relate her perspective on the project based on her organizational position and discuss her role in this audience evaluation project.

Importance

For evaluators who work both in and outside of informal learning settings, the premise of evaluation capacity building aligns with VSA’s best practices in visitor studies and takes it one step further. The ability for organizations to take a more prominent role in co-creation, advocacy and use of evaluation not only supports operational aspects of the work, but fully grounds the practice in what works best for visitors and the overall development and implementation of experiences. Though clearly evaluation work takes many forms and evaluators will always play a necessary role, the capacity for an institution to use and work with evaluation thoughtfully is paramount.

The role of an evaluator taking on a capacity building orientation requires time, patience, and thoughtful listening that builds on both the needs of the organization and the existing skills and resources. Sustaining the process over a period of years helps weave evaluation process into organizational culture and ways of thinking and doing.

The partnership between the Eiteljorg Museum and IUPUI Museum Studies points to necessary ingredients of a successful, mutually beneficial relationship. The Eiteljorg is ever evolving and is basing that evolution on audience feedback. The Museum Studies Program is a true collaborator in this journey. As university faculty, their public scholars craft their research and teaching to something that is collaborative and outcomes-focused—the final products are accessible to and valued by the community.

References

Patton, M. Q. (1997). *Utilization-Focused Evaluation: The New Century Text*. (3rd ed.) Thousand Oaks, CA: Sage.
Stockdill, S. H., Baizerman, M., Compton, D.W. (2002). Toward a Definition of the ECB Process: A Conversation with the ECB Literature. *New Directions for Evaluation*, 93, 7-25.

Additional Links

IUPUI Museum Studies: <http://liberalarts.iupui.edu/mstd/>

Eiteljorg Museum of American Indians and Western Art: <http://www.eiteljorg.org>

TUESDAY, JULY 26

9:00-10:15 a.m. Concurrent Sessions—Four

Understanding and Capturing the Visitor Experience

Jan Packer, School of Tourism, University of Queensland, Australia (presenter)

Roy Ballantyne, School of Tourism, University of Queensland, Australia (presenter)

Nigel Bond, School of Tourism, University of Queensland, Australia (co-author)

Purpose

According to its website, VSA focuses on “all facets of the visitor experience in museums, zoos, nature centers, visitor centers, historic sites, parks and other informal learning settings” and is “committed to understanding and enhancing visitor experiences in informal learning settings through research, evaluation, and dialogue” (<http://visitorstudies.org/>). This paper examines the concept of visitor experiences from both a theoretical and empirical perspective, and presents research designed to operationalise and measure the experiential qualities elicited by different types of exhibitions in a range of cultural institutions. A tool will be introduced that has been found to be useful in capturing, and thus further studying, the visitor experience.

Perspectives

This paper builds on and extends Zahava Doering’s pioneering work on satisfying experiences in museums (Doering, 1999; Pekarik, Doering and Karns, 1999). Pine and Gilmore’s (1999) portrayal of experiences as a new economic offering, distinct from goods and services, has brought considerable recent attention to this construct in the wider business, tourism and leisure fields. Increasingly, visitors seek an “experience” – they want to feel something, to have their minds, bodies or spirits engaged. People want to be affected by their experience; they want it to be memorable or even transformative. This paper focuses on the subjective experience itself, as distinct from the activities, events or environments that elicit it, and from the outcomes that result from it.

Methods

A questionnaire in the form of an adjective checklist was developed in order to measure the subjective visitor experience. Visitors were presented with 116 words or phrases, in random order, and requested to tick those that best described what they had experienced in their visit that day. The checklist was administered to 747

visitors to five cultural institutions in London in May-June 2010: the Natural History Museum, Tate Britain, Victoria and Albert Museum, Kew Gardens and London Zoo.

Data & Analysis

Fifteen dimensions of the visitor experience were identified, each represented by five items from the checklist, thus enabling a score from 0-5 to be calculated for each respondent, on each dimension. Fourteen of the dimensions were positive and one negative. Visitors' scores on the 15 dimensions were compared across the five sites.

Results

There were significant differences between the five sites on all 15 dimensions. These differences illustrate the unique "personality" of each site. Each site had at least one dimension and several individual items which were endorsed more highly than at other sites. Different demographic and motivational groups were found to have different types of experience.

Importance

If the core product of a museum visit is the experience gained (Prentice, Witt and Hamer 1998), it is clearly important to understand and be able to measure subjective experiences. Being able to measure the experiential qualities elicited by different exhibitions or institutions will enable further research to be undertaken regarding the kinds of experiences that different groups of visitors prefer, the factors that facilitate different types of experiences, and the impact of visitor experiences on other desired outcomes. It will enable exhibits to be evaluated and compared, and changes resulting from various interventions to be measured.

This paper presents new research in an under-researched but important area and presents an innovative and useful tool that can be applied in a range of museum environments. It will be of interest to academic researchers, research students, visitor researchers in museums, zoos and aquariums, art galleries and botanic gardens, exhibit designers, and all VSA members who are dedicated to the ongoing improvement of the visitor experience.

References

- Doering, Z. D. (1999). Strangers, guests, or clients? Visitor experiences in museums. *Curator: The Museum Journal* 42 (2): 74-87.
- Packer, J. (2008). Beyond learning: Exploring visitors' perceptions of the value and benefits of museum experiences. *Curator: The Museum Journal*, 55 (1), 33-54.
- Packer, J. and Bond, N. (2010) Museums as restorative environments. *Curator: The Museum Journal*, 53, 4, 421-456.
- Pekarik, A. J., Doering, Z. D. and Karns, D. A. (1999). Exploring satisfying experiences in museums. *Curator: The Museum Journal* 42 (2): 152-173.
- Pine, J., & Gilmore, J. H. (1999). *The experience economy: Work is theatre and every business a stage*. Boston: Harvard Business School Press.
- Prentice, R.C., Witt, S.F., and Hamer, C. (1998). Tourism as Experience: The Case of Heritage Parks. *Annals of Tourism Research*, 25, 1, 1-24.
- Quinlan Cutler, S. and Carmichael, B.A. (2010). The dimensions of the tourist experience. In M. Morgan, P. Lugosi, and J.R.B. Ritchie (Eds.) *The tourism and leisure experience : consumer and managerial perspectives*. Bristol: Channel View Publications.

Zoo Members: Sustaining a Community of Core Learners

Jerry Luebke, Chicago Zoological Society-Brookfield Zoo (presenter)

Jennifer Matiasek, Chicago Zoological Society-Brookfield Zoo (co-author)

Purpose

The Chicago Zoological Society-Brookfield Zoo is starting the second year of a five year member study to explore the impact we have on our members and how we can better promote member learning and engagement within this community. This presentation will provide a brief overview of the study and share some preliminary results from the first and second year of data collection.

Perspectives

Zoos around the world rely on membership programs as a foundation for revenue, attendance, advocacy, community outreach, and education programs. As a result, understanding members should be high priority. Surprisingly, very few studies have been conducted with zoo members (Klenosky et al. 2008, Caldwell & Andereck 1994). For the Chicago Zoological Society (CZS), we are very interested in our members as a core community for our learning strategy (Storksdieck et al. 2005) and in exploring whether our education efforts have a meaningful impact on members' knowledge, attitudes, values, and behaviors over time.

Methods

For the first year of data collection, all current zoo members were invited to complete an on-line survey (i.e., we conducted a census study). Based on the anniversary month for joining or renewing a membership, emails were sent out on a monthly basis throughout the year inviting members to complete the on-line survey. For those members who did not provide the zoo with an email address, a postal letter was sent to the home address inviting the member to complete the on-line survey. In addition, non-member visitors to the zoo completed a similar survey during the summer months (June to August) and will serve as a cross-sectional comparison group for the longitudinal study.

Data & Analysis

Slightly over 12,000 members responded to the on-line survey by the end of 2010 and over 730 non-member surveys were completed at the zoo during the 2010 summer. Analyses of the initial results focused on comparing and contrasting members and non-members regarding their: 1) knowledge, attitudes, and values concerning animals, nature, and environmental issues, 2) current conservation behaviors and activities, and 3) value and perspectives of the zoo.

Results

Preliminary results suggest that our members' commitment to the organization and its mission increases over time and that there are various factors and benefits people find important to their zoo membership. Comparisons between member and non-member survey ratings revealed members, on average, tended to rate their knowledge, attitudes, and values more positively than non-members. While these results offer some initial insights, further research is needed to ascertain the impact of our zoo on its members.

Importance

The mission of CZS is to inspire conservation leadership by connecting people with wildlife and nature. One of the most receptive audiences for this mission is our zoo membership. Members are typically frequent zoo visitors, make up a significant proportion of participants in child and adult-focused education programs, and regularly receive communications from the zoo. We hope to demonstrate that engagement with the zoo and exposure to its animals and education messages have an impact on how members view wildlife and conservation and whether they make any changes to their daily lives regarding conservation actions as a result of zoo experiences. This information will be used to inform education strategies and improve the ways in which we communicate wildlife

and conservation messages to our members. In addition, we are hoping to identify reliable segmentation clusters of members and develop focused retention and acquisition materials that are customized to members' current interests and values. We may also gain a better understanding of why individuals choose not to renew their memberships and whether there are any defining characteristics of those who do not renew.

References

- Caldwell, L.A., & Andereck, K.L. (1994). Motives for initiating and continuing membership in a recreation-related voluntary association. *Leisure Sciences*, 16, 33-44.
- Klenosky, D. B., Oh, C., Panek, C. C., & Luebke, J. F. (2008). I want to join the zoo! A conjoint study of membership program preferences. Proceedings of the 2008 Northeastern Research Symposium.
- Storksdieck, M., Ellenbogen, K., & Heimlich, J. E. (2005). Changing minds? Reassessing outcomes in free-choice environmental education. *Environmental Education Research*, 11(3), 353-369.

Evaluating Diverse Activities and Audiences: Oakland Museum of California's Gallery of California Art

Rachel Gita Schiff, Randi Korn & Associates, Inc.

Purpose

This session will explore the effects of the Gallery of California Art (Art Gallery) reinstallation on diverse visitors' experiences at the Oakland Museum of California (OMCA), including:

- The use and experience of new interpretive and interactive elements and increased prevalence of seating throughout the Gallery.
- Aspects of the reinstallation that supported the Museum's overarching visitor goals and objectives.
- Recommendations for further enhancing visitor experience and connection to the Oakland Museum of California's Art Gallery.

Perspectives

Art museums today face numerous challenges in defining and measuring their appeal to diverse audiences. The Art Gallery underwent an extensive reinstallation project, funded in part by a grant from The James Irvine Foundation. Randi Korn & Associates, Inc. (RK&A) conducted a summative evaluation of the Gallery of California Art for the Oakland Museum of California. Findings from the summative evaluation of the Art Gallery will be presented in light of OMCA's goals: "create a more welcoming, comfortable and lively Gallery of California; foster intergenerational learning; attract and engage an ethnically diverse community; and foster a personal connection between art and the visitor."

Methods

RK&A worked with OMCA to tailor the evaluation methodology to the Art Gallery's unique goals and objectives. Using a mixed method evaluation design, RK&A conducted timing and tracking observations and, with a separate sample, in depth interviews of visitor groups.

Data & Analysis

RK&A conducted 93 timing and tracking visitor observations to discover how much time adult visitors spent in the exhibition and the range of visitor behaviors and 73 in-depth exit interviews to investigate the meaning visitors constructed from their experience. The target audience for the interviews were drop-in, adult visitors 18 years or older who spoke English, Spanish, Cantonese, and/or Mandarin. Timing and tracking data was analyzed using SPSS, a statistical package for personal computers, and the interviews were analyzed qualitatively for meaningful patterns and, as patterns and trends emerged, grouped by similar responses.

Results

Visitors perceived the Art Gallery as a lively space, spent considerable time in it, and visited numerous sections (Goal 1). Interpretive and interactive elements actively engaged families with children and stimulated new conversations and new ways of interacting with art and with their family in the Art Gallery (Goal 2). The current OMCA visitors who participated in the summative evaluation were ethnically diverse (Goal 3). Observed visitors engaged with works of art and the interpretive/interactive offerings accompanying them, and visitors' personal connection to the art was evident when they discussed their experiences (Goal 4). Evaluation findings also show that OMCA could further strengthen visitors' personal connection with the art in the orientation and specific visitor participation activities.

Importance

This study is significant because it shows that changes in gallery design and installation can greatly increase stay times for diverse audiences, even beyond previously accepted visitor saturation time limits, and successfully foster strong personal connections to art. The discussion of findings and lessons learned from the OMCA Art Gallery summative evaluation will add to the Visitor Studies community of learners and provide an opportunity to reflect on evaluating diverse visitors in art galleries and museums.

References

- Randi Korn & Associates, Inc. (2008). Framework for Engaging with Art, 2008 Visitor Study. Unpublished manuscript. Dallas, TX: Dallas Museum of Art.
- Randi Korn & Associates, Inc. (2010a). Remedial Evaluation of Select Exhibit Areas in the Gallery of California Art. Unpublished manuscript. Oakland, CA: Oakland Museum of California.
- Randi Korn & Associates, Inc. (2010b). Local Adult Visitors' Experiences Questionnaire. Unpublished manuscript. San Francisco, CA: San Francisco Museum of Modern Art.
- Serrell, B. (1998). Paying Attention: Visitors and Museum Exhibitions. Washington, D.C., American Association of Museums.

Additional Links

- Informalscience.org full report listing: <http://informalscience.org/evaluation/show/278>
- Oakland Museum of California website: <http://museumca.org/>
- Randi Korn and Associates, Inc. website: www.randikorn.com

Non-Visitor Studies: Researching the Needs and Experiences of New Audiences

Peter Linett, Slover Linett Strategies
Cecilia Garibay, The Garibay Group
Chloe Chittick Patton, Slover Linett Strategies

Purpose

This panel discussion will address and implicitly critique a bias built into the very notion of visitor studies, namely that it focuses on those who are already coming to cultural institutions and informal learning environments. What about *non*-visitors? Isn't it important for museums to understand their potential and target audiences, as well, so they can do a better job engaging and serving their whole communities? Three researchers with diverse experience conducting visitor and potential-visitor studies will explore how museums can use research and evaluation to understand audiences who are demographically and attitudinally different from their usual "core" constituencies. We hope to spark dialogue about how the research and evaluation community can support cultural institutions in their efforts to diversify their audiences and enhance their relevance to their communities.

Three case studies will be drawn from the performing arts as well as the museum sector and will feature a range of research methods for investigating the distinct perspectives of new target populations. That methodological diversity is not coincidental; just as cultural institutions must meet new audiences on their own terms in programming and the visitor experience, they must also sometimes employ new research methods to reach and understand audiences who haven't yet crossed the threshold. The studies presented here used ethnographic, qualitative, and quantitative approaches, including recruited visits by the target non-attenders (a study design known as "experience sampling"), to generate fresh insights about how the institution is experienced and perceived by the audiences of interest. The researchers will also discuss the challenges and opportunities of applying those insights within museums to enhance programming, experience design, and communication decisions.

The session will also include time for discussion with attendees about the current and desired status of "non-visitor studies," barriers to pursuing it effectively, and how evaluators can contribute to museums' audience development and diversification goals.

Panelists' Perspectives

Cecilia Garibay will discuss two methods—video ethnography and community participatory panels—which are used to understand and engage new audiences. We used video ethnographies at the Chicago History Museum and the Garfield Park Conservatory to understand the experiences of families, a relatively new audience for both institutions. Applied ethnography (Babbie, 1998), as used in these studies, had three distinguishing features: a) visitors were followed throughout their entire visit; b) they sought to understand the museum experience as a whole; and c) video provided a "visual record" of various aspects of the visitor experience for in-depth analysis. Garibay will also discuss community participatory panels in which Vietnamese community members were invited to collaborate on several interactive sessions intended to a) provide insight into experiences which influence leisure decisions of Vietnamese families and b) test and collaboratively develop messaging strategies aimed at local Vietnamese. This approach is based on the visitor panel method Fischer and Carr (Fischer 1996) developed, but incorporates elements of critical theory and participatory design (Taxen, 2004) to make the community voice more apparent and to encourage dialogue between community members and the organization. Garibay will discuss how the research has informed the museums' inclusion efforts, exhibits and programs, marketing strategies and helped spur organizational change.

Chloe Chittick Patton will present multi-method "experience sampling" research conducted for the Minnesota Orchestra's "Inside the Classics" program, an innovative concert format designed to engage new audiences in live classical music. Newcomers to classical music were recruited to attend an "Inside the Classics" concert and then participate in a qualitative group discussion about the experience. Chittick Patton will show how the research was used both summatively (to evaluate the series' success in engaging new audiences) and remedially (to guide enhancements to the experience as the season progressed).

Peter Linett will discuss ethnographic research conducted among immigrant communities in Philadelphia for the Fleisher Art Memorial, the nation's oldest community art school and gallery. The research team of urban anthropologists, led by Michael Di Giovine (University of Chicago and Slover Linett Strategies), dispersed into the target neighborhoods to visit public, retail, and nonprofit spaces and observe and talk with residents who had never engaged with Fleisher. This "participant observation" method illuminated how art, creativity, and individual and collective expression fit into the lives of these Philadelphians and helped broaden the operative definition of "art" at the school.

References

Babbie, E. (1998). *The Practice of Social Research*. Albany, NY: Wadsworth Publishing Company.

Fischer, D., (1996). *Visitor panels: A handbook for improving interpretive materials through audience input*. Denver, CO: Denver Art Museum.

