Prairie Science: Integrating Informal Science and History Learning through Family Dialogue (Award #1223770)

Goal: To develop a museum exhibition that combines STEM activities with stories from history and use what we learn to develop a replicable model and a professional network to help history institutions interpret STEM.

Project Partners

CONNER PRAIRIE
INTERACTIVE HISTORY PARK

Science Museum of Minnesota

Cathy Ferree
Principle Investigator

Mark Dahlager
Co-Principle Investigator

Project participant museums

Oliver H. Kelley Farm, Elk River, MN

Mystic Seaport: The Museum of America and the Sea, Mystic, CT

California State Railroad Museum, Sacramento, CA

Wabash Historical Museum, Wabash, IN

These museums work with the project partners to develop hands-on exhibits tied to local history stories for their museums. Their participation is essential to building a useful and flexible model.

Goals

. Develop an exciting, engaging indoor exhibition at Conner Prairie (called Create.Connect) that combines hands-on STEM make-and-test activities with relevant stories from Indiana history and which can be used to prototype exhibits and methods to inform our model.

. Take what we learn in Create.Connect to create a replicable model for integrating history and science and offer guidance and resources to a national network of history museums who wish to integrate STEM.

Audiences

Families with children age 4-13

We developed Create.Connect based on research that suggests ways to encourage family participation and conversation. A large segment of Conner Prairie's audience is families, so it is an ideal venue for encouraging family exploration of STEM topics.

History museum professionals and other informal educators

Our goal in creating a replicable model and national network is to encourage more history institutions to interpret STEM in a way that fits with their institutions and to offer resources to assist with exhibit development.

Exhibit development and evaluation

We have completed two rounds of formative evaluation and a remedial evaluation in three prototype phases of the exhibition, collecting data using timing and tracking, unobtrusive observation, interviews, surveys and audio recording of visitors as they use the space. We are currently collecting data for the summative evaluation.

March 2013

This prototype included activity tables with associated large-format images and text labels with objects in vitrines. The exhibit elements were movable and modular to allow for changes.

September 2013

Finding our strategy of using static images and text unsuccessful, we installed a prototype environment –a 1936 farm kitchen. Large hands-on objects hide labels that visitors "snoop" to find.

March 2014

We have opened the permanent version of the exhibition that features four explorable environments with 2 or 3 hands-on STEM activities and relate to stories from Indiana history.

Key evaluation findings

**Guests are engaged in Create.Connect and facilitation increases engagement:** In formative evaluation of our second prototype, the median dwell time (overall time spent in the exhibition) for children was 10 minutes 10 seconds. This is an increase from the median dwell time in the first prototype (5 minutes 42 seconds). This dwell time is good for an exhibition of this size. When the gallery was facilitated by Conner Prairie staff, dwell times were longer than when the gallery was not facilitated and were longest when there was costumed historical interpretation.

With the addition of a historical setting and changes to our facilitation, dwell time in the exhibition increased and girls stayed longer than boys:

The second prototype exhibition included more historical setting, and we adjusted our interpretation based on research on how to best engage girls. We noted that girls were now staying in the exhibition longer than boys. In fact, in the second prototype girls stayed longer at each activity table than boys.

This difference is most pronounced at the circuit activities, which had the most developed historical setting at the time of evaluation.

Challenges and solutions
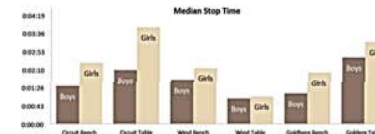
Challenge: Participant museums have different resources and needs.	Solution: Create a flexible model that can adapt based on staffing, budget and relevant historical content at participant
Challenge: Exciting hands-on activities draw attention away from history stories.	Solution: By making the history immersive, hands-on and "snoopable" it is more engaging for families.
Challenge: Conner Prairie staff and stakeholders were wary of including STEM due to our history focus.	Solution: We made the idea as tangible as possible. We showed a scale model of the exhibition to staff and stakeholders to show how it would align with our identity and interpretation .