Meastrement Moments

Embedding research into informal science education at the art/science/engagement interface

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Strong Designs

Mixed methods Multiple sources Multiple measures Linked data



Reliability & Validity

Pilot test & refine Replicate

Timing

Pre-performance Intermission Post-performance Delayed post-performance

Types of Questions

Nine content questions (Likert, quantitative) Emotion clouds (closed, qualitative) Creative questions (open, qualitative)

Approaches to Analysis

Randomly equivalent comparison groups Linked pre/intermission/post/delayed Crosstabs by background and demographics

Embedded

Imaginative Themed Seamless



Shapes & sizes Textures & colors Word choice

Creative Formats

Pilot Test & Refine

Develop your instruments over time by learning from what your audience says and refining your questions through experience.

At the first site, we asked an open-ended qualitative question: What struck you most about the tea? After analyzing responses from a few sites, we developed a quantitative measure to gauge audience members' reactions to Act Two.

What struck me most about the tea was...

Choreography, complexity, flow of the performance ______________________________

suggested by the performance ____ ____

Opportunity to reflect on current events ____ ___ ______

iPads ____ iPads

not at a little a medium a great blew all bit amount deal my mind

One More Measure The Tea is almost over...

Imaginative

Be creative with your data collection, especially for qualitative data.

At one site, audience members wrote "Letters to Edith" thanking her for the lovely tea and commenting on their experience so far. Their "letters" were sources of qualitative data.

At another site, audience be scientists and jot down

TEA TABLE GUEST 25 Feb. 201 Dear Edith, Thank you for inviting me to tea at your place. Your chocolate cake was ...

Tea servers wore physics-themed aprons in the lobby pre-performance and during intermission while distributing and So far, what strikes me most about the collecting instruments. They rewarded audience members with a tea experience is...

What I'm wondering about is..

I wish there were more of.. The Guest with number

Seamless

chocolate candy.

Themed

Incorporate the evaluation into the learning activities.

Post-performance instruments were hidden under tablecloths for audience members to "discover" as part of Act Two.

Repeat your learning theme throughout your evaluation activities.





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Introduction

Assessing informal science education programs poses a challenge: How do you rigorously evaluate impact without the research interrupting the learning activities? This multi-site, mixedmethods evaluation of *The Matter of Origins*, a contemporary art/science performance, exemplifies how rigor and creativity are possible at the art/science/engagement interface. This poster focuses on how the MSU evaluators and the Dance Exchange developed and implemented the evaluation. Research findings are reported elsewhere.

Context

Choreographed by Liz Lerman and the Dance Exchange, *The Matter of Origins* is a contemporary dance exploring historical perspectives and cutting edge physics about our beginnings. The performance presents stories, images, and movements in two acts. In Act One, the audience experiences projected media, soundscape, and dance by a multi-generational cast in a theatre. In Act Two, they adjourn to a nearby room to enjoy tea, cake, and dialogue facilitated by local scientists and scholars. Tea includes dance interruptions and additional science content, to stimulate reflection and public engagement about the nature of science, limits of measurement, and meaning of movements, both big and small.

Research Design

The challenge was to evaluate the impact of Act One, Act Two, and the overall performance in a way that would not take away from the audience members' experience. Together, the MSU evaluators and the Dance Exchange developed research designs, instruments (which we called "measures"), and data collection processes, so that rigor and creativity were maximized.

In general, audience members completed pre-performance, intermission, and post-performance measures. These hard-copy surveys included quantitative (Likert-scale) questions measuring their attitudes, interests, knowledge, and behavior concerning science; directed qualitative measures about their emotions (emotion clouds); open-ended qualitative questions about what struck them and about science themes they perceived during the performance and tea.

Audience members also provided background and demographic information, including race/ ethnicity, gender, age, level of education, science background, dance background, and informal science education background.

Research designs varied from site to site depending on theatre arrangements for Act One and Act Two; particular learning interests at each site; and the evaluation team's evolving understanding of the audience members' experiences.

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