Taxén, G. (2004). Introducing Participatory Design in Museums. In *Proceedings of the 8th Biennial Participatory Design Conference (PDC 2004)*, July 27-31 2004, Toronto, Canada, 204-213

Keeping Pace: Strategies for Effective Exhibit Evaluation on Tight Timeframes

Elisa Israel, Saint Louis Science Center

Scott Ewing, Oregon Museum of Science and Industry

Anna Lindgren-Streicher, Museum of Science, Boston

Joyce Ma, Exploratorium

Purpose

In an effort to keep exhibitions current, many institutions are moving to faster exhibit development processes. The shortened development time then impacts the time available to conduct front-end and formative evaluation. This session will highlight effective approaches to incorporating meaningful evaluation into rapid exhibit development processes.

Perspectives

Panelists will discuss how changes in the exhibit development processes at their institutions have affected approaches to conducting front-end and formative exhibit evaluation. The goal of the session will be to share successful strategies and techniques for keeping evaluation an integral part of the exhibit development process while being responsive to faster timeframes.

Panelists' Perspectives

Elisa Israel will introduce the session and provide an overview of the issue. At the Saint Louis Science Center, in an effort to keep pace with current science, exhibit development timeframes have been shortened in recent years, resulting in less time for conducting front-end and formative evaluation. In response, evaluators have had to be more selective in topics addressed as well as more creative in both the application of evaluation techniques and in the processes for sharing findings.

Scott Ewing will discuss how the exhibit development process at Oregon Museum of Science and Industry (OMSI) has been modified recently to better fit the changing realities of tightening timelines, growing budgets, and budget caps. OMSI has used several evaluation methods to address these constraints as well as modifying their project development process. One of these methods is group prototyping. Multiple exhibit prototypes are tested simultaneously in one short period of time to maximize the amount of information gathered. The level of resources involved can vary widely depending on the needs of the team. In this session, OMSI will share its experiences with this type of group testing.

Anna Lindgren-Streicher will discuss ways in which the Research & Evaluation Department at the Museum of Science, Boston has modified traditional front-end evaluation approaches to better fit within accelerated timelines. One technique uses a current exhibit's summative evaluation to collect front-end data for an upcoming exhibit on a related topic, allowing an exhibit team to have front-end data on hand as a project begins. Another approach has been to share "literature summaries" with development teams as questions and debates that can be informed by past work arise. By providing bullet-point style summaries of major articles in a given area, evaluators can turn literature summaries around more quickly than traditional literature reviews, providing "just-in-time" information for project teams. These and other modified front-end evaluation techniques for projects with accelerated timelines will be shared.

Joyce Ma will discuss how the Visitor Research and Evaluation Department at the Exploratorium has adapted the RITE (Rapid Iterative Testing and Evaluation) method for use in formative evaluation studies to quickly identify usability and comprehension issues. The RITE method [Medlock, et al., 2002], used in Human-Computer Interaction usability studies, is characterized by small sample sizes and quick turn-around. More importantly, this method may be used to help both evaluators and developers focus discussion on actionable items; that is, prioritizing problems and their solutions according to problem severity, solution feasibility and cost, and verifiability of the proposed fix. The rapid and iterative nature of this method can lead to a deeper understanding for the developer of the benefits and limitations of evaluation and, for the evaluator, the challenges of developing an exhibit.

Importance

The need to incorporate timely user feedback while working with short timelines and limited resources is a common challenge in exhibit development. This issue may be more prevalent among science museums, where there is often considerable emphasis on the presentation of current science; however, it likely extends to other museum types as well. Finding creative ways to adapt evaluation strategies to these limitations will ensure that the visitor voice continues to be an integral part of the exhibit development process.

References

Medlock, M.C., Wixon, D., Terrano, M., Romero, R., and Fulton, B. (2002). Using the RITE method to improve products: A definition and a case study. Presented at the Usability Professionals Association 2002, Orlando Florida.

New Directions Project: Training Graduate Students in Audience Research & Evaluation within Informal Learning Settings.

Nick Visscher, New Directions Project Coordinator, UW Museology Graduate Program

Kris Morrissey, Director, UW Museology Graduate Program

Kathryn Owen, Education Research Supervisor, Woodland Park Zoo

Purpose

The New Directions Project is a 3 year, IMLS-funded grant project bringing together staff from the UW Museology Graduate Program and the Woodland Park Zoo to train graduate students in audience research & evaluation through a series of coursework, directed fieldwork, mentorship and community museum collaborations.

Perspectives

This project sought to adopt a method of learning that involved professionalism through practice rather than classroom work alone. The process of developing a structure of practice, creating an intensive progression of coursework and directed fieldwork for students in a two-year graduate program, bringing in experts in the field to mentor students and fostering community partnerships will be discussed in addition to a synopsis of student work and comments on their experience over the course of their participation. Challenges in evaluating this project will be discussed, in addition to successes including the use of the VSA's Evaluator Competency for Professional Development document in summative evaluation of this project.

Nick Visscher came to the the *New Directions* Project since the spring of 2009, working directly with student projects and developing relationships with local museums, zoos and aquaria. Kris Morrissey and Kathryn Owen are the co-Principal Investigators of the *New Directions* project and have offered their time, talent and expertise,

each with over 20 years of informal learning practice, toward the development of coursework, and field projects with local museums, zoos and aquaria

Importance

This project may have implications to the field of museum studies training, offering an alternative structure of practice, incorporating more than a typical one-time course in evaluation into our Program's academic offerings. Through the intensive nature of project involvement of up to five academic quarters of evaluation experience we hope participation will influence students to become advocates for research & evaluation within every aspect of their chosen area of future practice from collections management to education to administration.

Program Websites

Website: <http://depts.washington.edu/uwmuse/about/initiatives/newdirections>

Youtube: <http://www.youtube.com/user/NewDirectionsProject?feature=mhum>

Twitter: follow us @UWNewDirections

ExhibitFiles: Knowledge, Identity, and Networks in the Informal Learning Community

Carey E. Tisdal, Tisdal Consulting

Wendy Pollock, Wendy Pollock LLC

Purpose

ExhibitFiles, a social media site for the exhibition community, was developed by the Association of Science-Technology Centers (ASTC) with funding from the National Science Foundation (NSF) to provide an infrastructure for sharing and building knowledge about exhibition development and design practices. Development of this site was affected by changing user expectations in the dynamic world of digital media and discussions across multiple NSF-funded sites about the interplay among personal identity, social networks, and professional knowledge. The presentation focuses on how the project director and evaluator collaborated during the remedial evaluation to make the remedial findings useful for decisions and action.

Theoretical Lens and Development Strategies, an Emergent Process

ExhibitFiles was designed in rapidly changing context of ideas about Web 2.0. Project directors unearthed additional theoretical frameworks before and after the site opened. They began with a case study model of documenting best practices developed for the NSF-funded project and book *Are We There Yet? Conversations about Best Practices in Science Museum Exhibits* (McLean & McEver, 2004). Other influences included learning theories based on communities of practice (Wenger, 1998) and Brown's (1999) conception of digital learning as part of a learning ecology. Maeda's *Laws of Simplicity* (2006) influenced design of user interface and site organization.

Remedial Evaluation Questions

- How did the project team assume the site would work?
- To what extent and in what ways do website users value and use the website functions?
- To what extent and in what ways do users perceive themselves as members of a community?
- To what extent and in what ways were these strategies successful in accomplishing project impacts?

Methodology

A remedial evaluation was conducted by Tisdal Consulting during 2009 and 2010. The methodology was naturalistic inquiry (Lincoln & Guba, 1985). Methods included the development of a program theory Weiss (1998), analysis of the website database ($N = 1357$), comparison to an association membership database ($N = 830$), an

online survey of registered members ($N = 286$), and in-depth interviews with the project team and registered members ($N = 18$). Findings were developed through triangulation.

Summary of Findings

A program theory was used to report findings.

- ExhibitFiles attracted its target audience with room for growth among professional organization members.
- The site design appeared effective and useful with highest priority improvements were search functions and areas for discussion.
- Percentages contributing content appeared on par with other web-based social networking sites, but users wanted broader participation.
- Levels of participation were associated with the extent of impact reported.
- Respondents pointed the value of emails about new content to prompt visits.
- Expectations for levels of new content were associated with use of other social media use.
- ExhibitFiles is part of a larger ecology of professional development for exhibit professionals.
- Types of professional knowledge use were reported.

Recommendations and Changes to the Site and Site Management

Recommendations were made for two areas: site functions and human systems. Priorities among revisions included (1) improved search functions, (2) prompting visits through emails (3) connections to other knowledge-based sites in informal learning, (4) reaching out for contributions, , (4) development of places for discussion, and (5) building awareness of the benefits professional community. Several recommendations supported decisions and actions to revise the system to support knowledge and networks among users.

Importance

Social media can develop knowledge, identity and community among professional groups. Evaluation can productively play important roles in documenting decisions and making assumptions explicit to support change as well as reporting information about users and their expectations.

Selected References

- Bickman, L. (1987). The functions of program theory. In L. Bickman (Ed.), *New directions for program evaluation*, No. 33 (pp. 5-17). San Francisco: Jossey-Bass.
- Brown, J.S. (1999). *Presentation at the Conference on Higher Education of the American Association for Higher Education*. Retrieve August 15, 2010 from http://serendip.brynmawr.edu/sci_edu/seelybrown/.
- Friedman, A. (Ed.). (March 12, 2008). *Framework for Evaluating Impacts of Informal Science Education Projects* [On-line]. Retrieve June 26, 2007 from http://insci.org/resources/Eval_Framework.pdf.
- Hoadley, C.M. & Kilner, P.G. (2005). Using technology to transform communities of practice into knowledge-building communities. *SIGGROUP Bulletin*, 25(31).
- Lincoln, Y. S., & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
- Maeda, J. (2006). *The laws of simplicity*. Cambridge, Mass: MIT Press.
- McLean, K., & McEver, C. (Eds). (2004). *Are we there yet? Conversations about best practices in science museum exhibits*. Walnut Creek, CA: Left Coast Press.
- Miles, M., & Huberman, A. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage Publications.
- Weiss, C. H. (1998). *Evaluation: Methods for studying programs and policies* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Wenger, E. (1998). *Communities of practice: learning, meaning, and identity*. New York, N.Y.: Cambridge University Press.

Additional Links

ExhibitFiles website: <http://www.exhibitfiles.org/>

High-Speed Evaluation: From Collection to Utilization in 24 Hours

Sarah Cohn, Science Museum of Minnesota
Al Onkka, Science Museum of Minnesota

Purpose, Perspectives, Importance

Holding the results of an evaluation in your hands immediately after collecting the data opens a world of possibilities for decision makers. A quick turnaround of evaluation results leads to faster, more informed decision-making. In this presentation, SMM staff will share their experiences with high-speed evaluation. They will discuss the process of facilitating and trouble-shooting this type of evaluation so that audience members can use it in their own work.

Evaluation staff at the Science Museum of Minnesota (SMM) recently participated in a couple of product prototyping meetings. In one case, project staff from numerous institutions met in one location for 2-3 days and presented exhibit prototypes. They traded feedback, discussed which products each team should develop and finalize, and made decisions for the coming year. SMM evaluators collected the project staff feedback at the beginning of the multiday meeting, and presented it to decision makers at the end.

SMM evaluation staff developed a technique for quickly collecting, analyzing, and disseminating results during this meeting. The technique has three steps: a) working with decision makers to identify key questions, b) using online survey technology to speed up data entry and analysis, and c) reporting findings in stages.

Identifying Key Questions

It is not always easy to decipher ahead of time which questions will be most important for the team's decision-making process. In some cases, too many questions are regarded as important, while at other times too few are identified. At the SMM multiday meeting, evaluators tried to identify and prioritize the key questions for quick reporting.

Online Technology

Online survey tools are most often used to collect data from people in various locations. It can also be used to eliminate data entry and simplify quantitative analysis. At the SMM meeting, nearly all of the participants had laptops or smart phones, so an online version of the survey was created to cut the data entry step from the process. Using the museum's wireless internet, most participants completed their feedback online. For those without online access, paper surveys were provided and evaluation staff entered the responses into the online survey to complete the data entry. Evaluators used the survey website's online tools to analyze and create reports for the quantitative data.

Data Rollout

High-speed evaluation teams can save a lot of headache and late night work by identifying key questions and generating report or data presentation templates ahead of time. The results should be rolled out as they are needed, and they need not be presented in traditional report format. SMM evaluators tailored the results presentation to the meeting environment.

Results

This rapid form of evaluation was effective in meeting the needs of the setting and the project teams. The

technique, however, still demanded a lot of the evaluation staff. Though the data collection was much more streamlined due to the use of online surveys, the number of products being evaluated and the type of data reporting added to the work. SMM evaluators have since modified the technique to cut down on the amount of time needed to complete this type of evaluation for future meetings.

Everyone should come to discuss and think through alternative ways of collecting data, understanding projects, and working with various teams during the process of developing strong, exciting products.

Emerging Practices for The Use of Evaluation Findings in Museums

Rena Youngs, Graduate, University of Washington Museology

Purpose

The purpose of this research was to begin to identify and assemble the key conditions and practices that support the use of evaluation findings in museums.

Perspectives

This study grew out of several conversations about the use (and non-use) of evaluation findings at the 2010 VSA conference. It synthesizes action steps around promoting the use of findings, from both evaluator and client multiple perspectives, and begins to articulate the key elements of evaluation use in a museum-specific context. Two key perspectives underpinned this research: 1) an important measure of an evaluation project's value is the extent to which it is put to use, and 2) the work of all pertinent stakeholders – client, museums, visitor studies professionals, and the museum field – is enhanced by striving for the utilization of evaluation findings.

Methods

This qualitative study used one exploratory, web-based, videoconference focus group (with visitor studies professionals) and seven web-based (VOIP) telephone interviews (with visitor studies professional and museum-based evaluation clients) to identify themes from the interviewees' professional experiences with successful evaluation and use.

Data & Analysis

An emergent design and analysis process, with multiple iterations of reading and coding of interview transcripts and notes, allowed new themes to develop as more data was added to the study.

Results

Participants reported four main categories of actions that promote the use of evaluation findings: 1) adequate investment of time and resources; 2) mutual sharing of knowledge about the value of evaluation and the unique context of a project; 3) well-developed evaluator / client relationships; and 4) accessible, actionable reporting and recommendations. Responsibility for these key conditions of evaluation use is shared among evaluators, clients, and other stakeholders.

Importance

This study suggests an initial, museum-specific framework for promoting the use of evaluation findings. It was designed and conducted in order to be of use to both the visitor studies community and the broader field of museum professionals. It supports many parties' work for greater use of evaluation findings, and the many attendant benefits thereof. The inclusion of both evaluator and client perspectives on the use of findings sets this research apart from most visitor studies literature; a deeper and wider exploration of client perspectives on in particular would be a fruitful area for future research.

Selected References

- Jacobsen, J.W. (2010) A Research Vision for Museums. *Curator: The Museum Journal* 53, no. 3, 281-289. doi: 10.1111/j.2151-6952.2010.00029.x.
- Krug, K. (2001) Our Colleagues, Our Selves: Modeling Museum Worldviews in the Process of Change. *Curator: The Museum Journal* 44, no. 3, 261-273. doi: 10.1111/j.2151-6952.2001.tb01165.x.
- Nold, C. (2002) Observing the Observers: A Director's View. *Visitor Studies Today* 5, no. 3, 1-9. http://historicalvoices.org/pbuilder/pbfiles/Project38/Scheme325/VSA-a0a6e3-a_5730.pdf.
- Patton, M.Q. (1997) *Utilization-Focused Evaluation*. Thousand Oaks, Calif.: Sage Publications.
- Preskill, H. (2011) Museum Evaluation without Borders: Four Imperatives for Making Museum Evaluation More Relevant, Credible, and Useful. *Curator: The Museum Journal* 54, no.1, 93-100. doi:10.1111/j.2151-6952.2010.00072.x.
- Rubenstein, R. (1990) Bridging The Applicability Gap Between Research and Planning. *Visitor Studies* 2, no. 1, 46-55. http://historicalvoices.org/pbuilder/pbfiles/Project38/Scheme325/VSA-a0a5e0-a_5730.pdf.
- Shettel, H. (1989) Do We Really, Really Need to Do Visitor Studies? *Visitor Studies* 1, no. 1, 25-31. http://historicalvoices.org/pbuilder/pbfiles/Project38/Scheme325/VSA-a0a1n1-a_5730.pdf.
- Visitor Studies Association. (2010) 23rd Annual Visitor Studies Association Conference Abstracts. *Visitor Studies Association*. Accessed May 4, 2011. <http://visitorstudies.org/uploads/documents/2010%20VSA%20Conference%20Abstracts.pdf>.

10:30-11:30 a.m. Concurrent Sessions—Five

Beyond Learning: A Discussion about How to Picture Success

Jennifer Novak-Leonard, WolfBrown
Joe E. Heimlich, Ohio State University Extension/Institute for Learning Innovation
Randi Korn, Randi Korn & Associates
Peter Linett, Slover Linett Strategies

Purpose

This conversational session will be an opportunity to engage in big-picture dialogue about how the museum field defines and measures success. Four researchers who have studied the outcomes of cultural and informal learning experiences in a wide variety of contexts (including, for additional perspective, the performing arts) will present brief, provocative, and widely divergent positions about how to picture success. Peter Linett will then facilitate a discussion among the researchers and with attendees. The session will conclude with a breakout exercise in which small groups of attendees brainstorm new metrics of success, then share their ideas with the full audience.

Panelists' Perspectives

Veteran evaluator Randi Korn will critique the prevailing wisdom about success measurement, which often treats attendance numbers as a proxy for relevance and meaning. Korn will offer an alternative view, reminding us that attendance and other institutional "performance" metrics are outputs rather than outcomes and need to be contextualized alongside more nuanced, qualitative measures. Such measures should assess three elements of museums that constitute the museum experience: meaningfulness; the unique qualities of the museum; and the

deep passion of its staff for their work. Korn will share her vision for a suite of metrics that might tell us about the difference a museum experience has made in the quality of a visitor's life.

