A Choreographer, a physicist, and an evaluator walk into a theater: Mixed methods research designs for evaluating impact at the art/science/engagement interface

Diane M. Doberneck, Ph.D.
National Collaborative for the Study of University Engagement

Paula K. Miller
Ph.D. student, Department of Sociology

John H. Schweitzer, Ph.D.
Center for Community and Economic Development

University Outreach and Engagement
Michigan State University

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Introduction and Overview

Presentation Team (5 mins)

Our Evaluation Research (20 mins)
  – About *The Matter of Origins*
  – About Our Collaborative Research Approach
  – About Our Findings (handout)

Rigor and Creativity (35 mins)
  – Strengthening rigor in research design
  – Adding creativity to research design
  – Incorporating community partner voices

Question and Answers (10 mins)
The Matter of Origins

Choreographed by Liz Lerman and Dance Exchange
  – 35 + years of creating dance and engaging people in making art
  – Won MacArthur Genius Award in 2002 for community organizing
  – Uses dance as a vehicle for human inquiry and engagement with contemporary issues of our time

Two Act Contemporary Dance Performance
  – Act One—on stage, multi-media, intergenerational dance explores Big Bang, Los Alamos, and origin stories

  – Act Two—in “tea room,” dialogue convened by provocateurs and punctuated by dance interruptions and led by physicist host

Let’s take a look—The Matter of Origins video
Our Evaluation/Research Challenge

How do you rigorously evaluate the impact without the research interrupting the learning activities?
We Wanted To Know…

NSF Informal Science Education/Early Concept Grants for Exploratory Research (EAGER)

– Changes in attitude
– Changes in interest
– Changes in knowledge
– Changes in behavior

Dance Exchange and Michigan State

– Connection between art/science ways of knowing
– Emotional engagement with content and learning
– Patterns in changes by demographic and background variables
Our Collaborative Approach

MSU learned about the performance & its goals.

MSU proposed questions & methods.

DE gave feedback, made counter suggestions.

DE helped us focus in on the different areas, especially for the attitude, interest, knowledge, behavior.

DE suggested the emotion clouds.

MSU made revisions & sent them new questions.

DE made the instruments look fun & engaging.

MSU & DE used the instruments & then made adjustments at upcoming performance sites.
**Evaluation Research**

**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

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**Strong Designs**
- Mixed methods
- Multiple sources
- Multiple measures
- Linked data

**Reliability & Validity**
- Pilot test & refine
- Replication

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**Creativity**
- Embedded
  - Imaginative
  - Themed
  - Seamless

**Creative Formats**
- Shapes & sizes
- Textures & colors
- Word choice
What about rigor?
Mixed Methods

Combine quantitative and qualitative data for stronger results.

To measure changes in audience members’ science knowledge, we asked Likert scale questions (quantitative) as well as open ended questions (qualitative).
Multiple Sources

Consider gathering data from more than one perspective or source.

One More Measure
The Tea is almost over. Please tell us about your experience.

<table>
<thead>
<tr>
<th>Engaged</th>
<th>Nervous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moved</td>
<td>Puzzled</td>
</tr>
<tr>
<td>Bored</td>
<td>Stimulated, Imagining</td>
</tr>
<tr>
<td>Amused</td>
<td>Distracted</td>
</tr>
<tr>
<td>Comfortable</td>
<td>Bored</td>
</tr>
<tr>
<td>Touched</td>
<td>Intimidated</td>
</tr>
<tr>
<td>Curious</td>
<td>filled with wonder</td>
</tr>
<tr>
<td>Serious</td>
<td>Worried, apprehensive</td>
</tr>
</tbody>
</table>

From Audience Members

From Provocateurs

We asked audience members about their emotions at the end of tea and asked tea table provocateurs about the audience members’ emotions at the end of tea. Two sources can increase the validity of the data.
Multiple Measures

Consider asking the same questions at different times for stronger evidence of change.

