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**INSIDE: A RARE AND NATURAL PARTNERSHIP: ROTO'S  
HANDS-ON "FIELD TRIPS"**

**PLUS: STAFF FACILITATION MODELS AT SCIENCE CENTERS**

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## S U B S C R I P T I O N      I N F O R M A T I O N

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# REVEALING FINDINGS FROM THE FIELD: EXPERIENCES DEVELOPING AND IMPLEMENTING A STAFF FACILITATION MODEL AT TWO SCIENCE CENTERS

*By Ivel Gontan, Scott Pattison, Summer Brandon, Andee Rubin, Elizabeth Andanen, Marcie Benne*

Organizations partner for a variety of reasons—in the case of the Oregon Museum of Science and Industry (OMSI) and ScienceWorks Hands-On Museum, the partnership was prompted by the need to investigate the transfer of a museum education model developed at a larger institution to a smaller museum. Would it be possible? What kinds of pitfalls and unexpected outcomes would we encounter? Now more than ever, funders are interested in how effective educational practices and experiences developed at one institution can be shared and adopted more broadly. However, oversimplified views of dissemination and scale-up efforts often obscure the complexity of taking an initiative to a new context.

This article tells the story of our experience transferring an approach to museum staff facilitation developed through the Researching the Value of Educator Actions for Learning (REVEAL) project. We share the lessons we learned from the process with the hopes that they will be useful to other projects and, most importantly, motivate ongoing discussions, explorations, and research within the field about how we effectively transfer educational resources and approaches across institutions and communities.

In the fall of 2013, OMSI was awarded National Science Foundation (NSF) funding to support a three-year Advancing Informal Science Learning (AISL) study called REVEAL. This research project posited that front-line educators are a central component of the visitor experience at informal science institutions. Yet, it was clear at the time that even though NSF had invested in a growing number of professional development projects designed for these practitioners, there was little research being done to demonstrate the impact of staff facilitation on visitors or to identify successful facilitation strategies. Focused on mathematics, the REVEAL project sought to address this need by developing and testing a model of how staff facilitation might deepen and extend family mathematical discourse at interactive exhibits and improve the guest experience overall. The facilitation model was developed and tested at OMSI and then used to train educators at ScienceWorks in order to explore how the facilitation approach and strategies might be adapted for other museums.

ScienceWorks is a small science center located in a rural community about five hours south of OMSI in Portland, Oregon. To give a sense of scale, ScienceWorks has about 44,000 visitors per year, compared to over 500,000 visitors at OMSI. The two institutions differ greatly in overall size and staffing; ScienceWorks has approximately 8,000 square feet of exhibit space, one full-time museum educator, and approximately six part-time educators. In contrast, OMSI has over 40,000 square feet of exhibit space, 14 full-time and 12 part-time museum educators, not including seasonal staff. These differences, as well as more subtle distinctions in organizational structure and culture, turned out to be important for shaping how the training was ultimately enacted and perceived at ScienceWorks.

REVEAL employed a two-phase research design to measure the impact of staff facilitation on family math discourse at exhibits and identify factors that influenced the outcomes of these interactions. The first phase focused on the development of the facilitation model and involved the research team working closely with two expert educators at OMSI to iteratively operationalize outcome measures, describe effective staff facilitation strategies and approaches, and explore contextual factors that shaped the outcomes of the interactions. This work resulted in the development of the REVEAL facilitation model of staff-facilitated family learning (Benne, Pattison, Rubin, & Dierking, 2016). The model is founded in three broad principles: encouraging families to enjoy exploring the mathematical relationships in the exhibits, at their own pace and ability level; putting visitor goals first and making sure they have an enjoyable, satisfying experience; and getting both kids and adults involved in order to support intergenerational communication within families.

