



Visitor Studies Association

**32nd Annual
Visitor Studies Association
Conference Abstracts**

Ways Of Knowing

**Detroit, Michigan
July 10-13, 2019**

Visitor Studies Association - 2019 Conference Abstracts

Introduction

Welcome to the 2019 Visitor Studies Association Annual Conference Abstracts!

The Abstracts serve as a preview of the vibrant conversations that will take place this year in Detroit as we explore ways of knowing through visitors studies. The Abstracts also serve an important role in recording the conversations for the future. Previous Conference Abstracts are available online at <http://www.visitorstudies.org/past-conferences>.

The 2019 VSA Conference Abstracts were compiled by Michelle Lentzner.

Visitor Studies Association - 2019 Conference Abstracts

Table of Contents

Introduction	1
Thursday, July 11	4
10:45-12:00 PM - Concurrent Sessions	4
Retrospective Pre-Posttests: How and When to Use This Cool Tool	4
Human Health Changes Associated with an Immersive Experience at a Zoo	6
Studying Touch as a Way of Knowing in the Art Exhibition	7
Ways of Seeing, Ways of Understanding	9
Data Collection, Data Management, Data Analysis, Oh My! Training Videos for Evaluation in Informal Learning Environments	11
Measuring Learning of Complex Topics: Challenges and Successes Explored	13
Studying Intangible Dimensions of Learning: Are We "Effing" the Ineffable?	14
Seeing through Multiple Lenses: Bridging Indigenous and Western Evaluation Worldviews	17
1:45-3:00 PM - Concurrent Sessions	19
Building Institutional Capacity and Cultures of Evaluation: Views and Lessons from Diverse Institutions	19
Incorporating Experts' Narratives into STEM Inquiry Programs: Assessing Family Learning	21
Ways of Knowing Detroit: Evaluation in the Motor City	23
CT without the Screen: Measuring Computational Thinking in Informal Education	24
What Do You Do Again? Framing Evaluation for Museum Staff	26
Friday, July 12	27
10:15-11:30 AM - Concurrent Sessions	27
Studying Visitors' Exhibition Experiences in an Immersive Virtual Environment	27
Designing and Evaluating Soundscapes in Virtual Reality Exhibitions	29
Appreciative Inquiry - A Tool for Community Engagement and Evaluation Strategy for Organizational Change	31
From Private to Public: Understanding Visitors' Perceptions of Pro-environmental Behaviors	32
Come Together! Successes and Challenges of Building and Sustaining Networks	34
Listen up! Kids' STEM-Focused Podcasts as Promising Family Learning Experiences	36
Evaluation as a Catalyst for Equity	37
Mind Your Brain! An Exhibition as a Platform for Social Learning	39
1:45-3:00 PM - Concurrent Sessions	40
Building Capacity for Cultural Responsiveness in the Visitor Studies Field	40
Comparing Evaluation Methods From Midwest to Middle of the Ocean	42
Unplugged and Plugged Computational Thinking for Children: Research and Practice	44
Challenging Front-End Evaluation to Study Challenging Topics	45

Visitor Studies Association - 2019 Conference Abstracts

Using Museums to Promote Cultural Identity Among Yemeni Students	46
The Great Outdoors: Visitors Studies and Evaluation in Outdoor Settings	48
Bringing New Techniques and New Staff to Museum Audience Evaluations	50
3:15-4:30 PM - Concurrent Sessions	51
Measuring and Aligning an Art Museum Distance Learning Program	51
Cultural Organizations Breaking Barriers: Leveraging Partnerships to Create Informal Learning Opportunities	52
Shared Measures for Evaluating Common Outcomes of Informal Education Experiences	54
Writing on the Wall: Centering Interpretation Around Visitor Access	56
Science Capital in Informal Spaces: Whose Voices and Whose Capital?	58
Adventures in Teen Evaluation	60
Integrating Young Museum Educators' Perspectives in Studying Visitor Experiences	61
Classroom in the Garden: Assessing Student Learning and Behavioral Changes	62
Saturday, July 13	64
9:45-11:00 AM - Concurrent Sessions	64
So Where is the Magic in Museums? Spiritual Ways of Knowing	64
Plotting to Uncover Visitors' Experiences	66
Trails of Walking, Ways of Talking: From Observation to Self-Reflection	67
Coloring Outside the Lines: Stories and Lessons from Experimental Programs	69
Inside Out: Digging Into the World of Internal Evaluation Departments	71
Explore Value of Immersive Technology	72
Lifelong Learning Starts Here: Prioritizing Your Own Professional Learning Opportunities	74
11:15-12:30 PM - Concurrent Sessions	75
Engaging with Community and Youth Advisory Boards	75
Multiple Definitions of Success for Makerspace Evaluations	77
Design-based Research that Integrates Researcher and Practitioner Ways of Knowing	78
Understanding and Measuring Engagement: Perspectives from Informal STEM Learning and Science Communication	81
Complex Collaboration: Lessons from a Longitudinal Evaluation Involving Multiple Stakeholders	83
Observing Empathy in Museum-Based Engineering Activities	84
Thinking Like an Evaluator: Capacity-Building at Two Children's Museums	86

Thursday, July 11

10:45-12:00 PM - Concurrent Sessions

Retrospective Pre-Posttests: How and When to Use This Cool Tool

Melanie Hwalek, PhD, SPEC Associates
Cassandra Filer, John G. Shedd Aquarium
Deborah Wasserman, COSI

Panel Presentation

Purpose: The Retrospective Pre-Posttest is a survey method that asks respondents to rate themselves on knowledge/attitudes after participating in a program, and also to rate how they were on the same knowledge/attitudes before participating in the program. Retrospective Pre-Posttest eliminates the problem of “boomerang effect” where participants seem to “get worse” from pretest to posttest. In traditional pre-post testing, respondents may rate themselves high at pretest, and then realize after completing a program how much they didn’t know/understand before – so they rate themselves lower at posttest. This fascinating phenomenon (also known as response-shift bias) and how Retrospective Pre-Posttest can ameliorate its effect is the focus of this session which will explore:

1. What research says about when to use RPT and when to use traditional pre-post testing to measure program outcomes
2. Basic RPT questionnaire design elements
3. How to analyze RPT data to gain the most insights from its use

Abstract: Funny things can happen when program outcomes are measured using pre-post testing. Decades ago, Howard et al. (1979) discovered the “boomerang effect” when using pre-post testing to examine the impact of communication skills workshops on dogmatism of noncommissioned officers. Researchers found that 62% of participants reported being more dogmatic after training. When asked “why” in follow up interviews, participants explained that they didn’t realize how dogmatic they were until after participating in training – they didn’t know what they didn’t know – a phenomenon which came to be termed “response shift bias.”

Since then, a plethora of research has explored the value of Retrospective Pre-Posttest; when it is better and when it is worse than using traditional pre-post testing (c.f. Lam and Bengo, 2003; Taylor et al., 2009). Retrospective Pre-Posttest is controversial largely because it is an “easier” methodology to implement, typically yields larger gains than pre-post testing, and is prone to inflationary bias (wanting to make yourself look good) and social desirability (wanting to be nice to the program implementers). However, there are also reasons why Retrospective Pre-Posttest is the preferred methodology, majorly because it reduces the impact of response shift bias and the resulting boomerang effect.

Retrospective Pre-Posttest is commonplace in visitor studies research (c.f., Falk and Gillespie, 2009; Falk et al., 2008). Falk used Retrospective Pre-Posttest to assess visitors’ emotions before and after engaging

Visitor Studies Association - 2019 Conference Abstracts

in a specific exhibit or science center overall; and to measure visitors' attitudes towards conservation, self-perceptions of their abilities to effect change, and perceptions around the roles of zoos and aquariums in promoting conservation. A search of InformalScience.org yielded documentation of studies using Retrospective Pre-Posttest to measure continuation of science outreach program use (Storksdieck et al., 2017); outcomes of youth environmental education programs (Stern and Powell EE21 Study, 2019); changes in motivations and understandings for youth zoo program participants (Blue Scarf Consulting, 2012); changes in interest, knowledge, and awareness for informal science educators (Iacovelli et al, 2012); changes in attitudes and awareness of giant-screen cinema professionals (Fraser & Yoco, 2011); and the impact of professional development workshops for museum professionals (Luke et al., 2010). Session presenter Solomon-Filer, has used Retrospective Pre-Posttests at John G. Shedd Aquarium to evaluate self-reported likelihood to perform conservation actions in the future, and student changes in interest and understandings before and after a STEM program.

It behooves VSA evaluators to understand the proper use of Retrospective Pre-Posttest. This session will: 1) share the major findings from the research on Retrospective Pre-Posttest methodology, 2) draw conclusions regarding when to use this method, 3) discuss ways to examine bias in Retrospective Pre-Posttest data and how to minimize bias, 4) illustrate various options for Retrospective Pre-Posttest instrument design using real-life examples from evaluations of programs at Shedd Aquarium and COSI, 5) provide an opportunity to analyze Retrospective Pre-Posttest data, and 6) demonstrate the rich insights that can be gleaned from the use of this cool tool.

Importance: Evaluators must be able to discern the appropriate measurement strategy for outcomes they want to investigate. Part of this decision is the appropriateness of the measure given guest time constraints and cognitive abilities. Retrospective Pre-Posttest presents a way of knowing that counterbalances pre-post testing. This session will address concerns of skeptics, and provide practical examples that evaluators can use as templates as they design their own Retrospective Pre-Posttest tools and share results with key stakeholders.

References:

Blue Scarf Consulting (2012). "Next level" student retrospective report of findings, 2012". Retrieved from http://informalscience.org/sites/default/files/2013-06-07_MN_Zoo_Next_Level_Retrospective_Report_of_Findings.pdf

Falk, J.H., Heimlich, J. and Bronnerkant, K. (2008) *Using identity-related visit motivations as a tool for understanding adult zoo and aquarium visitors' meaning making*. Curator Vol. 51, No. 1 pp. 55-80.

Falk, J.H. and Gillespie, K.L. (2009) Investigating the Role of Emotion in Science Center Visitor Learning *Visitor Studies* Vol. 12, No. 2 pp. 112-131.

Fraser, J. & Yoco, V. (2011) "GSCA 2010 conference attendees awareness and attitudes towards DIGSS". Retrieved from http://informalscience.org/sites/default/files/GSCA_Conference_Report_2011_01_04_copy.pdf

Howard, G.S., Ralph, K.M., Gulanick, N.A., Maxwell, S.E., Nance, D.W. and Gerber, S.K. (1979) Internal Invalidity in Pretest-Posttest Self-Report Evaluations and a Re-Evaluation of Retrospective Pretests. *Applied Psychological Measurement* Vol. 3, No. 1 Winter pp. 1-23

Visitor Studies Association - 2019 Conference Abstracts

Iacovelli, S., Beyer, M., & Kunz Kollmann, E. (2012). *Dimensions of public engagement with science: Summative evaluation*. Retrieved from

http://informalscience.org/sites/default/files/2012_Dimensions_of_Public_Engagement_with_Science_Summative_Evaluation.pdf

Lam, T. C. M. and Bengo, P. A (2003) *Comparison of Three Retrospective Self-reporting Methods of Measuring Change in Instructional Practice*. American Journal of Evaluation Vol. 24, No. 1 pp. 65-80.

Luke, J.J., Ancelet, J. E., Figueiredo, C. (2010). *Leap into Science: Year 3 Evaluation Report*. Retrieved from <http://informalscience.org/sites/default/files/Year3.FinalReport.V3.doc>

Stern and Powell EE21 Study (2019). Retrieved from https://frec.vt.edu/people/Stern/stern_docs.html

Storksdieck, M., Stylinski, C. & Canzoneri, N. (2017). *The Impact of Portal to the Public: Creating an Infrastructure for Engaging Scientists in ISL*. Summative Evaluation. Corvallis, OR: Oregon State University. Retrieved from

http://informalscience.org/sites/default/files/PoPNet%20Summative%20Evaluation%20Report-FINAL_3.pdf

Taylor, P.J., Russ-Eft D.F. and Taylor, H. (2009) *Gilding the Outcome by Tarnishing the Past: Inflationary Biases in Retrospective Pretests*. American Journal of Evaluation Vol. 30, No. 1 March pp. 31-43.

Additional Resources: SPEC Associates Website www.specassociates.org

Human Health Changes Associated with an Immersive Experience at a Zoo

Amy Niedbalski, Saint Louis Zoo

Individual Paper

Purpose: The primary research questions of this study were, “Does a walk through an immersive, naturalistic exhibit at a zoological institution provide short-term stress reduction for visitors?” and if so, “What factors contribute to this reduction of stress?”. Methods utilized to collect and determine visitors’ physiological and psychological stress and study results will be discussed, along with the implications of these results for zoos, aquariums, and other cultural attractions. The goal of this presentation is to convey to the audience a unique and tangible research approach in order to understand the human health impact of an exhibit experience at a zoological institution.

Abstract: Zoological institutions often use immersive, naturalistic exhibits to create an inclusive atmosphere that is inviting for visitors while providing for the welfare of animals in their care. In this study, we investigated the physiological changes in salivary cortisol and blood pressure, as well as the psychological changes among visitors before and after a walk through the River’s Edge, an immersive, naturalistic exhibit at the Saint Louis Zoo. Our study showed that participants had a significant reduction in salivary cortisol, diastolic and systolic blood pressure pre to post River’s Edge experience. Psychological assessments on mood show that most visitors felt happier, more energized, and less tense after the visit. Additionally, participants who spent more time in River’s Edge, had visited River’s Edge prior to the study, and participants who had seen more exhibits at the Zoo prior to entering River’s Edge experienced greater physiological and/or psychological benefits. We conclude that zoos providing experiences with immersive, naturalistic exhibits may influence short-term positive changes in

Visitor Studies Association - 2019 Conference Abstracts

physiological and psychological measures of health and well-being through reductions in blood pressure and cortisol production, as well as decreasing tense arousal, increasing energetic arousal, and increasing hedonic tone.

Importance: This study is an innovative and exciting “way of knowing” for researchers and practitioners, particularly at zoos and aquariums, to provide evidence of health outcomes for visitors. With this information, and results from other studies such as this, institutions may promote stress reduction as a benefit to visitation. Zoos interested in contributing to the well-being of their visitors can work to improve aspects of a visit that are shown to increase stress (e.g., poor parking experience), and provide exhibit experiences that decrease stress (e.g., close-up viewing of animals). More studies looking at the overall effects of zoos on human health should be conducted in order to determine the role that zoos may play in regards to health of their visitors and a zoo’s impact on a community. This research is applicable to all types of cultural attractions and may inspire similar studies across the field.

References:

Coolman, A., Niedbalski, A., Powell, D., Kozłowski, C. P., Franklin, A. D., and Deem, S. L. (2019). *Changes in Human Health Parameters Associated with an Immersive Exhibit Experience at a Zoological Institution*. In progress.

Studying Touch as a Way of Knowing in the Art Exhibition

Dimitra Christidou, PhD, Norwegian University of Science and Technology
Palmyre Pierroux, University of Oslo

Individual Paper

Purpose: The aim of the research presented here was to explore how touch becomes relevant as an interpretive resource when visitors in groups interact with original works of art. The study was a collaboration between a university and a museum partner. We will discuss the research design and the different methods used to study 1) visitors’ haptic interactions with five original sculptures made in stone and 2) how these entered into visitors’ meaning-making. In addition to identifying specific types of touch patterns, we will discuss how real – but also vicarious, touch functioned as a new way of knowing and introduced another realm of communicative and interpretive resources into visitors’ interpretive processes. As haptic interactions with original artworks are usually not possible in museums, we will also reflect on how our findings are relevant for current and future curatorial and exhibition practice.

Abstract: Background

Studies of visitors’ interactions in art museums often foreground their ocular-centric nature, using eye-tracking and other methods to capture and describe visitors’ acts of looking at artworks and reading texts (i.e. Walker et al. 2017; Filippini Fantoni et al. 2013). Recent approaches have argued for the inclusion of other senses and the body when visiting art museums, foregrounding the museum experience as an embodied experience (i.e. Christidou & Diamantopoulou 2016; Steier, Pierroux, & Krange, 2015). Despite this increased interest, there have been relatively few exhibitions in art museums that provide opportunities for visitors to touch original artworks instead of replicas mainly due to conservation concerns (Candlin 2004; Pye 2008).

Evighetens Form (Eternity’s Form), a touring exhibition produced by the National Museum of Art, Architecture and Design in Oslo, Norway (2016 – 2019), presented works by Norwegian modernist artist

Visitor Studies Association - 2019 Conference Abstracts

Aase Texmon Rygh that were based on variations of the Möbius strip, a surface with only one side and only one boundary and has the mathematical property of being non-orientable. Five original sculptures from this series made of dolomite stone were on display inviting visitors to 'follow the form with the hand (...) and thus understand the principle and experience the material' (Nasjonalmuseet, 2016). In collaboration with curators from the museum, a study was designed to examine if and how touch mediated visitors' interpretive processes in encounters with these artworks.

Methods

This paper presents observation methods and findings from an empirical study of both general public visits and a school excursion. For this study, the digital observation and survey tool Visitracker was used in the research design and data collection. Since little is known about haptic interactions with original sculptures, a tentative coding scheme with potential interactions was first developed. Visitracker was then used in the field to (1) refine the 'touch codes' through real-time observations of visitors' interactions with the sculptures, (2) collect data regarding visitors' movement and dwell time in the exhibition, and (3) collect their responses to a post-visit questionnaire. Additionally, we collected two hours of video recordings of visitors in groups to capture and analyze talk and interactions in situ.

Data and Analysis

Observations of 136 visitors, alone or in groups, were logged during a period of two weeks. 31 visitors completed questionnaires during this same period. Among other findings regarding visitors' movement and dwell time, the analysis of the video recordings and the interactions registered with Visitracker allowed us to identify specific 'sensing patterns,' including resting palm on surface; tracing form with palm; using palms; sensing edges and surfaces with fingertips; poking and pointing with index figure; and knocking with fist. Further, analysis of the video data show how both real and 'vicarious' touch introduced new gestures, bodily orientations, and haptic information as qualitatively new and different interpretive resources, fostering longer and deeper object-related inquiries than when viewing only, i.e. confirming or countering visual observations, discerning shape, texture, substance, and reflecting on the creation process.

Importance: The study contributes to ongoing research on how experiential knowledge, and specifically the sense of touch, is made relevant in processes of meaning-making in encounters with art. Haptic interactions in a gallery setting are fairly underexplored, and thus, their analysis contributes to the ongoing discussions in visitor studies. In terms of VSA learning competencies, the use of an advanced observation tool to develop and record types and patterns of touch and movement as visitors interacted with sculptures in an art museum contributes to "Knowledge of and Practices with Social Science Research and Evaluation Methods and Analysis." Moreover, the overall discussion on the research design and the methods used in this study reflect and expand upon the "Principles and Practices of Visitor Studies". Finally, the curators' aims and perspectives shed light on the 'Principles and Practices of Informal Learning Environments'.

References:

Candlin, F. (2004). "Don't Touch! Hands Off! Art, Blindness and the Conservation of Expertise." *Body and Society* 10: 71–90. doi: <https://doi.org/10.1177/1357034X04041761>

Christidou, D., and S. Diamantopoulou. (2016). Seeing and Being Seen: The Multimodality of Museum Spectatorship. *Museum & Society* 14 (1): 12–32.

Visitor Studies Association - 2019 Conference Abstracts

Nasjonalmuseet (National Museum of Art, Architecture and Design) (2016). Aase Texmon Rygh. Evighetens form. Retrieved on May 9, 2019: <http://vandreutstillinger.nasjonalmuseet.no/produksjon/aase-texmon-rygh-evighetens-form>. Translated from Norwegian to English by the authors.

Pye, E. (2008). *The Power of Touch: Handling Objects in Museum and Heritage Contexts*. Walnut Creek: University College London Institute of Archaeology Publications. Left Coast Press.

Steier, R., Pierroux, P., & Krange, I. (2015). Embodied interpretation: Gesture, social interaction, and meaning making in a national art museum. *Learning, Culture and Social Interaction*, 7, 28-42. doi:<https://doi.org/10.1016/j.lcsi.2015.05.002>

Walker, F., Bucker, B., Anderson, NC., Schreij, D., Theeuwes, J. (2017) *Looking at paintings in the Vincent Van Gogh Museum: Eye movement patterns of children and adults*. PLoS ONE 12(6): e0178912. <https://doi.org/10.1371/journal.pone.0178912>

Filippini Fantoni, S., Jaebker, K., Bauer, D. and Stofer, K. (2013) Capturing Visitors' Gazes: Three Eye Tracking Studies in Museums. In *Museums and the Web 2013*, N. Proctor & R. Cherry (eds). Silver Spring, MD: Museums and the Web. Published January 31, 2013. Retrieved May 9, 2019: <https://mw2013.museumsandtheweb.com/paper/capturing-visitors-gazes-three-eye-tracking-studies-in-museums/>

Additional Resources: <https://www.uv.uio.no/iped/english/research/projects/mediascapes/>

Ways of Seeing, Ways of Understanding

Luise Reitstatter, University of Vienna

Individual Paper



Purpose: A single viewer standing in front of a painting, this is the classical image that represents seeing art in a museum. The campaign announcing the rearrangement of the Austrian Gallery Belvedere worked with this visual stereotype (Fig.1). What was different was the connection between the painting and its viewer, showing visual similarities through clothing and body posture. But even without this aesthetic exaggeration, it is evident that seeing establishes social relationships and relates the object with the subject. However, what visitor research has already demonstrated in first timing and tracking studies is that seeing is not as static as these photographs or the ideal of quiet contemplation suggest. Seeing in the museum coincides with walking and the single viewer most often is accompanied by other visitors. This paper deals with the research question how visitors, walking around and being with others, see and in consequence understand art in the museum.

Abstract: Background

Answers are derived from the comparative study “Belvedere Before and After” (2018/2019) – a project of the Laboratory for Cognitive Research in Art History at the Department of Art History at the University of Vienna together with the Department of Computer Science at the University of Tübingen, the EVALab at the Department of Psychology at the University of Vienna and the Austrian Gallery Belvedere. The museum’s major rearrangement of the museum’s venue at the Upper Belvedere in spring 2018 offered the unique opportunity to study the visiting behavior of the same artworks in two different exhibition constellations. The team of art historians, museologists, psychologists and computer scientists thus joined forces to analyze the effect of the rearrangement of the museum’s collection.

Methods

The mixed method approach of mobile eye tracking, questionnaire and subjective mapping (drawing task in conjunction with an open interview) offers the opportunity to study different gaze patterns as well as processes of meaning making when visitors reconstruct their exhibition experience post-visit. Concretely, the talk will contrast quantitative data analysis from the mobile eye tracking videos (with respect to viewing time, sequences of looking at art and reading labels, eye movements within different

Visitor Studies Association - 2019 Conference Abstracts

artworks, interactions with other visitors) with qualitative content analysis of the subjective mapping interviews. The aim is to show how specific ways of seeing correspond to different ways of understanding art in the museum.

Procedure and data

The fieldwork took place in the last week of January 2018 and January 2019, following the identical procedures: First, regular visitors were invited to take part in and informed about the study. After having agreed, they signed a consent form with respect to their voluntary and anonymous participation. Then they were equipped with an eye tracking equipment consisting of a Pupil Labs Headset and a Microsoft Surface Pro Tablet worn in a light backpack (<1kg). After the calibration, participants independently visited an acclimatization room and three consecutive exhibition rooms following their natural art perception preferences. Post-visit, participants took part in the subjective mapping providing a posteriori personal insights through drawing on an illustrated floor plan and talking about the areas they remember the strongest. A detailed questionnaire complements information on the visitors' backgrounds. The overall sample consists of 109 participants in the "Before" and 150 participants in the "After" constellation. 13 artworks, from the most prominent "Kiss" by Gustav Klimt to less known artworks from the exhibition "Vienna Around 1900", were displayed in both constellations.

Findings

Within the broad empirical range of the "Belvedere Before and After" study, the presented findings will focus on a) specific ways of seeing and b) specific ways of understanding art and, most interestingly, c) how they relate to each other in the exhibition setting. To do so, the patterns of seeing in the museum as locating, prioritizing, or comparative activity will be contrasted with patterns of understanding art as a complex procedure where "entrance narratives", contextual factors such as spatial settings or given textual information and the general "museum effect" intermingle.

Importance: The specificity of the study is based in the unique empirical opportunity of investigating art perception patterns in relation to the same collection in two different museological constellations, without having interfered research-wise. This enables the analysis of the influence of contextual factors such as artwork combinations, display techniques and text resources under natural conditions. Mobile eye tracking, on the one hand, provides detailed behavioral data as it tracks the fast and jumping gaze between objects, people and space – an information impossible to detect through analogue observation techniques. Subjective mapping, on the other hand, allows to relate objective eye movements to subjective meaning making processes. This way, the study contributes to a better understanding of how visitors see and understand art in the museum setting.

References:

- Bennett, T. (2011). Civic Seeing: Museums and the Organization of Vision. In S. Macdonald (Ed.), *A Companion to Museum Studies* (pp. 263-281). Chicester: Wiley-Blackwell.
- Duncan, C. (2001). *Civilizing rituals. Inside public art museums*. London/New York: Routledge.
- Jafari, A., Taheri, B., & Vom Lehn, D. (2013). *Cultural consumption, interactive sociality, and the museum*. *Journal of Marketing Management*, 29(15-16), 1729–1752.
- Kirchberg, V., & Tröndle, M. (2015). *The Museum Experience: Mapping the Experience of Fine Art*. *Curator* 4, 58(2), 169-193.

Visitor Studies Association - 2019 Conference Abstracts

Reitstätter, L. (2015). *Die Ausstellung verhandeln. Von Interaktionen im musealen Raum*. Bielefeld: transcript.

Robinson, E. S. (1928). *The behaviour of the museum visitor*, Washington: American Association of Museums.

Santini, T., Brinkmann, H., Reitstätter, L., Leder, H., Rosenberg, R., Rosenstiel, W., & Kasneci, E. (2018). *The Art of Pervasive Eye Tracking: Unconstrained Eye Tracking in the Austrian Gallery Belvedere*. Proceedings of the 7th Workshop on Pervasive Eye Tracking and Mobile Eye-Based Interaction. Available: <https://dl.acm.org/citation.cfm?id=3208032> (17.05.2019).

Smith, L. F., Smith, J. K., & Tinio, P. P. L. (2016). Time Spent Viewing Art and Reading Labels. *Psychology of Aesthetics, Creativity, and the Arts*, 11(1), 77-85.

Additional Resources:

<https://crea.univie.ac.at/projects/belvedere-before-and-after/>

https://www.belvedere.at/bel_en/exhibition/a_new_look_the_permanent_collection_redisplayed

Data Collection, Data Management, Data Analysis, Oh My! Training Videos for Evaluation in Informal Learning Environments

Karen Peterman and Kim Kiesewetter, Karen Peterman Consulting Co
Jane Robertson Evia, Virginia Tech

Hands-on Workshop

Purpose:

This workshop style session will share a series of short training videos and related resources that were created for practitioners who need a refresher on evaluation practices for themselves, or those who need off-the-shelf resources that can be used to train volunteers and docents in basic evaluation methods.

Abstract: A recent NSF study noted that there are many evaluation capacity building resources available online, but that most focus on the early and late stages of the evaluation rather than the “messy middle” of the evaluation process (Kaminsky et al., 2018). The series featured in this workshop begins to fill that void by providing quick “how to” videos to share data collection methods, steps for data management, and basic statistical analyses.