Arts researcher Jennifer Novak-Leonard will share examples of her firm's work on measuring the [intrinsic impacts of live arts experiences](#). Those studies have focused on five general categories of impact: Captivation and Personal Involvement; Emotional Resonance; Intellectual Stimulation; Aesthetic Enrichment; and Social Bridging and Bonding. Novak-Leonard will discuss how those categories were identified and what underlying variables are used to quantify them. She will also share a recent application of this paradigm to an art museum as part of a multi-disciplinary research project in Liverpool, UK.

Free-choice learning researcher Joe Heimlich, who has studied audiences in contexts ranging from jazz clubs to science centers, will take issue with the field's emphasis on learning in its narrowly cognitive definition. He will argue that we've unnecessarily and unhelpfully labeled some experiences (such as art museums and symphony concerts) as "aesthetic" encounters and others (such as science museums) as "learning" experiences. As recent neuroscientific and psychological research have demonstrated, all learning has emotional, social, aesthetic, and other components, which are often left out of the conversation about museum impacts. Heimlich will share his multi-faceted concept of "learning" and discuss its usefulness in deepening the benefits people derive from cultural institutions.

Cultural consultant Peter Linett will introduce and frame the discussion with brief reference to existing models of success measurement in the museum field (such as M. Anderson ["Metrics of Success in Art Museums"](#) [2004] and J. Jacobson ["A Research Vision for Museums"](#) [2010]). Linett will also offer his own construct of museum success grounded in a humanistic understanding of visitor motivations. Drawing on philosophical aesthetics, he will argue that informal learning and aesthetic engagement in museums are both forms of play, and that our existing notions of success have been hampered by utilitarian and instrumentalist biases.

New Frameworks Needed: Capturing Visitor Engagement with History

Caren S. Oberg, Oberg Research

Purpose

Oberg Research proposes that public history practitioners and audience researchers partner to develop a new framework that captures the interaction between an exhibition's complexity and visitors. It is our assumption that practitioners in history museums have done a significant amount of thinking about how to present history's ambiguities. We suggest that audience research may be an underutilized partner in this thinking. This discussion is a part of Oberg Research's efforts to develop new approaches for gathering and categorizing audience interactions with exhibitions and programming in history museums.

Three questions will focus the discussion:

1. What does it mean to public history practitioners to have visitors engage or become comfortable with history's ambiguity and complexity?
2. How can audience researchers record and categorize visitors' engagement with ambiguity?
3. To what end can an understanding of visitors' engagement with ambiguity and complexity inform professional practice and museum decision-making?

This new framework has not yet been designed. This session is meant to open up these ideas to a larger audience for discussion. Session participants will not leave the session with a completed framework.

Perspectives

The very nature of ambiguity that makes history interesting also makes it difficult to predict and measure outcomes beyond names and dates. Outcome-based evaluation approaches and National Science Foundation (NSF) designed logic models are the most popular frameworks most available to history museums, especially considering their adoption by the Institute for Museum and Library Services (IMLS). It is Oberg Research's belief, however, that these models do not capture what is in the end the real meaning that visitors draw from their experiences in history museums because these models are based in measuring outcomes. These models do not allow for capturing the complexity of visitor thinking as they engage with history and, therefore, do not allow for data that will deeply inform decision making and practices. Therefore, a different model needs to be developed, one that is built around how practitioners and visitors think about their engagement with the complexities inherent with engaging history.

Importance

A new framework which captures the complexity of visitor thinking as they engage with history, developed out of the work conducted by public history practitioners and audience researchers, will inform future public history and visitor studies practice.

References

- Bunch, L. G. (2010). American museums still struggle with the legacy of race. *Museum*, 89(6), 43-49.
- McRaney, L., & Russick, J., Eds. (2010). *Connecting Kids to History with Museum Exhibitions*. Walnut Creek, CA: Left Coast Press.
- Weinberg, S. (2001). *Historical thinking and other unnatural acts: Charting the future of teaching the past*. Philadelphia, PA: Temple University Press.

Are We There Yet? Building Shared Research and Evaluation Agendas

Jessica J. Luke, Institute for Learning Innovation
Barbara J. Soren, Independent Consultant

Purpose

Last year's VSA conference, *Building Shared Agendas: Conversations on the Value of Visitor Studies*, culminated in a collectively-crafted working agenda that highlighted five key priorities for focusing the work of VSA professionals. Now, a year later, how useful is this working agenda? To what degree has it informed the work of VSA professionals who attended the 2010 VSA conference? How relevant is such an agenda to the strategic future of VSA as a professional organization? How important is it to VSA members? How might it help practitioners outside of the VSA field to better understand who we are and what we do, and what might they add to it? This double interactive session is designed to engage VSA, AMM, and IAM members in dialogue about the relevance, use, and potential applications of a field-wide agenda for research and evaluation.

Perspectives

The working research and evaluation agenda that emerged from the VSA 2010 conference recommended the following five specific areas of focus for visitor studies professionals.

1. Communicating about visitor studies, especially outside of the VSA community:
 - Create clear, accessible, commonly understood language for talking about visitor studies
 - Make visitor studies more accessible and less intimidating for developers, designers, and implementers of informal learning experiences

- Advocate for the value of visitor studies to board members, CEOs, executives, and other decision-makers; listen to their priorities and build bridges to visitor studies
 - Create forums for sharing data and methods in order to learn across disciplines and disseminate to a broader public
 - Collect, catalogue, curate, and share information about what we know
 - Move to a more open model of ownership for contracted evaluation work
 - Map the information ecology of which visitor studies (and VSA) is a part.
2. Integrating visitor studies into institutions:
- Move visitor studies from the institutional margins to the institutional core; integrate visitor studies into institutional planning
 - Study the internal structure of informal learning organizations
 - Focus on shifting the culture of informal learning organizations.
3. Refining methods and metrics:
- Enhance the rigor of our research and evaluation work
 - Continue to improve and innovate new methods for studying informal learning
 - Develop field-wide metrics and instruments; determine the balance between shared measures and the uniqueness of context.
4. Using more holistic approaches:
- Focus on the visitor more holistically beyond the four walls of the institution (e.g., ethnographer in the pocket)
 - Conduct studies that move beyond specific projects (e.g., institution-wide and cross-institutional)
 - Conduct meta-studies of findings to date, focused on bigger questions we've been asking over the last 20 years
 - Conduct meta-evaluation of our evaluation work to understand advancements as a field
 - Understand the role of informal learning organizations/platforms within the informal learning infrastructure.
5. Defining the community in which we work:
- Clarify what holds us together
 - Community of practice(s) vs. community of interest(s)?
 - What ends and impacts are we all working towards?
 - What are the intended outcomes of public(s) value(s) (e.g., a logic model)?

Format

This double interactive session (60 minutes in length) includes three distinct parts. First, discussion leaders Jessica Luke and Barbara Soren will spend 2-3 minutes setting the stage by explaining the origins of this working agenda and elaborating on each of the five key priorities. Second, Luke & Soren will encourage session participants to critically reflect on the agenda, discussing related actions they have taken or could take since VSA 2010, and to engage in small group dialogue around key questions, such as: How relevant is this working agenda for the VSA community? How could both the organization and members use it moving forward? What do we need to revise and/or change a year later? Third, discussion leaders will share back to the larger group key themes that emerged during small group conversation, and ask session participants to offer recommendations for future action around the research and evaluation agenda.

Importance

This session will appeal to researchers and practitioners alike, and to members of the VSA community as well as members of the AMM and IAM communities. Researchers will have an opportunity to react to the agenda with

their specific priorities and interests, and practitioners will be able to inform that same agenda with their wants and needs. Together, all professionals will benefit from a focused discussion of where to direct/channel? research and evaluation energies and resources, and why, and how the field can benefit from ongoing collaboration and conversations related to the public value of visitor studies.

References

Carr, D. (2011). Reflections on the field: Valuable thinking, variable knowing. *Visitor Studies*, 14(1), 2-12.

A Conversation with Barbara Butler

Stephen Bitgood, Professor Emeritus of Psychology, Jacksonville State University
Barbara Butler, PhD

Purpose

This interview is the ninth in a series that attempts to provide in-depth conversations with the leading professionals in the field of visitor studies. Lisa Hubbell (formerly McKinney) initiated these conversations in 2001 exploring many important issues in the field as viewed through the eyes of prominent leaders. This interview (with Steve Bitgood as interrogator) traces Barbara Butler's expansive career in academics, museums, and Visitor Studies. While many of the past participants in this series were noted for their volume of publications, Barbara's most important contributions have occurred behind the scenes.

Perspectives

Potential topics to be discussed include the relevance of Cyril Houle's view of professionalism to visitor studies; stages of adaptation to the idea of evaluation; the history of NSF's Informal Science Education during Barbara's term as program officer and director; the importance of making clear distinctions in terminology in visitor studies and informal education; The development of VSA's *Evaluator Competencies for Professional Development*; and the direction that visitor studies is going or should be going

Importance

The federal government is included as one of VSA audiences and the NSF Informal Science Education has been an important contributor to the work of VSA members. Knowing the history of an organization, especially a young one like VSA, is important for understanding its development and future.

References

Houle, C. (1980). *Continuing learning in the professions*. San Francisco: Jossey-Bass, Inc.

Evaluator Competences for Professional Development, retrieved from VSA web site on April 26, 2011 at <http://visitorstudies.org>.

Wells, M., & Butler, M. (2002). A visitor-center evaluation hierarchy. *Visitor Studies Today*, 5(1): 3-9.

Wells, M., & Butler, M. (2004). A visitor-centered evaluation hierarchy: Helpful hints for understanding the effects of botanical gardens programs. *The Public Garden*, American Association for Botanical Gardens and Arboreta, 19(2): 11-13.

1:15-2:15 p.m. Poster Sessions

Lessons Learned about Visitor Attention from Simulation Studies

Stephen Bitgood, Professor Emeritus of Psychology, Jacksonville State University

Purpose

This poster summarizes a series of museum simulation studies that examined factors influencing the engagement of attention to art prints. The basic methodology was similar to Robinson (1928) in that participants sat at a table and viewed art prints. In the current studies, however, we examined the effects of mental effort, choice, visual distraction, interest level, and perceived workload on willingness to read text passages associated with viewing art prints.

Perspective

Museum exhibitions are designed to capture and engage visitor attention. While capturing attention is easily accomplished, meaningful engagement is not. Engagement requires deeper mental processing than simply passively viewing exhibit material. Engagement is evidenced by such behaviors as reading interpretive labels, discussing exhibit content with other group members, etc. The studies reported here were designed to test various aspects of the attention-value model (Bitgood, 2010).

Method

Participants sat at a table, were presented with art prints from well-known artists. They were instructed to: (1) passively view (no mental effort condition) or actively describe (mental effort condition) the artwork; (2) rate degree of interest (1=lowest, 10 = highest) in seeing information about the artwork and artist; and (3) read out loud as much or little as he/she desired from a text passage about the artwork and artist (reading engagement).

Data & Analysis

The variables under study and the operations for defining these variables were: (1) **Value**: a ratio of utility (interest level rating) divided by cost (the length of the text passage); (2) **Mental effort**: instructions to either passively view art prints (low effort), describe art prints (moderate effort) or compare two art prints (high effort); (3) **Choice**: instructions to select one of three art prints (choice) for close examination versus instructions to select a specific print (no choice); (4) **Visual distraction**: presentation of non-target art prints along with a target print (compared with a single art print in which there was no distraction); (5) **Interest level**: rating of the degree of interest in seeing information about the artist and art work (Note: interest level was studied as both a dependent and an independent variable); (6) **Workload**: the length of text passage presented to participant associated with an art print; (7) **Engagement**: the proportion of text passage actually read when instructed to read either none, some, or all of the text passage.

Results

The most powerful predictors of engaged attention (proportion of text passage read) in order of impact were: (1) value or a ratio of interest rating divided by length of the text passage; (2) having a choice of art prints with which to engage; (3) workload (or length of the text passage by itself); (4) mental effort (having to actively describe rather than passively view the art print); (5) interest rating by itself; and (6) visual distraction (presence of three rather than one art print).

Importance

These studies suggest that a behavioral economic approach to visitor attention is helpful in understanding how to capture and engage visitor attention in a museum setting. Choice, value, and visitor interest are key factors in understanding when and why visitors pay attention.

Additional Links and References

Bitgood, S. (2011). *Social Design in Museums: The Psychology of Visitor Studies*:

<http://museumsetc.com/products/social-design>

Bitgood, S. (2010). *An Attention-Value Model of Museum Visitors*. Center for the Advancement of Informal Science Education: http://caise.insci.org/uploads/docs/VSA_Bitgood.pdf

Robinson, E. (1928). *The behavior of the museum visitor*. New Series No. 5. Washington, DC: American Association of Museums.

Other publications available at: <http://www.jsu.edu/psychology/bitgood.html>

What's Going on in this School Tour? An Evaluation of Student Behavior and Dialogue in VTS-based Elementary School Tours

Amanda Mae Bomar, Henry Art Gallery

Valerie Grabski, Graduate, University of Washington Museology

Lauren LeClaire, Graduate, University of Washington Museology

Purpose

This study investigated the conditions under which high levels of participation were observed during the Visual Thinking Strategies based (VTS-based) school tours at the Frye Art Museum in Seattle, WA.

Perspectives

The VTS-based tours at the Frye combine VTS methods with additional questions and activities designed to engage elementary students in conversations about contemporary and traditional art. While this study does not look at the effectiveness of VTS, it is interested in which factors are related to student dialogue about art, including the use of VTS questions by the gallery guides, time of the tour, presence of art related activity, and artwork presented.

Importance

The VTS-based school tours at the Frye Art Museum may provide an example of how museums can build off of already existing teaching models to fit their needs. This study describes what happens when additional material is used along side VTS.

Designing for Museum-Teacher Communication: A Consideration of Epistemological and Positional Framing

Lisa Brahms, UPCLOSE, University of Pittsburgh, Learning Research and Development Center

Meghan Bathgate, University of Pittsburgh, Learning Research and Development Center

Abstract

The current study examines the ways in which museums and teachers frame and negotiate their respective expectations and epistemologies regarding school visits to a museum. Through the iterative redesign of a

museum's school visit registration process, we explore the implications for communication and practice of participant groups' competing and converging framings.

The public school day is facing a growing emphasis on standardized testing-readiness and achievement in the compartmentalized disciplines of Math, Reading, and Writing (Fortney & Sheppard, 2010). In response, the time and resources allocated to the arts has been severely threatened. The Carnegie Museum of Art (CMA) believes that the visual arts have the potential to strengthen school-based learning if integrated into the more championed disciplines. CMA takes an "interdisciplinary" approach, viewing art's potential as not merely an instrument for learning other skills, and not simply of value in and of itself, but as a resource or tool for strengthening learning in other disciplines, serving as a vehicle to convey both learning strategies and creative processes. This is best achieved through the collaboration and combination of teachers' and museum educators' context-specific expertise. Through previous teacher participation in and evaluation of school programs, CMA felt teachers were not identifying with this interdisciplinary learning process associated with the visual arts. Through the iterative redesign of a school visit registration system, we explored teachers' expectations and perceptions of their role in the museum school visit. Our initial investigations revealed a disconnect between the Museum's objectives and teachers' expectations. We saw this as a problem of epistemological and positional framing.

Framing is a general construct used to describe how an individual or group begins to answer the often, tacit question, "What is it that's going on here?" (Tannen, 1993; Scherr & Hammer, 2009). In the case of CMA, epistemological framing ("What kind of knowledge is relevant to what I'm/we're doing in this context?") and positional framing ("How am I positioned to use the available information in this context?") are most relevant (Tannen, 1993; MacLachlan & Reid, 1994; Hammer et al., 2005; Hutchison & Hammer, 2009). In the context of a classroom visit to an art museum, teachers' and Museum staffs' framings vary considerably.

After considering our findings regarding the prototype registration process, we conducted a focus group to clearly identify participant group framings. This enabled the Museum staff and teachers to verbalize their perceptions and expectations of school visits to each other. In this conversation, we addressed the following questions: What is the Museum's epistemology regarding school programs? How do teachers' goals for a school visit align with this epistemology? What are expectations of teachers' role? How can an interdisciplinary approach best serve museums and schools? Results of this discussion will be presented.

Communication between teachers and museums is integral for the creation of meaningful and relevant learning experiences. In light of the realities facing 21st century schools, museums and teachers need to recognize and reassess their respective framings. Clearly defining expectations is the first step in finding common ground and recognizing the unique contributions of each party. The case of CMA offers an opportunity for museum professionals to reflect on the incongruity between museum and teacher expectations when planning school visits, and, through an iterative design process, showcases possible paths of communication between museums and teachers.

References

- Fortney, K., & Sheppard, B. (Eds.) (2010). *An alliance of spirit: Museum and school partnerships*. Washington, DC: American Association of Museums Press.
- Hammer, D., Elby, A., Scherr, R. E., & Redish, E. F. (2005). Resources, framing and transfer. In J. Mestre (Ed.), *Transfer of learning from a modern multidisciplinary perspective* (pp. 89-120). Greenwich, CT: Information Age Publishing.
- Hutchison, P. & Hammer, D. (2009). Attending to student epistemological framing in a science classroom. *Science Education*, doi: 10.1002/sce.20373.
- MachLachlan, G. L., & Reid, I. (1994). *Framing and interpretation*. Melbourne: Melbourne University Press.
- Scherr, R. E., & Hammer, D. (2009). Student behavior and epistemological framing: Examples from collaborative active-learning activities in physics, *Cognition and Instruction*, 27: 2, 147-174.

Tannen, D. (1993). *Framing in discourse*. New York: Oxford University Press.

“Pointing At” in Museum Exhibitions: Let's Get Meaning-Making Started!

Dimitra Christidou, Museum Studies, University College of London, Institute of Archaeology, London, UK

Purpose

By treating the museum visit as a social experience leading to shared meaning-making, my research explores the ways visitors direct others' attention, render public their personal fancies and stories and subsequently share meaning by referring to the displayed exhibits. The poster briefly presents one of the three case studies, that of the Courtauld Gallery in London, UK, introducing the possible ways the context (physical, social, personal and institutional) occasions the museum experience and the shared meaning-making for each group of visitors.

