WestEd
WestEd.org

Challenges and Successes:
The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

Cathy Ringstaff, Ph.D.
November 2020

Suggested citation: Ringstaff, C. (2020). *Challenges and Successes: The evolution of an international partnership between museum practitioners and learning researchers.* San Francisco, CA: WestEd.

WestEd is a nonpartisan, nonprofit research, development, and service agency that works with education and other communities throughout the United States and abroad to promote excellence, achieve equity, and improve learning for children, youth, and adults. WestEd has more than a dozen offices nationwide, from Massachusetts, Vermont, Georgia, and Washington, DC, to Arizona and California, with headquarters in San Francisco.

WestEd

WestEd.org

Contents

When museum professionals are approached by university researchers to work with them as they investigate questions related to visitor engagement, learning, or adult-child interaction, museums are usually tasked with recruiting visitors to participate in the research, rather than directly working with the researchers to theorize, collect data, and use the findings to improve the facility and services or to advance knowledge.

Move2Learn is an international project that takes a different approach to practitioner-researcher collaboration and its goal was to investigate how interactive museum exhibits can be designed to help three- to six-year-olds develop and communicate their scientific thinking. Funded by the National Science Foundation (NSF) and the Wellcome Trust, this project involved practitioners and researchers from the United States and the United Kingdom. The informal education centers included three in the U.S.: Phillip and Patricia Frost Museum of Science in Miami, FL; The Children's Museum of Indianapolis, IN; Sciencenter in Ithaca, NY, and three in the U.K.: Glasgow Science Centre, Glasgow, Scotland; Science Museum, London, England; and Learning through Landscapes, a U.K.-based international charity organization. Research partners included the University of Edinburgh, Scotland; University of Illinois Urbana-Champaign, IL; and University College, London, England. The project was led by two principal investigators—one in the US who worked in a museum, and one in the UK who worked in a university, and four Co-PIs (two each in the US and UK, including a researcher and a museum educator in each country). Over 20 individuals worked on the project over its implementation.

Project Goals

As is described on the project website (http://move2learn.net), Move2Learn was an international collaboration of informal science educators and learning science researchers that aspired to advance understanding of the role of embodied cognition in young children's learning of science in informal settings. Embodied cognition, according to participants in this project, is an umbrella term that refers to the theory that thought is intertwined with how the body interacts with the world; or more simply put, the idea that just as the mind drives the body, the body very much influences our thinking. Existing research on this topic suggests that encouraging children to engage in particular actions or gestures can contribute to more meaningful science learning (Kontra et al., 2012; Lindgren & Johnson-Glenberg, 2013).

Major goals of the Move2Learn project included:

1. Understanding the role of embodied cognition in young children's learning about science.
2. Informing the intentional design of science exhibits and body-based communication.
3. Developing a new practitioner/researcher interaction model to strengthen collaborations among informal learning practitioners and learning science researchers.

Part of the Move2Learn project involved engaging staff from WestEd to conduct an independent, mixed-methods external evaluation. The formative part of the evaluation sought to provide project staff with ongoing feedback over the life of the project with the intention of providing data to improve the project's development, implementation, and research components, as well as a summative evaluation focusing on evaluating the project's work related to Goal 3. The study was qualitative; data were collected through interviews, participation in project meetings, observations of the student data collection, and analysis of communication in the Slack application used by the project.

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

Ultimately, this report will focus on Goal 3 of the project, and will describe some of the significant challenges associated with creating an international practitioner-researcher partnership and the successes they achieved despite these challenges. Specifically, this report will discuss the project's efforts to build a strong partnership; benefits of working in a collaborative partnership for informal educators and researchers; partners' views about the projects' outcomes; and lessons learned that may be useful to consider when creating practitioner/researcher partnerships.

Study Context

Six study sites participated in Move2Learn research, including three in the US (in Florida, Indiana, and New York) and three in the UK (one in Scotland and two in or near London). The sites were diverse in terms of size (small vs. large); number of yearly visitors (100,000 to 5 million); and location (urban vs. rural). Most of the sites report serving preschoolers and families from various ethnic groups. All sites include visitors with low socio-economic status. The table below provides information about each of these study sites, including the target study population and information about the exhibits under study (i.e., STEM concepts involved and actions in which children engage).