The session will begin with an activity and related discussion that will set the stage for the work that follows. Next, a 10-minute overview of the video series will be provided. Participants will use this information to choose their first small group tour and discussion. Working with one of the session leads, small groups will meet for 15 minutes to “tour” and discuss the resources available. This process will be repeated a second time. A final large group discussion will be guided by a headlining learning activity.

Each set of videos in the series has been developed to reflect best practices. The videos were then field tested or reviewed by a team of experts. The data collection and data management videos, for example, were originally tested by a community of practice that consists of 25 science festivals from across the

Visitor Studies Association - 2019 Conference Abstracts

United States. They feature methods such as intercept survey practices (Peterman & Gathings, 2019), mystery shopping (Peterman & Young, 2015), and the applied use of national polling items from the Pew Research Center and General Social Survey to gather audience research data (Nielsen et al., 2019). A subset also explain the informed consent process.

The data management videos include practices that have been shared by leaders in the evaluation field, such as Ann K. Emery, as well as tips and tricks from the literature (Salkind, 2015). Each “how to” video shows a separate data management skill as it is applied to the kinds of data collected and strategies used in visitor studies evaluation and research; skills range from the basics of password protecting a data sheet, to re-coding data, to creating pivot tables in Excel.

The data analysis video series were developed to include the statistics that are used often in visitor studies, and with guidance from statistical texts (Green & Salkind, 2016; Salkind, 2016) and the RStudio online community. This series was vetted by leaders in the informal learning community, and includes conceptual videos that explain p values, chi square, independent-samples t tests and ANOVA. Each analysis also includes a brief How-To video that demonstrates how to perform it in Excel, SPSS, and R.

All of the resources are available free of charge. The series was designed to have broad applicability, with the hope that they will be useful to practitioners and evaluators across informal learning contexts and disciplines.

Importance: This session will allow participants to experience the video resources available, explore their potential uses to support ways of knowing in their evaluations, and ask questions of the development team to determine whether and how the videos are useful in participants’ own context. These outcomes are aligned with Competency C in that they will prepare participants and/or the volunteers and docents that participants train, to implement appropriate practice of social science research and evaluation methods and analysis.

References:

Green, S. B., & Salkind, N. J. (2016). *Using SPSS for Windows and Macintosh*, Books a la Carte. Pearson.

Nielsen, K., Gathings, M.J., Peterman, K. (2019). *New, not different: Data-Driven Perspectives on Science Festival Audiences*, *Science Communication*.

Kaminsky, A., Mansori, S., Ambat, E., McMahon, T., Goodyear, L., (2018, November). Building capacity of STEM evaluators: The landscape of people and resources in the field. A roundtable discussion presented at the annual meeting of the American Evaluation Association, Cleveland, OH.

Peterman, K., & Gathings, M.J. (2019). Community-Created Multi-Site Evaluations: A Method to Promote Evaluation Use Across a Sector. *Evaluation and Program Planning*.

Peterman, K., & Young, D. (2015). Mystery shopping: an innovative method for observing interactions with scientists during public science events. *Visitor Studies*, 18(1), 83-102.

Salkind, N. J. (2015). *Excel statistics: A quick guide*. SAGE Publications.

Salkind, N. J. (2016). *Statistics for people who (think they) hate statistics*. Sage Publications.

Visitor Studies Association - 2019 Conference Abstracts

Additional Resources: All resources can be found on the EvalFest website: www.evalfest.org.

Measuring Learning of Complex Topics: Challenges and Successes Explored

Zdanna King, Science Museum of Minnesota

Evelyn Ronning, Science Museum of Minnesota

Roundtable Discussion

Purpose: Learning about complex topics like evolution, climate change, or big data can be difficult to measure in informal environments where we have the pressure to avoid “testing” visitors. Bring examples and challenges from your own work for discussion and hear more about measuring evolution learning in the Theatrical Gaming project.

Abstract: Learning outcomes around complex topics like evolution, climate change, or big data can be difficult to measure in informal environments where we have the pressure to not “test” visitor knowledge, but explore understanding in ways that are less intrusive and more engaging.

We will begin with a short presentation about how we experimented with measuring changes in understanding of evolution for the Theatrical Gaming project (#1713316) at the Science Museum of Minnesota, now in its second year. This gaming and theatre experience starts with a ~30 minute stage show in a specialized theatre, which shares the key aspects of evolution and creates a narrative for visitors. This narrative is then used throughout a mini-gaming experience where visitors go on from the show to solve hidden challenges throughout the museum, using their evolution know-how and getting help along the way.

In our work with the project, we engaged different audiences in ways that balanced our goals of measuring outcomes with the need to be less burdensome and perhaps even engaging for visitors. We will share how we used embedded assessment, visualization feedback, meaning maps, recognition tests, closed-ended agreement-ranking items, and open ended interview & survey questions and how these worked with different audiences. These will be used as jumping off points for attendees to share their own experiences and what has worked for them, as well as times when measurements were problematic.

The group conversation will be devoted to exploring this project's and others' examples of measuring learning outcomes for complex topics, through conversation in large and small groups. Small groups will select challenges that data collectors at their table are facing and support by brainstorming solutions for approaching the work. At the end of the session, participants will share out with the larger group some of the ideas they came up with for tackling their challenge.

Importance: Attendees will gain new methods for measuring learning about complex topics like evolution, big data, and climate change.

Attendees will learn some specific ways that measuring learning about evolution has been successful and challenging through our work with the Theatrical Gaming project.

Studying Intangible Dimensions of Learning: Are We "Effing" the Ineffable?

Sarah May, Museum of Science, Boston

Becki Kipling, Museum of Science, Boston

Suzy Letourneau, New York Hall of Science

Roundtable Discussion

Purpose: Intangible dimensions of knowledge, like emotion or imagination, have been debated for centuries. Emotion is pitted against rationality. Imagination against reality. However, both arguably impact knowledge construction. This roundtable discussion will unpack these tensions, asking participants to reflect on the current limits of research, evaluation, and design addressing such constructs.

Participants will...

- Generate ideas about innovative approaches to design, evaluation, and research related to dimensions of learning less commonly considered (emotion, imagination, etc.).

- Build understanding about the principles and practices of informal learning environments, particularly in how learning occurs in informal settings through the lenses of emotion, imagination, and other intangible ("ineffable") qualities of engagement and knowledge construction.

Abstract: Goals and standards for exhibit and program development in informal learning environments have included cognitive and content goals, goals related to interests and attitudes, social goals, and physical inclusion goals. Other dimensions of learning also play a critical role in knowledge construction. For example, our understanding of emotion's role in human cognition has become more complex through advancements in affective sciences. Emotions direct attention, motivate engagement, and inspire deepened interest. Imagination is another construct comprising multiple ways of thinking, allowing learners to represent ideas not immediately present to the senses, fostering connections between disparate ideas, and supporting learners to understand ideas from another's perspective.

Both emotion and imagination, however, have attracted tension and conflict in terms of their relationship with knowledge and learning. Emotion has historically been viewed as a detriment to reasoning, and is often pitted against rationality. Imagination has been construed as the antithesis to reality, and is often underemphasized in learning contexts. Both constructs also evade definition, which makes both design and evaluation of experiences leveraging these processes difficult.

This roundtable discussion will be led by two research and evaluation professionals and one practitioner from informal science education institutions. Discussion topics will address the complex issues introduced above, through the lens of current and recent work these professionals are engaged in.

Sarah May and Becki Kipling, from the Museum of Science, Boston, will bring insights from work on emotional design and the role of imagination in informal science learning contexts. A recent project has focused on how to design for "productive struggle," an experience in which learners engage emotionally with feelings of imbalance (e.g., confusion, challenge, surprise) to persist through activities and achieve satisfying resolutions. Strategies for researching this emotional arc with learners have needed to be inclusive of the diverse ways emotions are experienced and expressed. In our work on imagination, we've conducted preliminary research on ways of thinking that imagination fosters among learners,

Visitor Studies Association - 2019 Conference Abstracts

such as in perspective-taking, mental models, and futures thinking. Themes that might guide our discussion include: how our measures of emotion have evolved; challenges we've faced in incorporating diverse affective goals in the development of designed experiences; or our approach to tackling the various definitions of imagination and its related skills.

Suzy Letourneau, from the New York Hall of Science, will discuss the development of methods to explore the connections between STEM learning and various emotional aspects of learning, such as persistence and empathy. Her experiences with two relevant studies will inform these topics of discussion. One study examined how parent-child interactions in a museum exhibit influenced children's persistence when completing a similar task on their own. Another involved the development of a coding scheme to analyze how narrative-based engineering activities can evoke different facets of empathy (including emotional responses and perspective-taking) to support children's engagement and persistence in the iterative design process. Discussion will focus on the theoretical basis for both studies and the different methodological approaches developed in collaboration with researchers and exhibit/activity developers.

Importance: Understanding that intangible aspects of learning are as valuable as more concrete, measurable aspects, the visitor studies field should continue to explore novel methods for research and evaluation of these constructs. Questions we might continue to grapple with include: How might informal education professionals leverage intangible constructs in service of learning and engagement? How do evaluators frame such intangible processes and ways of thinking in ways that authentically address their role in learning, while also maintaining rigor in study design? (How) can we avoid "effing" the ineffable through overly constraining definitions or incoherent measures? How might research, evaluation, or design strategies need to be reframed to address these constructs in their own right? What other less tangible dimensions of learning and engagement might also require a different lens for research and design (e.g., the role of the spiritual)?

References:

Imagination Resources:

Achiam, M. (2016). The role of the imagination in museum visits. *Nordisk Museologi*, (1), 89-100.

Achiam, M., & Sølberg, J. (2017). Nine meta-functions for science museums and science centres. *Museum Management and Curatorship*, 32(2), 123-143.

<https://doi.org/10.1080/09647775.2016.1266282>

Dufresne-Tassé, C., Marin, S., Sauvé, M., & Banna, N. (2006). L'imagination comme force dynamisante du traitement des objets muséaux par des visiteurs occasionnels [Imagination as a motivating force in visitors' apprehension of museum objects]. In C. Dufresne-Tassé (Ed.), *Families, schoolchildren and seniors at the museum: Research and trends* (pp. 160–176). Québec: ICOM CECA.

Hadzigeorgiou, Y. (2016). *Imaginative science education: The central role of imagination in science education*. Switzerland: Springer International Publishing.

Kind, A. (Ed.). (2016). *The Routledge handbook of philosophy of imagination*. New York, NY: Routledge.

Emotion Resources:

Blanchette, I. (ed.), 2014. *Emotion and Reasoning*. Psychology Press, New York 2014.

Visitor Studies Association - 2019 Conference Abstracts

Boehner, K., Sengers, P., & Warner, S. (2008). Interfaces with the ineffable: Meeting aesthetic experience on its own terms. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 15(3).

D'Mello, S., & Graesser, A. (2012). Dynamics of affective states during complex learning. *Learning and Instruction*, 22(2), 145-157.

Gadsby, J. (2011). The effect of encouraging emotional value in museum experiences. *Museological Review*, 15. 1-13.

Hess, J. L., & Fila, N. D. (2016). The manifestation of empathy within design: findings from a service-learning course. *CoDesign*, 12(1-2), 93-111.

Immordino-Yang, M. H. (2015). *Emotions, Learning, and the Brain: Exploring the Educational Implications of Affective Neuroscience*. New York, NY: W. W. Norton & Co.

Izard, C. E., 2010. The many meanings/aspects of emotion: Definitions, functions, activation, and regulation. *Emotion Review*, 2(4), 363-370.

Pekrun, R. (2010). Academic emotions. In T. Urdan (Ed.), *APA educational psychology handbook*, Vol. 2. Washington, DC: American Psychological Association.

Rappolt-Schlichtmann, G., Evans, M., Reich, C., & Cahill, C. (2017). Core Emotion and Engagement in Informal Science Learning. *Exhibition*, 36(1), 42-51. Retrieved from https://static1.squarespace.com/static/58fa260a725e25c4f30020f3/t/59483a782e69cf6d59283cfb/1497905810057/10_Exhibition_CoreEmotion.pdf.

Sengers, P., Boehner, K., Mateas, M., & Gay, G. (2008). The disenchantment of affect. *Personal and Ubiquitous Computing*, 12(5): 347-358

Walther, J., Miller, S. E., & Sochacka, N. W. (2017). A model of empathy in engineering as a core skill, practice orientation, and professional way of being. *Journal of Engineering Education*, 106(1), 123-148.

General Informal Learning Resources:

Dierking, L. D., & Falk, J. (2000). *Learning from museums: Visitor experiences and the making of meaning*. Walnut Creek, CA: AltaMira Press.

Friedman, A. (Ed.). (March 12, 2008). Framework for Evaluating Impacts of Informal Science Education Projects. Retrieved from http://insci.org/resources/Eval_Framework.pdf.

Reich, C., Price, J., Rubin, E., Steiner, M. (2010). *Inclusion, Disabilities, and Informal Science Learning. A CAISE Inquiry Group Report*. Washington, D.C.: Center for Advancement of Informal Science Education (CAISE).

Seeing through Multiple Lenses: Bridging Indigenous and Western Evaluation Worldviews

Jill Stein, JKS Consulting
Dr. Shelly Valdez, Native Pathways

Visitor Studies Association - 2019 Conference Abstracts

Dr. Nicky Bowman, Bowman Performance Consulting

Panel Presentation

Purpose: While visitor studies seek to understand diverse experiences and perspectives, the way in which we approach evaluation can limit (or broaden) what we see and how we know. Based on years of experience bridging Indigenous and Western evaluation processes, this panel highlights key themes and lessons learned through specific examples, and highlights principles of an indigenous research and evaluation paradigm. Participants will gain awareness of how our worldviews influence the evaluation process. We hope that through this panel session, participants will gain awareness and understanding of the principles of Indigenous evaluation processes, as well as similarities and differences to Western evaluation, as well as gain insights into the process of bringing multiple worldviews into evaluation through specific examples.

Abstract: While visitor studies seek to understand diverse experiences and perspectives, the way in which we approach evaluation can limit (or broaden) what we see and how we know. Our own cultural worldviews can influence the types of questions we ask, who and how we ask, and how we interpret what we find. The Visitor Studies field as a whole has primarily been grounded in western social science traditions (e.g. sociology, psychology, and anthropology), and yet we are increasingly working with communities and stakeholders who come from non-western worldviews, or embrace multiple ways of knowing. As Valdez points out (NSF 2004), “evaluators who are not familiar with Native ways of knowing, oftentimes find themselves disconnected from the shared knowledge of the group they are evaluating.”

In order to address this disconnection, and to understand and document learning in an authentic way across diverse contexts and settings, the visitor studies field needs to improve our ability to engage with multiple ways of knowing in our work. Based on many years of experience bridging Indigenous and Western evaluation processes and paradigms, this panel will draw from specific examples to explore key themes, considerations, challenges, and lessons learned around engaging multiple worldviews in the evaluation process. We will frame our presentations around key questions asked around this year’s conference theme, Ways of Knowing, as follows: How can we better respect and value ways of knowing that differ from dominant cultural lenses, especially when dominant lenses may include the disciplinary traditions that underpin visitor studies? How can the specific approaches of visitor studies be leveraged in support of greater equity among stakeholders?

Dr. Shelly Valdez (Laguna Puebloan) of Native Pathways and Jill Stein of JKS Consulting have been collaborating for nearly 15 years on cross-cultural evaluations that bring together Indigenous and western paradigms. Their work has included multi-year, NSF-funded collaborative partnerships that bridge traditional ecological knowledge and western science; partnerships between natural history museums and tribal museums; professional development initiatives that engage native knowledge holders, tribal educators, and informal science educators; as well as language revitalization and cultural immersion programs. Dr. Valdez and Ms. Stein will focus on the nature of their collaborative process, reflections on their learning, and key considerations and themes that have emerged from this work. They will draw on numerous evaluation projects as examples to model this work and focus on guiding principles of what they call “collaborative evaluation,” which emphasizes that both Indigenous and western evaluation processes are engaged, and each maintains its own integrity.

Visitor Studies Association - 2019 Conference Abstracts

Dr. Nicky Bowman (Mohican/Munsee), president and founder of Bowman Performance Consulting, LLC, and keynote speaker at VSA 2018 in Chicago, will continue the dialogue around culturally responsive evaluation practices using examples from her own work. Dr. Bowman brings both Indigenous and western evaluation paradigms to her research and evaluation processes in what she calls “blended evaluation.” She will draw from her decades of practice doing evaluation with educational, tribal, and community organizations to highlight how cultural worldviews influence her practice.

Importance: This session highlights an Indigenous research and evaluation paradigm and draws attention to ways in which Indigenous and western evaluation can work together or complement one another. This directly addresses the conference theme, Ways of Knowing, by centering a non-western epistemology and how this influences the evaluation process, in terms of collaborating with communities, developing the evaluation focus areas, choosing methods, designing studies and tools, and analyzing data. We will explore questions of how do we “know” and what is “valid” information when working in cross-cultural contexts. While panelists will share their experience through specific project examples, session participants will be encouraged to engage in dialogue and reflection around the cultural assumptions we make and how we produce knowledge and understanding through our evaluation work.

References:

Bowman, N. R. (2003). Cultural differences of teaching and learning: A Native American perspective of participating in educational systems and organizations. *The American Indian Quarterly*, 27(1), 91-102.

Bowman, N. R., Francis, C. D., & Tyndall, M. (2015). *Culturally responsive Indigenous evaluation. Continuing the journey to reposition culture and cultural context in evaluation theory and practice*, 335-360.

Mack, E., Augare, H., Cloud-Jones, L. D., David, D., Gaddie, H. Q., Honey, R. E., ... & Pete, T. (2012). Effective practices for creating transformative informal science education programs grounded in Native ways of knowing. *Cultural Studies of Science Education*, 7(1), 49-70.

Peticolas, L., Maryboy, N., Begay, D., Stein, J., Valdez, S., & Paglierani, R. (2012, August). A Place of Transformation: Lessons from the Cosmic Serpent Informal Science Education Professional Development Project. In *Connecting People to Science: A National Conference on Science Education and Public Outreach* (Vol. 457, p. 321).

Additional Resources:

Cosmic Serpent: <http://cosmicserpent.org/uploads/downloadables/CS-LegacyDoc27Nov2012.pdf>

Native Pathways: <http://www.nativepathways-edu.net/>

Bowman Performance Consulting: <http://bpcwi.com/>

1:45-3:00 PM - Concurrent Sessions

Building Institutional Capacity and Cultures of Evaluation: Views and Lessons from Diverse Institutions

Matthew Lasnoski, Freer Gallery of Art and Arthur M. Sackler Gallery

Visitor Studies Association - 2019 Conference Abstracts

Pei Koay, PhD, National Museum of the American Indian
Jessimi Jones, Philbrook Museum of Art

Panel Presentation

Purpose: In case studies from three very different museums, participants will be introduced to the opportunities and challenges of developing capacity for evaluative thinking. They will gain practical information to help them establish timelines, allocate resources and designate key milestones. During group discussion, they will consider how to make actionable change in their institution, such as current barriers to evaluative thinking in their museum and how to establish buy-in among your colleagues. Through discussion and reflection, participants will make at least one concrete commitment that they enact to create change at their institution. In addition, participants will gain a clearer idea about when their museum can conduct evaluation internally and when is it more beneficial to hire an external evaluator. This panel presentation is targeted at novice evaluators and researchers, emerging museum professionals, and museum administrators who want to obtain practical information for starting evaluation practices in their institution.

Abstract: This moderated panel presentation will explore three case studies about building internal capacity for evaluation. We discuss how each museum is working to build a culture of evaluative thinking to address the priorities of their different institutions: the National Museum of the American Indian, Freer|Sackler, and Philbrook Museum of Art.

The National Museum of the American Indian (NMAI) hired an interdisciplinary social researcher as an internal evaluator on a grant for program evaluation related to the impact of community engagement.

Evaluation has become a growing concern for NMAI, initially because of funders. But, increasingly, because the museum is beginning to see how evaluation can be an important tool for becoming a learning organization, in the past year, the evaluator's role has grown, to be used in other areas, including exhibits, operations, and other programming. The NMAI evaluator will share her experience about building evaluation capacity from the ground up as a full-time internal researcher and evaluator. In particular, she will discuss the role of the evaluator and how this is important for institutions to consider as they cultivate a culture of learning.

At the Freer|Sackler, the museum developed an internal team to conduct visitor studies over the past two years. The Audience Research Team (ART) consists of 33 individuals and is led by a team of 3 staff members from the Public and Scholarly Engagement department. ART also includes staff, interns, and volunteers who are curators, administrators, educators, and digital programmers. Individuals are trained to time and track visitors, conduct interviews, process interviews, and administer surveys.

Freer|Sackler staff will discuss how they develop and utilize ART. They will also share how it has benefited the museum in this short time frame. Since ART is in-house and cross-departmental, participants easily communicate these experiences with colleagues at meetings and informal conversations. Additionally, ART organizes regular, formal presentations of findings, which have been adapted for various stakeholders. This open line of communication and enriched knowledge has demystified the evaluation process at the museum, which has allowed the Freer|Sackler to make changes more effectively based on visitor research.

Visitor Studies Association - 2019 Conference Abstracts

Philbrook has laid necessary groundwork to align their mission to grow its relationships with the community as well as execute its strategic plan. Thus, Philbrook has identified the need to build institutional capacity for outcome-based evaluation, determine a framework for understanding audiences, and develop tools staff can use for their evaluation needs.

Philbrook will share the Philbrook Integrated Evaluation Program (PIEP), a three-year project funded by the Institute for Museum and Library Services, designed to build institutional capacity around evaluation and integrate evaluation into institutional planning and processes. Philbrook is working with Audience Focus, a consulting team of museum evaluation experts to grow staff capacity and competency around evaluation. A cross-departmental project team of curators, educators, communication, and guest experience staff - along with a core team of directors and the executive director- will be engaged in knowledge building workshops, practicing evaluation methods, engaging in strategic evaluation projects, and building of sustaining institutional processes around evaluation.

Importance: During this panel presentation, we seek to address the core ideas of the conference's theme, in particular how specific approaches of visitor studies can be leveraged to create a culture of learning about visitors. In the three cases studies, each speaker will present how they are building internal capacity for audience research and provide practical advice on how one might adapt these practices to their own institution. By sharing successes and setbacks from each case study, we seek to provide participants with tips to sustain evaluative thinking at their organizations and ideas on how to obtain necessary resources to create change in their institutions. Given the focus on reflecting on actionable steps towards building internal capacity, we will provide essential tools needed to encourage museums to invest additional staff time and resources towards evaluation and learning about their visitors.

References:

Beghetto, Ronald A. 2014. The exhibit as planned versus the exhibit as experienced. *Curator: The Museum Journal* 57(1): 1-4.

Pekarik, Andrew J., J.B. Schreiber, N. Hanemann, K. Richmond, and B. Mogel. IPOP: A Theory of Experience Preference. *Curator: The Museum Journal* 57(1): 5-27.

Pekarik, Andrew J., J.B. Schreiber, and N. Visscher. Overall Experience Rating - Measuring Visitor Response in Museums. *Curator: The Museum Journal* 61(2): 1-13.

Incorporating Experts' Narratives into STEM Inquiry Programs: Assessing Family Learning

Sue Allen, Maine Mathematics and Science Alliance
Christina Cid, High Desert Museum of Oregon
Catherine Haden, Loyola University
Kimberly Sheridan, George Mason University

Panel Presentation

Purpose:

This session brings together the awardees from IMLS's "STEMeX" program, now in its final stages, to share their different perspectives on assessing learning in STEM programs in museums and libraries. All

Visitor Studies Association - 2019 Conference Abstracts

of the projects featured in-depth studies of learning during family programs where local STEM experts provided personal narratives to enrich the inquiry of families with children aged 6-10. We will share insights and facilitate an audience discussion of applications to research, evaluation, and practice.

Abstract: Background:

In 2016, IMLS created a special research initiative named “STEMeX” (STEM Expert Facilitation of Family Learning in Libraries and Museums). Awards were made to four universities and museums, three of whom will share their work at the session. All awardees were required by the solicitation to study the learning of 6-10 year olds and their families during informal STEM learning experiences in museums and libraries. Specifically, the experiences had to involve hands-on inquiry that also incorporated personal narratives by local STEM experts.

A practitioner's perspective:

Christina Cid led the project team at the High Desert Museum in Oregon. The Museum collaborated with partners to explore the impact of experts’ use of storytelling and object-based inquiry on rural families’ STEM learning talk, understanding of the nature of science, engagement and attitudes. “Stories” included both experts’ personal stories and ones about scientific processes. The project team created a process to help experts deliver stories in a way to support the families’ understanding of and engagement in STEM. Tangible products from the work include resources to guide the development of programs with STEM professionals and tips on facilitation of STEM programs for young children.

The evaluator's perspective:

Evaluators Sue Allen and Scott Byrd studied the challenges reported by the four awardees as they constructed the programs, and the range of decisions they made to address them. Common challenges across the projects included: recruiting STEM experts who had (or could quickly develop) the skills to run a successful program; finding an inquiry activity that would engage parents and children in a discussion-rich collaboration; and finding ways to integrate narrative into object-based inquiry without being totally overshadowed by it. These decisions are summarized using several different representations.

A research perspective:

Catherine Haden led the research team from Loyola University in Chicago, collaborating with the Chicago Children’s Museum. In a key data-collection advance, the team developed inexpensive head-mounted cameras (“cap-cams”) that children could wear during the programs so that the researchers could easily see the family activities and interactions, and connect these with what the experts were doing and saying. The team found that when experts’ narratives were “engineering-rich” (conveying information about aspects of the engineering design process), more families discussed the engineering design process as they worked on their activities, and children’s post-program self-reports about their learning included higher levels of engineering content.

An alternative research perspective:

Kimberly Sheridan’s research team at George Mason University studied 24 culturally and socioeconomically diverse families engaging in and reflecting on hands-on engineering / making experiences. This team focused on the ways parents shaped their children’s access to STEM learning, providing access to STEM activities and influencing their attitudes and aspirations. Parents were often core to how children come to see STEM as a “thinkable” area of participation for their present and future selves (Archer et al., 2012). The researchers identified moments of “re-evaluation” (Blikstein, 2013): moment-by-moment shifts in participants’ conception of making and STEM that revealed STEM “thinkability” to be a highly dynamic construct.

Visitor Studies Association - 2019 Conference Abstracts

Importance: This session will highlight new research findings from the ever-important area of family learning in informal settings. Second, in an era of increasing interest in partnership-building within learning ecosystems, the session will highlight some of the specific challenges and benefits of bringing local STEM experts into museums and libraries to enrich their programs. Lastly, in keeping with the conference theme, the session will highlight several fresh approaches to assessing and representing learning, drawing from theoretical as well as practical approaches. These projects are particularly interesting as a set, because despite responding to a very tightly-constrained RFP, they created quite different programs and approaches to research.

References:

Archer, L., DeWitt, J., Osborne, J., Dillon, J., Willis, B., & Wong, B. (2012). Science aspirations, capital, and family habitus: How families shape children's engagement and identification with science. *American Educational Research Journal*, 49, 881-908.

Blikstein, P. (2013). Digital fabrication and "making" in education: The democratization of invention. In J. Walter-Herrmann & C. Buching (Eds.), *FabLabs: Of machines, makers and inventors*. Bielefeld, Germany: Transcript.