Perspectives

Museums are complex social environments where people with different backgrounds interact with each other and the content in various and, sometimes, unexpected ways. Social interaction has been valued among the basic motivations for visiting a museum as the vast majority of visitors arrive as member of a social group (Falk & Dierking, 2000; Leinhardt et al., 2002).

This research is based on previous research treating the museum experience as a sociocultural event during which visitors make meaning of those on display through interaction and collaboration. At the same time, it acknowledges the intertwined interaction of the personal, sociocultural and physical context (Falk & Dierking, 1992; 2000) by treating the museum experience as a situated, mediated, social and multimodal process. In addition, based on relevant research exploring visitors' verbal (Allen, 1997; Leinhardt et al., 2002; Leinhardt & Knutson, 2004) and nonverbal discourse (Rahm, 2004; Heath & vom Lehn, 2004), this research focuses on the “social practices” visitors use for sharing their personal fancies with the others.

Throughout this research the term *performance* is used to refer to visitors' responsive and situated verbal and non-verbal behaviours. By studying the unfolding nature of visitors' performances in different museum contexts (an art gallery, a science and, an anthropological museum) this research focuses on, gathers and compares possible ways different types of exhibits gain meaning for the visitors' group as a unit. Looking closer at the ways performances are produced, recognised and shared during the visit, the importance of joint attention and reference becomes salient, unveiling the dynamics of visitors' performances not only for the person performing, but also for others sharing the same space.

Methods

Qualitative research was chosen for studying human behaviour in natural context from the perspective of those who act while they act by using their own quotations (Miles & Huberman, 1994). Ethnomethodology and Conversation Analysis provided the methodological resources through which the situated, social and moment-by-moment occurrence of performance was captured through audio and video recordings coupled with field observations.

Data & Analysis

- Visitors in groups of at least two people interacting in front of specific exhibits.
- More than 300 hours of filming from March 2010 to April 2011 at three London-based museums (Wellcome Collection; Courtauld Gallery; Horniman Museum and the Gardens).
- Qualitative analysis by using the qualitative software Nvivo8.

Results

As the gallery environment produces several competing foci of attention upon which the visitors' attention may be drawn, this research supports that the use of reference, especially in the form of pointing, is important for the collaborative viewing in the museum in the sense that facilitates the sharing in ways that language cannot alone do.

Importance

- This research fills the gaps of previous research exploring the ways visitors make meaning in museums by focusing on their collaborative responses while also acknowledging the multimodal nature of the museum experience.
- Unveiling how visitors experience the museum; how visitors bring the museum to life while they attempt to make meaning.

References

- Allen, S. (1997). Sociocultural theory in museums: Insights and suggestions. *Journal of Museum Education* 22/2&3, 8-9.
- Falk, J. & Dierking, L. (1992). *The museum experience*. Washington, DC: Whalesback Books.
- Falk, J. & Dierking, L. (2000). *Learning from Museums: Visitor Experiences and the Making of Meaning*. Walnut Creek, CA: Altamira Press.
- Heath, C. & vom Lehn, D. (2002). Misconstruing Interactivity. In *Interactive Learning in Museums of Art and Design*, Victoria and Albert Museum, London 17–18 May 2002. Retrieved on 20 February 2009 from World Wide Web: http://www.vam.ac.uk/files/file_upload/5763_file.pdf
- Leinhardt, G., Crowley, K. & Knutson, K. (Eds.). (2002). *Learning conversations in museums*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Leinhardt, G., & Knutson, K. (2004). *Listening in on Museum Conversations*. Walnut Creek, CA: Altamira Press.
- Miles, M., & Huberman, M. (1994). *Qualitative Data Analysis; an Expanded Sourcebook*. 2nd edition, SAGE Publications.
- Rahm, J. (2004). Multiple Modes of Meaning-Making in a Science Center, *Science Education* 88, 223– 247.

Visitor Expectations and Satisfaction at Burke Museum Family Day Events

Emily Craig, Graduate, University of Washington Museology
Betsy O'Brien, Graduate, University of Washington Museology
Renae Youngs, Graduate, University of Washington Museology

Purpose

This study, conducted at the Burke Museum of Natural History and Culture in Seattle, sought to address the following evaluation goals:

- 1) Develop a profile of Family Day visitors
 - a. Who comes to Burke Family Days? With whom?
 - b. Where do visitors learn about family events?
- 2) Discover visitor expectations and experiences at Burke Family Day
 - a. How do visitor expectations and experiences align?
 - b. What do visitors identify as the most important expectations and experiences?
 - c. What characteristics of Burke Family Day events, if any, do visitors identify as special?

Perspectives

Implications of the study for the client, the Burke Communications office:

- Client can compare visitor profile to current communications strategy.
- Client can use findings about visitors' "favorite" activities to help shape future branding of the events and/or inform program staff's future work.
- Client will use findings to prepare for a wider visibility campaign.
- Client will be able to use findings to self-assess their efforts in terms of efficiency/reach and key audiences served.

Methods

Data was collected at 3 events: Meet the Mammals, Dino Day and Mushroom Maynia. Two data collectors were responsible for collecting pre-entry surveys. This survey addressed basic demographic information in addition to information regarding how the visitor heard about the Burke Family Day event and how the visitor finds out about similar events in the area. Two different data collectors were stationed outside the two museum exits and completed post-visit interviews. This interview was composed of two parts: a white-board activity that addressed visitor expectations and experiences for the particular family day event, and a few open-ended questions that addressed visitor enjoyment and acknowledgement of what makes the Burke Museum special. Additionally, the post-visit interview included a few demographic questions that echoed those included on the pre-entry survey.

Data and analysis

394 pre-entry surveys and 91 post-visit interviews were collected from adult visitors to the events. Visitor profiles were built using descriptive statistics and cross-tabulation. The open-ended portions of the interviews were analyzed qualitatively in order to develop a set of codes for visitors' reflections on their museum visits. Through the use of categories that emerged directly from the interview data, the researchers were able to describe those aspects of Burke Family Days identified as most important by visitors.

Importance

As an evaluation, this was an attempt on behalf of the Burke Museum to better identify a community of learners. Moving forward, the Burke will be able to use this information to better market Family Day events and better ensure that the present audience is being well served. This evaluation also contributes to an increased institutional commitment to evaluation; it is the Burke Museum's third *New Directions* evaluation project in as many years. Staff members have expressed growing enthusiasm about and interest in evaluation over the past three years. Programs like *New Directions* at the University of Washington allow for the introduction of audience research to diverse institutions in a safe way, which seems to be effective. This evaluation also experimented with using the iPad as a data collection tool. Information from post-visit interviews was collected using the iPad for both quantitative and qualitative data. In this regard, the researchers have valuable insight to share from having learned how to use the iFormBuilder software and how best to utilize the iPad as a data collection tool.

References

- Burke Museum of Natural History and Culture (2011). Mission -- Burke Museum. Retrieved from <http://www.washington.edu/burkemuseum/info/mission.php>
- Doering, Z. D. (1999). Strangers, Guests, or Clients? Visitor Experiences in Museums. *Curator: The Museum Journal*, 42(2), 74-87. doi:10.1111/j.2151-6952.1999.tb01132.x
- Kotler, N. (1999). Delivering Experience: Marketing the Museum's Full Range of Assets. *Museum News*, May/June 1999. Retrieved from http://aam-us.org/pubs/mn/MN_MJ99_DeliveringExperience.cfm
- Packer, J. (2008). Beyond Learning: Exploring Visitors' Perceptions of the Value and Benefits of Museum Experiences. *Curator: The Museum Journal*, 51(1), 33-54. doi:10.1111/j.2151-6952.2008.tb00293.x
- Packer, J. and Ballantyne, R. (2002). Motivational Factors and the Visitor Experience: A Comparison of Three Sites. *Curator: The Museum Journal*, 45(2), 183-197. doi: 10.1111/j.2151-6952.2002.tb00055.x
- Pekarik, A. J., Doering, Z. D., & Karns, D. A. (1999). Exploring Satisfying Experiences in Museums. *Curator: The Museum Journal*, 42(2), 152-173. doi:10.1111/j.2151-6952.1999.tb01137.x

Additional Links

<http://informalscience.org/project/show/1757>

Knowledge and Museum: Archive, Exhibit, Evidence

Kira Eghbal-Azar, Knowledge Media Research Center, Tuebingen, Germany

Purpose

This poster presentation will provide an overview about the interdisciplinary cooperation project *Knowledge and Museum: Archive, Exhibit, Evidence*. In addition to the project overview, the poster will focus on the sub-project "Presentation Practice and Evidence Attribution" (headed by the Knowledge Media Research Center) because it is the most relevant part for VSA conference participants.

The sub-project's objectives are to analyse 1) the creation of evidence by the curator and her implementation of an ebook in the major exhibition "Nexus" at the Museum of Modern Literature in Marbach and 2) the reception of this evidence and the usage of this ebook by the visitors. The main research questions are:

- To what extent do the intentions of the curator match the reception of the visitor?
- What effect do the exhibits and the presentation practice have on the meaning making and behaviour of the visitors?
- What is the role of digital media for the meaning making and what is their effect on the visitors' behaviour?

Perspectives

This cooperation project is carried out by the Knowledge Media Research Center (KMRC), the 'Deutsches Literaturarchiv Marbach' and its museums, the Ludwig-Uhland Institute for Empirical Cultural Study and the Institute for Art History at the Eberhard Karls University of Tuebingen. The project is funded by the German General Ministry of Education and Research. A new and interdisciplinary approach to an exhibition about literature is being tried out from other points of view than the study of literature. The project consists of four sub-projects:

1. "Spaces of Literature," headed by the Ludwig-Uhland Institute for Empirical Cultural Study;
2. "Iconicity of Literature," headed by the Institute for Art History;
3. "Materials of Literature," headed by the Ludwig-Uhland Institute for Empirical Cultural Study; and
4. "Presentation Practice and Evidence Attribution," headed by the KMRC.

The results of all research parts will influence the conception of the special exhibition about literature in the epochal year 1912 at the Museum of Modern Literature in Marbach in March 2012. Furthermore all results will be presented at the final workshop in March 2012.

Importance of the sub-project

The research design for "Presentation Practice and Evidence Attribution" combines psychological and anthropological theories and methods to a new cognitive science approach to visitor studies. It also applies new methods like mobile eye-tracking (compare Mayr et al., 2009 for first insights into mobile eye-tracking in visitor studies). It stresses the need of triangulating different kinds of methods, viewpoints and sources in visitor studies as George Hein (1998) explicitly recommended.

Importance of the whole interdisciplinary cooperation project

The first goal of this project is the relationship between museum, archive and science, which is currently experiencing reformation in Germany. Therefore this new kind of cooperation is being tried out. The second goal

of this project is to use an interdisciplinary perspective on exhibitions thereby analysing the transformation of museum objects from initially being archival material to finally entering into the exhibit, with a focus on the creation and the reception of evidence. We want to work out general methods and models of scientific museum research that also can be applied to contexts other than ours. And last but not least, the staff members can acquire a university-based and a museum-based qualification (Museumsvolontariat, German museum training needed to become a curator in Germany) at the same time.

References

- Hein, G. E. (1998). *Learning in the Museum*. London: Routledge.
- Mayr, E., Knipfer, K., & Wessel, D. (2009). In-sights into mobile learning: An exploration of mobile eye tracking methodology for learning in museums. In G. Vavoula, N. Pachler, & A. Kukulska-Hulme (Eds.), *Researching mobile learning: Frameworks, tools and research designs* (pp. 189-204). Oxford: Peter Lang.

Additional Links

- <http://www.iwm-kmrc.de/www/en/projekte/projekt.html?name=WissenundMuseum&dispname=WissenundMuseum> (in English)
- <http://www.wissen-und-museum.uni-tuebingen.de/das-projekt/> (only available in German)

Building the Evaluation Capacity of Museum Staff through Participatory Evaluation Activities

Gayra Ostgaard, Science Museum of Minnesota
Amy Grack Nelson, Science Museum of Minnesota

Purpose

Participatory evaluation can build evaluation capacity of museum staff. Building this capacity depends on learning from the successes and failures of previous evaluations. In an effort to build this base knowledge, this poster shares lessons learned from conducting two youth participatory evaluations with staff who have varying levels of evaluation expertise at the Science Museum of Minnesota (SMM).

Perspectives

Participatory evaluation involves sharing control of a study with project stakeholders (Cousins & Earl, 1995). This type of evaluation has many benefits, including having stakeholders who are more vested in a study and its results, as well as building the evaluation capacity of individual staff and departments (Patton, 2008). The involvement and role of the evaluator depends largely on the evaluation knowledge and understanding that stakeholders bring to the table (Fitzpatrick, Sanders & Worthen, 2004).

The SSM's Kitty Andersen Youth Science Center (KAYSC) offers STEM youth development and employment programs to underserved middle and high school youth. In 2009, a youth participatory evaluation was conducted of a KAYSC program in collaboration with a KAYSC youth program manager. During this evaluation, the youth program manager and internal evaluator facilitated evaluation workshops with KAYSC youth (Grack Nelson & Callahan Schreiber, 2009). The youth reviewed summative data from activities they led with museum visitors, identified what they would keep and change about the activities, and reflected on what they needed to do during their activities in order to reach their activities' objectives. The process resulted in recommendations for program improvements that were implemented by the youth.

As a result of these workshops, the youth were interested in carrying out their own evaluation to examine what visitors were learning from their activities. Because of this interest, the youth program manager and internal

evaluator led youth through an entire youth participatory evaluation process. The evaluator provided training to develop youths' understanding of evaluation and helped them refine the learning objectives for visitors interacting with their activities. The evaluator also worked with the youth to collaboratively create survey instruments and trained them to collect and enter the data themselves. Following this, the youth analyzed their data, identified specific areas for improvement, and created action steps to make those improvements. This evaluation ended up being the impetus for increasing youth participatory evaluation efforts in the KAYSC.

Another youth participatory evaluation took place in 2011 involving a different KAYSC program, youth program manager, and group of youth. It was modeled after the evaluation outlined above, but there were some differences. Unlike the first youth participatory evaluation that was motivated by the youths' interest in discovering what visitors were taking away from their activities, this evaluation was requested by the Director of the KAYSC. Additionally, the first youth program manager had significant experience with the KAYSC and evaluation while the second youth program manager was new to the KAYSC and to evaluation. Both of these evaluations necessitated buy-in from the program managers. The program managers were asked to move from being a leader of a youth team to co-facilitator of evaluation activities. However, because of differences in evaluation experience and knowledge, the two program managers took on differing levels of collaboration with the evaluator throughout the youth participatory evaluation process.

Importance

Conference participants will hear of techniques that worked at one and both of the youth participatory evaluations and the benefits of the process to the youth program managers as well as to the youth. This poster will be useful to evaluators working to build the evaluation capacity of both adult and youth staff at museums or other informal learning institutions.

References

- Cousins, J. B., & Earl, L. (1995). The case for participatory evaluation: Theory, research, practice. In J. B. Cousins & L. Earl. (Eds.), *Participatory evaluation in education: Studies in evaluation use and organizational learning* (pp. 3–18). London: Falmer.
- Grack Nelson, A., & Callahan Schreiber, R. (2009). Participatory evaluation: A case study of involving stakeholders in the evaluation process. *Visitor Studies*, 12(2), 199 – 213.
- Fitzpatrick, J. L., Sanders, J. R., & Worthen, B. R. (2004). *Program evaluation: Alternative approaches and practical guidelines* (3rd ed.). Boston, MA; Pearson.
- Patton, M.Q. (2008). *Utilization-focused evaluation*. (4th ed.) Thousand Oaks, CA: Sage.

Additional Links

Description and report of the Big Back Yard Park Crew Summative Evaluation on informalscience.org: <http://informalscience.org/evaluation/show/337>

Capturing the Visitor Experience: “Personality” Profiles of Five Museum Sites

Jan Packer, School of Tourism, University of Queensland, Australia (presenter)
Roy Ballantyne, School of Tourism, University of Queensland, Australia (presenter)
Nigel Bond, School of Tourism, University of Queensland, Australia (co-author)

Purpose

This poster extends and complements the Individual Presentation at this conference by Jan Packer and Roy Ballantyne on *Understanding and Capturing the Visitor Experience*. It presents results, in graphical format, that

attempt to capture the visitor experience at five museum sites in London. The tool used to obtain the data will also be presented.

Perspectives

VSA is “committed to understanding and enhancing visitor experiences in informal learning settings” (<http://visitorstudies.org/>). The core product of a museum visit is the experience gained (Prentice, Witt & Hamer, 1998), however, few attempts have been made to measure visitor experiences, a notable exception being Zahava Doering’s pioneering work on satisfying experiences in museums (Doering, 1999; Pekarik, Doering & Karns, 1999).

Methods

An adjective checklist was developed to capture visitors’ perceptions of their experience during a museum visit. The adjective checklist was designed to be quick and easy to administer, and to allow respondents to quickly skip past items that they did not perceive to be relevant to their visit. A total of 116 words or phrases were presented, in random order, and visitors were requested to tick those that best described what they had experienced in their visit that day. The questionnaire also collected a range of additional data about the respondent and the visit in order to further explore and understand the antecedents and consequences of the reported experiences. The checklist questionnaire was completed by visitors to five cultural institutions in London (150 per site): the Natural History Museum, Tate Britain, Victoria and Albert Museum, Kew Gardens, and London Zoo.

Data & Analysis

Fifteen dimensions of the visitor experience were identified, each represented by five items from the checklist, thus enabling a score from 0-5 to be calculated for each respondent, on each dimension. Fourteen of the dimensions were positive and one negative. Visitors’ scores on the 15 dimensions were compared across the five sites.