Study Site	Target Study Population	Exhibit	STEM Concepts	Actions
Frost Science Museum, Miami, FL Large, urban, diverse ethnic and SES audience 1.2 million visitors	ELL, low SES, Hispanic, Afro-American, Afro-Caribbean. Preschoolers and family visitors of all SES and ethnicities	River of Grass; whole-body, immersive, digital, experience of the Everglades	Living things have characteristics and have basic needs	Enacting animal movements. Re-directing water flow
Glasgow Science Centre, Glasgow, Scotland Large, urban; Located in low SES area 310,000 visitors	Preschoolers from inner city (Black, Asian, and minority ethnic groups)	Balance Board Exhibit	Distance and weight are fundamental concepts to balance	Placing weights at predetermined increments to make the beam balance
Children's Museum of Indianapolis, Indianapolis, IN Large, urban 1.2 million visitors	Ethnically diverse preschoolers, low SES from onsite preschool; families from mixed SES	ScienceWorks; Insect sweeping gesture, touchscreen whole-body digital simulation of entomologists	Living things develop in predictable patterns Physical characteristics of living things reflect how they live and behave	Sweeping a net to collect insect samples, counting

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

Study Site	Target Study Population	Exhibit	STEM Concepts	Actions
Learning through Landscapes, U.K. Outdoor learning in parks; 2 rural sites near London	Preschoolers and families from low SES	Suite of body-based activities for young children, centered around the theme of air resistance, (outside exhibit)	Wind, speed, force, and surface area	Gestures showing the relationship between concepts such as wind speed, size, shape of materials, and pull/push forces
Sciencenter, Ithaca, NY Small, rural, low SES; 100,000 visitors/year	Preschoolers from local Head Start (rural, low SES and family night events (including adults, children)	Dam Building	Water pressure; how movement of objects can impact	Moving objects and building a dam to stop flowing water
Science Museum, London, England Large urban 5 million visitors	Ethnically diverse preschoolers (Black, Asian, and minority ethnic groups)	Water Table; children explore water flowing from buckets into pools	Water has properties and characteristics that determine the way it behaves	Manipulating objects in water and pouring water

Fostering Practitioner-Researcher Collaboration

When seeking to create educational change, "collaboration is nothing new" wrote John Kania and Mark Kramer (2011). What is unusual about the Move2Learn partnership is that it sought to advance the development of a new research model that represents a paradigm shift in the manner in which learning research has historically been carried out in museum settings (Sobel & Jipson, 2015). Often, this type of learning research has been researcher-driven, with the museum providing the space and the subjects for the research, while the researcher investigates a topic of particular interest. This "bystander" approach has changed substantially over the years, and now museum professionals actively seek hard evidence to support the impact of their work and to inform their practice. Therefore, the goal of this partnership was to foster practitioner-researcher collaborative activity within and across museum sites and to emphasize the importance of mutually beneficial outcomes for all stakeholders.

In this partnership, practitioner/researcher teams jointly worked to: (1) develop, test, and refine new instrumentation to capture the impact and artifacts of embodied cognition (gestures, actions, and movement) in informal contexts and to (2) conduct a series of studies at different museums to leverage the knowledge and experience of museum professionals who have extensive experience working with children and families from a wide range of socioeconomic, cultural, and ethnic backgrounds. The collaboration was seen as essential to maximizing the robustness and reproducibility of research findings on an international scale.

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

Museum professionals actively seek hard evidence to support the impact of their work and data to inform their practice.

Components of a Strong Partnership

A review of literature related to building strong partnerships indicate that, while there are slight differences in the vocabularies that each author uses to describe important components of partnerships, the basic, underlying agreement is that strong partnerships require the following elements:

- Alignment, which requires a clear vision of what the project seeks to accomplish, with well-defined, mutual goals, and effective processes for working together;
- Effective, ongoing team communication, with a supporting infrastructure for collaboration and coordination. Important goals associated with communication includes building a shared vocabulary as well as trust and mutual respect;
- Collaborative project management, which involves having cross-functional and cross-organizational team composition and communication; structured processes for decision-making; and equal opportunities to contribute; and
- Dependability of partners in delivering on their commitments, which requires clear timelines and sufficient staff and resources.