Additional Resources:

<https://www.ims.gov/news-events/news-releases/ims-announces-22-million-new-stemex-grant-initiative>

Ways of Knowing Detroit: Evaluation in the Motor City

Kate Livingston, ExposeYourMuseum LLC
Tracey Williams, Charles H. Wright Museum of African American History
Diane Miller, Detroit Zoological Society
Kenneth Morris, Detroit Institute of Arts
Ruth Bergman, Holocaust Memorial Center

Panel Presentation

Purpose: This talk-show style session features four Detroit-area cultural institutions sharing and discussing what is happening in local museum evaluation, where evaluation capacity is growing and needed, and considering the future through multiple perspectives and lenses. Participants will learn about the history, past and current developments, and visitor studies contributions of three major Detroit-area cultural institutions. Participants will learn about how evaluation has (and has not) been integrated and embedded in three very different informal learning institutions in the Detroit area, including how these efforts fit within organizational priorities, strategies, initiatives, management, and administration. Participants will learn about how three major Detroit-area institutions are committed to the pursuit, dissemination, and critical assessment of visitor studies, including how attendance at the VSA 2019 conference and presence on this panel together are vehicles to support the continued development of visitor research and evaluation.

Abstract: Detroit's motto is "Speramus meliora; resurgente cineribus," which translates to "We hope for better things; it shall arise from the ashes." As you will no doubt see everywhere you look in Detroit, the city is rising. Detroit is known for its grit, its endurance, its innovation, its hustle, and of course its cars,

Visitor Studies Association - 2019 Conference Abstracts

art, and music--but it's also a growing hub for visitor studies. Four panelists from a range of Detroit-area cultural institutions will come together in this talk-show style session format to share and discuss with VSA attendees what is happening in local museum evaluation, where evaluation capacity is growing and needed, and to consider the future through multiple perspectives and lenses.

The panel will be facilitated and moderated by Kate Livingston (ExposeYourMuseum), a former Detroiter and the lead on two Institute of Museum and Library Services "Museums Empowered" grants to build evaluation capacity in museum staffs in Michigan. As the panelists and moderator came together to discuss the possibilities for this session, we agreed that it is always fascinating to learn from locals about what is happening in the conference's host city. We also agreed it would be crucial to involve both evaluators and non-evaluators from diverse institutions and from various roles and responsibilities. As such, the panel includes the Chief Program Officer from the Detroit Zoological Society, Diane Miller, the Director of Research and Evaluation from the Detroit Institute of Arts, Kenneth Morris, the Director of Education, Ruth Bergman, from the Holocaust Memorial Center, and the Guest Services and SRO Director from the Charles H. Wright Museum of African American History, Tracey Williams, who also manages the Wright Museum's IMLS evaluation capacity building grant.

Discussion questions posed to the panelists have been informed by the conference theme for 2019-- Ways of Knowing-- and may include:

- 1) Describe Detroit through the lens of a visitor to your institution--and through the lens of a non-visitor. How about through your own lens?
- 2) How can we conduct studies that honor stakeholders' needs and perspectives while also informing our institutional or field-wide questions?
- 3) What counts as research, evaluation, or evaluative thinking in your institution-- and who engages in the work? In what ways do we perpetuate bias through the ways we describe "evaluation"?
- 4) How might evaluators and non-evaluator museum practitioners see visitor studies differently, and what can we learn from each other?
- 5) How can evaluation support--and, in contrast, limit--access, equity, and inclusion?
- 6) What are the unique opportunities that exist for visitor studies in your institution--and across Detroit?
- 7) Where do you see the greatest need for evaluation capacity building--locally and beyond?

The panelists also want to leverage sharing a stage together and will pose questions to one another. Additionally, attendee participation will be welcomed and encouraged. The session will begin with a light-hearted exploration of what questions VSA attendees have about Detroit and will conclude with Q&A.

Importance: We travel to vibrant cities all across the country--and some attendees come from all across the globe--to the Visitor Studies Association annual conference. Each city holds its own stories, history, potential, and promise when it comes to the work of audience research and evaluation and it is both inspiring and essential to highlight what is happening locally.

Additional Resources:

Panelists' Museums and Organizations:

Charles H. Wright Museum of African American History:

<https://thewright.org/>

Detroit Institute of Arts:

Visitor Studies Association - 2019 Conference Abstracts

<https://www.dia.org/>

Holocaust Memorial Center (in Farmington Hills, MI):

<https://www.holocaustcenter.org/>

Detroit Zoo (in Royal Oak, MI):

<https://detroitzoo.org/>

The panelists encourage you to visit these rich and varied institutions while in Detroit.

Session Chair's Webpage:

<http://exposeyourmuseum.com/>

CT without the Screen: Measuring Computational Thinking in Informal Education

Megan Goeke, Science Museum of Minnesota

Gretchen Haupt, Science Museum of Minnesota

Rachel Becker-Klein, Two Roads Consulting

Purpose: This roundtable aims to further our understanding of how Computational Thinking (CT) can be conceptualized and assessed in informal education spaces by:

- Considering how evaluators and researchers are currently conceptualizing the constructs of CT;
- Exploring how CT may be adapted for (or already present) in exhibits, programs, and other experiences.
- Discussing the challenges and successes of developing a measure for CT skills or attitudes that may or may not be tied to a specific program

Abstract: While CT is defined in many ways, it is essentially a set of problem-solving methods leading to a solution that could be executed by a computer. At the Science Museum of Minnesota (SMM), we have been utilizing a framework in which CT is defined as problem-solving with decomposition, pattern recognition, abstraction, and algorithmic design (Rob-Bot Resources, 2018). Other models include dispositions or attitudes such as persistence and tolerance for ambiguity (ISTE & CSTA, 2011), the practice of debugging (Brennan & Resnick, 2012), or creativity (Korkmaz, Çakir, & Özden, 2017). We recognize that others in the Visitor Studies and informal education field may be working with different definitions of CT or measuring similar constructs without calling them CT; we welcome that multitude of perspectives to the roundtable.

Using SMM's CT measurements developed to evaluate a museum-school partnership for CT curriculum and other existing CT measurement tools as a starting point, participants will engage in conversation and build upon current CT definitions and measurement tools, all of which will be documented in a Google doc that can be shared with the wider VSA community.

During the roundtable, participants can expect to first consider existing computational thinking definitions through a crash course in what has emerged in the broad education field. All participants will receive a handout including the CT frameworks/definitions reviewed and a list of additional resources and references.

Visitor Studies Association - 2019 Conference Abstracts

Additionally, the presenters will share their experiences (challenges and successes) of developing CT measurement tools before moving into discussion about:

- What aspects of how CT is conceptualized limit or increase its applicability in informal education settings?
- How, if at all, are museum and informal education evaluators/researchers measuring CT in their programs and spaces?
- How can we approach CT in “unplugged” settings, including many exhibits and maker programs?
- Other lines of inquiry generated by participants.

Importance: Computational Thinking (CT) is gaining momentum in the formal education world as a way to prepare students for careers and a world increasingly dependent on computers and technology. As museums often follow trends in formal education, it is important for informal education institutions to begin developing models and tools for understanding CT in our own settings now in order to meet the need when it arrives.

As the vast majority of CT definitions and models come from formal education programs and are not fully compatible with the realities of informal education, particularly the “unplugged” or non-computer mediated nature of many experiences, this roundtable aims to further our understanding of how CT can be conceptualized and assessed in informal education spaces.

References:

Brennan, K., & Resnick, M. (2012). *Using artifact-based interviews to study the development of computational thinking in interactive media design*. Paper presented at annual American Educational Research Association meeting, Vancouver, BC, Canada.

https://web.media.mit.edu/~kbrennan/files/Brennan_Resnick_AERA2012_CT.pdf

International Society for Technology in Education (ISTE) & Computer Science Teachers Association (CSTA). (2011). *Operational Definition of Computational Thinking for K-12 Education*.

<http://www.iste.org/docs/ct-documents/computational-thinking-operational-definition-flyer.pdf>

Korkmaz, Ö., Çakir, R., & Özden, Y. (2017). A validity and reliability study of the Computational Thinking Scales (CTS). *Computers in Human Behavior*. DOI: 10.1016/j.chb.2017.01.005

Rob-Bot Resources. (2018). What is Computational Thinking? <https://robotresources.com/new-blog/2018/11/3/what-is-computational-thinking>

What Do You Do Again? Framing Evaluation for Museum Staff

Sara Davis, Saint Louis Science Center
Sena Dawes, Missouri Historical Society
Fran Mast, John G. Shedd Aquarium

Roundtable Discussion

Purpose: The goal of this session is to have participants: 1) hear how internal evaluators at three different types of institutions communicate about evaluation to other staff and 2) to collaborate on recommendations and strategies for communicating evaluation in an interesting way. The main

Visitor Studies Association - 2019 Conference Abstracts

takeaway of the session is to learn what evaluation topics are easily shareable and what content others have found challenging to communicate.

Abstract: Internal evaluators have unique relationships with their institutions. How the evaluation department is situated in the organization and its tenure can shape these relationships and affect communication. At the Saint Louis Science Center, evaluation has been around for more than 25 years, and there is a need for shifting perspectives of evaluation from a slow, check-the-box process to something more dynamic. The Missouri Historical Society hired their first internal evaluator almost three years ago; her communication has focused on introducing internally-led evaluation and positioning a budding department to be of value. Shedd Aquarium's Research & Evaluation department, which had already integrated evaluation into internal processes, just recently restructured, which has meant engaging new stakeholders and reintroducing themselves to existing stakeholders and evaluation champions. These examples demonstrate maintenance, starts, and shifts of views of evaluation among staff. We would also like to gain the perspective of other internal and external evaluators to help shape how we talk about evaluation to museum staff: Is there a general theme that all should share, or is it specific to the culture?

Importance: Communication is a never-ending challenge for all. For the internal evaluator, what you communicate depends on the culture of evaluation in your organization. Even the tenure of an evaluation departments can affect staff perspective on the role of evaluation in their work. Thus it is important to learn from one another and get examples of how to communicate with staff. What are key evaluation topics to share? What has worked for your organization? How do you want evaluation to be framed in your institution? What general communication techniques would help you discuss evaluation?

References:

American Evaluation Association. (n.d.). Retrieved May 2019 from <https://www.eval.org/p2i>

King, J. & Stevahn, L. (2013). *Interactive evaluation practice: Mastering the interpersonal dynamics of program evaluation*. Thousand Oaks, CA: Sage Publications, Inc.

Lahey, J. (Jan. 8, 2013). *How to Use the 1-3-3 Message Map to Make an Impact*. Retrieved from <https://www.engagingleader.com/using-the-1-3-3-message-map-for-leadership-presence-and-impact-video/>

Additional Resources:

www.slsc.org/openingmindstoscience2017

<https://mohistory.org/society>

<https://www.sheddaquarium.org/>

Friday, July 12

10:15-11:30 AM - Concurrent Sessions

Studying Visitors' Exhibition Experiences in an Immersive Virtual Environment

Palmyre Pierroux, University of Oslo

Rolf Steier, University of Oslo

Visitor Studies Association - 2019 Conference Abstracts

Anne Qvale, National Museum of Art, Architecture and Design

Individual Paper

Purpose: From a visitor studies perspective, one challenge in studying visitors' 3D virtual reality experiences in museum exhibitions has been the need for an evaluation framework that productively integrates findings from specialized technology-related studies of VR with "outcomes" research, defined as "changes in visitor behavior, skills, knowledge, attitudes, values, or condition after participating in a learning activity or experience." We present how this challenge was addressed in a study of visitors' experiences in a virtual-physical environment designed for an architecture museum 'exhibition experiment.'

The research design was collaboratively developed by an interdisciplinary team: two museum curators, a small team of architects, a VR designer, a soundscape expert, and two learning researchers. Based on this collaboration, three topic areas were identified and serve as analytical lens for the evaluation framework: 1) Technical quality, precision and equipment, 2) Designing digital architectural experiences for museum exhibitions and 3) Meaning making in VR architecture exhibitions.

Abstract: Methodological approach

The research was driven by shared interests in how virtual reality environments may be designed to foster visitors' experiential knowledge and new understandings of architecture in architecture museum exhibitions, which more typically rely on display analogue objects like models, drawings, and perhaps screens. The architect's concept for the virtual experience was to inspire visitors to think about how spaces formed in nature may be similarly experienced in architecture, heightening visitors' awareness of the body's dimensions and functions as one moves through a full-scale 'blended' virtual/physical environment (Pierroux, Steier & Sauge, 2019).

In planning the empirical studies of visitors' experiences in the exhibition experiment, 3-4 key research questions were formulated by the curators, the learning scientists, and the experts in sound and VR environments design, respectively. These research questions informed the design of the data collection, which comprises four different data types. First, 19 pairs of recruited visitors of different ages, gender, and with different levels of expertise in architecture were video recorded as they engaged with the exhibition and participated in pre-post interviews. Recordings of each visitors' VR experience, what they 'saw and heard' in the virtual environment, supplement the video recordings of their interactions in the exhibit. Following a week of studies with recruited visitors, the exhibition experiment was open to the public for three weeks. Directly after participating in the exhibition, non-recruited visitors were invited to complete a questionnaire available on a tablet at the gallery exit. The questionnaire consisted of 22 questions that addressed the three topic areas in the evaluation framework. Although not obligatory, the 287 questionnaire responses neared the total number of visitors, showing a high level of engagement in the 'experiment' aspect of the exhibition. In addition, 82 visitors consented to exit interviews specifically focused on the soundscape experience. The data corpus allowed us to study the visitors' movements and embodied sensory experiences (e.g. perception, listening and touch) of fundamental architectural qualities (e.g., space, acoustics, light and materiality), with a particular focus on experiential, social and performative aspects of their interactions with each other and the virtual and physical objects in the installation.

Data for different analytical lenses

Visitor Studies Association - 2019 Conference Abstracts

In keeping with the methodological focus of this paper, the four data types are discussed in terms of how they are used to address the different topics. 1) Technical quality, precision and equipment; this lens uses the data to explore the types of complexity needed in sound and representational material to create more immersive, comfortable, and safe experiences. 2) Designing digital architectural experiences for museum exhibitions; This lens uses the data to focus on how architects and museum curators can include the future in virtual designs, to open for new understandings and time-space experiences of contemporary architecture in an exhibition setting. 3) Meaning making in VR architecture exhibitions; this lens uses the data to explore how meaning and co-presence were constructed and performed by visitors, and to identify the behaviors, skills and knowledge involved in interpreting the architectural experience

Importance: The analytic lenses reflect the diverse interests and expertise that comprise the multidisciplinary research team. By systematically collecting multiple coordinated forms of data, we are able to both address these diverse interests, but also capture the richness of multisensory immersive VR experiences along with the implications for exhibition design. The research study is thus designed to reflect the 'multiple ways of knowing' that are central to museum, research, and design practices. As immersive and digital physical experiences become more sophisticated, more attention will be needed to such collaborative and mutually beneficial research initiatives. relevance to VSA members and the field.

References:

Carpó, M. (Ed.). (2013) *The Digital Turn in Architecture 1992-2012*, AD Reader. West Sussex: Wiley.

Pierroux, P., Steier, R., and Sauge, B. (2019) Born Digital Architectural Projects: Imagining, Designing and Exhibiting Practices. In Å. Mäkitalo, T. Nicewonger & M. Elam (Eds.), *Designs for Experimentation and Inquiry: Approaching Learning and Knowing in Digital Transformation* (pp. 87-109). London: Routledge.

Additional Resources:

The Forest in the House exhibition experiment was part of the Cultural Heritage Mediascapes project at the University of Oslo, financed by the Research Council of Norway.

http://www.nasjonalmuseet.no/en/exhibitions_and_events/exhibitions/national_museum_architecture/The+Forest+in+the+House.+Exploring+parallel+realities.b7C_wJHUYO.ips

<https://www.uv.uio.no/iped/english/research/projects/mediascapes/>

Designing and Evaluating Soundscapes in Virtual Reality Exhibitions

Joran Rudi, Norwegian Center for Technology in Music and the Arts (NOTAM)

Individual Paper

Purpose: A study of sound in VR for museum exhibitions

This paper presents a study of visitor experiences of the sound design for a Virtual Reality (VR) exhibit in an architecture museum. VR is an immersive technology where users experience their avatar in electronically generated 3D environments, and inclusion of audio must extend beyond common stereo playback in order to maintain the illusion. This entails sound processing for accurate (3D) sound representation and movement as visitors interact with the model. A secondary aim of this research was to gain knowledge about how sound can contribute to the design of museum VR exhibitions.

Visitor Studies Association - 2019 Conference Abstracts

Two techniques for immersive sound were tested in combination to better understand issues of complexity in both the construction of soundscapes and the quality requirements of different delivery methods. The design approach was employed in a less-than-optimal exhibition space, focusing on the visitor experience rather than the technical solutions. The study found that a credible near-field solution for sound can compensate for lack of acoustic clarity in the exhibition space.

Abstract: The exhibition design

Audio is generally underused in exhibition practices (Bubaris 2014) and not much discussed in visitor studies literature, thus the construction of the project soundscapes were made with a basis in the understanding of what soundscapes are, and how listening plays a role in perception of presence, in the soundscape literature (Schafer1978, Rudi 2013).

Signal processing methods were used for creating correct acoustics for the virtual environments, to craft sound trajectories in near-field and further away, and to create the perception of distances and directions. A playback engine for controllable semi-random playback was also constructed for creating an overall credible sound distribution along the time axis.

The signal processing methods that were used for increasing the visitors' sense of presence were essential for crafting the basis for experience, although technical aspects were not highlighted in our project as they typically are in acoustic research. Further, our "middle ground" technical descriptions have been related to the practical production of soundscapes rather than a more general discussion of technical possibilities and affordances. The key orientation of the exhibition design aimed for gaining knowledge on whether sound could be an attractive and efficient tool for increasing engagement and sense of presence in museum exhibitions of architecture.

Video recordings, questionnaires and interviews with visitors formed the data corpus in the project, and in particular 82 structured interviews on sound experience gave important information. The questions about sound were grouped in three: 1) Relevance and meaning of the inclusion of sound, 2) Credibility of the soundscapes, and 3) Perceived technical quality of the delivery methods. The responses and interview data have been summarized, and the general reactions to sound and the suitability of including sound in virtual reality exhibition designs are almost unanimously positive. Furthermore, a large majority of visitors thought of sound as contributing crucially to the perceived sense of presence and "being there." The conscious listening necessary to remember detail from the complex soundscapes (sound types, amplitudes, movement, directions and distances) was however very low, showing that hearing works the same in VR as in normal physical acoustic situations. The hearing pays little attention when soundscapes are predictable and conform with listener expectations, and active listening is triggered by surprise and discord when sound carries information of unusual events. Understanding hearing and listening from a psychoacoustic perspective is useful for creating exhibition soundscapes.

VR is a 3D technique, and use of 3D sound rendering was expected to increase the feeling of "being there." The responses confirm that 3D sound techniques in exhibition can be effective for creating a sense of credible immersion even with simplified delivery techniques and severe challenges posed by building acoustics. Thus, perceived relevance of the soundscapes seem to depend more on cognitive resonance than optimal technical quality, suggesting that a combination of headset and loudspeakers for delivery of sound to intimate and public sphere respectively can be a successful method for broader inclusion of sound into spaces that are acoustically suboptimal.

Visitor Studies Association - 2019 Conference Abstracts

Importance: New media technologies for interactive approaches are making inroads into museum practices, highlighting digital representations and complex cross-media narratives. This new scenario also draws attention to the general incorporation of sound and in particular the advances in sound representation and rendering that have become commonplace in music and other audio arts.

For successful incorporation of these new approaches and techniques in exhibitions and learning environments, it is necessary to better understand their requirements and limitations in these new contexts which are often less than optimal from an acoustic perspective.

The main contribution regarding sound from the project *The Forest in the House* is a confirmation that suboptimal conditions can be successfully addressed with a combination of methods, as long as the material itself supports a sense of realism and expectation, and psychoacoustic aspects are taken into consideration. This insight might ease incorporation of audio in museum mediation with insufficient budgets for building optimal acoustics.

References:

Bubaris, Nikos (2014) "Sound in museums - museums in sound." In *Museum Management and Curatorship*, 29:4, 391-402.

Rudi, Jøran. (2013). *Soundscape as a social construct*, Paper at EMS-network conference. Lisbon, June 20, 2013.

<http://users.notam02.no/~joranru//mediefiler/Soundscape%20as%20a%20Social%20Construct.pdf>

Visited April 28, 2019.

Schafer, Murray R. (1977). *The Tuning of the World*. New York: Random House.

Appreciative Inquiry - A Tool for Community Engagement and Evaluation Strategy for Organizational Change

Maritza Hernandez-Bravo, Denver Museum of Nature & Science
Amanda Trosten-Bloom, Rocky Mountain Center for Positive Change
Rebecca Teasdale, Garibay Group

Panel Presentation

Purpose: In this workshop, we will provide an experiential introduction to Appreciative Inquiry (AI): a radically inclusive, purposefully positive approach to organizational and community change. Participants will gain a working understanding and tools for applying the AI process as a community engagement strategy and as an evaluation strategy for organizational change.

Abstract: In this workshop, we will provide an experiential introduction to Appreciative Inquiry (AI): a radically inclusive, purposefully positive approach to organizational and community change. Following a brief overview of AI (what it is, where and how it works), participants will experience one of the foundational practices of AI: the one-on-one appreciative interview. They will hear how these questions were generated for the Denver Museum of Nature & Science (DMNS) by its Community Collaboration Project "core team." They will see how Appreciative Inquiry expanded DMNS' understanding of what is and what might be by changing who talked with whom and what they talked about.

Visitor Studies Association - 2019 Conference Abstracts

In the first case example, appreciative inquiry was used as a tool to create meaningful community engagement at the Denver Museum of Nature & Science with the Denver Metro community called the Community Collaboration Project (“CCP”). A core team of community members and museum staff formed a team that focused on meeting with underserved groups across Denver to ask about their most memorable experiences and enjoyment of nature and science. First, the CCP forged positive partnerships with several of the Museum’s underrepresented, underserved communities. In following the AI asset based approach, it surfaced innovative ideas for future programs and services; and enhanced the skills and mindset of current and future staff members.

After getting out into various communities the CCP Team came back together to make meaning of all that we had heard. We did this by learning to “listen for values.” The Museum then hosted a culminating summit for the project. We invited back community members we had originally connected with to hear, first hand, if what we had learned over the past 6 months resonated. We spent a day together crafting the guide posts for a new mission statement and an organizational document outlining the community values.

The AI approach aided in authentically respecting and valuing different ways of knowing and putting community voice at the forefront. This work was a transformational process that helped propel a cultural shift within the organization to be more community centered and operationalize what was heard from communities into our daily work.

In the second case example, AI was used to frame the evaluation of a professional development (PD) initiative for informal educators. PD activities were implemented cyclically in three developing countries in different regions of the world: Armenia, Myanmar, and Namibia. The trainers and evaluator were U.S. white women. Given the differences in power and culture, AI was selected as a strengths-based approach that surfaces and values multiple perspectives on a program and fosters positive change. Data collection focused on informal educators identifying the experiences they found most beneficial in the PD initiative and envisioning future PD that built on those strengths. Drawing on these data, the evaluator and trainers collaborated over three program cycles to identify strategies for improvement. Rather than focusing on critical feedback, AI enabled the evaluator to identify the experiences participants found most beneficial and use those findings to create and support positive change.

Importance: The question of “knowing” at the heart of this year’s VSA conference is central to the topic of this workshop. Appreciative Inquiry surfaces often untold stories of success, igniting hope and accelerating capacity for change by engaging the “whole system” – often including those on the margins – in discovering, dreaming and designing organizations and ways of working that reflect and honor “the whole.” Since its inception in the early ‘80s, it has been used for action research, community engagement, process improvement, culture transformation and more.

References:

Whitney, D. and Trosten-Bloom, A. (2010) *The Power of Appreciative Inquiry: A Practice Guide to Positive Change*. San Francisco: Berrett-Koehler Publishers.

Coghlan, A.T., Preskill, H., & Catsambas, T. T. (2003). An overview of appreciative inquiry in evaluation. *New Directions for Evaluation* 100, 3-22.

Preskill, H., & Catsambas, T. T. (2006). *Reframing evaluation through appreciative inquiry*. Thousand Oaks, CA: SAGE.

From Private to Public: Understanding Visitors' Perceptions of Pro-environmental Behaviors

Nadya Bennett, Columbus Zoo and Aquarium
Jennifer Rigney, Monterey Bay Aquarium
Erin Cote, University of Washington Museology Program
Maia Werner-Avidon, MWA Insights

Panel Presentation

Purpose: Museums, zoos and aquariums often message about social or environmental problems and suggest actions their audiences can take to help. For any given problem, there are a range of possible solutions organizations might offer their audiences from the private (e.g., recycling) to the public sphere (e.g., voting). Although we have many tools to help us move our audiences to action, many of those tools focus on action at the private sphere level. However, there's a lack of understanding about how the public perceives our specific calls to action (Truelove & Gillis, 2018) and how to move them beyond private sphere action (Amel et al., 2017). Thus, the goal of the current session is to raise questions about some of these gaps and explore ways three institutions have attempted to address them.

Abstract: This panel will discuss efforts made by three different organizations to better understand audience engagement with a range of calls to action—household, consumer, social and public. Building on the conference theme, Ways of Knowing, the panel will also compare and contrast the different methods used to engage visitors in these topics and understand their beliefs about or willingness to perform these actions—particularly those beyond small, individual-type behaviors. Although many environmental and other large-scale problems ultimately require systems change, we first need to understand how our audiences even understand different types of environmental action, their histories of engagement and perceived barriers to acting and whether they feel it's appropriate for our organizations to message about certain types of action.

Introduction

The moderator will introduce the session by discussing gaps in our understanding of how visitors perceive specific conservation actions as well as research on dominant mental models held by the mainstream American public around conservation action.

Case Study 1: Columbus Zoo and Aquarium

Nadya Bennett will discuss a collaborative study between Columbus Zoo and the North American Bird Conservation Initiative to explore guests' understanding of the conservation issues facing migratory birds, their relevance to the larger well-being of the environment and their perception of possible actions to take to support migratory bird conservation. The primary goal of this project is to develop a set of realistic, adoptable actions in support of conservation efforts surrounding the challenges faced by migratory birds along their seasonal flight paths.

Case Study 2: Woodland Park Zoo and University of Washington Museology

Erin Cote will discuss a collaborative study between Woodland Park Zoo (WPZ) and the University of Washington's graduate program in Museology. One of WPZ's current priorities is empowering zoo audiences to engage in social action in support of conservation and wildlife. Erin will present results from a study exploring how the public responds to advocacy actions for wildlife promoted by Woodland

Visitor Studies Association - 2019 Conference Abstracts

Park Zoo, the influence of psychographics and demographics on their response, and how this promotion affects the public's support of the Zoo.

Case Study 3: Monterey Bay Aquarium

Maia Werner-Avidon will discuss a study she conducted in partnership with The Monterey Bay Aquarium looking at visitors' awareness of and engagement with conservation-related actions and messaging. Visitors had a strong preference for actions they perceived they could do on their own. In contrast, visitors perceived many barriers to community-oriented actions. This finding exposes a conflict between the types of actions people are likely to engage in and the type of action necessary to solve large-scale environmental problems. The Aquarium is using these findings to explore ways that it can work to change visitors' perceptions of community-oriented actions and help them gain comfort with taking them on.

Discussion

The moderator will synthesize takeaways from the three evaluation studies, suggest direction for future evaluation and pose questions to the presenters and the audience.

Importance: Although museums, zoos and aquarium have many tools to draw from for inspiring visitors to take action, it's important for these institutions to understand visitor perceptions of their specific calls to action. In their review of the conservation psychology literature, Truelove & Gillis (2018) note that strategies for fostering pro-environmental behavior are often based on experts' characterizations of those behaviors and may be doomed to fail because they don't account for how "laypeople" actually view those behaviors. Additionally, Amel et al., (2017) argue that the time has come to move beyond a focus on private sphere behavior to better understanding how to foster collective action. The studies presented in this session represent a start towards addressing these gaps within our own institutional practices.