Results

There were significant differences between the five sites on all 15 dimensions. These differences, which illustrate the unique “personality” of each site, will be displayed graphically. Each site had at least one dimension and several individual items which were endorsed more highly than at other sites. For example, the Natural History Museum scored higher than other sites in Fascination; Tate Britain scored higher in Reflection; the Victoria and Albert Museum excelled in Wonder and Connection, Kew Gardens in Restoration, and London Zoo in Activity and Togetherness.

The ways in which dimensions of the visitor experience relate to other constructs such as motivations, activities, and benefits or outcomes will also be displayed. Of particular interest is the emergence of a visitor “career,” with evidence that the nature of the experience is different for first-time, infrequent, and very frequent visitors.

Importance

Being able to measure the experiential qualities elicited by different exhibitions or institutions will enable further research to be undertaken regarding the kinds of experiences that different groups of visitors prefer, the factors that facilitate different types of experiences, and the impact of visitor experiences on other desired outcomes. It will enable exhibits to be evaluated and compared, and changes resulting from various interventions to be measured. This poster presents an innovative and useful tool that can be applied in a range of museum environments. It will be of interest to academic researchers, research students, audience/visitor researchers in museums, zoos and aquariums, art galleries and botanic gardens, exhibit designers, and all VSA members who are dedicated to the ongoing improvement of the visitor experience.

References

Doering, Z. D. (1999). Strangers, guests, or clients? Visitor experiences in museums. *Curator: The Museum Journal*, 42(2): 74-87.

- Packer, J. (2008). Beyond learning: Exploring visitors' perceptions of the value and benefits of museum experiences. *Curator: The Museum Journal*, 55(1), 33-54.
- Packer, J., & Bond, N. (2010). Museums as restorative environments. *Curator: The Museum Journal*, 53(4), 421-456.
- Pekarik, A. J., Doering, Z. D., & Karns, D. A. (1999). Exploring satisfying experiences in museums. *Curator: The Museum Journal*, 42(2), 152-173.
- Pine, J., & Gilmore, J. H. (1999). *The experience economy: Work is theatre and every business a stage*. Boston: Harvard Business School Press.
- Prentice, R.C., Witt, S.F., & Hamer, C. (1998). Tourism as Experience: The Case of Heritage Parks. *Annals of Tourism Research*, 25(1), 1-24.
- Quinlan Cutler, S., & Carmichael, B.A. (2010). The dimensions of the tourist experience. In M. Morgan, P. Lugosi, and J.R.B. Ritchie (Eds.) *The tourism and leisure experience: Consumer and managerial perspectives*. Bristol: Channel View Publications.

Using Animals to Communicate about Science that Advances Human Health

Loran Carleton Parker, Purdue University (presenter)

Omolola A. Adedokun, Discovery Learning Research Center, Purdue University (co-author)

Wilella D. Burgess, Discovery Learning Research Center, Purdue University (co-author)

Sandra F. Amass, School of Veterinary Medicine, Purdue University (co-author)

Jon R. Bricker, Exhibit Design Center, Purdue University (co-author)

Purpose

The goals of this poster presentation are to describe a project funded by a Science Education Partnership Award from the National Center for Research Resources at the National Institutes of Health, discuss the evaluation of the project, share preliminary evaluation results, and solicit input from the Visitor Studies and Museum communities.

Perspectives

"Fat Dogs and Coughing Horses: Animal Contributions towards a Healthier Citizenry" is a project that partners research university scientists, outreach educators, school corporations, and museums to promote interest in and knowledge of health sciences. To achieve this goal, the project's educational and outreach initiatives use health issues that impact both animals and people as vehicles to introduce the public to health sciences, biomedical research, and related careers. This presentation will describe one of the three initiatives of the project: the development of a traveling exhibit on health science research.

We are developing a single exhibit composed of four independent modules each focused on a distinct health science topic. Each module describes research-based advancements in animal health that, through translation or adaptation, have also advanced human health. The four modules are:

1. The purpose and social importance of the clinical trials process for determining the safety and efficacy of medical treatments,
2. Comparative neuroanatomy that has advanced our knowledge of and treatment for spinal cord injuries in animals and humans,
3. Asthma and similar respiratory conditions in horses, and
4. The importance of healthy food choices and exercise for both people and animals.

Methods

We have recently conducted formative evaluations with the exhibit prototypes for the first two modules. The primary goals of these evaluations were to assess the efficacy of the exhibit at communicating its key messages

and identify elements of the exhibit that were highly successful, as well as, those that required modification. The prototypes were installed and displayed during two separate public events on the Purdue University campus and the activities (stops and behaviors) of visitor groups (64 total) were recorded as they viewed the exhibit modules. A subset of groups (34 total) were interviewed after their viewing and asked to summarize the exhibit and discuss their experiences.

Data & Analysis

Observational data were tallied by module element and activity type (Yalowitz & Bronnenkant, 2009). The percentage of visitors stopping and compositions of visitor activities were examined for each element of the modules. Notes from visitor observations and interviews were analyzed for content and categorized. Categories of visitor self-reported learning were created from the qualitative data and compared to pre-determined “key messages” used to guide exhibit development.

Results

Preliminary formative evaluation indicates that the exhibit prototype was effective at communicating its key messages. Categories of visitor self-reported learning corresponded with all but one of the exhibit’s key messages and visitors were engaged by the comic book-like panels of illustration and text. The evaluation results also identified ways in which the prototype could be modified, including altering the text to emphasize a key message that was lacking in visitor discussions.

Importance

This poster describes the exhibit development and evaluation process, explores the preliminary evaluation results in more detail, and discusses directions for future work. The project has encountered several challenges that will be relevant to other museum professionals interested in exhibit development and evaluation. We will engage attendees in a discussion about how we have approached challenges to date and solicit their feedback on our future plans.

References

- Chittenden, D., Farmelo, G., & Lewenstein, B.V. (Eds.) (2004). *Creating Connections: Museums and the Public Understanding of Current Research*. Walnut Creek, CA: Alta Mira Press.
- Yalowitz, S.S., & Bronnenkant, K. (2009). Timing and Tracking: Unlocking Visitor Behavior. *Visitor Studies*, 12(1), 47-64.

Additional Links

Exhibit development website: <http://www.purdue.edu/svmengaged/sepa/exhibits>

Holding Power of Seattle Aquarium Exhibits for the Toddler Audience

Andrea Barber, University of Washington, Museology Graduate Program, *New Directions*
Kaleen E. Pavis, University of Washington, Museology Graduate Program, *New Directions*

Purpose

The Seattle Aquarium seeks to discover how toddler families experience the aquarium’s permanent exhibits. The goal of this study is to begin to document toddler-exhibit interactions in order to better understand the aquarium experience for the toddler family audience. Specifically, the research question is: Which exhibit elements are attracting and holding the attention of the toddler family audience?

Perspectives

The Seattle Aquarium is a scientific, museological institution located in Seattle, Washington that focuses on living collections and researches marine life. The mission of the Seattle Aquarium is “to inspire conservation of our marine environment.” Part of this mission is achieved through the Aquarium’s exhibit floor, which is composed of exhibits highlighting different marine climates. In addition to these exhibits, on-site classrooms are used for public and school programs.

Some of the Aquarium’s public programs, such as “Toddler Time,” are designed to serve the toddler audience. Evaluating the experience of this audience is of high priority to the Seattle Aquarium. The Aquarium has undergone many changes in its exhibits over the past decade and further plans are in development. At one point it was an institutional focus to incorporate early childhood learning into exhibits, but many of these elements have been removed in recent years. Therefore, the Aquarium seeks to discover how the pre-Kindergarten family group experiences the institution in its current iteration. Knowing which of the current offerings are being used by this audience could serve to inform future exhibit changes.

A previous study on toddler audiences categorized furniture as an exhibit element and suggested that toddlers prefer shiny colors (Danko-McGhee, 2006). That study, along with Steve Yalowitz and Kerry Bronnenkant’s (2009) work with tracking and timing, were the primary influence of this study. A modified tracking and timing technique along with visitor interviews were implemented to provide information to better understand the toddler family audience’s use of exhibit space at the aquarium.

Methods

Observation and interview data were collected from January – March 2011. Using a mapping method, toddler families were tracked at three exhibits. Where they stopped, how long they stayed, and what behaviors they displayed while at each exhibit element were noted. Interviews with toddler caregivers were also conducted during the aquarium’s early childhood program “Toddler Time.”

Data, Analysis & Results

Nearly 300 exhibit observations and almost 50 interviews comprise the data set. Results suggest that toddlers spent more time in the Hands-on Hallway and the Family Activity Center than the Octopus Area. While the dwell times in these two exhibits were comparable, the allocation of time attending to exhibit elements varied. In the Hands-on Hallway one exhibit element, the felt board, was the primary focus. However, in the Family Activity Center time was more evenly distributed across multiple exhibit elements. In addition to this preliminary look at the data, information about caregiver preferences and more generalizable findings should be forthcoming.

Importance

Understanding what exhibit elements are attracting and holding the attention of toddlers and their caregivers can help museums create more fulfilling experiences for all members of the visitor group and potentially foster learning opportunities. Discovering what holds the attention of the young museum audience and what their caregivers prefer can inform exhibit design at the Seattle Aquarium and other museological institutions that aim to serve this audience. By connecting with and enhancing the experiences of this young audience, the museum begins what could be a life-long relationship with museums and learning.

References

- Danko-McGhee, K. (November 1, 2006). Favourite artworks chosen by young children in a museum setting. *International Journal of Education Through Art*, 2(3): 223-35.
- Yalowitz, S.S., & Bronnenkant, K. (2009). Timing and Tracking: Unlocking Visitor Behavior. *Visitor Studies*, 12(1): 47-64.

Multi-Sensory Sense-Making: How Children Explore Objects and Ideas

Nancy Owens Renner, Learning Research Scientist, San Diego Natural History Museum and University of California San Diego, Cognitive Science

Purpose

How do children use their bodies to explore objects and ideas? Can we see evidence of how they use perceptual experience to create conceptual knowledge? This research uses new observational methods to discover and describe the organization of children's exploratory behavior in science museum exhibits. Detailed observation and coding of behavior recorded on video show systematic patterns in multisensory engagement and sense-making activities. Future work will explore how these research methods can be adapted to exhibit evaluation and how research results can inform exhibit design.

Perspectives

By focusing on interaction, this research describes how children use resources within a learning ecosystem to make sense of experience. To accomplish this task, the researcher must focus on the interactions that matter, involving multisensory exploration and pickup of information in the environment. Behavioral evidence of exploration, information pickup and integration can be found in allocation of attention, use of objects, and content and timing of speech and gesture (Gibson, 1979; Hutchins, 1995, 2010; Goldin-Meadow, 2003; Johnson, 2010). This perspective on human learning and cognition as embedded in action can be described as embodied, situated, and distributed.

Methods

To understand how the exhibit environment structures cognitive activity, the research team began by creating a rich video record of children interacting with exhibits. Several days of video data collection include first-person perspective video, recorded with head-mounted cameras worn by elementary students, and third-person perspective video, recorded with hand-held cameras operated by researchers.

Data & Analysis

The research team indexed the video to create an outline of the event structure, making large-scale behavioral patterns and anomalies apparent for more detailed study. We transcribed and coded a subset of the video in a densely detailed manner with multiple dimensions related to modalities in coordination with physical objects (looking, touching), social interaction, speech, gesture, and reading behavior. The coded video permits a broad array of qualitative and quantitative analyses at multiple time scales.

Results

Based on micro-analysis of behavior at a time-scale of milliseconds, we can describe macro-scale behavioral patterns organized into larger activities. By engaging multiple modalities (sensory, motor, and communicative), the children use their bodies to explore objects and ideas, as if to explore tacit questions.

Active sensing • *What is it?* Sensory-motor exploration dominates the children's behavior. The children learn about objects and environments by experiencing relationships between movement and the senses (Nöe, 2004), driving sensory input through multiple modalities simultaneously.

Discovery of exhibit uses (or affordances) • *What can I do with it?* Children's perceptual skills help them to find how their bodies fit with objects in the environment and where they can take action (Gibson, 1979.) Through imitation learning, observation of others plays a role in finding affordances.

Look for cause and effect • *What will happen if...?* The discovery of cause and effect relations is a means to develop perceptual skills (Piaget & Inhelder, 1969). Active sensing and discovery of object uses embody children's exploration of causality. In physical and social realms, they seem to explore patterns of dependence, which they use to infer causality (Schultz & Gopnik, 2004).

Use the body to express ideas • *How do I make sense of this?* Abundant research suggests that gesture and speech derive from the same source (McNeill, 2005). Both give the researcher information about the children's perceptual experience and conceptualization. Children use gesture to express ideas that they can't easily express in words, especially for bilingual children (Goldin-Meadow, 2003), or because gesture can convey spatial and temporal qualities in a manner different from speech (Parrill & Sweetser, 2004).

Demonstrate, interpret, and explain • *Can I show and tell?* Children comment on exhibits; they share what they perceive and know, often in short sentences accompanied by gesture anchored to the objects. Their demonstrations, interpretations, and explanations may be spontaneous or elicited by others.

Importance

The body is the vehicle of learning and cognition. Children's efforts to make sense of their perceptual experiences exert organizing structure on behavior and thought. Children engage in a continuous project of bringing perceptual, motor, and other cognitive resources of the body into coordination with resources in the world. Future work will explore how in-depth multimodal research methods can be adapted to fast-paced exhibit evaluation. In addition, this ongoing research program will inform a design framework that promotes active perception for conceptual learning.

References

- Gardner, H. (1985). *The mind's new science*. New York: Basic Books.
- Gibson, J.J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.
- Goldin-Meadow, S. (2003). *Hearing gesture: How our hands help us think*. Cambridge: Harvard University Press.
- Hutchins, E. (1995). *Cognition in the wild*. Cambridge: MIT Press.
- Hutchins, E. (2010). Cognitive ecology. *Topics in Cognitive Science*, 2(3): 1–11.
- McNeill, D. (2005). *Gesture & thought*. Chicago: The University of Chicago Press.
- National Research Council. (2009). *Learning Science in Informal Environments: People, Places, and Pursuits*. Committee on Learning Science in Informal Environments. Bell, P., Lewenstein, B., Shouse, A., & Feder, M.A. Eds. Washington, DC: The National Academies Press.
- Nöe, A. (2004). *Action in perception*. Cambridge: MIT Press.
- Parrill, F., & Sweetser, E. (2004). What we mean by meaning: Conceptual integration in gesture analysis and transcription. *Gesture*, 4(2): 197–219.
- Piaget, J., & Inhelder, B. (1969). *The psychology of the child*. New York: Basic Books.
- Schulz, L., & Gopnik, A. 2004. Causal learning across domains. *Developmental Psychology*, 40(2): 162-176.

Additional Links

<http://informalscience.org/member/show/8569>

Using Keyword Analysis to Explore Qualitative Data

Lisa Sindorf, Exploratorium

Purpose

The purpose of the poster is to illustrate how keyword analysis, a methodology from the field of linguistics, can be used by researchers and evaluators to quickly interpret qualitative data. This poster will present two examples that show how we identified keywords of unusual frequency and used them to explore qualitative interview data. In the first example, this analysis technique was used to characterize visitor talk as being “novice-like” or “expert-like.” To do this, we extracted keywords from visitor interviews around a particular topic, by comparing them to an expert-like baseline: text from a set of scientific websites about the same topic. Analyzing the visitor talk to

look for the keywords unique to each set of text allowed us to quickly determine which version of an exhibit elicited more expert-like talk.

In the second example, we used this technique to help generate an emergent coding scheme. We compared visitors' descriptions of their engagement at two different types of exhibits—immersion and tabletops. We compared the descriptions against each other and extracted keywords unique to each type. These keywords suggested—in minutes—potentially promising categories to develop into a detailed coding scheme.

Perspectives

Keyword analysis is increasingly common in the field of linguistics as a means for exploring written data and extracting keywords of unusual frequency. Web-based software makes this method a fast and fruitful way to explore qualitative data. Yet keyword analysis is not commonly used in visitor studies. Essentially, keyword analysis compares the text across data sets: either comparing a data set to a baseline, or comparing the data from two or more treatment groups. When comparing to a baseline, this method identifies words that occur more frequently, proportionally, in the target corpus than in the baseline. When used to analyze data across two comparison or treatment groups, the keywords identified by this method are often distinctive and may suggest themes in the text for further analysis.

Importance

Researchers and evaluators will come away with knowledge of keyword analysis, a powerful method for quickly identifying themes within qualitative data and comparing themes across data sets.

References

- Caldas-Coulthard, C. R., & Moon, R., (2010). 'Curvy, hunky, kinky': Using corpora as tools for critical analysis. *Discourse Society*, 21(2), 99-113. doi:10.1177/0957926509353843
<http://das.sagepub.com/content/21/2/99>
- Kilgariff, A., & Grefenstette, G. (2003). Introduction to the special issue on the web as corpus. *Computational Linguistics*, 29(3), 333-347. doi:10.1162/089120103322711569
<http://www.mitpressjournals.org/doi/abs/10.1162/089120103322711569>
- Kilgariff, A., Rychly, P., Smrz, P., & Tugwell, D. (2004) The sketch engine. *Proceedings of Euralex*, France, 105-116.
<http://www.kilgarriff.co.uk/Publications/2004-KilgRychlySmrzTugwell-SkEEuralex.rtf>
- Kucera, H., & Francis, W.N. (1967). *Computational analysis of present-day American English*. Providence: Brown University Press.