For the second phase of the study, four OMSI educators were trained in the REVEAL facilitation approach and the research team collected data on these staff members interacting with over 260 different families over the course of six months at OMSI, including observations, video recordings, and visitor surveys. In the final stage of the project, the facilitation training developed at OMSI was adapted and delivered at ScienceWorks, using the same training

techniques, such as watching and discussing videos of staff-family interactions, and taking care to respect the skills and educational philosophies of the ScienceWorks staff. The research team repeated the data collection cycle used during phase two, observing and recording video of facilitators interacting with visitors and surveying families at ScienceWorks. The data from the video recordings, observations, and surveys were analyzed by staff at OMSI, which resulted in a deeper understanding of which aspects of the facilitation model resonated most with visitors and highlighted differences between the two institutions.

After the data collection was complete at both OMSI and ScienceWorks, researchers documented and reflected on the experience by writing a case study (Creswell, 2013; Stake, 2006) of our experience delivering the training at ScienceWorks. Through the process of documenting the story of researcher and educator experiences during development, implementation, and data collection, we were able to reflect on the unique characteristics of ScienceWorks and the OMSI-ScienceWorks partnership that shaped how the training was implemented, how it was perceived by staff, and ultimately how it influenced interactions with visitors. The case study approach to analysis focused on a close review of the written accounts, educator testimonies, and researcher debriefs in order to develop a holistic understanding of the process of developing the REVEAL facilitation model at OMSI and transferring it to ScienceWorks.

## REFLECTIONS AND LESSONS LEARNED

The implementation of the REVEAL facilitation model training and subsequent team reflections and data collection at ScienceWorks allowed us to see distinct differences

in the ways staff members perceived the trainings and the value of collaboration between institutions to develop a more widely applicable model. How the training ultimately took shape at ScienceWorks, and the ways staff applied the facilitation model with museum guests, appeared to be shaped by a variety of factors, including the unique contexts of the museums and communities, the organizational cultures and educational philosophies at the two institutions. All of these influenced the approach to partnership that we ultimately developed with ScienceWorks. Below we outline the lessons learned that emerged from this collaborative process.

### Museum Context

The differences between a museum in a large city and one in a small town revolved to a great extent around the surrounding community. As we reflected with ScienceWorks staff, a visitor's expectation for engagement with educators is likely different in Ashland than Portland. Many ScienceWorks visitors return frequently during the year, creating a more familial environment. Because of this, ScienceWorks may be able to provide a more personalized experience for many of their guests, which creates bonds between educators and families. The physical space is also a factor that makes a difference. A smaller gallery means that parents are more apt to let children roam further and stay away longer, leading to more educator and child interactions that don't necessarily involve the whole family. Another difference we noted was that the average engagement time at exhibits with facilitators was longer at ScienceWorks than at OMSI. We suspect this was because there wasn't the pressure to "see everything" that one might experience in a big museum—visitors were able to spend more time exploring mathematical concepts with educators, or just play longer.

Overall, these reflections highlight the need to be mindful of how the contextual factors within the community where the museum is located can affect relationships between educators and visitors. It is important to consider these factors when thinking about the replicability or transferability of a training model.

### Organizational Culture

The educational approach at ScienceWorks is about encouraging open-ended, hands-on learning experiences. As such, educators at this museum were not as keen on the idea of delivering math content but preferred to let families dictate their own learning focus. The biggest adjustment in terms of the training was that OMSI appeared to have stronger content sharing goals for floor facilitators than ScienceWorks, where the focus is on helping visitors engage with exhibits and follow their own curiosity. In contrast, the primacy of visitor goals was an obvious element