References: Amel, E., Manning, C., Scott, B. Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(April), 275–279.

<https://doi.org/10.1017/S0376892900018178>

Truelove, H. B., & Gillis, A. J. (2018). Perception of pro-environmental behavior. *Global Environmental Change*, 49(July 2017), 175–185. <https://doi.org/10.1016/j.gloenvcha.2018.02.009>

Werner-Avidon, M. (2018). *Monterey Bay Aquarium Conservation Messages Front-End Evaluation Report*. Unpublished Internal Document. <https://www.informalscience.org/monterey-bay-aquarium-conservation-messages-front-end-evaluation-report>

Come Together! Successes and Challenges of Building and Sustaining Networks

Nicole Reed, Woodland Park Zoo

Kari Nelson, Thanksgiving Point

Claire Thoma Emmons, The Children's Museum of Indianapolis

Nick Visscher, Denver Zoo

Alexander Lussenhop, Museum of Science, Boston

Panel Presentation

Visitor Studies Association - 2019 Conference Abstracts

Purpose: The purpose of this session is to discuss various aspects of building and sustaining professional networks. Typically, the critical points in the life cycle of networks are 1) building them, and 2) sustaining them if/when funding changes. The reality of networks is that developing tools, doing research, and working together requires resources of time and money. Panelists will share their experiences of participating in a diverse group of learning, research, and evaluation networks and discuss successes and challenges around building and sustaining these professional networks of various sizes, purposes, and compositions. It will also provide attendees the opportunity to share their own experiences with professional networks and help to identify potential solutions to shared challenges.

Abstract: This session will focus on the development and sustainability of professional networks. Panelists will discuss the decision making process and unique considerations that went into creating and sustaining each network. Panelists will share successful strategies, challenges, and potential solutions based on experiences with different types of learning, evaluation, and research networks. This will provide insight into the multiple aspects of developing networks depending on purpose, audience, and overall goals.

Nicole Reed will introduce a new learning network built around empathy best practices in programming and measurement. This learning network involves 19 AZA accredited zoos and aquariums and is funded through an anonymous source. Currently, the network is in the beginning stages of formation, with needs assessments completed for the 19 institutions. Moving forward, the goal is to provide resources and training to each site around incorporating empathy best practices and to support a shared space of resources and tools.

Kari Nelson will speak about the Children's Museum Research Network (CMRN), a group of researchers and evaluators from 15 children's museums who have completed four collaborative studies. The CMRN was initially funded through an IMLS grant for the purpose of conducting field-wide research that would answer questions about the learning value of children's museums posed in the Children's Museum Research Agenda.

Claire Thoma Emmons will share experiences from the Indianapolis Consortium of Audience Research & Evaluation (ICARE). ICARE is a local group of evaluators that has never had external funding and includes members from art, children's, and history museums, a zoo, and independent consultants. The group has been a community of practice for over 5 years, and successfully completed a collaborative project in 2018.

Nick Visscher will share reflections from participation in the Denver Evaluation Network (DEN). Initially funded by an IMLS grant in 2012, DEN continues to meet today and serves the purpose of connecting museum professionals in the Denver/Mountain-Plains region to build evaluation capacity. DEN originally had a formal structure which required regular meeting attendance and participation in collaborative evaluation studies. Now, four years after grant-funding has ended, DEN continues in a more informal capacity.

Alex Lussenhop will share experiences from the Collaboration for Ongoing Visitor Experience Studies (COVES). COVES is a group of North American museums who use a shared survey instrument to collect visitor experience data which can then be aggregated and compared. COVES is currently a member-supported entity housed within the Museum of Science, Boston, two IMLS grants went into its formation.

Visitor Studies Association - 2019 Conference Abstracts

Panelists will encourage open discussion with attendees who have experience with other networks to share additional successful strategies and possible solutions to common challenges raised to introduce an even broader diversity of perspectives around professional networks. Discussion will provide real world examples of professional network building strategies for those interested in building a specific network as well as provide insight into the inner workings of a professional network for those who may want to get involved in a network in their region or with one of the ones presented.

Importance: This session will reflect on our multidisciplinary practices and continue to contribute to a shared domain of scholarship. Additionally, attendees will gain knowledge of practical implications, processes, successful strategies and challenges related to building professional networks; and deepen their understanding of challenges and potential solutions related to sustaining professional networks over time. A collection of strategies for overcoming common challenges will be generated from the panelists and attendees and made public after the conference as a useful idea list for those thinking of starting a network, those currently trying to build a network, and for members of networks encountering challenges to long-term sustainability. These learnings will be useful for anyone interested in building or participating in a professional network.

Additional Resources:

<https://www.zoo.org/empathy>

<http://childrensmuseums.org/members/community-conversations/cmrn?highlight=WyJyZXNlYXJjaClslm5ldHdvcmsiLCJuZXR3b3JrJ3MiLCJyZXNlYXJjaCBuZXR3b3JrIl0=>

Trainer, Steel-Inama, and Christopher. 2012. Uncovering Visitor Identity – A Citywide Utilization of the Falk Visitor-Identity Model. *Journal of Museum Education*. 31(1) pp104-114.

<http://www.understandingvisitors.org/>

<https://www.informalscience.org/creating-collaboration-ongoing-visitor-experience-studies-c-coves-white-paper>

<https://www.informalscience.org/understanding-our-visitors-fy18-coves-report>

<https://www.informalscience.org/coves-summative-evaluation-findings>

Listen up! Kids' STEM-Focused Podcasts as Promising Family Learning Experiences

Amy Grack Nelson, Science Museum of Minnesota

Individual Paper

Purpose: Very little is known about the use and resulting educational value of children's STEM podcasts. This paper will share emerging findings from a NSF-funded exploratory research project of American Public Media's STEM podcast for kids, Brains On! The project is framed by three overarching research questions that will begin to create knowledge not only for the Brains On! team but other developers, evaluators, and researchers of children's STEM podcasts and the informal STEM education field at large:

Visitor Studies Association - 2019 Conference Abstracts

1) Who is the audience for Brains On! and what are their motivations for listening? 2) How are Brains On! listeners using the podcast and engaging with its content? 3) What kinds of impacts does Brains On! have on its audiences? Attendees will gain insight into what the research has uncovered in relation to these three research questions and what questions remain for future areas of inquiry.

Abstract: A three phase mixed-methods exploratory research study is being carried out to address the research questions. In Phase 1, we reviewed secondary data sourced from comments audiences provided through social media sites, iTunes reviews, Minnesota Public Radio and Brains On! donor comments, and a sample of emails and mail sent to Brains On!. In Phase 2, we conducted an online survey of Brains On! listeners, with a focus on understanding Brains On!'s core audience of kids ages 5 - 12. A total of 735 adults completed the survey about a child listener in their household. In Phase 3, we conducted interviews with children (and their parents/guardians) from the core audience. We interviewed a total of 63 children from 47 family groups.

Findings

Below are summaries of some of the findings emerging from our research. The presentation will go into more detail of these and additional research findings.

The Brains On! listening audience lacks diversity, with 80% of child listeners identifying as white and 58% identifying as male. Additionally, core audience members tend to come from households that are highly-educated (63% have a graduate degree), have a household income of \$100,000 or more (60% of households), are public radio listeners (92% of households have an adult who has listened in the last 30 days), and have an adult working in a STEM field (62% of households).

Almost all children in the core audience (98%) have listened with a group that includes at least one adult, and half (51%) have listened to the podcast alone. A finding of particular interest was the large number of families (91%) that listen to Brains On! in a vehicle together, creating what appears to be a unique informal STEM learning environment that seems to foster opportunities for joint media engagement and family learning. Findings show these trips prompt periods of group engagement characterized by shared listening, group activity like guessing an episode's mystery sound, and conversations both during and after listening to an episode (99% of families listening in cars have had conversations in their vehicle about what they were hearing while listening). Although Brains On! wasn't developed with joint media engagement in mind, Brains On! has many of the design features research has found to support joint media engagement and thus support family learning through media: the ability to replay and pause the media, portability of the media, media that is engaging to the various audiences that listen together, and media that fits into existing family routines (Takeuchi & Stevens, 2011).

Listening to Brains On! appears to have a wide range of impacts on child listeners. Some of these impacts include helping to foster and increase children's interest in STEM, sparking children's curiosity and leading them to asking more STEM-based questions, increasing children's knowledge of STEM and STEM careers, helping children develop and practice their listening skills, and helping children see themselves as someone who can do STEM.

Importance: Children's STEM-focused podcasts are becoming increasingly popular for children and families. However, with very little research and evaluation done on this informal learning medium, it is difficult to truly understand the overall impact and value of children's podcasts as a means for engaging children and families in science learning and discovery. More information is needed to understand who listens, why they listen, how they listen, and the impact of listening. Findings from this research will

Visitor Studies Association - 2019 Conference Abstracts

benefit the ISE field by beginning to fill a gap in the current knowledge around the potential for STEM-focused children's podcasts to contribute to a range of ISE outcomes for children and families, as well as provide insight into what features of children's STEM-focused podcasts can lead to those outcomes. The study results may also encourage ISE organizations to create their own podcasts for children, increasing the reach and impact of this emerging ISE medium.

References:

Takeuchi, L., & Stevens, R. (2011). *The new coviewing: Designing for learning through joint media engagement*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.

Additional Resources:

Brains On! Podcast: <https://www.brainson.org>

Evaluation as a Catalyst for Equity

Cecilia Garibay, Garibay Group
Swarupa Anila, Detroit Institute of Arts
Diane Miller, Detroit Zoological Society
Laura Huerta-Migus, Association of Children's Museums

Panel Presentation

Purpose: This session brings together practitioners and evaluators to explore the role evaluation can play in supporting equity in the informal learning field.

Abstract: It has become imperative for museums and other informal learning spaces to engage broader cross-sections of their communities. Much of the conversation in the field has focused on the role and responsibility of practitioners to work toward inclusion.

Significantly less discussion has taken place in the informal learning field, however, on evaluators' role and responsibility in moving the field toward greater equity. While frequently portrayed as value-neutral, evaluation practice is often guided by a form of "epistemological ethnocentrism" (Reagan, 1996, cited in Hopson, 2003). Too often, evaluations of exhibitions and programs typically reflect the same dominant perspectives in the informal learning field that can replicate inequities.

We posit, however, that evaluators can and must help advance equity and support practitioners' work toward inclusion.

This interactive session brings together practitioners and evaluators to collectively explore how evaluators can help the field achieve greater equity. Among the questions we examine are:

- What does it mean for evaluators to rise to the challenge of advancing equity and inclusion? What responsibility do evaluators have in their studies to explicitly attend to issues of culture, power and privilege, and marginalization?
- What challenges do practitioners who focus on equity face when working with evaluators on their projects? What happens when there is lack of alignment in attending to inclusion or when

Visitor Studies Association - 2019 Conference Abstracts

evaluators rely on practitioners to provide the cultural competence when working with non-dominant communities?

- What can we learn from practitioners who work toward inclusion? What are some concrete ways evaluators can intentionally integrate an equity lens into their work? What are the implications for practitioners and evaluators in their collaborations?
- How might culturally responsive evaluation approaches inform our work? What implications do our epistemologies and methodologies have for equitable practices?

Importance: Working toward inclusion and advancing equity cannot be the sole responsibility of practitioners and informal learning organizations. If we are to achieve equity, evaluators can and must play a critical role in supporting practitioners and moving the field toward more inclusive practices. This requires, however, that we as evaluators carefully examine our assumptions and beliefs, methodologies, and own practices.

References:

Garibay, C. and Teasdale, R. (2019). Equity and Evaluation in Informal STEM Education. *New Directions in Evaluation*. John Wiley and Sons.

Garibay, C. (2011). Responsive and Accessible: How Museums Are Using Research to Better Engage Diverse Cultural Communities. *ASTC Dimensions*.

Hopson, R. K. (2003). *Overview of multicultural and culturally competent program evaluation. Issues, challenges and opportunities*. Woodland Hills, CA: The California Endowment.

Mind Your Brain! An Exhibition as a Platform for Social Learning

Marilla Kortessalmi, Laurea University of Applied Sciences

Kari Halme, Laurea University of Applied Sciences

Kati Tyystjarvi, Heureka, the Finnish Science Centre

Heidi Rosenstram, Heureka, the Finnish Science Centre

Panel Presentation

Purpose: Mind your brain! was a science center exhibition about the brain and its well-being, developed by the Finnish Science Centre Heureka in collaboration with the Finnish Brain Association. The exhibition was series of brain challenges to be solved in small groups. The tasks enforced the visitor for social interaction. Because of the nature of the exhibition, our objective to the study was to analyze how the design influenced learning.

The UAS students interviewed the visitors (n= 164).The data was analyzed in content-analysis and interpreted deductively on Bandura's (1997) model of social learning.

We argue that social interaction and multidimensional tasks in the exhibition enabled the visitors to reflect their knowledge of brain and their brain-healthy practices. The exhibition design enabled to learn from others as well as to learn of others. By experiencing new things and by reflecting to the peer group members, the visitors also learnt of themselves.

Visitor Studies Association - 2019 Conference Abstracts

Abstract: The exhibition approached brains in multidimensional series of tasks. They challenged the different parts of visitors brains. The tasks included i.e. music, dancing and meditating as well as logical games and fact presentations. The tasks were visited in 2-5 person groups and they required cooperation. To enhance the interaction, the groups carried a model of brain as the trigger button.

As the exhibition emphasized social interaction, we wanted to study the visitor experiences in the viewpoint of social learning. Social learning associates inseparable the outer conditions, i.e. environment and peers, to the learning process (Bandura, 1997). Social learning has also been associated with learning through observation of others, whereas different approaches has focused on copying mechanisms (i.e. Rendell et al. 2010). Recently Falk and Dierking (2018) argued that learning from museums should not focus on facts only, but include social learning elements as empathy, self-efficacy and agency.

Our research objectives were to analyze, first, how exhibition design affected the visitors learning experiences and second, how learning of and from others were associated. The data was collected by a group of students from Laurea University of Applied Sciences . They interviewed the visitors (n= 164) right after their brain exhibition tour. The questions covered the experiences of the exhibition as well as the visitors perceptions of learning in the exhibition. The transcribed texts where categorized using Bandura´s triangle of social learning as determining human behaviour. First category (cognitive factors) explained the facts and presumptions. Second category (behavioral factors) explained the learnings of his/her behaviour and practices. Third category (environmental factors) explained the exhibition design and learning from others. After the first analysis round we added two sub categories to the third category. Category 3A explained the feelings the exhibition evoked. Category 3B explained the visitors learning of others.

According to the data, the exhibition design enable the visitors to reflect their knowledge and presumptions (“I did not know earlier about my body or how my brain functions”) and to reflect their capabilities and practices (“The piano tasks reminded me, am I too fixed to old habits”). The group work and social interaction encouraged the visitors to experience new things (“ It was easy to fling, I danced with my son many times”) and hence to collect information of self and self-efficacy.

In the data there were few mentions of learning from others. More than that, the exhibition enabled to learn of others, (“I recognized the tasks got you easily excited. The people are quite adventurous, after all, even though shy sometimes”).

Bandura´s concept of social learning explains the determinants of human behaviour. In the exhibition of brain and it's well-being, the target was to arise the awareness of the visitors behaviour and practices that influenced brain well-being. The design of this exhibition was aligning this objective. The concept of social learning expanded the understanding of this phenomenon.

Importance: The exhibition design often relies on presenting the facts and information. However, the exhibitions might have an agenda to influence to the visitors habits and practices. In order to influence them, the exhibition should be designed to cover all elements of human behaviour. The exhibition should teach cognitive factors, but also give information of self-efficacy and enable social interaction as well as enable emotions and feelings.

References:

Visitor Studies Association - 2019 Conference Abstracts

Bandura, A. (1997). *Self-efficacy. The exercise of control*. New York: W.H.Freeman and Company.

Falk, J. & Dierking, L. (2018). *Learning from Museums*. Second Edition. Lanham: Rowman & Littlefield, (2018). Series: American Association for State and Local History book series.

Rendel, L., Boyd, R., Cownden, D., Enquist, M., Eriksson, K., Feldman, M.W., Fogarty, L., Ghirlanda, S., Lillicrap, T., and Laland, K.N. Why Copy Others? Insights from the Social Learning Strategies Tournament. *Science*. 2010 April 9; 328(5975): 208–213. doi:10.1126/science.1184719.

1:45-3:00 PM - Concurrent Sessions

Building Capacity for Cultural Responsiveness in the Visitor Studies Field

Evelyn Christian Ronning, Science Museum Minnesota

Jill Stein, JKS Consulting

Shelly Valdez, Native Pathways

Cecilia Garibay, The Garibay Group

Kenneth Morris, Detroit Institutes of the Arts

Working Group

Purpose: Building off conversations facilitated by the Building Communities FIG at VSA 2018, this working group session focuses on collaborative work around key priorities that emerged around building capacity for culturally responsive evaluation practices. A group of panelists with expertise in the area of culturally responsive evaluation (CRE) will provide insights on the core skills, competencies, and/or perspectives that support CRE, resources for personal and professional development in CRE, and processes for supporting organizational change and learning. This will be followed by small-group activities and discussion in order to draw upon the experiences of attendees. We intend for participants to: 1) gain awareness of key priorities articulated by the VSA community around building capacity for culturally responsive evaluation; 2) gain insights through open dialogue around the role of culture in evaluation practice; and 3) actively participate in conversations around barriers and opportunities for building cultural competency across the visitor studies field.

Abstract: Conversations around the need for culturally responsive evaluation practices and perspectives have permeated the Visitor Studies field for many years. This has occurred through conference presentations, keynote speakers, articles, FIG discussion groups, and informal dialogues. It is clear that evaluation has a strong potential role to play in supporting diversity, equity, and inclusion practices within informal learning institutions, and perhaps in facilitating change in institutional culture around engaging diverse audiences and communities more broadly. Based on conversations held at VSA 2018, through Bridging Communities FIG lunch and their sponsored session, “Collective Insights: Strategies for Culturally Responsive Evaluation Capacity Building,” this year’s session will highlight key priorities articulated through these conversations, hear insights from experts in the field, and strategize ways to address these priorities within the visitor studies field through dialogue.

Jill Stein, a VSA board member-at-large and Bridging Communities FIG co-lead, will summarize key themes that developed out of last year’s conversation as follows:

Visitor Studies Association - 2019 Conference Abstracts

Skills and Competencies - There was strong agreement across the discussion groups that CRE needs to be central to the VSA Evaluator Competencies; in fact, it was recommended that all the Evaluator Competencies be re-written with a culturally responsive lens, rather than “siloeing” cultural responsiveness as a distinct skill set, and that it go beyond the competencies to be integrated in VSA more broadly.

Professional Development Opportunities – Themes of the conversations around professional development focused on providing CRE resources or a toolkit, focusing on pipeline work, devoting an issue of Visitor Studies to culturally responsive evaluation, supporting CRE mentors, and continuing to build a peer network around culturally responsive evaluation.

Organizational / Leadership – In this discussion group, key recommendations included creating a statement of position from VSA around culturally responsive evaluation, building collaborative partnerships with others doing this work (e.g. AEA, CREA, GEDI), provide space within and across VSA to talk about power and privilege (more regularly, and not only at the conference in sessions like Collective Insight), attend to dominant cultural norms and ways of being within VSA.

Evelyn Ronning, Bridging Communities FIG co-lead, will co-present data from case studies utilizing evaluation capacity building to support organizational change around diversity and inclusion and using a developmental evaluation approach to a community-based project. This will be shared as an example of evaluation capacity building with a culturally responsive lens, and will focus on process and lessons learned that might be applicable to other such initiatives. Additional presenters from MASS Action – a collaborative initiative designed to align museums with more equitable and inclusive practices – will be engaged as co-presenters and facilitators of small group conversations. Key discussion questions for panelists and attendees will include: 1) What are the core skills and competencies that are central to a culturally responsive evaluation practice? 2) What are most significant supports needed to develop culturally responsive practices? 3) what is the role of evaluators in advocating for culturally responsive engagement with communities?

Importance: We see this session as central to this year’s conference theme, Ways of Knowing, as it supports dialogue and reflection around how we as a community currently utilize culturally responsive practices and how we can grow and strengthen these areas. Culturally responsive evaluation is at its core a recognition of diverse ways of knowing and gathering knowledge, and seeks to find processes and methods that can honor these diverse perspectives. We hope to provide insights around what it means to practice culturally responsive evaluation, as well as reflecting on ourselves and our VSA community in terms of how we can better support engagement with the diverse ways of knowing that communities engaged with museums represent. In order to remain relevant into the future, museums need to strengthen their engagement with diverse communities and worldviews, and evaluators can play a central role in facilitating this process through a culturally responsive lens.

References:

American Evaluation Association. (2011). *American Evaluation Association public statement on cultural competence in evaluation*. Fairhaven, MA: Author. Retrieved from <https://www.eval.org/p/cm/ld/fid=92>

Dunaway, K. E., Morrow, J. A., & Porter, B. E. (2012). Development and validation of the cultural competence of program evaluators (CCPE) self-report scale. *American Journal of Evaluation*, 33(4), 496-514.

LaFrance, J. (2004). Culturally competent evaluation in Indian country. *New Directions for Evaluation*, 2004(102), 39-50.

Visitor Studies Association - 2019 Conference Abstracts

SenGupta, S., Hopson, R., & Thompson-Robinson, M. (2004). Cultural competence in evaluation: An overview. *New Directions for Evaluation*, 2004(102), 5-19.

Additional Resources:

MASS Action Toolkit - <https://www.museumaction.org/resources>

VSA Evaluator Competencies: <https://www.visitorstudies.org/evaluator-competencies>

Comparing Evaluation Methods From Midwest to Middle of the Ocean

Erin Tate, Saint Louis Zoo

Individual Paper

Purpose: Comparing and contrasting the use of evaluation instruments used for similar projects in different geographic locations, this session will look at tools used in the St Louis region and modification and implementation of these tools in the Commonwealth of the Northern Marianas Islands (CNMI). In both projects, community outreach programs aiming to assess attitudes, awareness, and intent for behavior change for conservation projects, as well as teacher workshops involving these conservation projects, were evaluated. As cultural institutes expand their reach outside of their literal walls, flexibility and adaptation are key first steps in transforming the known into a larger or different cultural context.

Abstract: With only 2-3 weeks of on-grounds presence in the CNMI annually, Pacific Bird Conservation is a non-profit collaboration of Zoo professionals from a variety of institutions who work with biologists operating in CNMI (which is a United States territory). During this window of time, endangered birds are caught at field sites on Saipan and translocated to northern islands with little human presence. The Marianas Avifuna Conservation Project is the foresight of the CNMI government, working with Pacific Bird Conservation, hoping to prevent an ecological crisis such as the one Guam experienced with the brown tree snake. In addition to the field work, this time is also spent engaging with the local community through tabling at events, library programs, and school programs. The MAC Project hopes to expand this engagement into internships, a larger presence in school programming, and partnerships with local community-based environmental alliances who are already established in Saipan. The Saint Louis Zoo has had long history of partnering with Pacific Bird Conservation and the MAC Project, including providing a dedicated Education Liaison who is responsible for education programming, relationship building and communication with all stakeholders and partnership institutions.

The MAC Project had no previous experience in evaluating the outcomes of their programming or outreach efforts. In 2017, the Saint Louis Zoo's CARE (Conservation and Audience Research and Evaluation) department was pulled in to assist Pacific Bird Conservation in evaluating community and school programs in the Northern Marianas Islands. Having worked with programs in the St. Louis area that target similar education goals (identifying awareness, attitudes, and actions towards conservation in school groups who are taken to the field – a goal similar to a long-term goal possessed by the MAC Project) it was decided that the CARE department would be a good fit to evaluate program outcomes for grant reporting.

This session will discuss the instruments modified– Animal Awareness Day tabling survey assessing awareness, attitudes, and conservation behavior for species celebrated on-grounds was modified to be

Visitor Studies Association - 2019 Conference Abstracts

used for the Flame Tree Festival and CNMI Environmental Expo. Additionally, a community garden teacher workshop pre/post survey (Milkweed for Monarchs) used for a school community garden workshop geared towards CNMI teachers assessing their comfort taking students in nature, implementing real-world conservation into their curriculum, and resource identification. Types of modifications made and how they were relevant to the MAC Project and to the CNMI audience will be discussed. Challenges included communication logistics, facilitation of evaluations, playing catch-up to project goals and timelines, and Super-typhoon Yutu. This session will wrap with next steps, including a brief summary of the 2019 MAC Project season.

Importance: As the field of evaluation in cultural institutions grows, we are learning to expand our professional horizons and think adaptively and laterally while embracing sensitivities to different audience needs – whether those audiences are regularly involved with our institutions or not. This session aspires to share the findings of this unique project and the learning experience it provided as an established program explores and embraces evaluation. Attendees will gain insight into an instrument modification process, collaborating with external stakeholders when entering an established program, and the challenges and opportunities of applying familiar instruments to new audiences and programs.

Unplugged and Plugged Computational Thinking for Children: Research and Practice

Monica Cardella, Purdue University
Hoda Ehsan, Purdue University
Philip Cardella, Imagination Station

Hands-on Workshop

Purpose: This session examines children's engagement in computational thinking through: (1) a presentation of research on children's engagement in CT in informal learning environments, (2) a presentation on practitioner experiences implementing CT activities, and (3) a hands-on session that features CT activities, toys and games and approaches for studying/evaluating CT learning.

Abstract: This hands-on workshop session will consist of two presentations followed by an interactive hands-on session, all focused on computational thinking (CT) activities for young learners. In the first presentation, researchers will introduce the CT competencies that guided both the design of an exhibit and the research. The first presentation will also include research findings on how different types of plugged and unplugged (i.e. no or low-tech) activities can support children's engagement in computational thinking and activities associated with computational thinking. The second presentation will be given by the executive director of a small science center as he describes CT-related programs and events held at the museum and challenges and strategies associated with implementing successful events related to computational thinking and programming.

After the scheduled presentations, the session chair will introduce different research-based CT activities, toys and games that can be used in informal settings. Session participants will have the opportunity to try the activities and interact with the toys and games. The session chair will also facilitate a discussion around how to implement and conduct research on CT activities in their informal learning settings.

Importance: The prevalence of computers continues to grow -- in the workplace, in schools, and in our daily lives. Increased access to technology opens up new opportunities for creative endeavors that

Visitor Studies Association - 2019 Conference Abstracts

people can engage in. For example, in addition to playing video games, children can create their own video games.

Computational thinking involves a set of skills and cognitive processes that are related to programming but also complex problem solving across many fields. Some researchers suggest that through exposure in the early years, by the time children get to high school computational thinking can become second nature. Precursor CT skills and competencies related to CT can be promoted through developmentally-appropriate low-tech and play-based activities in settings like museums and science centers. However, to promote CT and to design appropriate activities that help children develop CT-related competencies, a clear understanding of key concepts, and developmental trajectories, and experience-based approaches is critical.

References:

V. Barr, C. Stephenson, and B. V. Barr, "Bringing Computational Thinking to K-12: What is Involved and What is The Role of the Computer Science Education Community?" *ACM Inroads* , vol. 2, no. 1, 2011.

J. M. Wing, "Computational Thinking," *Communications of the ACM*, vol. 49, no. 3 . , 2006.

J. Cuny, L. Snyder, and J. M. Wing, "Demystifying Computational Thinking for Non-Computer Scientists," Unpublished. Manuscript, 2010

National Research Council, Report of a Workshop on the Pedagogical Aspects of Computational Thinking. Washington, D.C.: The National Academies Press, 2011.