Additional Links

Two examples of web-based keyword analysis tools

- The Sketch Engine: <http://www.sketchengine.co.uk/>
- Lexical Tutor: <http://www.lextutor.ca/keywords/>

Looking at Sustainability in the Front-End Evaluation of Digital Media Programming

Edith Stevens, ICF Macro

Helene Jennings, ICF Macro

Pino Monaco, Smithsonian Center for Education and Museum Studies

Purpose

The front-end evaluation of the Smithsonian Institution's (SI) pilot program for educators in mobile/digital media use incorporated several methods to capture the challenges of moving from a summer professional development

experience to implementation in the classroom. With a very quick start-up period, the evaluators designed an approach to use focus groups, observations, and interviews to determine what was being delivered, how it was being received, and how lessons from the pilot might be applied in subsequent years. A key consideration for the evaluators was to gain feedback on the sustainability of the investment in professional development of the teachers.

Perspectives

Through SI's Smithsonian Center for Education and Museum Studies, the Hirshhorn Museum and Sculpture Garden and the National Postal Museum created, developed, and implemented a program to enhance education through the use of mobile and digital media. During the summer of 2010, SI conducted a pilot phase of two digital media programs—workshops for young people and professional development for educators—to inform and train them to use digital media to explore SI collections and exhibits and create products they can share with others.

Methods

Following is an overview of the evaluation activities and their purpose:

- **Observation of Mobile Learning Institute (MLI) workshops:** To gain a deeper understanding of individuals' experiences with workshops at different points in time.
- **Focus groups:** To gather feedback from participants about their prior knowledge, expectations, needs, attitudes, and workshop experiences.
- **Staff interviews:** To gain insight into workshop planning and implementation, learn about what went well, and gather suggestions for improvement.
- **Follow-up interviews:** To determine the long-term impact of what participants learned and produced, with an emphasis on how participants have utilized SI museums and online resources following the workshops.

Results

Our analysis of the data resulted in the identification of five components that are critical to the success of future MLI workshops. Following is an overview of the findings and recommendations that were provided to SI:

- **Marketing:** SI must clearly define the target audience, identify and utilize the most effective communication channels for reaching that audience, and clearly communicate key information to potential participants.
- **Technology resources:** SI must be intentional about the technology selected in terms of usability and access. If the MLI will focus on technology that participants may not typically have access to, facilitators should work with participants to generate ideas for how they can apply what they have learned to the classroom or their daily lives.
- **Museum resources:** SI should continue to expose participants to a wide range of exhibits and different ways of interacting with them. If it is important for participants to continue to access these resources afterwards, SI should strategically introduce participants to those online resources and how to access them.
- **Sustainability:** SI must support the participants by encouraging them to create lessons that can be implemented in their classrooms, share their experience with other educators, and address barriers to using mobile technology in the classroom such as limited access and restrictive policies.
- **Staffing:** In order to recruit and support highly-qualified workshop staff, the leadership must coordinate to identify the desired qualifications, communicate key information to potential applicants, establish a process for selecting candidates, and provide adequate support to facilitators.

Importance

Conference attendees who either conduct front-end evaluations or engage others to carry them out will have a clear example of how the issue of sustainability can be built into the earliest efforts of an evaluation. Additionally,

participants will gain a deep understanding of the steps involved in the front-end evaluation, including the value of post-program follow-up with participants.

References

This section includes the references used to provide SI with an annotated bibliography of influential works that are most relevant to SI with regard to its Mobile Learning Institute. Key findings from these resources address the trends, policies, challenges, and benefits to using mobile devices to support learning in formal and informal educational settings.

- Brown, M., & Diaz, V. (2010). *Mobile learning: Context and prospects*. Boulder, CO: EDUCAUSE. Retrieved from <http://net.educause.edu/ir/library/pdf/ELI3022.pdf>
- Egyptian Museum. Eternal Egypt Project. http://www.eternalegypt.org/EternalEgyptWebsiteWeb/HomeServlet?ee_website_action_key=action.display.about&language_id=1&link_key=0
- Google Art Project. <http://www.googleartproject.com/>
- Ketelhut, D.J., Dede, C., Clarke, J., Nelson, B., & Bowman, C. (2007). *Studying situated learning in a multi-user virtual environment*. Cambridge, MA: Harvard Graduate School of Education. Retrieved from <http://128.103.176.29/rivercityproject/research-publications.htm>.
- Meeker, M., Devitt, S., & Wu, L. (2010). *Internet trends*. New York: Morgan Stanley. Retrieved from http://www.morganstanley.com/institutional/techresearch/pdfs/Internet_Trends_041210.pdf
- Project Tomorrow. (2010). *Learning in the 21st century: Taking it mobile!* Irvine, CA: Project Tomorrow. Retrieved from http://blackboard.com/resources/k12/k12_ptmobile_web.pdf
- Project Tomorrow. (2010). *Project K-Nect evaluation report*. Irvine, CA: Project Tomorrow. Retrieved from http://www.tomorrow.org/docs/Project_K-Nect_EvaluationReport_Final_Jul7.pdf
- Shore, R. (2008). *The Power of Pow! Wham! Children, digital media and our nation's future*. New York: The Joan Ganz Cooney Center at Sesame Workshop. Retrieved from http://www.joanganzcooneycenter.org/upload_kits/cooney_challenge_advance_1_.pdf
- Shuler, C. (2009). *Pockets of potential: Using mobile technologies to promote children's learning*. New York: The Joan Ganz Cooney Center at Sesame Workshop. Retrieved from http://www.joanganzcooneycenter.org/upload_kits/pockets_of_potential_1_.pdf
- Tate Modern Museum. <http://www.tate.org.uk/modern/multimediatour/>

Including Learners Who Prefer Spanish through Culturally-Responsive Evaluation

Hever Velázquez, Oregon Museum of Science and Industry
Anita Kinney, Oregon Museum of Science and Industry
Yesenia Carmolinga, Oregon Museum of Science and Industry

Purpose

The purpose of this poster is to share how the front-end research for OMSI's "Sustainability: Promoting Sustainable Decision Making in Informal Education" project followed culturally-responsive principles to ensure the inclusion of family members who prefer Spanish. This poster illustrates that principles such as instrument co-development and data handling guidelines were critical, even with a bilingual and bicultural evaluation team.

Perspectives

The Oregon Museum of Science and Industry (OMSI) is developing a National Science Foundation-funded exhibit and program titled, "Sustainability: Promoting Sustainable Decision Making in Informal Education." The project targets a general audience with a special effort to include family members who prefer Spanish. To ensure the inclusion of this special target audience in front-end research, a bilingual and bicultural team followed basic

tenets of culturally-responsive evaluation (e.g. Garibay, 2005). This project is in direct alignment with the VSA 2011 conference theme, "Sustaining a Community of Learners," as we took steps to ensure these studies included a significant and growing population of Hispanic learners within our community. This poster briefly presents the goals, considerations, design, procedures, and lessons learned of two front-end studies that illustrate culturally-responsive evaluation principles such as instrument co-development and data handling guidelines.

Importance

These studies are timely for conference participants in terms of the highly significant topic of sustainability and in terms of connecting with Hispanic audiences, the fastest growing minority group in the US. The evaluation team for the Sustainability project followed culturally-responsive evaluation principles by having a bilingual team, including members of local Hispanic communities, and co-developing a front-end research study with an interview instrument in English and Spanish. The point of conducting the research in Spanish was to ensure the inclusion of the special target group by removing linguistic barriers; the point was not to exploit differences between the answers of those interviewed in Spanish and those interviewed in English. Even with this co-development approach, the team learned that some of the Spanish words used to describe the exhibit and program content had few everyday connotations for the interview participants. Therefore, the team decided to do a second study with the special target audience in order to approach the content from a different perspective that included Spanish words with more common associations. These studies built a progressively more detailed picture of the special target audience and provided the exhibit and program developers with clearer examples of behaviors and contexts that were relevant to both the general audience and the special target audience.

References

Garibay, C. (2005). *Evaluation: Culturally responsive approaches*. Summary provided at the Association of Science and Technology Centers annual conference, October 2005.

Research Experiences for Undergraduates: Fostering Diverse Talent in the Visitor Studies Field

Hever Velázquez, Oregon Museum of Science and Industry
Anita Kinney, Oregon Museum of Science and Industry
Yesenia Carmolinga, Oregon Museum of Science and Industry

Purpose

The purpose of this poster is to share how the Oregon Museum of Science and Industry (OMSI) received a National Science Foundation (NSF) project supplement fund to train and mentor students as Research and Evaluation Apprentices within an informal science education setting. This type of funding is called Research Experiences for Undergraduates (REU), and can encourage diversity in the visitor studies field by attracting students with unique competencies from multiple disciplines.

Perspectives

OMSI used funding from NSF for REUs to train and foster student interest, knowledge, and skills in the competencies of visitor studies professionals. This REU program is in direct alignment with the VSA 2011 conference theme, "Sustaining a Community of Learners." The program enabled OMSI's Evaluation and Visitor Studies division to hire REU students as Research and Evaluation Apprentices to help design and implement front-end and formative studies. The funding also extended the professional development of the students by providing the opportunity to participate in the VSA 2011 conference.

Importance

This poster provides general information on OMSI's REU program, as well as outcomes, lessons learned, and recommendations from the perspectives of the REU students and OMSI's Evaluation and Visitor Studies division mentors. The poster will illustrate that an REU program can benefit the field by including students from diverse cultural and academic backgrounds in professional capacities within the field. For instance, the participation of these REUs increased the representation of bilingual (Spanish/English) professionals in the visitor studies field. It is our understanding that OMSI's REU program is the first that NSF has funded for visitor studies, and this poster is an important part of raising awareness of the opportunity among visitor studies professionals.

References

Garibay, C. (2005). *Evaluation: Culturally responsive approaches*. Summary provided at the Association of Science and Technology Centers annual conference, October 2005.

Evaluating the Engagement of the Public in Nature Conservation

Monae Verbeke, EUZoos-XXI

Evaluation of informal science education in designed environments, such as at a zoo, aquarium or museum, includes the study of visitor knowledge, attitudes, and behaviors. A part of zoo education focuses on conservation education. The question that arises from informal education in these spaces is whether the conservation education in these spaces is making an impact on the knowledge, attitudes, and behaviors of the visitors.

Methods

This study at Niabi Zoo in Coal Valley, IL, an AZA-accredited facility, collected data at four modern exhibits (Elephant, Giraffe, Australia, and Gibbon) to address these topics. Two methods were used: tracking and observing visitor behavior and a post-visit survey. Variables in the observational study included dwell time in an exhibit, number of visitors reading signs, and the number of visitors interacting with interpretives. The survey documented reasons for visiting the zoo, previous experience at a zoo, familiarity with conservation terms, opinions about Society's role in seven important conservation issues, and reported the favorite exhibit at the zoo.

Results

Visitors reported reading at least one sign significantly more often than they were observed reading a sign. Therefore, using self-report data is misleading for visitor research. As exhibit walkway length can affect the visitor's dwell time, the adjusted dwell time was created by dividing the time spent in an exhibit by the walkway length. Adjusted dwell spent was not dependent on the number of signs in the exhibit; however, adjusted dwell time was significantly longer when more interactives were present.

The survey showed that the exhibit which visitors reported as their favorite exhibit did not correspond with a longer adjusted dwell time at the exhibit. Visitors were familiar with the conservation terms "endangered species" and "biodiversity" and could provide examples, although not always accurate. However, respondents were not familiar with the conservation terms, "invasive species" and "ecological connectivity". Although respondents generally reported conservation issues were important worldwide, they often reported they were not important locally or relevant in their own lives. In fact, respondents often believed that human-made conservation issues were over-rated by the Press. Most respondents recognized that "human-made disasters" and "critical habitat preservation" were important conservation issues.

Successes of informal science education at Niabi Zoo are reviewed. Recommendations to improve informal science education for Niabi Zoo and for zoos in general are made.

References

- Bell, P., Lewenstein B., Shouse A.W., & Feder, M.A. Eds. (2009). *Learning science in informal environments*. Washington, DC: The National Academies Press.
- Dierking, L.D., Adelman, L.M., Ogden J., Lehnhardt K., Miller, L., & Mellen, J.D. (2004). Using a behavior change model to document the impact of visits to Disney's Animal Kingdom: A study investigating intended conservation action. *Curator*, 47(3): 322-343.
- Falk, J.H., & Adelman, L.M. (2003). Investigating the impact of prior knowledge and .interest on aquarium visitor learning. *Journal of Research in Science Teaching*, 40: 163–176.
- Gallup Organisation. (2007). *Attitudes of Europeans towards the issue of biodiversity*. European Commission Directorate, Brussels, 71 pp.
- Jensen, E., & Wagoner, B. (2010). Science learning at the zoo: Evaluating children's developing understanding of animals and their habitats'. *Psychology and Society*, 3(1): 65-76.
- Moss, A., Francis D., & Esson, M. (2008). The relationship between viewing area size and visitor behavior in an immersive Asian Elephant Exhibit. *Visitor Studies*, 11: 26–40.
- Moss, A., & Esson, M. (2010). Visitor interest in zoo animals and the implications for collection planning and zoo education programmes. *Zoo Biology*, 29: 715-731.
- Patrick, P.G., Matthews C.E., Ayers D.F., & Tunnicliffe, S.D. (2007). Conservation and education: Prominent themes in zoo mission statements. *Reports and Research*, 38(3): 53-59.
- Reading, R.P., & Miller, P.J. (2007). Attitudes and attitude change among zoo visitors. In Zimmermann A, Hatchwell M, Dickie L, West C, (Eds.) *Zoos in the 21st century: Catalysts for conservation?* (Pp. 63-91). Cambridge: Cambridge University.
- Schweigruber, H. A., & Fenichel, M. (2010). *Surrounded by science: Learning science in informal environments*. Washington, DC: The National Academies Press.
- Smith, L., & Broad, S. (2008). Do zoo visitors attend to conservation messages? A case study of an elephant exhibit. *Tourism Review International*, 11(4): 225-235.

Additional Links

<http://www.euzoos-xxi.org/>

2:30-3:45 p.m. Concurrent Sessions—Six

Traveling the Silk Road: A Journey into Collaborative Exhibition Development and Evaluation

Bella Desai, American Museum of Natural History – Education
Lauri Halderman, American Museum of Natural History – Exhibitions
Camellia Sanford, Rockman et al

Purpose

The session will explore the collaborative development process and stakeholder evaluation of a recent temporary exhibition at the American Museum of Natural History. We hope the audience will take away:

- An understanding of the administrative infrastructure that allocates human and fiscal resources to the collaborative development of exhibitions, grounded on educational goals.
- The different aspects of this exhibition that were specifically designed to bring history, science, religion, literature, invention, technology, music, languages, and aesthetics together to tell the story of three cities that were as interconnected in the 6th Century as they are now in the 21st Century.
- A model of how informal institutions can be supported by outside evaluators to engage in a cross-departmental, participatory evaluation in which they to collect and reflect upon their own visitors' data.

Panelists' Perspectives

Bella Desai will focus on the process of creating educational goals for the exhibition as well as the development of the educational and public programming elements connected to the exhibition. Lauri Halderman will provide a highlights tour of the exhibition itself and insights into the development of various exhibition elements. Camellia Sanford will bring the perspective of an outside evaluator, and discuss the methods and outcomes involved in stakeholder evaluation.

Importance

We hope to provide an example of one institution's "journey" of moving from collaboratively generated exhibition goals, to the interpretation and presentation of these goals in a variety of multimodal, multimedia exhibit elements, to a collaborative, participatory evaluation that engaged the exhibition designers, educators, and evaluators in a conversation about ways to define and potentially measure impact. A candid discussion of this process will be relevant to those who are looking to explore the opportunities and challenges of new models of working collaboratively in both exhibition development and evaluation. The nature of this collaboration clearly connects to the core conference theme—by requiring investment from a wide variety of stakeholders for all aspects of this process, we are examining precisely how to create and sustain a broad community of learners.

References

Grack Nelson, A., & Callahan Schreiber, R. (2009). Participatory Evaluation: A Case Study of Involving Stakeholders in the Evaluation Process. *Visitor Studies*, 12(2), 199-213.

Additional Links

<http://www.amnh.org/exhibitions/silkroad/>

Integrating Evaluation into Exhibition Development: A Case Study

Swarupa Anila, Detroit Institute of Arts (presenter)
 Stephanie Downey, Randi Korn & Associates, Inc. (co-author)
 Eric Gyllenhaal, Selinda Research Associates (co-author)
 Amanda Krantz, Randi Korn & Associates, Inc. (presenter)
 Kenneth Morris, Detroit Institute of Arts (presenter)
 Deborah Perry, Selinda Research Associates (presenter)
 Matt Sikora, Detroit Institute of Arts (presenter)

Purpose

Examining the process of creating the special exhibition "Through African Eyes: The European in African Art, 1500 to the Present" at the Detroit Institute of Arts, the presentation will explore issues surrounding the influence of evaluation on exhibition development from the perspective of internal evaluators, evaluation consultants, and an interpretive specialist. The panel presentation will touch on three key themes:

- 1) The benefits and challenges of integrating visitor studies throughout the exhibition planning and development process, especially when the exhibition addresses potentially sensitive subject matter
- 2) The need for strategies to facilitate in-house review of evaluation results to identify and implement action steps and development decisions
- 3) The effects of contextual factors (such as organizational culture, the economy, and external pressures) on conducting and using evaluation

Perspectives

The exhibition, which explored the diverse and evolving relationships between different African cultures and foreigners, offered a number of challenges for project team members, who sought not only to create a groundbreaking exhibition that would be valued by the art history community but also to ensure visitors would appreciate and understand the exhibition's complicated ideas. The exhibition marked the first time the museum implemented a comprehensive program of evaluation initiatives over the life of the project. Selinda Research Associates conducted a literature review and front-end study early in the project, the DIA's evaluation staff conducted formative evaluation interviews about interpretive drafts and a visitor satisfaction survey, and Randi Korn & Associates led a summative evaluation of the exhibition after installation. Throughout the exhibition development process, evaluators and the interpretive planning team engaged in dialogue to identify and prioritize key findings to inform the group's work.