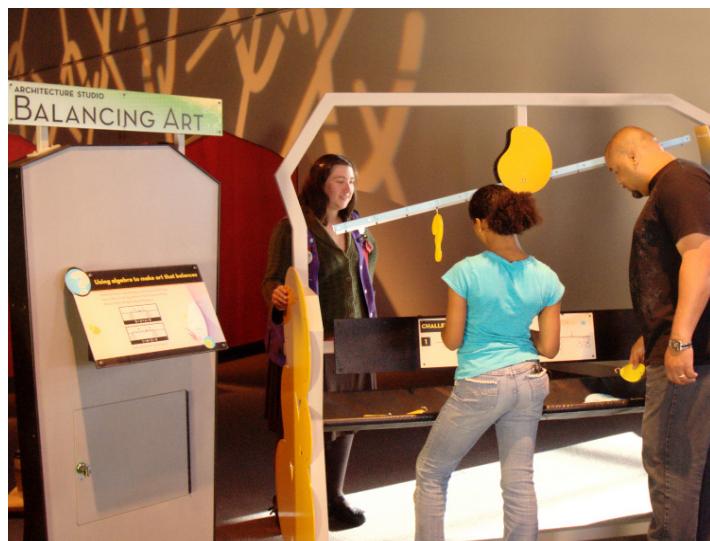


Figure 1: The Balancing Art exhibit was used for testing the REVEAL facilitation model at OMSI.

for ScienceWorks staff, although it had been a challenge for OMSI educators. Educators at ScienceWorks also seemed to be focused on younger children's experience more so than the adults, so the REVEAL facilitation goal of promoting intergenerational communication was less familiar and comfortable to them. Finally, because of limited staffing and budget, more educators at ScienceWorks are volunteers and, unlike at OMSI, both paid and unpaid staff participated in the ScienceWorks training. This diversified the perspectives represented during the training and seemed to contribute to broader and deeper discussions about museum facilitation.

All of these findings emphasize the importance of considering an institution's unique approach to education. We recognized that the educational philosophy at ScienceWorks could be compatible with the REVEAL model and adapted aspects of the training, in collaboration with ScienceWorks staff, to ensure that the approach both aligned with and stretched the practices of educators at the smaller museum. Humility and a collegial learning approach also led to the training being received in a positive light, which added to the value for all those involved.

### *Approach to Partnership*

The collaboration with OMSI and ScienceWorks was established from the beginning of the project. The education director at ScienceWorks was an advisor for the project team and gave input throughout the development of the training model at OMSI. This level of involvement made the partnership feel authentic and also ensured that the adaptation of the training would be applicable to ScienceWorks staff. It was important for OMSI educators and researchers to be respectful and honor the fact that ScienceWorks had their own established approach to informal science learning. The process built trust between the two teams and contributed to the way the ScienceWorks educators participated in the training. It was easier to deliver the training in a meaningful way to staff at ScienceWorks because a person they already respected as a facilitator could authentically assure them that the content was valuable.

These reflections clearly point to the value of having a well-respected and integrated staff member from ScienceWorks as an integral part of the project from the beginning. Not only did this lead to a more relevant and impactful training, it also broadened the team's perspective on how individual educator styles can affect the way a training is received.

### **CONCLUSION**

We learned many valuable lessons while developing the REVEAL facilitation model at OMSI and transferring it to ScienceWorks, and the three themes above only begin

to scratch the surface of the potential factors to consider when sharing practices and resources across institutions and communities. Informal science education centers vary greatly in terms of size, surrounding communities, and educational philosophies, but one thing they have in common is the desire to provide a safe, enriching, and positive experience for their visitors. Given the scarce number of programs, professional development, and training resources for museum educators, it's critical to understand how findings from projects like REVEAL can be shared with multiple institutions. This is especially true for smaller museums in rural communities, like ScienceWorks, that struggle to access professional development opportunities for their staff. Based on our experiences, we believe the sharing of these resources must involve close collaboration and careful attention to the unique needs and contexts of different organizations—disseminating or scaling-up project results cannot follow a one-size-fits-all approach. In the end, perhaps the greatest measure of success for the collaboration between OMSI and ScienceWorks was not the direct replication of the REVEAL facilitation model but the strong relationship established across the institutions and the motivation and desire by educators at both organizations to adapt the core facilitation principles to the unique context of each setting.

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## ON THE COVER:

*Organized from its founding in 2003 as a custom exhibit planning and design firm that operates its own dedicated and full-scale engineering and production shop, Roto has always sustained an active prototyping and evaluation practice. In 2012 Roto joined forces with Dublin City Schools to create a truly STEM experience for their students. Roto conducts a full spectrum of formal and informal user studies, including front-end topic and idea testing, prototype evaluation, and final exhibit testing, while students engage in the actual work of exhibit development right alongside Roto's professional project teams.*

*Full story on page 3.*