BBC [Online]. Bitesize . Retrieved from <https://www.bbc.com/education/topics/z7tp34j>

Lu, J. & Fletcher, G. (2009). Thinking about Computational Thinking. *ACM Sigcse Bulletin*. 41. 260-264. 10.1145/1539024.1508959.

Additional Resources:

<https://stemforall2018.videohall.com/presentations/1285>

<https://engineering.purdue.edu/INSPIRE/Research>

Challenging Front-End Evaluation to Study Challenging Topics

Cat Scharon, The Field Museum

Individual Paper

Purpose: This session will focus on two complementary methodologies used to assess the prior knowledge, attitudes, and interests of predominantly non-Native audiences ahead of the Field Museum's renovation of its Native North America Hall. Anticipating that respondents might feel uncomfortable or ill-equipped to provide meaningful insights, we departed from our usual front-end studies to address two major goals: 1) to understand the kinds of context and support needed to engage diverse audiences with unfamiliar and potentially difficult history; and 2) to understand how visitors react to the mix of ancestral and contemporary works to effectively emphasize continuity and juxtaposition. Informed by Commemorative Museum Pedagogy (Rose, 2016), this session will provide an

Visitor Studies Association - 2019 Conference Abstracts

overview of our survey and interview methods, including the segmentation of audiences according to their pre-existing notions about discrimination against Native Americans today.

Abstract: In the coming years, the Field Museum's Native North America Hall will be transformed. Museum staff and Native American community partners are working together to renovate the hall, which has many displays that have stood largely unchanged since the 1950s. The renovated hall, slated to open in late 2021, is representative of efforts on the museum's part to engage with Chicago's Native community and to better represent this stories. This presentation will focus on two front-end evaluation studies conducted at the beginning of this multi-year effort to overhaul the exhibition.

Beginning with a survey panel to understand the different barriers and opportunities that might stem from visitors' prior knowledge and attitudes, our analysis grew to include the segmentation of audiences according to their pre-existing views on discrimination against Native Americans today. Drawing on the methodologies of the Reclaiming Native Truth project (2018) and the theoretical background of Commemorative Museum Pedagogy (Rose, 2016), this approach highlights the demographic and psychographic range of non-Native audiences. This audience research is not meant to be wholly prescriptive of exhibition content; rather, this work hopes to spark conversation about the idiosyncratic nature of engaging with difficult content in museum settings and point to potential avenues for further exploration.

Additionally, we will discuss a second study comprising semi-structured interviews with 30 cued visitor groups in the pre-renovation exhibit hall. Each exhibit experience was guided to include a blend of ancestral works and at least one by a living Native artists, providing a window into visitors' understanding (or confusion) about continuity of culture. Qualitative analysis of these responses showed that while visitors struggled with the juxtaposition or recontextualization of traditions and contemporary works, they were also receptive to the inclusion of contemporary work and themes.

Importance: This evaluation project challenged our assumptions about ways of knowing in a variety of theoretical and practical contexts, from understanding the disconnect between cultural conceptions of time and history to the creation of psychographic profiles. The fundamental goal to meet visitors where they are to help them engage with unfamiliar and challenging history requires us to step away from linear notions of learning, progression, and time. By sharing our methods and perspective, we hope to generate conversations about the ways museums can use front-end evaluation to understand disparate views and harness tension in a productive way.

References:

First Nations Development Institute, Echo Hawk Consulting. 2018. Reclaiming Native Truth: A Project to Dispel America's Myths and Misconceptions. Retrieved from: <https://rnt.firstnations.org/research/>

Rose, J. 2016. Interpreting Difficult History at Museums and Historic Sites.

Additional Resources:

Making Room for Native American Voices: <https://www.fieldmuseum.org/blog/making-room-native-american-voices>

Changing the Narrative in the Field Museum's Native North America Hall: <https://www.wbez.org/shows/wbez-news/changing-the-narrative-in-the-field-museums-native-north-america-hall/4646fd66-8839-43fc-9c8c-f6eafa8dd3c8>

Using Museums to Promote Cultural Identity Among Yemeni Students

Marion Tate, Wayne State University
Dr. Navaz Bhavnagri, Wayne State University

Panel Presentation

Purpose: This presentation promotes cultural identity among Muslim Yemeni immigrant/refugee students (11-14 years-old) through multiple visits to local museums, art activities, and technology.

Abstract: As nativism and intolerance increases, social-political volatility also increases (Yu, 2017). Therefore, some Muslim immigrants may feel reluctant to express their cultural identity; but museums, on the other hand, can enhance their cultural identity.

This presentation, therefore, promotes cultural identity among Muslim Yemeni immigrant and refugee students (11-14 years-old) who thrice visited the Detroit Institute of Arts, and once visited the Arab American National Museum. Their cultural identity was further enhanced with pre-post audio/videotaped activities, which were related to museum artifacts, namely: discussing children's literature introducing museums and immigrant experiences, using iPad, Chrome Books and PowerPoint to investigate museum artifacts, creating visual (e.g., Arabic calligraphy, Islamic tiles), performing (e.g., dagger-dance, Islamic music), and culinary (e.g., tabbouleh).

The presenter used the following data collection methodology to assess children's cognitive and affective outcomes on cultural identity data collection before, during, and/or after museum visit: observation to assess student-student, teacher-student interactions, and enjoyment; interviews to build the teacher's knowledge about Yemeni culture and to assess students' meaning-making process; and documentation to evaluate students' background knowledge.

This presentation will be grounded in Vygotsky's socio-cultural theoretical concepts and empirical research on museum education with specific emphasis on research published by VSA. This project is unique because: it focuses on Yemeni children, which are not systematically studied; there were multiple museum visits, unlike a typical school visit to a museum; the duration of this project was for one academic year; and it, additionally taught English as a second language, when promoting cultural identity.

The presenter will ask participants to reflect on one example from the presenter's outcomes and explain the difference between cognitive and affective outcomes using an illustration from learners' own work (Outcome B.4 VSA Competencies), Provide examples of how theories such as Vygotsky's Sociocultural theory on museum education was applied during the museum project.

Importance: Museums can enhance the cultural identity of some Muslim immigrants who may feel reluctant to express their cultural identity because of increased nativism. This presentation, therefore, promotes cultural identity among Muslim Yemeni immigrant/refugee students (11-14 years-old) through multiple visits to local museums, art activities, and technology. The presenter used the following data collection methodology to assess children's cognitive and affective outcomes on cultural identity before, during, and/or after museum visits: observation to assess student-student, teacher-student interactions, and enjoyment; interviews to build the teacher's knowledge about Yemeni culture and to assess

Visitor Studies Association - 2019 Conference Abstracts

students' meaning-making process; and documentation to evaluate students' background knowledge. This presentation will be grounded in Vygotsky's socio-cultural theoretical concepts and empirical research on museum education. Participants, using their own work, will explain the difference between cognitive and affective outcomes and provide an example using; e.g., Vygotsky's Sociocultural theory, as applied during the museum project.

References:

- Almy, M. (1966). Young children's thinking, studies of some aspects of Piaget's theory.
- Ash, D. (2004). Reflective scientific sense-making dialogue in two languages: The science in the dialogue and the dialogue in the science. *Science Education*, 88(6), 855-884
- Ash, D. (2004). How families use questions at dioramas: Ideas for exhibit design. *Curator: The Museum Journal*, 47(1), 84-100.
- Braswell, G. S. (2012). Variations in Children's and Adults' Engagement With Museum Artifacts. *Visitor Studies*, 15(2), 123-135.
- Coffee, K. (2007). Audience research and the museum experience as social practice. *Museum management and curatorship*, 22(4), 377-389.
- Danko-McGhee, K. (2006). *Nurturing aesthetic awareness in young children: Developmentally appropriate art viewing experiences*. In: Taylor & Francis.
- DeVries, R., & Kohlberg, L. (1987). *Constructivist early education: Overview and comparison with other programs* (Vol. 1987): Natl Assn for the Education.
- Fasoli, L. (2003). Reading photographs of young children: Looking at practices. *Contemporary Issues in Early Childhood*, 4(1), 32-47.
- Freidus, H. (2007). The Experience of Experience. *Journal of Early Childhood Teacher Education*, 28(3), 289-299.
- Freidus, H. (2010). Finding passion in teaching and learning: Embedding literacy skills in content-rich curriculum. *The New Educator*, 6(3-4), 181-195
- Kanjou, Y. (2018). The Role of the Local Community and Museums in the Renaissance of Syrian Cultural Heritage. *Journal of Eastern Mediterranean Archaeology & Heritage Studies*, 6(4), 375-391.
- Leftwich, M., & Haywood, C. (2016). The Littlest Historians: Early Years Programming in History Museums. *Journal of Museum Education*, 41(3), 152-164.
- Lifschitz-Grant, N. (2018). Mornings at the Museums: A Family Friendly Early Childhood Program. *Journal of Museum Education*, 43(3), 260-273.
- Mayer, M. M. (2005). *Bridging the theory-practice divide in contemporary art museum education*. In: Taylor & Francis.
- Melber, L. M. (2008). Young Learners at Natural History Museums. *Dimensions of Early Childhood*, 36(1), 22.
- Piaget, J. (2005). *The psychology of intelligence*: Routledge.
- Pierroux, P. (2003). Communicating art in museums: Language concepts in art education. *Journal of Museum Education*, 28(1), 3-7.
- Puchner, L., Rapoport, R., & Gaskins, S. (2001). Learning in children's museums: is it really happening? *Curator: The Museum Journal*, 44(3), 237-259.
- Spybrook, J., & Walker, S. L. (2012). Creating inclusive, literacy-embedded play centers in a children's museum: Connecting theory to practice. *Journal of Early Childhood Teacher Education*, 33(4), 382-391.
- Vygotsky, L. S. (1980). *Mind in society: The development of higher psychological processes*. Harvard university press.
- Vygotsky, L. (1994). *The problem of the cultural development of the child*. The Vygotsky reader, 2003.

Visitor Studies Association - 2019 Conference Abstracts

Wertsch, J., V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wertsch, J. V. (1989). A sociocultural approach to mind: Some theoretical considerations. *Cultural Dynamics*, 2(2), 140-161.

Wertsch, J., V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.

Wilkinson, D., & Kinouty, M. (2018). Two for the Price of One. *Primary Science*, 152, 5-7.

Wolf, B., & Wood, E. (2016). Integrating scaffolding experiences for the youngest visitors in museums. *Journal of Museum Education*, 37(1), 29-37.

The Great Outdoors: Visitors Studies and Evaluation in Outdoor Settings

Kari Ross Nelson, Thanksgiving Point
Michelle Mileham, Tracy Aviary
Nette Pletcher, Bees Kneez Creative

Panel Presentation

Purpose: The purpose of this session is to deepen participant understanding of principles and practices for studying informal learning in outdoor settings. Outdoor settings such as gardens, zoos, and nature centers present unique characteristics for visitors and, subsequently, for evaluators interested in studying those visitors. Rooted in an ethnographic perspective, participants will see the value of evaluating authentic experiences in authentic spaces. A secondary purpose of this session is to foster an expanded network of other professionals doing similar work by inviting active discussion.

Abstract: Outdoor settings such as gardens, zoos, and aquaria present unique characteristics for visitors and, subsequently, for evaluators interested in studying those visitors. In an exploration of informal learning in outdoor spaces, framing a study with an ethnographic approach can provide a rich understanding of the visitor experience not available from more common methodologies such as exit surveys.

Ethnographic research is a qualitative method in which researchers observe and/or interact with a study's participants in their real-life environment. After a review of the methodology and literature describing it in the field of visitor studies, the three presenters will share their own experiences and encourage discussion with attendees who have related experience.

Kari Ross Nelson will share a formative study of signage for a water wise garden in Ashton Gardens, Thanksgiving Point. Layering strategies from timing and tracking, intercept interviews, and usability-inspired think-aloud interviews, the study revealed similarly layered findings.

Michelle Mileham will discuss how her department formatively evaluates Tracy Aviary's off-site nature play program and participants' barriers to nature play. Strategies for collecting this information have varied from paper forms to in-the-moment electronic surveys and is now collected as part of program registration. Benefits and limitations to these different methods will be shared alongside participants' perceptions of nature play.

Nette Pletcher will explore solutions to addressing a range of issues associated with outdoor data collection, from the uncontrollable (e.g., weather) to the practical (e.g., places to sit) to the managerial

Visitor Studies Association - 2019 Conference Abstracts

aspects (e.g., staffing). Examples from evaluations conducted at zoos around the country will provide context for these complications, and suggested strategies for anticipating and overcoming obstacles will be shared.

Throughout the session presenters will encourage open discussion among attendees. As attendees enter the room, they will be invited to indicate their work settings and/or interests on posters. During each segment, presenters will invite attendees to share their own experiences, strategies and solutions relevant to challenges raised. While the presenters bring diverse experience and perspective, discussion among attendees will allow even broader diversity and real-world examples of evaluation and visitor studied in outdoor settings. A collection of these strategies will be made available to attendees using contacts gathered in the initial poster activity, with the hopes of fostering professional networking beyond the conference.

Importance: Browsing contents of recent issues of Visitor Studies Journal, nearly half of the research studies and evaluation reports relate to informal learning in outdoor spaces. Rising emphasis in climate, conservation and environmental education suggests that visitor studies in these spaces will only increase. An understanding of ethnographic methodologies and practical application of them is useful for uncovering and analyzing the emotions and attitudes of visitors, which are important to organizations interested in connecting people to nature and inspiring conservation behaviors. Rather than removing research subjects from the authentic environment, this approach embeds the researcher in the experience that the visitors are having, allowing for a more direct connection between observations made and questions posed.

Bringing New Techniques and New Staff to Museum Audience Evaluations

Ramee Gentry, United States Holocaust Memorial Museum

Hands -On Workshop

Purpose: How can a museum introduce new approaches of audience research to its exhibition development, and how can it increase the participation and buy-in of its staff across its institution? How can a museum infuse human-centered design principles into its formative evaluations processes, and see the results of the work directly applied to the development of its exhibitions?

This workshop gives participants a hands-on dive into a different type of evaluation technique that uses brainstorming, the power of team collaboration, and lots of post-it notes! As this conference explores the different “ways of knowing” we explore how we can use quick, simple design of items and displays that give our audiences a way to both show and tell us a great deal about how to improve the experiences we create for them.

Abstract: As the U.S. Holocaust Memorial Museum reached its 25th anniversary, it commenced a “revitalization” of its permanent exhibition, beginning with an audience evaluation to inform the process. USHMM departed from previous conventional evaluation methods by hiring IDEO, a firm that promotes “human-centered design” for its clients. Together, USHMM+IDEO developed a research strategy that included a blend of quantitative and qualitative instruments. While a number of these instruments were the more familiar evaluation techniques (surveys and focus groups) the project also used a technique never before done as part of the Museum’s formal evaluations: using small-scale, low-cost prototypes to experiment with different learning techniques through new design approaches.

Visitor Studies Association - 2019 Conference Abstracts

In addition to incorporating this technique, USHMM also intentionally chose to invest in training and using its own staff to carry out the work, as a means of increasing ownership of the results and building up knowledge and capacity for future evaluation endeavors.

In this workshop, participants will engage in rapid brainstorming activities to give them a very condensed version of the process for this technique.

We begin with an overview of the concept of human-centered design as developed by IDEO and how the team applied these concepts to the evaluation project at USHMM.

We then break into smaller groups for two rounds of exercises that offer participants a condensed version of the same exercises USHMM+IDEO did to develop their evaluation tools.

1st Small Group Exercise: Exploring “prototype” method of audience learning. Groups will be given a question/learning goal, and then do small group work brainstorming to develop potential prototype instruments that could be tested. Particular focus will be on the power of framing “How Might We” questions, and the difference between creating a design for testing learning versus testing for final exhibition display. Participants will learn techniques used by IDEO to foster creativity, collaboration, and synthesis (hint: it involves big boards, lots of post-it notes, lots of markers, and drawing--even for the not-artistically inclined!) Each group will share the results of their work, and they will learn what the USHMM+IDEO team developed at this stage in the process.

2nd Small Group Exercise: Developing the testing instrument. Groups will do another round of brainstorming to determine ways to test the prototype, develop iterations of the prototype, engage the audience, and collect data. Particular emphasis will be on incorporating rapid iterations into the process, and how that enhances learning. Again, each group will share out the results of their work, and will then learn how the USHMM+IDEO team approached this process.

The workshop will close with a presentation showing the final results of the work done by USHMM+IDEO, and its direct application in exhibition design principles. In addition to the findings, participants will learn how this evaluation work at the Museum was expanded to include many staff with little to no previous evaluation experience. Practical discussion among participants will give guidance on expanding the pool of evaluators, with focused training on observation and intercept techniques.

Importance: Participants will leave with lots of hands-on experience, some lively discussion, and a packet of material summarizing the key concepts and techniques covered during the session. More importantly they will also leave with the seeds of some ideas for projects they can try out at their own institutions. This conference explores “ways of knowing” and this workshop will help participants expand these ways of knowing in two ways: by demonstrating different ways we can learn from our audience through the power of human-centered design, and by expanding the number of people in our institution who participate in our evaluation work.

Additional Resources: Awaiting approval of executive summary of the USHMM+IDEO audience evaluation.

3:15-4:30 PM - Concurrent Sessions

Measuring and Aligning an Art Museum Distance Learning Program

Erin Wilcox, RK&A / Detroit Institute of Arts

Individual Paper

Purpose: This paper presentation will describe a multi-phase, mixed-methods evaluation of a distance learning program from the Virginia Museum of Fine Arts (VMFA). Participants will understand the process and importance of conducting formative and summative evaluation on an art museum program for students. From a methodological standpoint, participants will understand the purpose of combining mixed methods in the research design and analysis of a museum program. From a program development standpoint, participants will understand how learning outcomes associated with a museum program were developed to relate to critical thinking skills and other curriculum-based outcomes for students in the classroom. Additionally, participants will understand the challenges related to conducting evaluation with students and public school districts and learn some possible solutions to these issues.

Abstract: This paper presentation covers the multi-phase, sequential, mixed-methods approach used to develop and evaluate a distance learning program from the Virginia Museum of Fine Arts (VMFA).

Background

The Distance Learning Program (DLP) is a one-to-one video conference between a museum educator in a museum gallery and a classroom of students in Virginia. The museum educator presents between two and four artworks during the session and encourages students to practice critical and creative thinking through an inquiry-based learning approach whereby students observe, interpret, works of art as well as make connections to their personal lives and their curriculum.

Program Planning

Although the VMFA had already developed plans for the DLP, RK&A staff supported the growth and ultimate structure of the program through intentional planning, formative evaluation, and finally summative evaluation. To begin, RK&A helped VMFA develop a framework to determine program outcomes for both students and teachers. This framework was the outcome of a workshop discussion with multiple internal and external stakeholders.

Formative Evaluation

Due to the nature of the program and limitations to data collection with school students, RK&A decided to use a mixed-methods approach for evaluating the program. RK&A designed and conducted a formative evaluation of the program implementing unobtrusive observations and teacher interviews. Based on the formative findings and discussion during a reflection workshop, VMFA assessed and realigned the program. Finally, RK&A conducted a summative evaluation of the program combining student assessments, teacher interviews, and unobtrusive program observation. Select findings from the formative study will be included in the presentation to show how they were implemented to align the program to better achieve intended outcomes.

Working with School Districts

Visitor Studies Association - 2019 Conference Abstracts

Additionally, the presentation will include obstacles involved in collecting data in public school districts involved with submitting to internal review boards, working with school district administrators, and coordinating with teachers and students. The presenter will share solutions to these fairly common problems and suggestions for avoiding them to benefit session attendees and future projects.

Importance: The presentation of the process of evaluating and aligning a distance learning program may inform the work of other practitioners working with similar programs. Additionally, the discussion of obstacles related to collecting data within a school district will provide tips for other evaluators who are planning to work with these sometimes confusing and unpredictable institutions.

Cultural Organizations Breaking Barriers: Leveraging Partnerships to Create Informal Learning Opportunities

Kathleen Doll, Claremont Graduate University
Mollie Parsons, Sante Fe Botanical Gardens

Panel Presentation

Purpose: Presenters will share lessons learned from an on-going collective impact project, in Santa Fe, New Mexico. The four perspectives on creating spaces for informal education will be from a museum educator, external evaluator, the granting foundation, and program participants. Spotlighting the role of museum educators and program evaluation to create meaningful informal learning opportunities for underserved youth, the objectives of the presentation are three-pronged. First, the session hopes to promote an understanding of how to leverage community partnerships to expand informal learning initiatives outside the museum walls. Secondly, attendees will learn new techniques to implement collaborative, theory-driven, and strategic program evaluations. Finally, the panelists will provide resources for audience members to construct cross-sector partnerships, expand informal education in their communities, and design strategic evaluation plans of their organization's various programmatic initiatives.

Abstract: Project Background

Within 37 square miles, Santa Fe, New Mexico is home to a diverse array of over 65 nonprofit and cultural organizations, including the iconic Georgia O'Keeffe Museum, the progressively wacky Meow Wolf, and the rapidly developing Santa Fe Botanical Garden. However, this small, seemingly affluent, and culturally rich city also struggles with worrisome youth outcomes. On numerous indicators of wellness, ranging from kindergarten readiness, to school attendance, to high school graduation, Santa Fe County reports data substantially below than the national averages (<http://www.santafeb2c.org>, 2015).

As a facet of this unique landscape, 15 museum educators from across Santa Fe banded together in 2013 to form the Santa Fe Community Educators Network (SFCEN). Initially striving to enhance professional development and share best practices, SFCEN is currently over 100 members strong, representing 40 organizations. Members now also focus on making their cultural institutions accessible to diverse audiences, especially to underserved youth in Santa Fe. To accomplish their goals, SFCEN leverages community partnerships, a collective impact model, and evaluation to provide an array of informal education programming, reaching youth that typically don't have an opportunity to be traditional museum "visitors."

Visitor Studies Association - 2019 Conference Abstracts

Topics for Discussion

This presentation explores informal education from four perspectives: museum educators, an external evaluator, the granting foundation, and education program participants. To accomplish this, the presentation will first open with an introduction to the Santa Fe context and city-wide collective impact efforts. Additionally, the preliminary portion of the presentation will explore the diverse informal education initiatives of the SFCEN. Panelists will share their array of current out-of-school-time and in-school programming initiatives and how they align their programming with community needs. Through this, audience members will visualize what is possible through museum educators driven networks.

Collective Impact. This introduction will provide the foundation for a break-out activity regarding collective impact. A discussion will be facilitated, allowing audience members to assess the need for collaborative networks in their communities, reflect on how collective impact may be useful in their contexts, and workshop how to build a collaborative network.

Evaluation. The presentation will then highlight the powerful influence of evaluation in promoting the work of the SFCEN's citywide informal education programming. Current evaluation efforts utilize mixed method evaluation (Creswell & Clark, 2011), to offer one way of "knowing" what is working for the SFCEN's informal education initiatives. Additionally, the presentation highlights strategies for effective stakeholder-evaluator partnerships, leveraging utilization-focused (Patton, 2008) and theory-driven evaluation approaches (Donaldson, 2012), as well as a strategic evaluation planning framework (Portzline & Preskill, 2008; Center for Disease Control and Prevention, 2015). Another break-out activity will challenge audience members to explore their capacity to engage in a strategic evaluation planning framework.

Including a Diversity of Voices. Finally, perspectives from the Santa Fe Community Foundation, teachers, and youth who engaged in the informal programming will be shared to further provide insight on the impact of the SFCEN initiatives. Audience members and panelists will openly dialogue about the various ways of knowing the impact of collective work in the informal education domain.

Importance: By sharing four distinct perspectives on the on-going collective impact work and actions of the Santa Fe Community Educator's Network (SFCEN), the presentation demonstrates one way to flip the script on traditional museum visitorship. By leveraging informal collective education initiatives to bring art and culture out from behind museum walls, and back into the everyday lives of community's youth, it is possible to reshape youth wellness outcomes.

Additionally, the panelist illustrate how embedding a mixed-methods approach to evaluation across the network of community educators has the potential to strengthen partnerships, inform programmatic decision-making, integrate strategic planning, and ensure the goal attainment.

Furthermore, each perspective within this presentation provides further insight on how we can "know" the impact of the informal education initiatives. Audience members will leave the presentation with strategies to create museum educator networks, generate cross-sector partnerships, collectively evaluate informal education efforts, and directly benefit their communities.

References:

Centers for Disease Control and Prevention. *Learning and Growing through Evaluation: State Asthma Program Evaluation Guide*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Environmental Health, Division of Environmental Hazards and Health Effects, Air Pollution and Respiratory Health Branch, April 2010.

Visitor Studies Association - 2019 Conference Abstracts

Clark, V. P., & Creswell, J. W. (2011). *Designing and conducting mixed methods research*. vol, 3, 93-94.

Donaldson, S. I. (2012). *Program Theory Driven Evaluation Science: Strategies and Applications*. Routledge.

Patton. M. Q. (2008) *Utilization-Focused Evaluation* (4th ed.), Thousand Oaks, CA: Sage.

Preskill, H. , & Portzline, B.Z. (2008). *Developing and implementing an evaluation system*. Unpublished manuscript. (Available from H. Preskill & B. Z. Portzline, hpreskill@ca.rr.com)

Shared Measures for Evaluating Common Outcomes of Informal Education Experiences

Amy Grack Nelson, Science Museum of Minnesota
Karen Peterman, Karen Peterman Consulting, Co.
Ryan Auster and Alex Lussenhop, Museum of Science, Boston

Panel Presentation

Purpose: Since the late 2000s, interest in the development and use of shared measures in the informal science, technology, engineering, and mathematics education (ISE) field has increased. What are shared measures and why are they important? Session attendees will learn what is meant by a “shared measure,” the technical qualities (reliability and validity) of these measures, benefits and concerns around the use of shared measures, and examples of three shared measure initiatives that exemplify how shared measures can help build individual evaluation capacity as well as provide new learnings for the ISE field at large. This panel is based on a recently published article in a *New Directions for Evaluation* special issue focused on evaluation in informal STEM education (Grack Nelson, Goeke, Auster, Peterman, & Lussenhop, 2019).

Abstract: There has been a recent increase in the development and use of shared measures to evaluate common outcomes in informal STEM education. With this increase, there is a need for evaluators to better understand the technical qualities of shared measures, benefits and concerns around their use, and how they can help to push the ISE field forward. In addition to providing an overview of topics around shared measures, the panel will discuss three shared measures initiatives, Collaboration in the 21st Century (C2C), Collaboration for Ongoing Visitor Experience Studies (COVES), and EvalFest.

C2C project

The C2C project developed and validated a shared measure to assess team communication skills in 6th – 12th grade STEM OST programs (Grack Nelson, 2017, 2018). This project illustrates the meaningful involvement of stakeholders to operationalize the construct of teamwork skills to ensure it was grounded within the context of STEM OST programs across the country, hence helping to increase the utility of the shared measure and the resulting evaluation results. This project resulted not only in an instrument that evaluators can be confident will gather reliable data, has adequate validity evidence for use with STEM OST programs, and is grounded in what actually occurs in these programs, but contributes to the ISE field detailed definitions of a construct area tailored to STEM OST contexts, something that had been previously lacking.

Visitor Studies Association - 2019 Conference Abstracts

COVES project

The COVES project is a data initiative through which science museums across the country collect feedback on the common construct of “visitor experience.” While a key part of the COVES project is the development and validation of a shared measure, other innovative aspects of the project include a flexible survey instrument, infrastructure developed to support ongoing data collection, a centralized database for the shared measure’s data, and the resulting possibility for shared use and meaning making. The COVES team also developed a dashboard tool for sharing data in an ongoing fashion and allowing customization for institutions’ questions, helping to promote data use. COVES is an example of an effort to not only advance the evaluation practice of the collaborating institutions but also develop and test ways to produce cross-project findings to advance knowledge for the ISE field.