Importance

The panel presentation will facilitate dialogue among individuals who viewed the project from different perspectives—including museum staff and external consultants, evaluators and interpretive specialists—to explore the variety of factors that influenced how evaluation contributed to the exhibition development process. Their experiences will serve as a concrete starting point for discussing broader issues related to fully integrating visitor evaluation into the exhibition development process, including how to maximize its impact toward the achievement of the ultimate goal of enhancing visitors' experiences.

References

- Patton, M. Q. (1997). *Utilization-Focused Evaluation*. Thousand Oaks, CA: Sage Publications.
- Preskill, H., & Torres, R. T. (2000). The learning dimension of evaluation use. In V. J. Caracelli & H. Preskill (Eds.) *New Directions for Evaluation*, no. 88 (pp. 25–37). San Francisco: Jossey-Bass.
- Sonnichsen, R. C. (2000). *High Impact Internal Evaluation: A Practitioner's Guide to Evaluating and Consulting Inside Organizations*. Thousand Oaks, CA: Sage Publications.

Additional Links

- Carroll, V. (2004). *Power and Parody: The "European" through African Eyes, 1500 to the Present*. (Unpublished manuscript). Detroit, MI: The Detroit Institute of Arts. (Available on www.informalscience.org)
- Cotter, H. (2010, April 15). The exotic in eyes of African beholders. *The New York Times*. Retrieved from <http://www.nytimes.com/2010/04/16/arts/design/16african.html>
- Gyllenhaal, E. D. (2007). *Through African Eyes: Front-end evaluation*. (Unpublished manuscript). Detroit, MI: The Detroit Institute of Arts. (Available on www.informalscience.org)
- Randi Korn & Associates, Inc. (2010). Summative evaluation: "Through African Eyes: The European in African Art, 1500–Present" Exhibition. Retrieved from <http://informalscience.org/evaluation/show/282>

It Takes a Community to Evaluate a Network

Christine Reich, Museum of Science Boston
Marcie Benne, Oregon Museum of Science and Industry
Marjorie Bequette, Science Museum of Minnesota

Purpose

This session will describe the evolution of the unique logistical and philosophical approaches used to evaluate the Nanoscale Informal Science Education Network (NISE Net).

Perspectives

Museum networks are a growing trend. The National Science Foundation (NSF) is currently funding multiple networks related to informal science learning and networks are forming in other kinds of museums as well. NISE Net is a network of over 300 museums, universities and other organizations who are working together to “foster public awareness, engagement, and understanding of nanoscale science, engineering, and technology” (<http://www.nisenet.org>). This Network, which is funded by two consecutive \$20 million grants from NSF, is currently in year six of its planned ten-year initiative.

Methods

A network is qualitatively different than an organization or a project. Networks tend to be large, feature distributed leadership, and embrace diverse approaches for engaging visitors in learning. This has significant implications for evaluation, and requires multiple evaluators to complete the needed studies.

During the first three years, multiple groups conducted NISE Net evaluations: Inverness Research, Inc., Multimedia Research, and internal evaluators from the Exploratorium, the Museum of Science (MOS), Oregon Museum of Science and Industry (OMSI) and the Science Museum of Minnesota (SMM)). Collectively, these groups comprised the “evaluation team,” yet they did not operate together as such. They worked in parallel, with each conducting their own study that examined a discrete part of the Network.

Year 4 marked a substantial shift in how the Network was evaluated. A new, more cohesive evaluation team was formed that is comprised of evaluators from MOS, SMM, and OMSI. Their work is overseen by a Committee of Visitors, a group of highly experienced evaluators who review all evaluation plans, methods and findings. This Committee of Visitors includes Carol Weiss, Saul Rockman, Bruce Lewenstein, and Frances Lawrenz. This group will work together for years six through ten of the Network to study its components and impacts.

Many other professionals from the visitor studies field have supported NISE Net data collection through their own institutions, and contributed ideas to NISE Net evaluation by engaging in informal conversations and participating in conference presentations with Network evaluators. NISE Net is having a profound impact on visitor studies professionals. From the front-lines of NISE Net evaluation, connections between internal evaluation departments and the Committee of Visitors have enabled rapid-response communication on current thinking around learning measures, inclusive audiences, client relationships, tools, staffing, evaluation approaches, priority questions, and working within real-world constraints.

Importance

NISE Net evaluation efforts have required evaluators to work together in new and different ways. This collaborative effort has been fruitful, yielding over 200 evaluation reports in the first five years. These studies have examined multiple aspects of the Network, and have been used to improve specific deliverables -- such as exhibits, programs, web-sites, and professional development trainings, as well as the development of the network as a whole.

In addition to the sheer volume of work, this evaluation effort has also resulted in new thinking about how to evaluate a distributed network. As NISE Net expands and grows, so must the evaluation. For example, in years 6 through 10, evaluations will be conducted by all network members and not just by the evaluation team. In collaboration with the evaluation team, NISE Net professionals will explore their own questions, gather their own data, and interpret its meaning for their work. This new approach not only facilitates a broader reach for evaluation, but also serves as an opportunity for professional learning as it enhances the ability for evaluation to test practitioners' theories of action and underlying assumptions.

Additional Links

<http://www.nisenet.org/catalog/evaluation>

Changing Teaching Materials through Evaluation and Collaboration with Teachers

Nicole Stutzman, Dallas Museum of Art

Sharisse Butler, Institute for Learning Innovation

Purpose

As more teachers turn to the Web and informal learning institutions for help in developing classroom lessons, museums endeavor to make their online resources as accessible, useful, and inspirational as possible. The Dallas Museum of Art is currently engaged in exciting collaborative work with K-12 teachers to redesign online teaching materials for works of art in the Museum's African and Asian collections. Throughout their collaboration with twenty diverse K-12 teachers, DMA staff (practitioners and evaluator) implemented various evaluation strategies, and findings have changed the Museum's entire approach to online teaching materials. This presentation will focus on the evaluation process and collaboration with teachers, emphasizing how high practitioner and stakeholder involvement can increase the usability and impact of evaluation findings.

Perspectives

The Dallas Museum of Art has a long tradition of serving and supporting teachers through professional development opportunities and educational resources. In 2000, the DMA determined to digitize all K-12 teaching materials and made them available for free via the Museum's web site. Since that time, subsequent teaching materials in various digital formats have been produced to result in over thirty curricular units being available online (www.DallasMuseumofArt.org/Resources). While the available resources contain extensive information, they could be greatly enhanced through additional multimedia content and through evaluation with K-12 teachers on the design and use of these materials.

In 2009, the Institute for Museum and Library Services awarded the DMA a two-year Museums for America grant for the project *Connect: Teachers, Technology, and Art*. The goal of Connect is to develop, in collaboration with teachers, a model for converting, producing, and delivering dynamic, web-based teaching units for classroom use. The collaboration and evaluation with K-12 teachers highlighted in this institutional presentation is at the core of the *Connect* project.

The twenty teachers collaborating with DMA museum educators on the *Connect* project are divided into two panels: Teacher Panel I and Teacher Panel II. Panelists were selected with goals of representing the diverse target population of teachers served and include a broad representation of grade levels and subjects. Committed to better understanding teachers' preferences for learning about art and teaching with art, DMA staff also selected teachers that resemble the characteristics of various clusters defined by a Framework for Engaging with Art (FEA) Teacher Study conducted in 2007 with Randi Korn & Associates. This FEA study, which involved over 400 teachers, shed new light on the DMA's teacher audiences and served as a catalyst for the reconsideration of

teacher programs and resources.

Importance

Session attendees will:

- Discover how one museum benefitted from incorporating evaluation and collaborative work with key community stakeholders, K-12 teachers, in the revision and refinement of educational resources;
- Learn about the collaboration model and evaluation methods implemented with K-12 teachers, and learn ways in which K-12 teachers' voices, needs, and practices are reflected in the redesign of online teaching materials;
- Hear examples of specific ways in which practitioners were centrally involved in the evaluation process; and
- Consider the impact of this project on larger institutional conversations across departments.

References

Dallas Museum of Art Teaching Materials: <http://www.dallasmuseumofart.org/Resources>

Dallas Museum of Art. (2007). Audience Research: Levels of Engagement with Art and Teachers. Retrieved from <http://www.dallasmuseumofart.org/AboutUs/Frameworkforengagingwithart/index.htm>

Leftwich, M. and M. Bazley. (2009). Pedagogy and Design: Understanding Teacher Use of On-line Museum Resources. In D. Bearman and J. Trant (eds.). *Museums and the Web 2009: Proceedings*. Toronto: Archives & Museum Informatics. <http://www.archimuse.com/mw2009/papers/leftwich/leftwich.html>

Smithsonian Institution Office of Policy & Analysis. (2008). Classroom Realities: Results of the 2007 National Survey of Teachers. Retrieved from <http://www.si.edu/opanda/docs/Rpts2008/NMAH%20Teachers.final.080703.pdf>

Additional Links

<http://www.ims.gov/applicants/samples/mfa/Dallas%20Museum%20of%20Art.pdf>

Museum Visitors' Impressions of Interacting with Scientists

Susan Foutz, Institute for Learning Innovation

Purpose

As part of the recent interest in public engagement with science, many museums are creating programs or lab spaces to bring working research scientists into the museum space. Very little of what is known about visitors' impressions of these interactions has been shared with the field. This presentation draws on visitor studies conducted by Institute for Learning Innovation (ILI) researchers during the NSF-funded Portal to the Public (PoP) project (Grant # 0639021). As part of the PoP project, ILI conducted front-end and formative evaluation and research studies with visitors at the three partner museums. The presentation will draw from these data sources to provide a holistic view of visitors' expectations, motivations, and satisfaction with face-to-face interactions with scientists.

Perspectives

PoP was a 3-year collaborative project among three museums (Pacific Science Center, Explora, and North Museum of Nature and Science) and one research partner (ILI) to develop a framework for Informal Science Educators to engage scientists and public audiences in face-to-face interactions that promote appreciation and understanding of current scientific research and its application.

Methods, Data & Analysis

Data presented will be drawn from the following studies conducted as part of the PoP project:

- *Front-End Evaluation Study*: Interviews conducted in Year 1 of the project at all three museums (n=271).
- *Formative Evaluation Studies*: Interviews conducted in Years 1 & 2, multiple studies per museum site.
- *Research Visitor Study*: Surveys conducted in Year 3 at all three museums (n=175).

All visitor interviews and surveys employed open-ended questions and Likert-like rating questions. Non-parametric statistics were performed on the quantitative data. Qualitative data were coded according to categories developed through an inductive process.

Results

Results from the three studies included:

- When asked if science topics that are still being debated and investigated should be presented in museums, the majority of respondents (84%) replied positively to including these types of topics. Interestingly, almost 20% mentioned that these topics should be presented in a “balanced” way, thus using the framing of conflict common in the media to think about unfinished science or science in progress. (Front-End Evaluation)
- Visitors’ interest in “the museum providing opportunities to meet and talk with scientists” was rated a mean of 5.4 (on a 7-point scale). Nearly a third of visitors (27%) rated the statement a 7, “very interested.” (Front-End Evaluation)
- Visitors to PSC said that interacting with a scientist offered them a more in-depth look at science. They described scientists as extremely well-informed and that having scientists available to talk about their work added a much needed human element to science. (Formative Evaluation)
- More than half of visitors (54%) to Year 2 programs at North responded that they appreciated the hands-on materials/demonstrations in general or mentioned specific hands-on activities as part of their interactions with scientists. (Formative Evaluation)
- Nearly half (49%) of visitors indicated that their interaction with a scientist left them curious to learn more about the topic, and 45% said that “new questions and ideas came up for me.” (Research Study)
- Visitors appreciated the activity-based interaction with scientists, rating their satisfaction with “the activity used by the scientist/researcher to communicate science” as a mean of 6.3 (on a 7-point scale). (Research Study)

Importance

By understanding what visitors value about the opportunity to meet and interact with scientists, evaluators and museum practitioners alike will be more informed on the nature of visitor-scientist interactions, what outcomes these interactions are likely to support, and how to create experiences that meet public expectations.

Practitioners in particular will learn how a current trend in public engagement in science—meeting a scientist in person—is perceived by the visitor.

Related References

- Chittenden, D. (2004). Background and thoughts on museums, media, and the public understanding of research: An international working conference. In D. Chittenden, G. Farmelo, & B. V. Lewenstien (Eds.), *Creating connections: Museums and the public understanding of current research* (pp. 337-352). Walnut Creek, CA: Altamira Press.
- Farmelo, G. (2004). Only connect: Linking the public with current scientific research. In D. Chittenden, G. Farmelo, & B. V. Lewenstien (Eds.), *Creating connections: Museums and the public understanding of current research* (pp. 1-26). Walnut Creek, CA: Altamira Press.
- Feinstein, N. (2005, April). *What scientists get from working in science museums*. Paper presented at the American Educational Research Association Annual Meeting, Montreal, Quebec, Canada.
- Field, H. & Powell, P. (2001). Public understanding of science versus public understanding of research. *Public Understanding of Science*, 10, 421-426.

- Logan, R.A. (2001). Science mass communication: Its conceptual history. *Science Communication*, 23(2), 135-163.
- Mayfield, H. (2004). What about audiences? Tailoring PUR programs for museum visitors. . In D. Chittenden, G. Farmelo, & B. V. Lewenstien (Eds.), *Creating connections: Museums and the public understanding of current research* (pp. 109-126). Walnut Creek, CA: Altamira Press.
- MORI (2000). *The role of scientists in public debate: Full report*. [technical report] The Wellcome Trust. Retrieved from http://www.wellcome.ac.uk/stellent/groups/corporatesite/@msh_peda/documents/web_document/wtd003425.pdf
- Storksdieck, M. & Falk, J.H. (2004). Evaluating public understanding of research projects and initiatives. In Chittendan, D., Farmelo, G. & Lewenstein, B. V. (Eds.), *Creating connections: Museums and the public understanding of current research* (pp. 87-108). Walnut Creek, CA: AltaMira Press.
- Tisdal, C.E. (2011). *Portal to the Public summative evaluation: Comparative case studies of implementation at five sites*. [technical report] Pacific Science Center, Seattle, WA.
- Ucko, D. A. (2004). Production aspects of promoting public understanding of research. In D. Chittenden, G. Farmelo, & B. V. Lewenstien (Eds.), *Creating connections: Museums and the public understanding of current research* (pp. 211-234). Walnut Creek, CA: Altamira Press.

Additional Links

Portal to the Public overview video: www.pacificsciencecenter.org/portal/video

Full report from the 2nd Synthesis Meeting (September, 2010): www.pacificsciencecenter.org/portal/synthesis

Ingenuity Lab: Engaging Audiences through Design Challenges

Scott Randol, Lawrence Hall of Science

Purpose

Lawrence Hall of Science's *Ingenuity in Action* exhibit has the goal of providing a space where visitors can participate in the engineering design process—by providing them with building materials and challenging them to create an invention, design, or solution to meet a specific challenge. Evaluation conducted by the Center for Research, Evaluation, & Assessment (REA) was designed to look at whether or not visitors using the stations exhibited habits of mind of engineers and are aware that they are participating in the engineering design process. Evaluation questions included:

- To what extent does the exhibit engage children in behaviors related to the engineering design process?
- To what extent are participants aware that they are participating in engineering-related behaviors?
- Are certain activities within the exhibit better at engaging visitors in engineering behaviors than others?
- What impact does facilitation have on the visitor experience?

This session will summarize early findings from the study and will introduce an observational instrument for tracking engagement in engineering processes.

Perspectives

LHS was inspired and informed by the long history of engineering design and tinkering in exhibit spaces and seeks to create an exhibit platform that will serve as an easily updatable, highly repeatable visitor experience as well as one that is “domain neutral” and can be applicable to all fields of engineering and that encompasses the entire engineering process. The model is organized around four “stations” that serve as a platform for presenting rotating engineering design challenges and provides a platform for substantive partnerships with local industry and academic work across engineering domains. Ultimately, this model could be shared and replicated in institutions across the nation.

Methods

Evaluators from REA conducted observations of 286 individuals in 112 groups. Observations documented time spent at the activity, completion level, engagement level, facilitation level, affect, and engineering behaviors. Following the observation, a subset of groups were asked to participate in an interview focused on awareness of the process they were engaging in and whether they were aware that this process reflects the engineering design process used in the real world.

Results

- The exhibit appears to provide a very positive experience to visitors.
- Activities are very good at eliciting certain engineering design behaviors, particularly those related to building and testing.
- Visitors are not necessarily making clear connections between what they are doing at the exhibit and what happens in the real world.
- Facilitation plays a significant role in enhancing children's experience of the activity.

Importance

Findings from the evaluation suggest that the model developed successfully promotes engineering "habits of mind" in visitors through a model that can be shared and replicated in institutions across the nation. In addition to the model of an exhibit space, the observational instrument for tracking engagement in engineering processes developed by evaluators developed can be used in related studies.

Engaging Visitors in Using Evidence: Comparing Three Program Formats

Maia Werner-Avidon, Lawrence Hall of Science

Purpose

Linking Evidence to Explanation in Global Science (LEEGS) is a project of the Lawrence Hall of Science (the Hall) to develop curriculum-based content modules for spherical display systems (e.g. Science on a Sphere, SOS) that engage museum visitors in the process of observing and interpreting patterns of global climate data. The goals of the project were to engage visitors in interpreting scientific data, recognizing patterns in data, and, ultimately, using that data as evidence to formulate explanations. Modules were designed to operate in three modes: 1) autorun; 2) docent-facilitated; and 3) hands-on workshop.

Evaluation was conducted by the Center for Research, Evaluation, & Assessment (REA) at the Hall. Evaluation questions included:

- Do the presentations encourage visitors to use evidence and reasoning to back up claims?
- What patterns of scientific thought are exhibited during the presentation (e.g. identification of patterns, presentation of alternative ideas)?
- Is there a difference in the use of scientific thought processes depending on the presentation mode?