Obviously, these components work together. Having a clear vision of what the project seeks to accomplish means little if the infrastructure for supporting collaboration and coordination is inadequate. Similarly, having collaborative project management only goes so far if the partners are not dependable in delivering on their commitments.

Overcoming Challenges Associated with Alignment of Goals and Actions that Influenced the Partnership

According to Kania and Kramer (2011), a partnership seeking to have "collective impact" must have a "shared vision for change, one that includes a common understanding of the problem and a joint approach to solving it through agreed upon actions." Over the course of the Move2Learn project, we found that the alignment of the vision of different partners waxed and waned, depending on a variety of factors.

Although team members clearly had a shared understanding of what the project was ultimately designed to achieve, there were challenges to reaching a consensus about how to best achieve these mutual goals. For example, some US team members wanted to collect data related to the ethnicity of visitors as well as parental income, using a parent survey (PALS: Parental Attitudes about Learning and Science), developed by the project team, in order to investigate whether there are socio-cultural and economic differences that are apparent in children's embodied interaction (one of the original research questions). However, UK team members felt that collecting data on these specific variables was not necessary and might even be inappropriate. There were also slight disagreements between the US and UK

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

about the phrasing of some of the questions on the survey. Ultimately, the surveys administered in the US and UK were slightly different. Moreover, collection of these surveys did not appear to be a significant priority among UK researchers.

Significant differences in the museum exhibits chosen for the research also led to methodological variations when collecting data at the different sites. While partners started out with the assumption that aggregating data across sites would not be possible due to the differences in design and purpose of the exhibits, differences in methodological approaches continued until the end of the project, which limited partners' ability to use a "joint approach" and "agreed-upon actions" (Kania & Kramer, 2011). The descriptions of two of the Move2Learn exhibits—one in Miami and the other in London—illustrate these differences across sites.

In Miami, for example, research for Move2Learn focused on the River of Grass Exhibit (ROG), which provides children with an opportunity to explore science content that is inspired by the Everglades National Park, a 1.5-million-acre wetlands preserve on the southern tip of Florida. The exhibit consists of a water table experience out-of-doors and a 270-degree, full-body digital interactive indoors that simulates a variety of elements of the Everglades: day-night cycle, animal behaviors, water flow, and plant life. Data collection for this project included a pre-interaction warmup, a video of the child's exhibit experience, and a post-experience interview with child-adult dyads. PALS survey data were collected from each adult. Collecting and analyzing data at this site was challenging due to lack of lighting in the digital interactive part of the exhibit (as required by the "night cycle" portion of the exhibit) and noise from visitors and other features of the exhibit. Researchers at this site also decided after piloting data collection not to continue pre-experience interviews. This decision was made primarily because the researchers at this site did not believe that "knowledge gain" was the outcome they were interested in measuring. Instead, they did a warm-up activity to build rapport with the children before they entered the exhibit.

Researchers in London began by collecting pilot data related to a "marble run" exhibit at a preschool. Initially, their data collection involved pairs of children, and included a pre-interview focused on children's experiences that are similar to the physics of the marble run, such as playing on slides or riding a bike on a hill. As a pre-activity, researchers gave children a shoebox lid in which they could roll a ball as a way to provide them with a sensorimotor experience relating to the marble run. At this site, researchers initially used "the [methodological] paradigm presented in Miami" but "modified [the] protocol after reviewing the [marble-run] data collected from these interviews and interactions" at the preschool. Eventually, the research in London shifted to a water table exhibit at the Science Museum, and data collection included pre-interviews, observations, and post-interviews with parents and children rather than child-child dyads. In these interviews, researchers decided to encourage children to use their bodies to express their understanding, such as showing the researchers how they brush their teeth. PALS survey data were not collected.

External evaluation data indicate that, as late as Year 3 in the project, there were still some disagreements among a few team members about how to best fulfill the proposed scope of work, and how to best collect and analyze reliable, valid, and meaningful data that would allow the project to support or contradict hypotheses put forth in the proposal. In the final interviews, a few partners expressed some dissatisfaction about the project's alignment overall. One partner, for example, had hoped that researchers across sites would use the same instruments and collect the same data, which would have allowed cross-site comparisons.

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

However, most team members ultimately accepted that "different people are doing slightly different studies," and felt this these differences were acceptable "as long as it's all about the central embodiment goal." Some partners even viewed these differences as a strength of the research, since they provided more scenarios and more places to provide evidence.