Evalfest project

The EvalFest project was designed to develop and learn from common evaluation methods used across science festivals. The EvalFest project not only illustrates the development of shared measures, but the use and validation of an off-the-shelf measure with new audiences and in new contexts, in this case using the Activation Lab’s Engagement Survey (Chung, Cannady, Schunn, Dorph, & Bathgate, 2016) in a science festival setting. The EvalFest project was designed to create not just shared metrics but also shared data for the community. Data collection is centralized through an online survey platform, and data are stored in a shared database. This allows for both individualized evaluation reporting as well as cross-festival comparisons to provide the ISE field with additional understanding about science festivals as an informal learning mechanism.

Importance: Shared measures are becoming more widely used and integral to the practice of visitor studies professionals. For this reason, evaluators need to be familiar with what it means for a measure to have validity evidence, how to make sense of this evidence in light of their own data collection needs, be able to identify when additional validation work is needed, and be able to recognize when a shared measure is simply not a good fit. The projects highlighted in this session not only speak to the creation and use of shared measures, but share the larger benefits of the development of infrastructure to support comparisons of shared measures data across projects and institutions to develop new understandings of the impacts of informal learning experiences.

References:

Chung, J., Cannady, M. A., Schunn, C., Dorph, R., & Bathgate, M. (2016). *Measures technical brief: Engagement in science learning activities*. Retrieved from <http://activationlab.org/wp-content/uploads/2018/03/Engagement-Report-3.2-20160803.pdf>

Grack Nelson, A., Goeke, M., Auster, R., Peterman, K., & Lussenhop, A. (2019). Shared measures for evaluating common outcomes of informal STEM experiences. In A.C. Fu, A. Kannan, & R.J. Shavelson (Eds.), *Evaluation in Informal Science, Technology, Engineering, and Mathematics Education*. New Directions for Evaluation, 161, 59-86. <https://onlinelibrary.wiley.com/doi/full/10.1002/ev.20353>

Grack Nelson, A. (2018). *Youth Teamwork Skills Survey: Survey and manual*. St Paul, MN: Science Museum of Minnesota.

Grack Nelson, A. (2017). *Development and validation of a survey to measure perceived team communication skills in middle and high school STEM out-of-school time programs*. (Unpublished doctoral dissertation). University of Minnesota, Minneapolis, MN.

Visitor Studies Association - 2019 Conference Abstracts

Additional Resources:

The Collaboration in the 21st Century (C2C) Project: <https://www.informalscience.org/collaboration-21st-century-c2c-measuring-essential-skills-stem-workforce>

The Collaboration for Ongoing Visitor Experience Studies (COVES) Project: <http://www.understandingvisitors.org/>

The EvalFest Project: <https://evalfest.org/>

Writing on the Wall: Centering Interpretation Around Visitor Access

Lauren Holley, Illuminated Ideas

Lauren Smedley, Lauren Smedley Design

Panel Presentation

Purpose: For many visitors, labels are the primary access point to interpret art, but is this technique visitor-centered? Two projects questioned the purpose a label serves, what it communicates to visitors, and how to tailor this content to a wide audience. As a point of access to interpretation, reimagined labels could communicate more directly based on content requested by potential visitors, inviting a broader base of the public to a space traditionally dismissed as not “for them.” Sharing these ideas helps explore interpretation on a broader level, and opens discussion surrounding content and accessibility using novel or non-static interpretive tools like in-gallery activities, artmaking, programs, and tours. Attention to audiences who are traditionally absent enables museums to better address not only those who are coming in the door, but also support those who are less likely to spend time in a museum.

Abstract: For many visitors, labels are the primary access to interpretation within an art museum. While museums have shifted their focus from objects to visitors, labels remain the same, or largely inconsistent across museums. If labels are the primary form of interpretation, their content and design must become visitor-centered rather than museum-centered in order to create meaningful context for visitors. Keeping visitors and potential visitors at the forefront, two projects took a considered look at the label’s purpose in a museum, what it communicates to visitors, and how to tailor this content to a wider visitor audience.

Both projects were driven by the awareness that, while some people feel they are “museum people,” many audiences are chronically underrepresented in museums. This result is magnified for contemporary art, where “getting it” can create in and out groups, as well as perpetuate the idea that art is for some and not for others. As public-serving institutions, museums have the responsibility to support access and inclusion of all visitors and potential visitors to the museum, rather than reinforce boundaries.

While contemporary art was the primary content in question for study participants, results regarding intention to support self-efficacy and interest cut across museums and cultural spaces; discussion will explore similarities and limitations of these studies in their applicability to disciplines and content related to science, conservation, history, and other concepts.

Visitor Studies Association - 2019 Conference Abstracts

Each project in this panel examines the way contemporary art labels are able to build a visitor's confidence when viewing art, and used distinct approaches to assess what content is desired from those who are traditionally excluded from the museum's visitor base. In 2015, a study at the Blanton Museum of Art in Austin, Texas determined the influence of an existing wall label in supporting interpretation self-efficacy was not significantly measurable; however, this study established a scale for measuring such a construct, which could be used broadly at art museums to begin assessing where interpretation support is most needed.

As disseminators of information, label content is critical. Another study also in Austin, Texas examined ideal content of a label. Participants were shown a piece of art and asked the simple question, "What would you want to know about this art?" The resulting answers helped determine the content and design of the label.

As a point of access to interpretation, the projects re-imagined what a label could communicate to potential visitors and found similar results. Sharing these ideas helps explore interpretation on a broader level, and opens discussion surrounding content and accessibility using novel or non-static interpretive tools like in-gallery activities, art-making, programs, and tours. Attention to audiences who are traditionally absent enables museums to better address not only those who are coming in the door, but also support those who are less likely to spend time in a museum.

Importance: It is rare to have the opportunity to step back and question, at a base level, what is of interest within the wealth of content we have to offer the public. Through this session, participants will understand that not all visitors nor potential visitors have access to artworks and interpretive tools that make them comfortable in an art museum setting. Methodologies that help in assessing visitor perceptions of artworks and their interpretation interests will be discussed, along with their reception among visitors and potential visitors. Finally, the session will outline the types of label content and design which broadly appeal to visitors and potential visitors. Discussion will center around application of findings within broader subject matter contexts (e.g., science, living collections) and ideas for implementation with access for all visitors in mind.

References:

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Hooper-Greenhill, E. (1999). *The Educational Role of the Museum*. London: Routledge.

Granell, A., Segura, J., & Winner, E. (2014). *Perception of Contemporary Art in Younger and Older Adults*. Poster presented at the annual Visitor Studies Association conference, Albuquerque, NM.

Pitman, B., & Hirzy, E. (2010). *Ignite the power of art: Advancing visitor engagement in museums*. Dallas: Dallas Museum of Art.

Randi Korn & Associates, Inc. (2008). *Levels of engagement with art, 2008 study*. Unpublished research prepared for the Dallas Museum of Art, Dallas, TX.

Visitor Studies Association - 2019 Conference Abstracts

Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, UK: NFER-NELSON

Serrell, B. (1996). *Exhibit labels: An interpretive approach*. Walnut Creek: Alta Mira Press.

Tröndle, M., Kirchberg, V., & Tschacher, W. (2014). Is this art? An experimental study on visitors' judgement of contemporary art. *Cultural Sociology*, 8(3), 310-332. doi: 10.1177/1749975513507243

Additional Resources:

Museum Visitors' Self-efficacy and Interest in Contemporary Art:

https://static1.squarespace.com/static/5592e3dde4b07bcfbacfb77/t/5a84d050652deaecce799ee/1518653526448/Thesis_LWilson.pdf

Blog posts addressing Museum Visitors' Self-efficacy and Interest in Contemporary Art:

<http://www.illuminatedideas.com/blog/category/%5BContemporary+Art%5D+Study>

Science Capital in Informal Spaces: Whose Voices and Whose Capital?

Monae Verbeke, PhD

Shannon K. McManimon, PhD

Choua Her

Zdanna King

Roundtable Discussion

Purpose: 1. Participants will actively discuss the characteristics that define 'science capital' as it relates to informal learning settings, including what makes it unique in comparison to formal educational settings.

2. Participants will learn about and discuss recent studies in the field that have attempted to utilize and rethink, through a variety of methods, the application of science capital in informal spaces.

3. Participants will engage in discussions about measurement challenges, promising approaches, and future directions for the field.

Abstract: The session will explore the concept of science capital by discussing its utility and application in designing informal science learning experiences for broader audiences. Science capital, a relatively new theory in science learning, has been "imagined like a 'holdall' containing all the science-related knowledge, attitudes, experiences and resources that a person acquires through their life. It includes what science the individual knows, how they think about science, who they know (e.g. if their parents are very interested in science) and what sort of everyday engagement they have with science" (Archer et. a., 2014). In this presentation, we will discuss how a) science capital has most extensively been explored: primarily within formal education research, while it has been less frequently applied to informal learning environments like museums and national parks; and b) the incorporation of the science capital framework into two NSF Advancing Informal Science Learning research projects. In this roundtable discussion, we will briefly review our research on science capital and discuss the opportunities and challenges for informal learning environments, including our experienced difficulties in measuring and evaluating it.

Visitor Studies Association - 2019 Conference Abstracts

As a concept, science capital explains how people know what they know, how they think what they think, who they know, and how they do what they do, as it relates to science. Within formal education, research often focuses on the barriers facing underrepresented individuals, and what educators can do to improve each dimension of science capital. Yet, little research has addressed how informal education institutions can be a part of this conversation. We will provide case studies on how the lens of science capital has been applied in two informal science learning research studies as a means to understand and expand ISL practices to diversify audience and promote more inclusive experiences.

We will lead with two 10-minute case studies to set the stage for how researchers applied the concept of science capital in two different ISL research studies. We will then turn to sharing tools and data to think collectively on how a newer theory like science capital may shift our understanding on how we further ISL. The roundtable participants will be encouraged to engage with the session leaders in a discussion focused on personal reflections on science capital; the role of science capital may play in their work; the role of science capital; and opportunities and challenges for similar projects.

The presenters hope that the outcomes of this roundtable discussion will include: 1) a theoretical discussion on how science capital may add value to informal science learning experiences, and 2) recommendations for applications of science capital in informal science learning research.

Importance: The focus of this roundtable discussion is to consider the implications for employing Archer and Dawson's concept of science capital in informal learning environments. The session explores two science capital research studies conducted by the Institute for Learning Innovation and the Science Museum of Minnesota. In doing so, we will consider a) what the concept of science capital is and its utility for understanding informal science learning (ISL) and engagement; b) how thinking about science capital can address issues of broadening diversity in ISL; and d) the opportunities and challenges for ISL, including the difficulty in measuring and evaluating it. Two case studies will address the application of science capital in two different ISL research studies. We will then share tools and data to think collectively on how a newer theory like science capital may shift our understanding on how we further ISL.

Adventures in Teen Evaluation

Jennifer Borland, Rockman et al
Sara Davis, Saint Louis Science Center

Hands-On Workshop

Purpose: This presentation explores the different levels and forms of teen engagement in youth program evaluation. First diving into understanding our own perceptions of working with teens and what techniques would help evaluators work with teens in general, the session digs deeper into opportunities to have teens become partners in evaluating their own programs. Presenters will facilitate discussion and role-play activities that will better prepare evaluators to engage teens in evaluation.

Abstract: This session offers a starting point to learn more about working with teens for those hesitant to jump in or curious about what is possible on the teen evaluation engagement spectrum. The session will be set up to be more interactive and even a little immersive to help demonstrate the techniques that the presenters have used with teens.

Visitor Studies Association - 2019 Conference Abstracts

Starting the session Borland will provide a brief recap from the 2018 VSA conference session “Talking About Teens” to get participants thinking about teens as a unique audience. After an icebreaker used frequently in youth programs participants will be invited to share examples of successful teen programming and related research.

In the second half of the session, Davis will provide an overview of participatory evaluation and how it applies to the teen audience (references will be shared via a Google Doc). In particular, Davis will pull examples from her own experience in working with the Youth Exploring Science program and from the work of Kim Sabo Flores to provide scenarios with hands on activities that can be used to help teens hone their own evaluation skills or to make the evaluation more integrated into how teens experience programs.

Importance: Teen audiences are similar to adult audiences in many ways—including their ability to grasp more advanced concepts and their verbal skills to communicate information about their experiences. However, there are unique cultural differences that should be taken into consideration by evaluators and researchers seeking to work with teen audiences—e.g., social norms within groups of teens and between teens and adult program facilitators. Understanding these unique characteristics will inform how practitioners work with teens in research and evaluation projects on the teen engagement spectrum: starting as just a data point all the way to acting as co-investigators.

References:

Borland, J. and Price, A. (2018). *Talking About Teens: Evaluating Museum Programs that Target Teens*, co-created proceedings from a session at the Visitor Studies Association Conference, Chicago, IL, July 2018. <https://docs.google.com/document/d/18nQkjiCzqTAOA5ykFh-PI94Tbe6MT16jrZtuHKTFK0Q/edit>

Cousins, J.B. and Whitmore E. (1998). Framing Participatory Evaluation. *New Directions for Evaluation*. 1998(80), 5-23. doi:10.1002/ev.1114

Fletcher, A. (2017). *Ladder of Youth Voice*. Retrieved from <https://freechild.org/ladder-of-youth-participation/>

Sabo Flores, K. (2008). *Youth Participatory Evaluation: Strategies for Engaging Young People*. San Francisco, CA: Jossey-Bass.

Additional Resources:

<https://www.slsc.org/connections/students/yes-program-youth-exploring-science/>

Integrating Young Museum Educators' Perspectives in Studying Visitor Experiences

C. James Liu (presenting author) and Katherine Culp (non-presenting author), New York Hall of Science

Individual Paper

Purpose: There is an increasing focus on museum educators' roles in shaping and supporting visitors' learning experiences in informal learning environments. While much research has focused on how museum educators enhance visitors' learning and motivation, little attention has been paid to their perspectives on evaluation and assessment, resulting in a lack of understanding of museum educators'

Visitor Studies Association - 2019 Conference Abstracts

contribution to visitor studies. This presentation will share the approach of utilizing young museum educators' agency and problem-solving skills to develop and improve ways to better understand visitors' learning and experience in a science museum. We will share preliminary results of the projects to illustrate the needs and potential strategies to provide professional development opportunities for museum educators in order to improve organizations' capacity in conducting visitor studies.

Abstract: Museum educators are a valuable asset to the museum field. They are not only often the face of the museum, but also the key contributors to the quality of visitors' learning experience. As a result, there is an increasing focus on how museum educators support visitors' learning and engagement, particularly in the field of science, technology, engineering, and mathematics (STEM). However, little attention has been given to museum educators' role in better understanding the impact of their work, which impedes developing inclusive and comprehensive approaches to provide effective feedback and training. This project addresses this gap by inviting museum educators in the process of designing and developing programs, public events, and activities through the lens of evaluation.

In the first year of this project, a group of high school- and early college-aged museum educators (called Explainer Fellows, N = 8) joined the project to design and evaluation public STEM programs in this ongoing exploratory study. The goal is to investigate how the Fellows, as both researchers and educators, developed their own ways to better understand visitors' experience. In particular, we framed our work around engineering design. The Fellows first learned the engineering habits of mind—a set of skills and mindsets that are critical for future engineers—and designed activities to communicate the habits of mind to visitors through public programs and events (e.g., career nights). During this process, the Fellows also had to consider how to define and assess the impact of the events and programs that they created on visitors' understanding of engineering. By working closely with project researchers, museum staff, and engineers, the Fellows developed and implemented the programs, as well as collected and analyzed data from visitors.

The assessment of the project included both outcomes from the Explainers (including the Fellows) and the public. For the Explainers, we adopted a well-established assessment, Engineering Professional Skills Assessment, to evaluate their understanding of engineering habits of mind (N1 (Fellow) = 8; N2 (other Explainer) = 11), and conducted interviews at the middle and end of the project. We also collected their portfolio of the program/activity development. For the public, we piloted a parent/adult survey (N3 = 63) asking their perception of learning engineering in the museum, and a game-like short question to assess children (9-14 years old, N4 = 36) and youths' (15-18 years old, N5 = 24) perception of engineering habits of mind.

The preliminary results from the data indicated that the program provided a unique experience for these young museum educators to explore ways to improve theirs and their colleagues' work in teaching engineering concepts and engaging with museum visitors. The survey data suggested that both parents and children have limited understanding of engineering habits of mind, and may not see the value of museum educators' contribution in their learning experience. The project team will modify the project design and implement the second year of the project in August, 2019.

Importance: The study directly addresses the need of honoring and investigating stakeholders' perspectives in conducting visitor studies, and challenges the boundaries between museum educators and evaluators. The study also highlights the opportunity in career development for young museum professionals in the STEM field. The information generated from the project will highlight the benefits of and concerns about integrating museum educators' needs and perspectives into visitor studies. Practical

Visitor Studies Association - 2019 Conference Abstracts

strategies will also be provided to the museum field for being more inclusive when conducting visitor studies.

References:

Gupta, P., & Negrón, J. (2017). There is no “off” button to explaining: Theorizing identity development in youth who work as floor facilitators. In P. Patrick (Ed.), *Preparing informal science educators: Perspectives from science communication and education* (pp. 153-170). New York, NY: Springer.

McCormack, J.P., Beyerlein, S.W., Kranow, A.A., Pedrow, P.D., & Schmeckpeper, E.R. (2014). *Scenario and scoring sheet development for Engineering Professional Skill Assessment*. Proceedings of the 121st ASEE Annual Conference and Exposition, paper #9942. Indianapolis, IL, April 11-14, 2014.

National Research Council. (2009). *Engineering in K-12 education: Understanding the status and improving the prospects*. Washington, DC: National Academies Press.

Additional Resources:

https://www.nsf.gov/awardsearch/showAward?AWD_ID=1763917&HistoricalAwards=false

Classroom in the Garden: Assessing Student Learning and Behavioral Changes

Dr. Martha Brown, RJA Consulting

Individual Paper

Purpose:

The goal of this presentation is to demonstrate:

- How botanical gardens can partner with schools and teachers to provide field experiences for students
- How to align program goals with academic standards
- How to use pre-post tests to assess learning and behavioral changes

Additionally, we will discuss our attempt to determine if water conservation education had an impact on students' own water conservation behaviors, and what we will do differently in the future to better assess behavioral changes.

Abstract: In 2017, the Community Foundation of Palm Beach and Martin Counties awarded the Friends of Mounts Botanical gardens with a two-year grant to provide wetlands education to a total of 1200 students. In the 2018-2019 school year, the program was offered to 10th grade students in area high schools, with two middle schools participating again. Mounts' Curriculum Specialist developed and taught an age-appropriate curriculum for both grade levels, while RJA Consulting developed and analyzed assessments of student learning.

The program consisted of three teacher contact sessions with students: 1) a classroom visit focusing on core concepts of the curriculum, 2) field experience collecting water samples at Mount Botanical Gardens and at Arthur R. Marshall Loxahatchee National Wildlife Refuge in the Everglades, and 3) a follow-up classroom visit where water conservation behaviors were discussed.

Assessment Description

Visitor Studies Association - 2019 Conference Abstracts

A 15-item pre/post-test was developed to assess what students learned in the Ambassadors of the Wetlands program. Both the curricula and assessment were aligned with multiple Florida State Standards in Science and Language Arts. The eighth-grade test consisted of five multiple choice, one matching, and four binary (true/false) questions. The 10th grade test consisted of two sets of matching questions, four multiple choice, and three constructed response questions. Additionally, students were asked to rate how likely they were to practice 10 water conservation behaviors both before and after the program. These behaviors were the same for both high school and middle school students.

Assessment Administration

The Curriculum Specialist administered the pre-test to students during her first classroom visit. Afterward, she began teaching the curriculum. Shortly after the classroom session, the students went on a field trip to Mounts Botanical Gardens and the Everglades where they gathered water samples, analyzed the water content, and saw the flora and fauna that comprise Florida wetlands. After returning to the classroom, teachers or the Curriculum Specialist administered the post-test.

Data Analysis

The Curriculum Specialist collected the tests and entered the results into an Excel spreadsheet which contained built-in data validation to ensure accurate data input. The number of students who answered each question correctly was then calculated and graphically visualized to allow for pre-post comparison. Additionally, student responses to water conservation questions were analyzed to determine if behaviors changed as a result of participating in Ambassadors of the Wetlands.

Sample

A total of 235 10th grade assessments and 68 8th grade assessments were analyzed. This was 50% of the total number of students who participated in 2018-2019.

Outcomes

The percentage of correct answers increased by an average of 43% in the 8th grade and 25% in the high school grades according to pre-post test analysis. However, the post-test to determine if water conservation behaviors had changed was administered prior to the presentation on water pollution and conservation, resulting in no detectable change. We determined in future years to wait one month after the presentation and post-test students on water conservation behaviors, as this would allow them time to determine what they could do in their own lives and community.

Importance: Experiential learning is highly effective yet assessing what young people learn from those field experiences is often difficult. Most conservation-oriented organizations are interested in learning if people change their behaviors after a visit or program. However, this information is sometimes difficult to obtain, especially when budgets are small. Because our program served a captive audience (students) and relationships were formed with their teachers, we could use a pre-post test to determine how the program impacted students' mastery of science standards and their behaviors. We also learned that behavioral change takes time, and that our methods for documenting those changes need to be revised. Because this program was new to the Garden, our team approached it as a learning opportunity, which created space for mistakes and forthcoming improvements. Although the learning assessment was summative, how we worked together allowed for course corrections along the way.

Additional Resources:

<https://www.mounts.org/programs-for-schools/>

Saturday, July 13

9:45-11:00 AM - Concurrent Sessions

So Where is the Magic in Museums? Spiritual Ways of Knowing

Kiersten F. Latham, Kent State University

Individual Paper

Purpose: The purpose of this paper is to bring an important issue to the surface, the role of spirituality in museums. It is not meant to present a tool or set of measures for evaluation, but rather to present a synthesized view of current research related to this topic that can be used to address such ways of knowing in the museum context. In addition, a research platform for future work will be introduced as a possible approach to a longer term research agenda. Possible outcomes for the session include:

- Participants will leave with a compact overview of museums as sites for deeply felt experiences.
- Participants will learn about the emerging Spiritual Research Paradigm.
- Participants will be inspired to start thinking of ways to learn more about the spiritual aspects of visitor experiences.

Abstract: In 2002, Silverman asked, “Where is the magic in museums? Where is the Soul? (p7). She was referring to those moments of enchantment, insight, transformation, and deep significance. Silverman was expressing frustration that, in museums, we are losing our “divine side of life, of the power of imagination, myth, dream and vision...” (Gablik in Silverman, 2002: 23). In fact, most people have some kind of spiritual belief, a deep knowing/questioning in something beyond the rational. This capacity is one of few characteristics that makes humans unique (Ergas, 2016). If so, why are we not acknowledging spiritual ways of knowing—or deep knowing—in our museum visitors? Having a belief system is not the same as knowing things spiritually; for many, there is a difference between being spiritual and being religious (Fuller & Parsons, 2018). Spirit, over time and space, has been a source by which we can know and be known. It is this aspect that museums could attune to, as spiritual ways of knowing do not limit themselves to the inside of a church (Maranda, 2018). There is empirical evidence that our seemingly secular spaces are felt deeply by many visitors (Latham, 2013; Falk, 2006; Packer & Ballantyne, 2016; Ogden, 2014; Soren, 2009). In fact, some might argue that the museum is indeed another kind of spiritual or sacred space, a liminal space (Buggeln, 2012; Duncan, 1995). With these factors, how can museums embrace this way of knowing? What can museums do to prepare for, allow, or even elicit spiritual encounters in museums?

This paper offers a condensed distillation of evidence that museums should be acknowledging spiritual ways of knowing in their audiences. I introduce the emerging Spiritual Research Paradigm (2016), part of the “contemplative turn” in higher education, which provides both a platform for understanding and methodologies for gathering data. While these strategies are not developed for museum evaluation, they are ripe for informing and inspiring museums to be more intentional and inclusive.

Importance: The conference theme, Ways of Knowing, asks “How do we know what we know?” Traditionally, we interpret this as what “rational” ways do we know. Of late, good work has been done in museum studies and other fields to reveal that “knowing” is not simply about cognitive or instrumental manifestations but also affective, or emotional aspects. But even with this positive and

Visitor Studies Association - 2019 Conference Abstracts

more holistic direction, few discuss spiritual ways of knowing in the museum context. With a large majority of humanity exploring their own spiritual needs and beliefs, it is time to address this more fully in museums. Providing clarity around defining “spiritual” (eg. It’s not just about religion) and how it might matter in a museal context will help museums serve their audiences more wholly. More fully including spiritual ways of knowing in consideration of museum visitor experience will contribute to a richer understanding of museum choices, intentions, and encounters.

References:

Buggeln, G. (2012). *Museum space and the experience of the sacred*. Christ College Faculty Publications. Retrieved from http://scholar.valpo.edu/cc_fac_pub/10

Duncan, C. (1995). *Civilizing rituals: Inside public art museums*. London; New York: Routledge.

Ergas (2016). Knowing the unknown: Transcending the educational narrative of the Kantian paradigm through contemplative inquiry. In Lin, J., Oxford, R. L., & Culham, T. E. (2016). *Toward a spiritual research paradigm: Exploring new ways of knowing, researching and being*. Charlotte, NC: Information Age Publishing, Inc.

Falk, J. H. (2006). An identity-centered approach to understanding museum learning. *Curator: The Museum Journal*, 49(2), 151–166. <https://doi.org/10.1111/j.2151-6952.2006.tb00209.x>

Fuller, R. & Parsons, W. (2018). Spiritual but not religious: A brief introduction. In, Parsons, WB (ed.), *Being Spiritual but Not Religious: Past, Present, Future(s)*. Routledge, Milton. Retrieved from <https://ebookcentral.proquest.com>

Lin, J., Oxford, R., & Culham, T. (2016). *Toward a spiritual research paradigm: Exploring new ways of knowing, researching and being*. Charlotte, NC: Information Age Publishing, Inc.

Latham, K. F. (2013). Numinous experiences with museum objects. *Visitor Studies*, 16(1), 3–20.

Ogden, B. (2014). In Search of the Transformational: Evaluating Exhibitions to Enhance Museum User Experience. Retrieved from <https://blogs.uoregon.edu/bogden/files/2013/10/FINISHED-Final-Full-Research-Proposal-In-Search-of-the-Transformational-115hbyk.pdf>

Packer, J., & Ballantyne, R. (2016, January 1). Conceptualizing the Visitor Experience: A Review of Literature and Development of a Multifaceted Model. *Visitor Studies*, 19(2), 128-143.

Rounds, J. (1999). Meaning making: A new paradigm for museum exhibits? *Exhibitionist*, 18(2), 5–8.

Silverman, L. H. (2002). Taking a wider view of museum outcomes and experiences: theory, research and magic. *Journal of Education in Museums*, 23, 3–8.

Soren, B. J. (2009). Museum experiences that change visitors. *Museum Management and Curatorship*, 24(3), 233–251.

Plotting to Uncover Visitors’ Experiences

Karl St-Pierre, Canadian Museum of History

Individual Paper

Visitor Studies Association - 2019 Conference Abstracts

Purpose: Typology is a common tool for Visitor Studies professionals working in museums. It simplifies the description of visitors, it allows for more cohesive visitor analysis, and, as a result, it helps to design better exhibitions and programs. What are the markers that help develop typologies? How typologies facilitate understanding of results from visitor studies? In this session, participants will explore approaches to designing typographic visitor research. More specifically, the session advocates for the use of merging Cartesian and Empirical approaches when designing research inquiries and/or developing typologies.