Perspectives

Spherical displays like SOS have proven that scientific data can be visually compelling (Nelson, 2006). At the same time, constructing explanations has been shown to be a powerful method of helping children understand scientific content in science museums (Crowley and Jacobs, 2002). The LEEGS project builds upon these findings to develop presentations that combine the visual power of the spherical display system with supports designed to encourage visitors to think about the data on the display, look for patterns, and formulate explanations. REA

adopted a framework developed by McNeill, Krajcik, and colleagues and explained by Berland and Reiser (2009) to identify how visitors use evidence and reasoning to support a claim.

Methods

REA used visitor observations and written responses to evaluate the program. A challenge to this study was that visitor observation alone would not necessarily be sufficient to understand visitors' use of evidence to support their claims because the amount of verbal interaction varies greatly depending on the format. REA responded to this challenge by asking visitors to write down a claim at two points in the presentation.

Data & Analysis

Visitor observations were conducted of 98 groups. Visitor observations were used to examine the verbal communication taking place during the presentation (e.g. identification of patterns, use of evidence and explanation verbally, presentation of alternative ideas, discussion within and across groups). Written responses were collected from a total of 379 visitor groups. Visitors' written items were analyzed to evaluate the extent to which visitors used evidence to support their claims. Data from both the observations and written items was also analyzed to examine differences in the presentation formats.

Results

The following summarizes the key findings from the program evaluation.

- Overall, the LEEGS presentations were successful in getting visitors to use evidence to support their claims.
- Workshop and docent-led presentations were more successful than autorun at engaging visitors in verbally expressing scientific thought processes.
- Workshop and docent-led presentations appeared to be more successful than autorun at getting visitors to use moderate or detailed evidence in supporting their explanations.

Importance

There are a number of findings from this study that could be used to guide the development of future presentations for the SOS system. Recommendations include developing presentations that engage visitors in making predictions, sharing ideas and identifying patterns and including prompts and pauses in autorun programs to allow visitors to discuss ideas. Additionally, this study presents the use of a written evaluation instrument, which has the potential to be broadly utilized for programs that do not elicit verbal communication.

References

- Berland, L. K., & Reiser, B. J. (2009). Making sense of argumentation and explanation. *Science Education*, 93(1), 26-55.
- Crowley, K. & Jacobs, M. (2002). Building islands of expertise in everyday family activity. In Leinhardt, G., Crowley, K. & Knutson, K. (Eds.), *Learning conversations in museums*. Mahwah, NJ: Erlbaum.
- Nelson, A.G. (2006). *Science on a sphere: Formative evaluation report*. St. Paul, MN: Science Museum of Minnesota Evaluation and Research in Learning.

Learning Impact as a Measure of Organizational Success

Chantal Barriault, Science North

Jennifer Pink, Science North

Amy Henson, Science North

Purpose

Assessing an organization's success is traditionally based on financial performance and customer satisfaction. Free choice learning institutions such as science centers and museums are no different in their need to be accountable to stakeholders and investors. However, assessments of the learning impact of an institution's exhibits or experiences are not easily translated into and rarely included in measures of organizational success. The focus of this session will be to discuss the merits of including visitor learning in assessing an institution's success, using Science North as a case example.

Perspectives

Science North's Research and Evaluation Group was created in 2008 and, like in many museums and science centers, its purpose was to improve exhibits and visitor experiences based on research results in order to maximize visitor engagement and learning. In less than 3 years, research and evaluation has become an integral part of the planning, design and improvement of our exhibits, our immersive theatres and our traveling exhibits. A self-reflective and research culture has emerged among staff and we now integrate research into the developmental and formative process of most visitor experiences.

Typically, organizational performance is measured with financial performance, goal achievement, and customer satisfaction. Science North's organizational scorecard now includes a Learning Impact measure, the details of which are determined by the Senior Scientist of Research and Evaluation, the Science Director and the Senior Accountant. The inclusion of a Learning Impact measurement is a testament to the prominent role visitor studies plays in setting strategic direction and guiding visitor experience decisions at the executive level of the organization.

Panelists' Perspectives

Chantal Barriault will describe the progress of Science North's research initiatives while reflecting on the factors that contributed to the successful integration of visitor and learning impact studies in all areas of the organization. Amy Henson will share her experience in applying learning impact results to inform the development of exhibits and visitor experiences. Jennifer Pink will address the motivations, challenges and importance of setting learning goals as an organizational priority.

Importance

Understanding visitor learning contributes to the development of high quality exhibits and visitor experiences. However, the Science North example suggests that visitor studies can figure more prominently in measuring overall organizational success by asking: "How we are performing as a free-choice learning institution?"

Additional Links

<http://sciencenorth.ca>

<http://sciencecommunication.ca>

WEDNESDAY, JULY 28

9:15-10:15 a.m.
Concurrent Sessions—Seven

Appropriately Critical: How Can We Foster Critical Practice in Conference Sessions?

Joe E. Heimlich, Ohio State University Extension/Institute for Learning Innovation

Jessica J. Luke, Institute for Learning Innovation

Eric Ledbetter, Visitor Studies Association

Kris Morrissey, UW Museology Graduate Program

Purpose

How critical are we of the research we all present? How do we continue to “raise the bar” by being appropriately critical, yet build community and make the conference a safe place to present? The delicate balance will be the focus of this difficult, but necessary discussion.

Perspectives

As visitor studies matures as a field, the quality and the sophistication of the research being presented at the conferences will also mature. The maturation around the quality of the research being conducted creates several issues, three of which include how new and younger researchers and evaluators are brought into the field, how to build the community around rigor and accuracy as standards of practice, and how to continue to build the field while nurturing each other.

- 1) In the university setting, many young researchers are introduced to critiques of research, both their own and others. Some of the ways in which this is done offend and “strike fear” into the hearts of individuals. Other ways are supportive and nurturing; critical but firm; demanding but gentle. In practice, writing articles for professional journals is often the only deeply critical review of a researcher’s work, though some in visitor studies do not publish regularly in these journals, and the reviews can be confusing rather than clarifying to the author. An alternative forum is needed. How can a professional conference become a place where new and younger evaluators and researchers can have their work supportively challenged?
- 2) Increasingly, visitor studies and VSA are becoming visible to other fields and researchers. *Visitor Studies* is being used by researchers across many disciplines as a quick exploration of three articles in a recent edition of *Visitor Studies* revealed citations of those articles in 17 other journals. *Visitor Studies* is increasingly visible at other professional meetings and through its high-profile work in CAISE and other projects. The field as a whole is moving toward more consistent rigor and accuracy in its work and this will continue to evolve. How can a professional conference become a place where the community builds itself around increasing standards of rigor and accuracy?
- 3) It is important that VSA conference is a “safe place” for its members and guests. Many members attend and “try out” ideas in the conference setting. Presentations are often of works in progress and feedback is invaluable. Yet to build the community around our shared practice, it is imperative to continually work to enhance our skills. Whether the work is qualitative inquiry or advanced statistical modeling, the work

we do is learnable, practicable, and perfectable—basic tenets of defining behavior. How we do this within the sharing sessions is a challenge. How can the VSA conference become a place to enhance the prestige of the field while still serving as a place for “community” and nurturance of that community?

Importance

This discussion is a forum in which participants can engage in meaningful dialogue about the issues of how we increase our rigor while ensuring a safe place for community and individual growth. We enter this discussion with no answers, but with strong opinions. Given side conversations at last year’s conference, there are other strong opinions that differ from each of ours’, but collectively this conversation may help as we examine Visitor Studies as a practice.

On-line References

www.sonoma.edu/users/n/Nolan/n400/critique.htm

http://downloads.lww.com/wolterskluwer_vitalstream_com/sample-content/9780781765442_Rascati/samples/Chapter03.pdf

<http://clairewardle.com/2010/05/23/social-media-journalism-a-research-critique/>

<http://www.autodidactproject.org/other/markovic.html>

<http://www.gwu.edu/~litrev/>

Tweaking Tweets and Perfecting Posts: Can Social Media Help Advance an Institution's Mission?

Susan Kevin, Monterey Bay Aquarium

Jennifer Matiassek, Chicago Zoological Society

Purpose

Zoos and aquariums increasingly use social media to build relationships with individuals and supplement visits. But how effective are these platforms at fostering meaningful conversation and motivating personal action? The Brookfield Zoo and Monterey Bay Aquarium are each exploring the use of Facebook and Twitter to spark users’ emotions and enable conversations about mission-focused topics. As a group we will encourage the audience to share their own challenges to building online communities and the possible solutions to evaluating the impact of social media communication strategies.

Perspectives

Social media is a relatively quick, inexpensive, and easy way to communicate with certain segments of an institution’s audiences. Kelly (2010) found that museum visitors are more likely than non-visitors to use social media. The Pew Research Center for Internet & American Life (2011) found users of social networking sites tend to be more actively involved in mission-driven groups or organizations. However, most institutions are still struggling to realize the potential of social media for engaging audiences or sustaining online dialogue about critical issues (Russo et al., 2008).

One area where social media platforms offer promise is for continuing conversations after visitors leave. As outlined by Ballantyne and Packer (2010) these continued conversations reinforce the learning, emotional reactions, and behavioral intentions that are cultivated during an on-site visit and are critical for creating advocates of environmental conservation. Based on museum audiences, Russo et al. (2008) report that visitors are interested in learning about “complex, controversial topics” as long as they are provided with opportunities to comment on and discuss the topics with each other and staff members. This makes social media a valuable framework for sparking interactive conversations about issues as diverse as climate change, habitat destruction, or species survival.

Research on network development is beginning to provide insight into how, when and why certain messages engage online audiences. In an analysis of what New York Times articles were shared most frequently via email, Tierney (2010) found that readers gravitated to positive articles that addressed intellectually challenging topics that also inspired awe—each of which are consistent with many conservation messages. To supplement this type of research, the Brookfield Zoo and Monterey Bay Aquarium are studying how differing social media message content influences audience engagement via Twitter and Facebook.

Importance

This presentation will be of interest to evaluators grappling with assessing a current social media strategy. Some of the topics for discussion include: how to measure social media users' responses to posted content, and what is the relationship between posted content and user response? By tapping into the cumulative knowledge and experiences of audience members we hope to come to a better understanding of how to sustain networks of online learners. Our shared goal is to use social media tools to not only communicate, but to continue sparking emotions and enabling conversations that have lasting effects on the issues we care about most.

References

- Ballantyne, R., & Packer, J. (2011). Using tourism free-choice learning experiences to promote environmentally sustainable behaviour: The role of post-visit "action resources." *Environmental Education Research*, 17(2), 201-215.
- Kelly, L. (2010). How Web 2.0 is changing the nature of museum work. *Curator*, 53(4), 405-410.
- Pew Internet & American Life Project. (2011): <http://pewinternet.org/Reports/2011/The-Social-Side-of-the-Internet.aspx>
- Russo, A., Watkins, J., Kelly, L., & Chan, S. (2008). Participatory communication with social media. *Curator*, 51(1), 21-31.
- Tierney, J. (2010). Will you be e-mailing this column? It's awesome. *The New York Times*, February 9, 2010. www.nytimes.com/2010/02/09/science/09tier.html

Additional Links

- www.montereybayaquarium.org/efc/flamingos.aspx
- www.twitter.com/montereyaq
- www.twitter.com/brookfield_zoo
- www.facebook.com/montereybayaquarium
- www.facebook.com/pages/Brookfield-Zoo/52678154169

Developing and Sustaining Internal Evaluation Capacity without Internal Evaluation Departments

Marley Steele-Inama, Denver Zoo
Amber Christopher, Denver Zoo

Purpose

Museums, zoos, aquariums, parks and nature centers are increasingly expected and required to conduct evaluations of programs or services. Despite the rising emphasis on evaluation, it is unusual for these institutions to have the internal capacity needed to develop and sustain evaluation practice. While evaluation capacity building (ECB) is gaining momentum as a "hot topic of conversation, activity, and study" (Preskill & Boyle, 2008), it does not appear to have the same impetus in the museum field. In a simple search of 'capacity building' on

American Evaluation Association's public e-library, 408 items resulted, while the same search on Visitor Studies Association's online archive fielded zero results (both searched May 9, 2011). Additionally, while some have internal evaluation departments, most of the 17,500 museums, zoos and aquariums in the United States do not. This discussion session will focus on how museums are grappling and dealing with building internal evaluation capacity without internal evaluation departments and limited resources. The session shares one institutions' attempt to develop an interdepartmental Evaluation Team to manage evaluation activities and build internal capacity, as well as an opportunity for other institutions to share their own challenges and successes building internal evaluation capacity.

Perspectives

Denver Zoo lacked internal evaluation capacity until 2010 when it hired its first Manager of Education Research and Evaluation. Even so, this position was filled by staff whose expertise was more in curriculum development and less in evaluation. However, with an unparalleled interest in growing evaluation activities and capacity in its institution, Denver Zoo strategized how to design and implement an approach to help staff learn about and engage in evaluation practices. Since Denver Zoo is an organization that values collaboration among departments, it utilized Preskill and Boyle's (2008) recommendation to create an evaluation unit or team that is responsible for zoo-wide evaluation and ECB.

The Evaluation Team formed in Fall 2010 and consists of a diverse group of individuals with varying degrees of evaluation capacity: a team leader (Research and Evaluation Manager), an "executive champion" (Chief Operating Officer), and representatives from various departments, including human resources, information technology, marketing/communications, guest services, development/membership, animal programs, conservation biology, and exhibit planning. The team met monthly initially, and now biweekly, to develop its team charter, including its purpose, goals and initiatives through 2013. A total of 10 goals have been identified that fit within two mega-goals: build internal evaluation capacity and manage zoo-wide evaluations. A set of initiatives were developed to achieve each goal.

Panelists' Perspectives

Denver Zoo's Marley Steele-Inama, education research and evaluation manager, and Amber Christopher, guest services director, will share their experiences coordinating and participating on the Evaluation Team. Goals and initiatives of the team will be discussed, as well as next steps as this team takes on one of the largest Denver Zoo internal evaluation initiatives to date—the evaluation of its largest and most innovative exhibits, *Asian Tropics*, and the exhibit's programming. Interactive discussant participants will share with others the practices and strategies that have worked in their organization to increase ECB without internal evaluation departments, as well as challenges faced and how they have been addressed.

Importance

Addressing the conference theme "sustaining a community of learners," this session will allow participants to explore how organizations build and maintain internal evaluation capacity through strategies that embrace on-going organizational learning. Participants will discuss resources and activities needed in the museum field (e.g. leadership support, incentives, trainings, communities of practices, involvement in evaluation practice, and coaching) to address one of Preskill and Torres' (1999) and Preskill and Boyle's (2008) essential elements for ECB: the transfer of learning to everyday work.

References

- Preskill, H., & Boyle, S. (2008). A multidisciplinary model of evaluation capacity building. *American Journal of Evaluation, 29*(4), 443-459.
- Preskill, H., & Torres, R.T. (1999). *Evaluative inquiry for learning in organizations*. Thousand Oaks, CA: Sage.

A Critical Look at Our Models of Exhibition Evaluation

Stephen Bitgood, Professor Emeritus of Psychology, Jacksonville State University

Ross J. Loomis, Professor Emeritus of Psychology at Colorado State University

Purpose

To discuss and clarify models of exhibit evaluation, how they are defined by evaluators, and how more consistent use of terms and methodology needs to be encouraged.

Presenters' Perspectives

Ross Loomis provides a review of some current views of evaluation. Trochim's (2006) strategies for doing evaluation are described and applied to evaluation in visitor studies. These strategies include participant (client) oriented; scientific-experimental, management-oriented systems, and qualitative-anthropological. Loomis describes how these strategies are found in exhibition evaluation, arguing that each of Trochim's evaluation strategies has contributed to evaluation in visitor studies.

Steve Bitgood: (1) offers a list of criteria for assessing evaluation models; (2) reviews and compares the evaluation models of Screven (1990), Miles (1993; 1994), and the Bitgood-Shettel model (Bitgood, 1990; 1994; Bitgood & Shettel, 1994); and (3) discusses the inconsistent use among evaluators of evaluation terminology and methods.

Importance

There is currently inconsistency among evaluators in the use of terminology associated with exhibition evaluation. For example, what some call "remedial evaluation" is identified as "critical appraisal" or "formative evaluation" by others. Such ambiguity leads to confusion among evaluators and unrealized expectations by clients. Clients may believe they have commissioned a remedial evaluation with mock-up testing, when, in fact, they are receiving a critical appraisal with recommendations for change based on opinion rather than visitor data. The evaluators of the visitor studies community should either agree on the use of terminology, or make clear how their usage differs from others.

References

- Bitgood, S. (1991). Introduction: Visitor studies in 1990. In Bitgood, Benefield, & Patterson (eds.) *Visitor Studies: Theory, research, and practice, Vol. 3* (pp.7-15).. Jacksonville, AL: Center for Social Design.
- Bitgood, S. (1994). Classification of exhibit evaluation: How deep should Occam's Razor cut? *Visitor Behavior*, 9(3), 8-10.
- Bitgood, S., & Shettel, H. (1994). The classification of exhibit evaluation: A rationale for remedial evaluation. *Visitor Behavior*, 9(1), 4-8.
- Miles, R. (1993). Grasping the greased pig: Evaluation of educational exhibits. In. S. Bicknell & G. Farmelo (Eds.) *Museum visitor studies in the 90s* (pp.24-33). London: Science Museum of London.
- Miles, R. (1994). Let's hear it for Mr. Occam: A reply to Bitgood and Shettel on remedial evaluation. *Visitor Behavior*, 9(3), 4-7.
- Screven, C. (1990). Uses of evaluation before, during, and after exhibit design. *ILVS Review: A Journal of Visitor Behavior*, 1(2), 36-66.
- Trochim, W. (2006). The research methods knowledge base, 2nd edition.
<http://www.socialresearchmethods.net/kb/>