We asked the same Likert scale questions twice during the performance (pre and intermission OR pre and post) and in the delayed post survey six to eight months later.
Linked Data

Develop ways of linking pre-test and post-test data together for stronger analysis.

At our first site, we asked for email address as a “linker.” At subsequent sites, we used seat/ticket number because everyone had one and felt more comfortable sharing that number than their email.

Sincerely,
The Guest with number $GA$ - [Blank Spaces]
Pilot test & refine

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

What struck me most about the tea was…

At the first site, we asked an open-ended qualitative question—what struck me most about the tea? After analyzing responses from a few sites, we developed a quantitative measure to gauge audience members’ reactions to Act 2.
Replicate

Consider exploring the same research questions, with different populations or at different sites—to find out whether the results are consistent.

At all study sites, we examined the impact of a dance performance and a tea discussion on audience members’ attitude, interest, knowledge, and behavior concerning science.

University of Maryland

Wesleyan University
What about creativity?
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.
Themed

Repeat your learning theme throughout your evaluation activities.

Tea servers wore physics-themed aprons in the lobby pre-performance and at intermission while distributing and collecting instruments. They rewarded audience members with a chocolate candy.
Seamless

Incorporate the evaluation into the learning activities.

Post-performance instruments were hidden under tablecloths for audience members to "discover" as part of Act 2.
Creative Formats

At one site, audience members were asked to be scientists and jot down “napkin notes” about their experiences.

At another site, the Likert scale questions were on the back of a teacup shaped survey.
What about community partner voices?
What about community partner voices?

At each of the four evaluation sites, we collaborated with faculty and staff on campus to ask site-specific questions.

At Montclair State, we asked about education level as a background question, since many of their students are first generation college students.
Emotion Clouds

Ask your community partners about their ideas for the evaluation research.

Dance Exchange suggested an “emotion cloud” to measure audience members’ emotions at intermission and post-tea.

Circle all the words below that describe you right now. Feel free to write in any additional words.

- Engaged
- Amused
- Confused
- Worried/Apprehensive
- Comfortable
- Curious
- Nervous
- Puzzled
- Touched
- Awe-Struck
- Distracted
- Serious
- Bored
- Intimidated
- Stimulated
Data Collection

University of Maryland
– 3 performances, 3 tea rooms (Sept 2010)
– Data collected from 1,100 audience members

Wesleyan University
– 2 performances, hybrid tea (February 2011)
– Data collected from 159 audience members

Montclair State University
– 5 performances, 1 tea room on stage (March 2011)
– Data collected from 590 audience members

Arizona State University
– 1 performance, 2 tea rooms (April 2011)
– Data collected from 282 audience members

To date, 2,131 audience members have completed at least one survey.
Discussion Scenarios

**Instructions:** Work in teams to consider how you would improve the rigor and creativity in EITHER scenario #1 OR scenario #2. Be prepared to report your ideas to the full group.

1. Positive youth development through after-school sports programs at a community-based organization focused on immigrant youth

2. Community-engaged study abroad program in Tanzania that brings faculty researchers, U.S. students, Tanzanian students, and Tanzanian community members together to address needs in two rural villages
Reporting Out

• How did you address **rigor** through your research design?

• How did you add more **creativity** to the evaluation process?

• How did you include **community partner voices** in your process?

• What **other issues** did you choose to address in your proposed evaluation/research plan?
Questions and Answers
References


Dance Exchange, www.danceexchange.org


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Contact Information

Diane M. Doberneck
connordm@msu.edu

Paula K. Miller
mille995@msu.edu

John H. Schweitzer
schweit1@msu.edu

University Outreach and Engagement
Michigan State University
Kellogg Center, Garden Level
East Lansing, MI 48824-1022
Phone: (517) 353-8977
Fax: (517) 432-9541
E-mail: outreach@msu.edu
Web: outreach.msu.edu