Abstract: This presentation will demonstrate how visitor behaviour and journey mapping in museums can use both Cartesian and Empirical data interpretations methods simultaneously. Participants will expand their data interpretation and protocol design competencies.

The first part of this presentation will briefly define Cartesian and Empirical approaches and explore the benefits and risks of both.

The second part will introduce a research evaluation of a self-guided tour conducted for the Canadian Museum of History. Session participants will be given the opportunity to follow the theoretical path taken by the evaluator and understand why the Empirical approach was insufficient to complete the typology study. More specifically, this case study will show that the use of an experiential approach was helpful to identify categories, but that by using a Cartesian method of data analysis, previously unknowable categories were uncovered. As a result, a more complete typology is available to museum evaluators for their continuing research.

The third part of the presentation will reinforce the idea that research benefits the use of both deduction and induction to establish facts and perspectives.

Importance: This presentation will demonstrate that the use of typologies facilitates understanding of research results. Indeed, it facilitates the organization of data and the writing of researchers' reports and simplifies the understanding of research results for clients or the senior management.

This presentation will also show that the creation of a robust typology is based both on the results of previous research, and the context in which the data is collected. Specifically, typologies need strong foundations to support their presence and relevance, and at the same time, they need to be easily adaptable to evolve in any situation.

Finally, this presentation will allow participants to come away ready to try this method at their own institutions and develop best practices for their work.

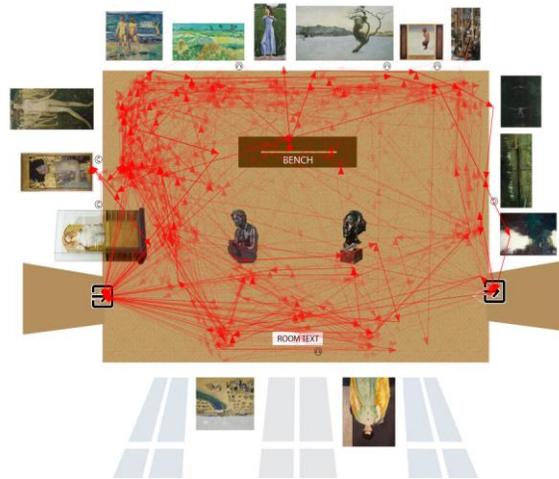
Trails of Walking, Ways of Talking: From Observation to Self-Reflection

Dimitra Christidou, University of Oslo

Luise Reitstatter, University of Vienna

Individual Paper

Visitor Studies Association - 2019 Conference Abstracts



Purpose: This presentation introduces the 'Belvedere Visitracker' study conducted by the University of Oslo and the University of Vienna in collaboration with the Austrian Gallery Belvedere. In this study, Visitracker, a digital tablet-based tool, was used to collect data through in-gallery observations, a post-visit questionnaire and Social Meaning Mapping (SMM). SMM was used in post-visit researcher-led sessions during which visitors in groups recounted verbally their movement in one of the museum rooms while marking it on the tablet's surface using a toolbox. Through several examples from our dataset of 76 pairs of visitors, we will illustrate how visitors linked artefacts by embedding them in space, time and a narrative through a process of creating, editing, and sharing with others. This paper aims at expanding on methods and research conducted in visitor studies by drawing upon a multidisciplinary approach to data collection, data analysis and design of research.

Abstract: Background

This paper presents findings from the 'Belvedere Visitracker' study conducted by the University of Oslo and the University of Vienna in collaboration with the Austrian Gallery Belvedere. As the museum has recently rearranged its permanent collection, the 'Belvedere Visitracker' study was designed to explore visitors' experience in one of the central rooms, the Secession room. Combining observational, visual and verbal data, the study investigates: How do visitors move through space, physically approach and interact with each other and the 16 artworks displayed in the Secession room? How do they reconstruct their experience through Social Meaning Mapping after the visit?

Methods

In this study, the novel digital tablet-based tool Visitracker was used to collect data through in-gallery observations, a post-visit questionnaire and the new qualitative tool called Social Meaning Mapping (SMM) during a researcher-led session. SMM is designed to be used in post-visit researcher-led sessions during which visitors in groups are prompted to recount their movement in one of the museum rooms verbally and visually by marking it on the tablet's surface using a toolbox. Both their talk (verbal activity) and the maps (visual activity) are recorded through the app. SMM addresses a methodological challenge of incorporating visitors' own narrative understandings of their movements and meaning-making processes into data collected by researchers through in-gallery observations (i.e. time and tracking studies).

Data and Analysis

We collected data from 76 pairs of visitors (=152 individuals). The analysis of the data collected through in-gallery observations foregrounded meaning making patterns regarding (a) visitors' movement and use

Visitor Studies Association - 2019 Conference Abstracts

of space in the Secession room, (b) visitors' preferences in relation to the artworks displayed in this room, and (c) the use of resources such as text, audio-guides or smartphones. The audio and visual data collected through SMM was analysed qualitatively with NVivo 12 software. The analysis illustrated how visitors linked artefacts visually and embedded them in space, time and a narrative through a process of creating, editing, and sharing them with their co-visitor and the researcher.

Findings

The data collected with Visitracker through the in-gallery observations enabled us to aggregate visitors' movement patterns in the Secession room (Figure 1) and thus, easily identify the areas which visitors occupy, or not, the most, and the artworks and resources they use, or not, the most. The data collected through SMM (i.e. both visitors' maps of their trails and their verbal accounts of their experience in the Secession room) foregrounded aspects of visitors' personal and sociocultural context and often linked these with aspects of the physical context. Apart from their own art-related knowledge, visitors brought into their meaning making a variety of personally-related knowledge resources such as hobbies, previous museum experiences and current societal debates. Additionally, visitors related both verbally and visually their experience in this room to the given situation in the museum, allowing us to explore how social and spatial constellations may shape their experience.

Importance: This paper is closely connected to the conference theme of as it introduces new ways of knowing about the museum experience: a digital app that enables museum researchers and practitioners to collect and combine data using three different methods. The micro-focus on visitors' experiences in one museum room enables a very detailed investigation of their interactions and meaning making processes in relation to space, resources and other visitors. Examples of automatic data visualisations created through the app contribute to the ongoing discussions in the field regarding the use of technology and its potential to inform museum practice. The discussion of the app, methods and findings expands on the methods and research conducted in the field of visitor studies and thus, directly promotes two VSA learning competencies, namely "Knowledge of and Practices with Social Science Research and Evaluation Methods and Analysis" and "Principles and Practices of Visitor Studies".

References: Jafari, A., Taheri, B. & vom Lehn, D. (2013). Cultural consumption, interactive sociality, and the museum. *Journal of Marketing Management*, 29 (15-16), 1752-1752. doi: 10.1080/0267257X.2013.811095

Nurse Rainbolt, G., Benfield, J.A., & Loomis, R.J. (2012). Visitor self-report behavior mapping as a tool for recording exhibition circulation. *Visitor Studies*, 15 (2), 203–216. doi:10.1080/10645578.2012.715035

Peterson, D. and Levene, M. (2003). Trail records and navigational learning. *London Review of Education* 1 (3), 207-216.

Tröndle, M., Wintzerith, S., Wäspe, R. and Tschacher, W. (2012). A museum for the twenty-first century: the influence of 'sociality' on art reception in museum space. *Museum Management and Curatorship*, 27(5), 461-86. doi:10.1080/09647775.2012.737615

Tzortzi, K. (2014). Movement in museums: mediating between museum intent and visitor experience. *Museum Management and Curatorship*, 29 (4), 327-48.

Yalowitz, S. S., & Bronnenkant, K. (2009). Timing and tracking: Unlocking visitor behavior. *Visitor Studies*, 12 (1), 47–64. doi:10.1080/10645570902769134

Visitor Studies Association - 2019 Conference Abstracts

Additional Resources:

<https://www.uv.uio.no/iped/english/research/projects/mediascapes/>

<https://crea.univie.ac.at/projects/studies/belvedere-visitracker/>

Coloring Outside the Lines: Stories and Lessons from Experimental Programs

Jessica Sickler, J. Sickler Consulting
Ben Wiehe, Science Festival Alliance
Chris Cadenhead, CRĒO Industrial Arts

Panel Presentation

Purpose: This panel will feature a critical discussion about two programs that took a proven, established programming model and posed the question: “What would happen if we tried to apply this model in a completely different setting?” Both examples have spent recent years testing the flexibility and boundaries of what they thought they knew about their established model. Experience-developers have uncovered struggles and successes in program implementation; evaluation has had to reconsider what “success” and program evaluation look like.

Abstract: In its original form, Portal to the Public (PoP) is a model for science museums to train scientists to engage with their visitors about science research (Selvakumar & Storksdieck, 2013). More recently, “PoP: Diversifying the Framework, Expanding the Network” explored whether the model could work in cross-disciplinary settings. Three partners -science center, art museum, and history museum– developed and tested strategies to bring professionals from other disciplines into their museums. Each institution experienced false-starts and course-corrections as they tried new approaches to recruitment, training, and programming. Evaluation required mid-course corrections to address emergent challenges, such as adding an unplanned formative study to better understand each professional audience’s view of public engagement work, as we discovered that what we know about scientists didn’t translate to other disciplines. This study shaped the distinguishing profiles for each of the professional audiences and helped define the framework for cross-disciplinary PoP. As the project concludes, the team is assessing the extent to which this approach has value to institutions beyond the partner sites.

“Science In Vivo” is spearheaded by the Science Festival Alliance (SFA), growing out of the network of increasingly common and successful science festival events. The team asked: “Instead of expecting people to come to the science festival, what if we took the science experiences to where the people are?” A distributed network of 24 teams is exploring this question as they experiment with integrating science experiences into existing cultural events where crowds already gather. From parade routes to beach boardwalks, these settings present the opportunity for fundamentally reordered interactions, with audiences in greater control of participation. The process of reviewing applications, implementing, and supporting sites has helped SFA refine critical features of the model – such as integration that prioritizes the experience of the existing gathering, and making significant adaptations to science engagement models to prioritize the comfort, needs, and preferences of the audience. Given the diversity of implementation, Science In Vivo’s first evaluation step was to unpack and understand the complexity inherent in these environments, and how science experiences fit within them. The project

Visitor Studies Association - 2019 Conference Abstracts

took a deeply contextualized approach, using pairs of external participant-observers and a flexible protocol designed to generate humanistic critiques of this activity, within and across sites.

This session will emphasize a synthesizing panel discussion to generate ideas from the different perspectives of these two programs, grappling with:

- As experience-designers were pushed to move out of their comfort zones, what were common themes in what designers needed to hear and think about in order to make the leap?
- What are the trade-offs and benefits of differing approaches to documenting impacts?
- The two projects took different approaches to the challenge. One tried to adapt an existing framework, while the other asked projects to start as far outside of past models as they could and work backwards to familiar techniques. What strengths and weaknesses emerged in each?
- How did funders' expectations and priorities influence the approach taken by each project – in implementation and evaluation?

Importance: There is increasing interest and discussion about cross-disciplinary learning and experiences in museums and informal learning settings, but in reality, disciplinary boundaries can be challenging to cross. Different disciplines (e.g., art, science, history) have different views about the purpose of public engagement, different communication goals, and different incentive structures. Attendees in different public settings and cultural events bring different expectations, desires, and social norms. These projects, and the issues they raise for discussion, faced head-on the challenges of mixing different perspectives, taking time to understand another point-of-view, and seeking common ground.

References:

Selvakumar, M. & Storcksdieck, M. (2013). Portal to the Public: Museum educators collaborating with scientists to engage museum visitors with current science. *Curator*, 56(1) 69-78.

Additional Resources:

<http://popnet.pacificsciencecenter.org/about/>
<https://sciencefestivals.org/toolkit/vivo/>

Inside Out: Digging Into the World of Internal Evaluation Departments

Elisa Israel, Saint Louis Science Center
Stephen Ashton, PhD, Thanksgiving Point Institute
Sena Dawes, Missouri Historical Society
Amy Niedbalski, Saint Louis Zoo

Working Group

Purpose: As more institutions recognize the value of evaluation and commit resources to support internal evaluation departments, there is a growing need for internal evaluators to have opportunities to connect with and learn from one another about the particular challenges associated with working internal to a museum, zoo, nature center, or other informal learning institution. Challenges such as cultivating buy-in and support for incorporating evaluation into internal processes, making the case for staff and budgets (and then managing them), and communicating evaluation findings to colleagues across the organization are common across different types of institutions and different size departments. This working group session will bring together internal evaluators and those interesting in learning more about internal evaluation departments, to discuss common challenges, share successful

Visitor Studies Association - 2019 Conference Abstracts

approaches to working internally, and begin to reimagine VSA's Internal Evaluation Managers Focused Interest Group (FIG).

Abstract: Session presenters represent a science center, zoo, history museum, and a multidisciplinary indoor/outdoor multi-venue facility. Their departments range in size from one to six paid staff. The departments they lead also have vastly different lengths of time that they have been part of their institutions, with one department being only two years old and others having been in part of their institutions for over a decade. This diversity provides a broad range of perspectives on working internal to an institution.

Through this session, the presenters will highlight some of the similarities and differences between their departments, using that as a jumping off point for deeper discussions where participants can pose questions, share their own challenges and successes, and learn from one another. Using the working group format, presenters will share some of the challenges they've faced, but also invite participants to identify additional issues that are relevant to them. Through a combination of small-group discussions and a large-group activity, participants will help develop new directions for a revitalized Internal Evaluation Managers FIG to pursue.

The session will use a combination of presentation, small-group discussion, and large-group activity. Each presenter will provide a brief overview of their departments and describe some of the challenges they have faced as internal evaluators.

Following the overviews, session participants will be invited to share questions or challenges they would like to explore further. These questions and ideas will be used to shape small-group discussions facilitated by the presenters, after which, presenters will facilitate a large group activity in which participants will be encouraged to reflect on the small group discussions and identify what conversations they want to continue (or start) as part of revitalizing the Internal Evaluation Managers Focused Interest Group (FIG) and what approaches to doing so would be of interest.

Importance: One of the key benefits of VSA is the opportunity it provides members to network with other evaluators and researchers who work in informal learning environments. The growth of the Focused Interest Groups (FIGs) has provided platforms for members with common interests to connect, share, and grow their skill sets. When the Internal Evaluation Managers FIG began several years ago, there was much interest in having a space where internal evaluators could share and learn from one another; however, in recent years, the FIG has become less active. Through this session we hope to spark renewed interest in reimagining and reactivating this group, including broadening its reach to engage internal evaluators more broadly, not only those leading departments.

Explore Value of Immersive Technology

Imfan Hoi, Woodland Park Zoo
Kathleen Finneran, Pacific Science Center
Fran Mast, John G. Shedd Aquarium
Stefanie Mabadi, Dig In UX

Panel Presentation

Visitor Studies Association - 2019 Conference Abstracts

Purpose: As immersive technology has been implemented increasingly to deepen visitors' experience or showcase information effectively and vividly, significant questions remain on how and to what extent immersive experiences can be served as a medium to communicate with visitors in new ways and can strengthen audiences' engagement. This session aims to explore the values and impacts of providing immersive experience to guests in the field. Four panelists from different setting of organizations – aquarium, zoo, science center and user-experience evaluation firm – will share insights on whether immersive experience can deepen visitors' engagement and what researches or evaluation have been used to understand the value of immersive experience.

Abstract: This session first draws a big picture of trends, values and types of immersive experiences in museums. Dig In UX, a user-experience(UX) evaluation firm bringing UX approaches to traditional museums, has explored how to utilize UX-methodologies to assess values, contents and potential experience of immersive-technology implementation. In order to reveal underlying motivators, intentions and deep connections to content, UX-methodologies holistically assess immersive experiences, in various forms, inspire feelings of being alive and more fully engaged, senses activated, and the feeling of being transported. While investigating immersive experience through this UX and human-centered lens, participants will explore different types of immersive experiences how UX-methodologies are used in assessments, and potential for connecting to various key mission values.

The guest experience continually evolves to meet community expectations and attract new audiences. People desire dialog and experiences over static information are they able to select what information and activities they interact with. To be an influence on people, museums are investigating immersive interaction from exhibition and education to research.

Shedd Aquarium has explored the concept of immersion through the lens of exhibition design, particularly as it related to facets of conservation science learning in zoos and aquariums. Methodologies, trends, limitations and experiential implications from a variety of exhibition studies will be discussed. Utilizing an inductive research approach, result from across studies appear to suggest that there is a relationship between immersive design and the extent to which visitors report affective connections with animals and the environment and feel knowledgeable about the connections between animals, people and the environment. These findings appear to be in alignment with previous research suggesting that additional design elements associated with immersive exhibits support increased visitor engagement in exhibition content leading to knowledge gains and positive affective responses (Bitgood 2011;Harvey et al. 1998;Peart 1984;Peart and Kool 1988;Peers 1991).

Interpretive conditions in exhibits at Woodland Park Zoo(WPZ) are limited to restricted views and traditional ways of learning about animals and their habitats. In an effort to shed more light on animal behavior, their welfare and more, WPZ conducted an experimental study on how a virtual reality(VR) experience can better educate and connect guests to animals, increase their empathy for animals and spur them to participate in wildlife conservation. Development of this study, evaluation and its relationship to WPZ's empathy work will be shared.

PacSci's also implemented augmented reality(AR) to enhance a physical object, space or exhibit and has studied how AR altered the experience of the exhibit for guests. The AR addition to the Puget Sound Tide Model intended to refresh an aging – but still relevant and historic – exhibit and add engaging content without altering the display itself. As one of PacSci's first experiments in using AR, there was a lot to be learned in terms of how AR could spark curiosity and engagement. Using timing and tracking,

Visitor Studies Association - 2019 Conference Abstracts

and interviews, PacSci explored the impact of the AR layer on the amount of time guests spent in the exhibit, their behavior, and their perception of the value of AR.

Importance: High technology is booming not only in business industries but also in museums and non-profit organizations. The educational programs, exhibit designs or audiences' studies in museums have been exploring unique ways to offer audiences in an innovative and extraordinary environment that have the potential to engage them to support organizational missions. While investigating the potential of high technology in this industry, immersive technology is one of the opportunities to engage and enrich guests' experience. This session introduces the implementation of immersive technologies, discovers insights on immersive experience from these different setting organizations and encourages participants to discuss future practices and researches.

References:

Bitgood, S. 2011. *Social Design in Museums: The Psychology of Visitor Studies: Collected Essays*. Edinburgh: Museums Etc.

Harvey, M. L., R. J. Loomis, P. A. Bell, and M. Marino. 1998. "The Influence of Museum Exhibit Design on Immersion and Psychological Flow." *Environment and Behavior* 30(5): 601–27.

Peart, B., and R. Kool. 1988. "Analysis of a Natural History Exhibit: Are Dioramas the Answer?" *The International Journal of Museum Management and Curatorship* 7: 117–28.

Peart, B. 1984. "Impact of Exhibit Type on Knowledge Gain, Attitudes, and Behavior." *Curator* 27(3): 220–37.

Peers, B. 1991. *Improving the Motivational Power of Museum Dioramas*. Unpublished manuscript. Ottawa, ON: Canadian Museum of Nature.

Lifelong Learning Starts Here: Prioritizing Your Own Professional Learning Opportunities

Kirsten Ellenbogen, Great Lakes Science Center
Kate Livingston, ExposeYourMuseum LLC
Michelle Maghari, Crocker Art Museum

Panel Presentation

Purpose: Those of us who attend the Visitor Studies Association conference (and/or work in audience research and evaluation) are dedicated to providing lifelong learning experiences for visitors. It is important to also think about our own growth and development, turning inward and advocating for our own ongoing learning. There are many professional development opportunities available, however it can be overwhelming to know where to find them and how to best advocate for our inclusion in them. This session unpacks and demystifies opportunities to support our continued learning and professional development. Participants will have the opportunity to turn the evaluator lens on themselves, and conduct personal reflection on their goals are and how they might achieve them. Participants of this session will hear about less common and non-traditional professional development opportunities, all of which may contribute to personal growth and learning.

Visitor Studies Association - 2019 Conference Abstracts

Abstract: Maybe you want to create a full-time evaluation position at your institution, or maybe even lead a museum someday. Perhaps you're at a crossroad in your career and not sure what's next. Are you struggling with issues around work/life balance or prioritization? Are you interested in bolstering your leadership skills? If these sound like you, this session is an opportunity to join fellow colleagues to consider how we make our own learning opportunities and professional development (PD) a higher priority.

In our organizations, PD is often used synonymously with taking a workshop or attending a conference, but there's a broad constellation of learning opportunities often hiding in plain sight for museum workers and visitor studies professionals. Have you heard about the leadership programs offered by your local chamber of commerce? What about foundations offering free training in nonprofit marketing, development, and management? There are young professionals meetups, leadership cohorts specifically for emerging leaders of color, women in tech groups, and more. If you know where to look, there are countless (both general and niche) opportunities to build your network and grow your skills. What if you could find just the right fit? What opportunities might challenge you, help you to grow, and propel you to your best and brightest future?

This session brings together three individuals at very different phases and stages of their careers, and in very different roles--Kirsten Ellenbogen, Great Lakes Science Center CEO and former VSA President, Michelle Maghari, Director of Visitor Services at the Crocker Art Museum, and Kate Livingston, evaluation consultant and certified executive and leadership coach. Together, they will unpack, demystify, and explore the various ways learning opportunities can be leveraged and utilized across one's career.

The three panelists have explored how to develop themselves and their teams through a variety of strategies. After an overview of the importance and value of ongoing self-development and an introduction to strategies and mechanisms, session attendees will break into three groups and each panelist will facilitate a small group discussion on the following three topics: 1. advocating for learning opportunities in your role/institution (led by Kirsten Ellenbogen); 2. finding local opportunities (led by Michelle Maghari); and, 3. career and leadership coaching (led by Kate Livingston). All breakout groups will focus on practical, applicable tools and skills, as well as reflective exercises to identify your own learning goals, and a buddy system to help motivate you through the year.

Handouts with ideas and possible next steps for participants will be distributed in person and made available online--both to session attendees as well as VSA conference goers who did not attend the session. The session will conclude with brief report-outs from each group and an optional opportunity for session attendees to stand up, voice, and commit to their goals and next steps on their learning journeys.

Importance: We refer to ourselves as "lifelong learning" organizations, yet when it's time to cut costs, PD is often the first item to go. While we invest deeply in the learning and experiences of our visitors, we often invest far less in the learning experiences of our internal workers and staffs. Learning opportunities are often positioned in museums and nonprofits as a "nice to have," not a "need to have," but what we know from the research (see references, below) is that employees who are invested in, cultivated, and encouraged to grow not only stay in their jobs longer, but have increased confidence, loyalty, and greater productivity--and go on to become some of the most essential thought leaders and change-makers in their fields.

Visitor Studies Association - 2019 Conference Abstracts

Additional Resources:

<https://www.shrm.org/hr-today/news/hr-magazine/pages/0101wells.aspx>

<https://www.inc.com/chad-halvorson/5-reasons-you-should-be-investing-in-employee-development.html>

<https://www.daveramsey.com/blog/is-professional-development-worth-the-money>

<https://www.forbes.com/sites/victorlipman/2013/01/29/why-development-planning-is-important-neglected-and-can-cost-you-young-talent/>

<https://hbr.org/2013/10/if-you-want-innovation-invest-in-people>

<https://katelivingstoncoaching.com>

11:15-12:30 PM - Concurrent Sessions

Engaging with Community and Youth Advisory Boards

Ardice Hartry, The Lawrence Hall of Science

Roundtable Discussion

Purpose: Community-based and Youth-focused advisory groups can help draw connections between community needs and evaluation of museum offerings. In order to be successful, they require trust, flexibility, funding, and appreciation for different ways of knowing. In this roundtable, museum professionals discuss best practices for creating and engaging with community-museum partnerships. The goal of the session is to enable participants to envision how they might engage advisory boards in designing evaluations and using evaluation data for decision-making.

Abstract: Community-based and youth-focused advisory groups can help museums remain relevant to their audiences and surrounding communities by offering opportunities to share resources and to co-create exhibits, programs, and activities. Many advisory boards function through sharing of information, but often little focus is given to understanding how that information is valued and gathered, and how different groups construct knowledge from that information. Our institution has a goal of ensuring that our evaluations and visitor studies are conducted using culturally-responsive evaluation strategies, and we see community and youth input as critical to that process. Museum professionals often have one set of goals, while community members may have others. For example, museum leadership may feel that community members need to be exposed to a range of different jobs opportunities (e.g., what is biotechnology?) while community members would rather explore how new industries impact their environment. It is critical to the evaluation process to identify the goals in advance, because they drive the decisions about measures and outcomes, and, ultimately, about whether to retain or revise an exhibit or program. Without community input, there is likely to be a disconnect between what visitors want to learn, what they pay attention to, what they strive to get from a program, and what the designers put into that same program. Therefore, community input is critical from the beginning of design.

Visitor Studies Association - 2019 Conference Abstracts

In this roundtable, museum professionals will consider key questions that need to be addressed when working with advisory groups: how are groups defined and recruited? Who decides what representation is needed and who represents each audience? Who sets the initial agenda? The ongoing agendas? What information or types of information are considered privileged? In other words, when we say, “We know that...” how do we know? Finally, if advisory groups remain advisory only – with no financial control over decisions – does this mean that they are inherently sidelined? The answers to these questions will be placed on a continuum between “audience-focused” and “field-focused”. Then, those with experiences working with advisory groups will describe the challenges and affordances of different approaches. These challenges and affordances will be connected to different goals and different approaches, enabling participants to see how different solutions are tied to different understanding of the roles of advisory boards. Finally, the presenter will share resources our institution has used and discuss how these have been helpful and what limitations remain.

Importance: This new model of community informed practice will enable museum to have the sustained benefit of creating a museum that is far more welcoming, responsive and inclusive. This model could become a hallmark design principle informing the creation and implementation of various public program experiences. From the conversation, participants should have strategies they can use to elicit regular, meaningful feedback from visitors, empowering all visitors to advise the direction of their programming through designing evaluations and making sense of evaluation data.

References:

Annoni, J., Balbuena, M., Bonney, M., Bonta, M., Camp, J., Cheatom, M...Wilson, B. (2018). *Partnerships for Impact: A Workbook for Informal Science Educators and Outreach Specialists Working with Diverse Communities*. Retrieved from <http://power30icbos.blogspot.com/2018/10/the-partnerships-for-impact-workbook-is.html>

Multiple Definitions of Success for Makerspace Evaluations

Rebecca Teasdale, Garibay Group

Individual Paper

Purpose: Makerspaces in museums, libraries, and community-based organizations support hands-on exploration of materials, technologies, and processes through the design and production of physical artifacts. Like other informal learning environments, makerspaces can be characterized as free-choice spaces because engagement is voluntary, visitor-directed, and individualized. Yet, as with other informal learning contexts, evaluations of makerspace tend to examine success based on staff-identified criteria—most often, staff-defined target outcomes and indicators. It is unlikely that these criteria are relevant for all visitors, however, given the variability of visitors and their motivations. This raises questions about how visitors define success and how evaluators can identify and incorporate multiple definitions of success in makerspace evaluations. In this paper, I present research that explores varying definitions of success for a library makerspace serving adults. I examine how motivations and values varied across a sample of visitors, the relevance of staff-identified evaluative criteria, and implications for evaluation.

Abstract: This paper is drawn from a larger exploration of a public library makerspace located in a majority African American city in the U.S. Rust Belt. The research is structured as a values-inquiry case study—a methodology used to surface stakeholder values associated with a specific program and

Visitor Studies Association - 2019 Conference Abstracts

examine the extent to which stakeholders value different program outcomes (Mark, Henry, & Julnes, 2000). Findings are intended to inform selection of target outcomes and indicators in subsequent evaluations (King, McKegg, Oakden, & Wehipeihana, 2013; Mark et al., 2000; Renger & Bourdeau, 2004). In this study, data collection and analysis were guided by third-generation activity theory (Engeström, 1987, 1999) and focused on the immediate goals and larger motivations and desired benefits associated with makerspace participation. Data were collected in three phases. First, I analyzed a purposive sample of documents to identify program objectives for the makerspace. Second, I conducted semi-structured focus groups with makerspace staff and leaders to understand their vision and intent for offering the makerspace and the meaning they made from the program objectives. Third, I conducted semi-structured interviews with a purposive sample of makerspace visitors to understand their motivations for participation, the purposes toward which they directed their making, the benefits they sought from participation, and the meaning they made from the program objectives. Data were analyzed in multiple stages using methods of open coding and constant comparison (Corbin & Strauss, 2015), informed by the theoretical framework. I specified evaluative criteria that represented each program objective, as well as visitors' specific motivations, purposes, and desired benefits. These criteria describe the aspects or dimensions on which a program is judged and reflect a "successful" program or desired state (Julnes, 2012; Sadler, 1985; Scriven, 2012). Findings revealed that each visitor's criteria profiles were unique, and no criterion was identified that was relevant for all visitors in the sample. Visitors' criteria were broader and more varied than criteria drawn from program objectives; however, at least one criterion drawn from program objectives was relevant for each visitor in the sample. These findings are consistent with the high level of individual choice and customization associated with makerspaces and other free-choice learning contexts and the variability of visitors and their motivations (Allen et al., 2007; Falk & Dierking, 1998; Wardrip et al., 2017). Further research is currently underway to develop methods for incorporating evaluative criteria (i.e., target outcomes and indicators) that represent visitors' definitions of success into makerspace evaluations.

Importance: This research has three key implications for evaluations of makerspaces in museums, libraries, and community-based organizations. First, drawing evaluative criteria (i.e., target outcomes and indicators) exclusively from program objectives could result in evaluators missing key outcomes and benefits associated with makerspace participation. Second, applying criteria universally to all makerspace visitors could result in "false negatives"—that is, the absence of an outcome could be misunderstood as a lack of success rather than a lack of relevance. In both scenarios, the benefits of the makerspace could be underestimated. Third, identifying and incorporating visitors' definitions of success honors visitors' needs and perspectives when measuring makerspace success, a priority reflected in the conference theme. While this research focused on one particular informal learning context—a public library makerspace for adults—these implications challenge evaluators across free-choice settings to identify and incorporate visitors' definitions of success into the evaluations they conduct.

References: Allen, S., Gutwill, J., Perry, D. L., Garibay, C., Ellenbogen, K. M., Heimlich, J. E., . . . Klein, C. (2007). Research in museums: Coping with complexity. In J. H. Falk, L. D. Dierking, & S. Foutz (Eds.), *In principle, in practice: Museums as learning institutions* (pp. 229–246). Lanham, MD: AltaMira Press.

King, J., McKegg, K., Oakden, J., & Wehipeihana, N. (2013). Evaluative rubrics: A method for surfacing values and improving the credibility of evaluation. *Journal of MultiDisciplinary Evaluation*, 9(21), 11-20.

Julnes, G. (2012). Managing valuation. *New Directions for Evaluation*, 133, 3-15.

Visitor Studies Association - 2019 Conference Abstracts

Mark, M. M., Henry, G. T., & Julnes, G. (2000). *Evaluation: An integrated framework for understanding, guiding, and improving policies and programs*. San Francisco: Jossey-Bass.

Renger, R., & Bourdeau, B. (2004). Strategies for values inquiry: An exploratory case study. *American Journal of Evaluation*, 25(1), 39-49.

Sadler, D. R. (1985). The origins and functions of evaluative criteria. *Educational Theory*, 35(3), 285-297.
Scriven, M. (2012). The logic of valuing. *New Directions for Evaluation*, 133, 17-28.

Wardrip, P., Brahms, L., Reich, C., & Carrigan, T. (2017). *Making + learning in museums and libraries: A practitioner's guide and framework*. Retrieved from Washington, DC:
<https://www.informalscience.org/makinglearning-museums-and-libraries-practitioners-guide-and-framework>

Design-based Research that Integrates Researcher and Practitioner Ways of Knowing

Rae Ostman, Arizona State University

Marta Beyer, Museum of Science

Marcie Benne, Oregon Museum of Science and Industry

Panel Presentation

Purpose: With educators and researchers working side by side, design-based research (DBR) projects can develop educational materials and refine a theoretical model simultaneously. In this session, team members will describe methods and practices for two DBR projects, share lessons learned, and discuss how the work benefited from different professional perspectives. Team members from the ChemAttitudes project will explain how they are working collaboratively to refine a theoretical framework for creating hands-on activities that increase the public's interest, relevance, and self-efficacy in chemistry, in addition to developing and distributing a set of hands-on activities that embody the research findings. Team members from the REVEAL project will share how they developed a model of facilitation for family math learning at exhibits. Attendees will be encouraged to ask questions, reflect on ways that this approach is similar or different to their practices, and consider how they have or might apply these ideas.

Abstract: This session will highlight two innovative projects that have used DBR to develop and evaluate hands-on activities and unfacilitated, interactive exhibits in the context of science centers and children's museums: ChemAttitudes, led by the Museum of Science, and REVEAL, led by the Oregon Museum of Science and Industry. Team members will provide an overview of the DBR methods used for each project, and explain the working process of the team and partners. They will also describe how the collaborative nature of DBR work has benefited the learning experiences, research findings, recommendations, practices, and theories that were generated in these efforts.

Design-based research (DBR) combines iterative formative research with design experiments that are based upon learning from prior research and practice. With educators and researchers working side by side, a DBR project can develop and refine educational (and/or professional development) materials at the same time that it develops and refines a contextual theoretical model. Testing is done in a naturalistic setting such as a museum, rather than a lab or other controlled setting. As a result, DBR

Visitor Studies Association - 2019 Conference Abstracts

contributes to practice and research simultaneously and both the educational products and the research process are tightly integrated and informed by the context of use.

Funded by the National Science Foundation (NSF), ChemAttitudes: Using Design-Based Research to Develop and Disseminate Strategies and Materials to Support Chemistry Interest, Relevance, and Self-Efficacy is a collaboration of the National Informal STEM Education Network (NISE Net) and the American Chemical Society (ACS). The goal of the project is to promote positive attitudes toward learning about chemistry by engaging multiple and diverse public audiences all across the United States in facilitated, hands-on chemistry activities. Specifically, the project is focused on identifying evidence-based design strategies that increase participants' interest in chemistry, their perception of its relevance to their lives, and their sense of self-efficacy to learn chemistry. Major project activities include a design-based research study articulating design strategies for encouraging learning outcomes and supporting the development of exemplary hands-on activities; the production of a toolkit of activity materials and professional resources to disseminate the findings of the DBR study; and a broader US adult survey focused on public attitudes towards chemistry.

Researching the Value of Educator Actions on Learning (REVEAL) was an NSF-funded research project led by the Oregon Museum of Science and Industry. In this project, museum educators joined a design-based research team to develop a model of facilitation for family math learning at exhibits. The DBR process was adapted to the research problem and context while maintaining practitioner-researcher partnerships, iterative cycles of inquiry, and theory refinement. The resulting REVEAL facilitation model illustrates a relationship between responsive facilitation practices (observe, support, reflect) and visitor experience outcomes that is influenced by physical, personal, and sociocultural factors. The REVEAL facilitation model has the characteristics needed for generating hypotheses as demonstrated by a subsequent quasi-experimental study based on the model.

Importance: This session explores design-based research (DBR), with a particular focus on considering how this methodology allows research projects to integrate complementary ways of knowing. Presenters will share their experiences of two different DBR projects, one focused on STEM learning at hands-on activities and the other focused on STEM learning at museum exhibits, and explain the value of close collaboration between educators/practitioners and researchers in these projects. Attendees will gain a deeper understanding of DBR, learn some of the common benefits and challenges related to this type of project, and take away practical tips and lessons from the two case studies.

References:

Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design research: Theoretical and methodological issues. *The Journal of the Learning Sciences*, 13(1), 15-42.

Garibay, C., & Huerta-Migus, L. (2017). *REVEAL process evaluation report on culturally responsive research*. Portland, OR: Oregon Museum of Science and Industry.

Gontan, I., Pattison, S. A., Brandon, S., Rubin, A., Andanen, E., & Benne, M. (2016). REVEALing findings from the field: Experiences developing and implementing a staff facilitation model at two science centers. *Informal Learning Review*, 138(May/June), 15-17.

National Academies of Sciences, Engineering, and Medicine. 2016. *Effective Chemistry Communication in Informal Environments*. Washington, DC: The National Academies Press.
<https://doi.org/10.17226/21790>.

Visitor Studies Association - 2019 Conference Abstracts

Oregon Museum of Science and Industry. (2016). *Adelante Mujeres + OMSI: Learning with community partners*. Portland, OR: Oregon Museum of Science and Industry.

Ostman, R. (2018). *Let's do chemistry: A framework and strategies to encourage positive attitudes toward learning chemistry in museums and informal settings*. Tempe, AZ: Arizona State University.

Pattison, S. A., Benne, M., Rubin, A., Gontan, I., Andanen, E., & Dierking, L. D. (2016). *Staff facilitation that supports family learning at exhibits: Findings and recommendations from the REVEAL project*. Portland, OR: Oregon Museum of Science and Industry.

Pattison, S. A., Randol, S. M., Benne, M., Rubin, A., Gontan, I., Andanen, E., Bromley, C., Ramos-Montañez, S., Dierking, L. D. (2017). A design-based research study of staff-facilitated family learning at interactive math exhibits. *Visitor Studies*, 20(2), 138–164.

Pattison, S. A., Rubin, A., Benne, M., Gontan, I., Andanen, E., Shagott, T., Francisco, M., Ramos-Montanez, S., Bromley, C., & Dierking, L. D. (2018). The impact of facilitation by museum educators on family learning at interactive math exhibits: A quasi-experimental study. *Visitor Studies*, 21(1), 4–30.

Ramos-Montañez, S., Randol, S., Herran, C., Pattison, S., Rubin, A., Shagott, T., Andanen, E., and Benne, M. (2018). *Emergent Activity Frames in Facilitated Family Interactions at Math Exhibits*. Portland, OR: Oregon Museum of Science and Industry.

Additional Resources: Many of the resources cited in the references are available on the project webpages:

REVEAL project: <https://external-wiki.terc.edu/display/Reveal/About+the+Project>

ChemAttitudes project: <http://www.nisenet.org/chemattitudes>

Understanding and Measuring Engagement: Perspectives from Informal STEM Learning and Science Communication

Kevin Crowley, University of Pittsburgh

Kelly Riedinger, Center for Research on Lifelong STEM Learning at Oregon State University

Melissa Ballard, Center for Advancement of Informal Science Education

Amy Grack Nelson, Science Museum of Minnesota

Paulette Vincent-Ruiz, University of Pittsburgh

Marie Hobson, Natural History Museum London

Palmyre Pierroux, University of Oslo

Panel Presentation

Visitor Studies Association - 2019 Conference Abstracts

What is STEM Engagement?

An interview series with 12 scholars on how they conceptualize and measure engagement.



caise center for advancement of informal science education

Purpose: Many practitioners in the visitor studies field need to measure engagement in their work. The concept of engagement is informed by various theories from different disciplinary perspectives, including education research, science communication, social psychology, and the learning sciences.

To support professionals in making sense of these diverse perspectives, CAISE interviewed 12 scholars in informal STEM education, science communication, and citizen science who study or develop activities and environments where engagement is an observable phenomenon and/or a goal. We asked these experts how they conceptualized and measured engagement, and how engagement intersects with other related concepts.

We'll present our findings in a "talk show" style panel showcasing these experts' perspectives. Attendees will reflect on their own ideas about engagement and be inspired to make meaningful choices in how they design and select instruments in their work.

Abstract: Since producing the report *Many Experts, Many Audiences: Public Engagement with Science and Informal STEM Education* (McCallie et al., 2009), CAISE has been following how the concept of engagement is being defined, used, and measured in science communication and informal STEM learning settings and experiences.

In informal STEM education, thinking about engagement has evolved from a focus on innovative ways of attracting the initial attention of science center/museum visitors or media consumers to strategies for designing environments and activities that foster deeper experiences, such as experimentation, skill development, and contemplation in a variety of settings.

In the science communication field, engagement increasingly refers to "two-way" approaches to designing and facilitating interactions between STEM professionals and diverse "publics" that take into account the knowledge and prior experiences of those audiences.

For professionals in both fields, it is challenging to make sense of the diverse theories from different disciplinary perspectives.

A RESOURCE TO HELP MAKE SENSE OF "ENGAGEMENT"

In 2018, CAISE interviewed 12 informal STEM education, science communication, and citizen science professionals who study or develop activities and environments where engagement is an observable, identifiable phenomenon and/or a goal of a designed experience. We asked these experts how they conceptualized and measured engagement, and how engagement intersects with other related concepts, such as STEM interest, identity, self-efficacy, and other important dimensions of learning and communication.

Visitor Studies Association - 2019 Conference Abstracts

WHAT WE HEARD

There was a general consensus among the interviewees that educational engagement has cognitive, affective, and behavioral dimensions. It can take the form of wrestling with ideas; feeling emotional responses to activities, such as interest or frustration; and using physical movements or gestures that demonstrate, for example, active attention and listening (as articulated by Douglas Clark, University of Calgary; Josh Gutwill, Exploratorium; Benjamin Heddy, University of Oklahoma; Victor Lee, Utah State University; Christian Schunn, University of Pittsburgh; Paulette Vincent-Ruz, University of Pittsburgh).

John Besley at Michigan State University, characterized public engagement activities as ones that are designed to get people to process information and phenomena at a deeper cognitive level, which is important for forming and changing beliefs. Sara Yeo at University of Utah mentioned online activities such as liking, sharing, and commenting on content as behavioral examples of engagement that may have consequences for both the individual person engaging and the way in which others perceive and respond to content.

We also heard about different ways of measuring engagement: surveys (although they are an imperfect tool), observation, analyzing behavioral choices, back-end analytics of social media interactions, and even tracking eye movements or gaze and heart rate.

ABOUT THE SESSION

In this session, members of the CAISE task force on evaluation and measurement, as well as some of the interviewees, will discuss converging and diverging perspectives on engagement. Audience members will reflect on how they've conceptualized and measured engagement in their own work and will get the chance to debate with other participants.

Importance: The field of visitor studies has evolved in scope and sophistication with regard to epistemology and methodology, as well as knowledge-building in general. Reflecting on how we know what we know about audiences and impacts, and what it means to engage in responsive, responsible measurement, has moved the community forward on many fronts. However, the visitor studies field continues to grapple with how to define and measure key aspects of informal learning experiences. One of these aspects is the construct of "engagement." This session spotlights a selection of researchers and practitioners who design for and/or measure engagement in informal STEM learning and science communication experiences and settings. These varied perspectives will allow session attendees to reflect on the diverse ways engagement can be conceptualized and measured in their own work.

References:

Bell, J., Besley, J., Cannady, M., Crowley, K., Grack Nelson, A., Philips, T., Riedinger, K., & Storksdieck, M. (2019). *The role of engagement in STEM learning and science communication: Reflections on interviews from the field*. Washington, DC: Center for Advancement of Informal Science Education. Retrieved from <http://informalscience.org/sites/default/files/CAISE%20Engagement%20Overview.pdf>

McCallie, E., Bell, L., Lohwater, T., Falk, J., Lehr, J., Lewenstein, B., Needham, C., & Wiehe, B. (2009). *Many experts, many audiences: Public engagement with science and informal science education. A CAISE inquiry group report*. Washington, DC: Center for Advancement of Informal Science Education. Retrieved from http://caise.insci.org/uploads/docs/public_engagement_with_science.pdf

Visitor Studies Association - 2019 Conference Abstracts

National Research Council. (2009). *Learning science in informal environments: People, places, and pursuits*. Washington, DC: The National Academies Press. Retrieved from <https://www.nap.edu/catalog/12190/learning-science-in-informal-environments-people-places-and-pursuits>

Additional Resources:

As preparation, we recommend that you read the task force's reflections on the interviews (Bell et al., 2019) and review a few of the interviewees' perspectives. You can watch their video clips, read interview highlights, or review the full conversation at www.informalscience.org/engagement.

What is STEM Identity, Interest, and Engagement?: An Interview Series With 35 Scholars

- informalscience.org/identity
- informalscience.org/interest
- informalscience.org/engagement

About the CAISE Evaluation and Measurement Task Force: informalscience.org/em-task-force

Complex Collaboration: Lessons from a Longitudinal Evaluation Involving Multiple Stakeholders

Ashlan Falletta-Cowden, Falletta-Cowden Consulting

Jenny Flowers, Field Museum

Michelle Rabkin, The Chicago Academy of Sciences

Panel Presentation

Purpose: Our panel will explore collaboration on longitudinal program evaluations that involve multiple institutions and stakeholders. Using the Early Education Science Partnership (E2SP) program as a case study, our panel will examine how to collaborate with various stakeholders to design a project that is both adaptive to the changing needs of a longitudinal project while also maintaining continuity formed with key themes. Our presentation and the following discussion will give attendees ideas and tools that they can draw upon as they design and carry out large-scale evaluations.

Abstract: This presentation will explore the nature of collaboration across a longitudinal project as illustrated with the case study of the Early Education Science Partnership (E2SP) program. The E2SP program was a collaboration between two museums (the Field Museum and the Peggy Notebaert Nature Museum), one school systems partner (Big Shoulders Fund), and several teams of evaluators. Over the course of the four-year program, the E2SP team collaborated with ten partner schools to prepare over 50 pre-K to 3rd grade teachers to implement the Next Generation Science Standards and build the capacity of these schools to strengthen and support science instruction and integrate museum resources into science teaching and learning.

Our panel presentations and discussion will delve into a number of topics centered on our "lessons learned" using the E2SP program as a case study. These topics include: plans for succession and managing changes in evaluation teams, establishing roles and responsibilities around evaluation among non-evaluation staff at collaborating institutions, building trust across institutions and partners, navigating IRB challenges across institutions, and adapting evaluation reporting to meet the needs of

Visitor Studies Association - 2019 Conference Abstracts

varied stakeholders. We will share how the evaluation was conceptualized along with the study design, the IRB process, the methods, and the team's expectations for the evaluation. We will examine the ways the E2SP team would have approached preparations or components differently in hindsight and why these changes would have improved the evaluation and the collaboration between evaluators and non-evaluators. The team will discuss approaches that yielded success and engage the visitor studies community through discussion in an exploration of how others have overcome similar challenges.

Importance: Through the case study of E2SP and our discussions between panelists and attendees, we hope that participants in this session leave with insights into the functional management of evaluations involving multiple stakeholders and institutions. In essence, we aim to create a forum in this session that allows for the presenters and the audience to explore less frequently discussed, and sometimes sensitive or political, aspects of evaluations spanning multiple years with diverse stakeholders in an effort to better prepare evaluators and non-evaluators to successfully plan for and execute these types of collaborations.

Additional Resources:

Early Education Science Partnership <https://www.fieldmuseum.org/educators/partnerships/early-elementary-science-partnership>

Observing Empathy in Museum-Based Engineering Activities

ChangChia James Liu, Susan Letourneau and Dorothy Bennett, New York Hall of Science

Individual Paper

Purpose: This presentation will discuss how narratives and empathy can be integrated into museum-based engineering design activities, and the potential impact of this approach on girls and other groups that remain underrepresented in STEM fields. Recent studies have described empathy as a critical part of the engineering process — allowing engineers to understand their clients' perspectives and design solutions that meet users' needs. In informal learning settings, there is anecdotal evidence that narratives can provide human contexts to engineering problems and invite learners to imagine others' points of view. However, few studies have documented what types of narrative framings can evoke empathy, how empathy can be observed in informal settings, or how to conceptualize its effect on engagement in the engineering process (e.g., ideation, iteration). The current study addressed these gaps by developing six engineering activities that incorporated narratives in a variety of ways, and examining the impact on visitors' engagement.

Abstract: Background: Research in engineering education and policy has shown that girls remain significantly underrepresented in engineering (National Science Foundation, 2017). Although engineering is often taught using decontextualized or competitive engineering challenges, girls (and many other learners) are often more engaged by designing solutions to problems with personal or social relevance (Ceci & Williams, 2010; Rusk, Resnick, Bern, & Pezalla-Granlund, 2008). At the same time, researchers in engineering education have described perspective-taking and empathy as integral parts of the design process, allowing engineers to more deeply understand their clients' needs and perspectives (Walther, 2017; Hess & Fila, 2016). Researchers and activity developers in museums have found that adding narratives to otherwise abstract engineering activities can provide a meaningful context and support user-centered thinking (Bennett, 2000; Bennett & Monahan, 2013). However, there

Visitor Studies Association - 2019 Conference Abstracts

is little systematic evidence that defines what kinds of narrative elements are most effective in eliciting empathic responses and supporting engineering practices such as ideation and iteration.

Methods: In this project, museum practitioners and researchers developed six pairs of engineering activities that incorporate narrative in different ways (through a combination of characters, settings, and problem frames). Each pair includes one version of the activity with these narrative elements, and one without — for example, designing an invention to lift a heavy object (non-narrative) or to help a grandmother carry her groceries (narrative). Through iterative development of these activity pairs and comparison of the narrative and non-narrative versions, we are examining how engineering activities can incorporate narratives, and how various narrative elements can support empathy and engagement. Data include observations and interviews with girls (ages 7-14) participating in each activity with their families. We coded the data to identify multiple facets of empathy — both emotional and cognitive — and visitors' engagement in the engineering process.

Results: Data from this study supports the hypothesis that narratives can evoke empathy by suggesting a point of view and connecting visitors with the users of a design. In addition, observations and interviews revealed how specific materials and facilitation strategies can communicate narratives and support different facets of empathy — for example, relatable characters can elicit emotional responses like concern and compassion, deepening engagement with problem ideation and iteration. The lessons learned across the set of six activities are being synthesized into a set of design principles for integrating narratives into engineering activities, along with examples of a range of empathy behaviors that were observed.

Importance: The results of this study contribute to the field's theoretical understanding about the connections between social and emotional skills (e.g., empathy) and STEM practices. By not only articulating how these aspects of learning relate to each other, but also defining specific strategies for supporting empathy as a critical part of the engineering process, the study suggests novel entry points and ways of engaging with engineering. In addition, the study has resulted in coding schemes for identifying empathy in engineering activities, which may be useful in a variety of formal and informal settings. In the next phase of the project, two other museum sites will test the developed activities, providing information about how they can be adapted for different settings and audiences. Together, these results have implications for the design of inclusive and effective STEM learning experiences that engage all children in the core concepts and practices of engineering.

References:

Bennett, D. (2000). *Inviting girls into technology: developing good educational practices*. Commissioned paper for the American Association of University Women. Excerpts in American Association of University Women (2000). *Tech-savvy: Educating girls in the new computer age*. Washington, DC: AAUW Educational Foundation.

Bennett, D., Monahan, P., & Honey, M. (2016). Museum Design Experiences That Recognize New Ways to Be Smart. *Connecting Science and Engineering Education Practices in Meaningful Ways*, 39-57.

Ceci, S. J., & Williams, W. M. (2010). Sex differences in math-intensive fields. *Current Directions in Psychological Science*, 19(5), 275-279.

Hess, J. L., & Fila, N. D. (2016). The manifestation of empathy within design: findings from a service-learning course. *CoDesign*, 12(1-2), 93-111.

Visitor Studies Association - 2019 Conference Abstracts

Monahan, P., & Bennett, D. (2013). NYSCI Design Lab: No Bored Kids!. In *Design, Make, Play* (pp. 52-67). Routledge.

National Science Foundation, National Center for Science and Engineering Statistics. 2019. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2019*. Special Report NSF 19-304. Alexandria, VA. Available at <https://www.nsf.gov/statistics/wmpd>.

Walther, J., Miller, S. E., & Sochacka, N. W. (2017). A model of empathy in engineering as a core skill, practice orientation, and professional way of being. *Journal of Engineering Education*, 106(1), 123-148.

Additional Resources: Project page: <https://www.informalscience.org/understanding-how-narrative-elements-can-shape-girls-engagement-museum-based-engineering-design>

Thinking Like an Evaluator: Capacity-Building at Two Children's Museums

Aubrey Henriksen, Creative Discovery Museum
Jessica Sickler, J. Sickler Consulting

Roundtable Discussion

Purpose: Attendees will discuss strategies for building evaluation capacity by building evaluation support structures for their institution, such as internal working groups, external professional development groups, and internship programs. We will address strategies including internal working groups, external professional development groups, internship programs, and working with evaluation consultants or trainers. We will also discuss the types of goals that are important for capacity-building work, such as helping staff develop and practice evaluative thinking skills. Finally, attendees will discuss overcoming capacity-building challenges when an institution does not have dedicated evaluation staff.

Abstract: This discussion will share overlaps, distinctions, and reflections on the strategies of two IMLS-funded evaluation capacity-building projects in Tennessee – one at Discovery Center (DC) in Murfreesboro and one at Creative Discovery Museum (CDM) in Chattanooga. Both projects sought to build capacity and cultivate an institutional culture of evaluation by partnering with external evaluation consultants: DC with J. Sickler Consulting (JSC); CDM with Randi Korn & Associates (RK&A). But each project took a slightly different approach.

DC and JSC engaged museum staff in a year-long process to learn and apply evaluative thinking skills within the work of the museum. The foundation of this work was in recent efforts to better define evaluative thinking and outline the key mindsets and practices that comprise it (Buckley, et al., 2015; Fierro, et al., 2018), rather than focusing simply on the skills of implementing an evaluation study. Through workshops, coaching, and three staff-led projects, the partnership sought to increase staff's ability to identify assumptions in program design, articulate focused, actionable questions, identify appropriate and feasible sources of evidence to answer questions, and interpreting results into actionable strategies. CDM took a three-part approach – building capacity internally through monthly cross-departmental meetings, externally in the community through the Chatt Evaluation Group, and recruiting evaluation support from interns through a local university partnership.

Visitor Studies Association - 2019 Conference Abstracts

In this session's roundtable format, the presenters will briefly overview the process they each used, and then facilitate a discussion about the affordances and challenges of the various capacity-building techniques used by these two efforts, as well as other strategies that have been used by attendees. Key issues may include contrasts in capacity-building process or goals for institutions with internal evaluators and those without dedicated evaluation staff. The group may consider what goals should be prioritized within capacity-building work, how to mitigate staff (or leadership) apprehension about evaluation or time commitment, and which types of staff engagement strategies are more and less successful.

Importance: Building evaluation capacity across departments at an institution has the potential to bring staff together under a shared understanding of impact. By developing evaluative thinking, staff can begin to see how their contributions and programs build towards the institution's overarching goals. By identifying assumptions and collecting and analyzing data, staff without any evaluation experience can learn how to use evaluation and data to drive decisions to benefit their stakeholders. The Discovery Center and the Creative Discovery Museum have put this theory to the test and are already seeing the implications at all levels of their museums from development and marketing to exhibits and education.

References:

Buckley, J., Archibald, T., Hargraves, M., & Trochim, W.M. (2015) Defining and teaching evaluative thinking: Insights from research on critical thinking. *American Journal of Evaluation*, 36(3) 375-388.

Fierro, L.A., Codd, H., Gill, S., Pham, P.K., Targos, P.T.G., & Wilce, M. (2018) Evaluative thinking in practice: National Asthma Control Program. *Evaluative Thinking: New Directions for Evaluation*, 158, 49-72.