Overcoming Challenges Associated with Communication

Over the course of the Move2Learn project, there were several challenges related to communication. With such a large number of participants, different time zones, different organizational structures, and a number of other factors that will be described below, there was a struggle to ensure the team was communicating effectively. Ultimately, the partners were able to institute various mechanisms to improve communication.

Effective team communication required building a shared vocabulary

Building a shared vocabulary was challenging for the Move2Learn collaborators, even though the group developed a shared glossary of terms from the very beginning of the project to improve communication. At first, the greatest barrier related to developing a shared vocabulary was related to the terms "embodied" cognition, interaction, or learning—complex concepts that have led to debates even among experts in the learning sciences. Researchers and practitioners alike recognized the difficulty of the concept under study, including by people researching embodied cognition. Initially, the team also had disagreements related to what constituted "interactions," "actions vs. gestures," and what serves as an indicator of engagement. However, after team members worked together on developing a coding scheme and practiced discussing and coding videotaped observations and interviews with children, the team was able to reach agreement about these different terms. As one team member stated, "In the end, we overcame that, but it was very confusing for…even several months, what interactions, actions, gestures, all that was. But in the end, I think we're aligned."

There was also disagreement about the term "learning." In interviews, emails, interaction on Slack.com (software designed for team communication), and in project meetings, struggles with building a shared vocabulary appeared, and the challenges associated with the term "learning" led to disagreements about how (or if) learning could be measured in these informal educational environments. To some partners, assessment of learning needs to include a measure of behavior change; to others, the type of impact that should be studied in museums related more to "foundational and experiential…than it is in terms of changing behavior." These definitional differences had important implications for the methods that were used for data collection and analysis, and the repeated discussions about defining learning frustrated some of the partners.

Several partners valued these ongoing conceptual discussions about shared definitions, however, and looked at that these challenging conversations as "growth points" resulting from bringing partners together from different disciplines. Ultimately, while the partners did not all agree on the definition of what constitutes "learning" and how to best measure it in informal environments, sufficient consensus was reached among most partners, which enabled them to move forward with collecting and analyzing site-specific data at different sites.

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd

WestEd.org

Effective team communication required having regular, productive conversations

The Move2Learn partnership communicated through five major channels—face-to-face meetings; online meetings through Zoom that involved either the leadership team or smaller subgroups; conversations on Slack, an app that is designed to facilitate teamwork; and Concept Cafés, where discussions about the implications of the partners' work in the field of informal education, among other topics, and occasionally featured presentations by project advisors.

Face-to-face meetings. Face-to-face meetings were limited in this project because of the cost of bringing together people who are spread throughout the US and UK. Moreover, a hurricane prevented the Principal Investigator and the project director from the US from attending the project launch in Glasgow, and the Covid-19 pandemic led to cancellation of the final face-to-face meeting in the UK.

Most partners highly valued opportunities for face-to-face interaction and wished for more. Practitioners also appreciated having the opportunity to work directly with the researchers at their museums, and the researchers felt that this should have been done more extensively and across sites in the US and in the UK. Partners felt that face-to-face meetings improved productivity and communication compared to online meetings, where it was harder to reach a consensus about important decisions.

Online meetings. Zoom meetings were conducted fairly regularly for the leadership team, either monthly or every two months. Occasionally, meetings were held for the entire partnership team. Finding times that worked for key partners to meet was an ongoing problem. Given the number of partners and the time differences, communication might have been improved if the meeting times were scheduled for an entire semester in advance (at a minimum). Toward the end of the project, meetings were scheduled in advance such that they took place at the same time each month.

A majority of partners expressed that communication during the online leadership meetings was often not as effective as they had hoped. For example, issues that partners thought were resolved in prior meetings were often revisited at later meetings, and some people felt the meetings were stressful due to conflicts that arose. Several partners felt that there simply wasn't enough time to have "deep, deep conversations about every single agenda item and get anywhere."

Subgroup meetings. Team communication improved when discussions took place in smaller, subgroup settings. Given the large number of sites and people in the partnership, working in these smaller groups had a beneficial impact on relationships and improved communication, and several people wished that these types of meetings had started earlier in the project. They also reported that smaller groups allowed greater goal alignment and development of high levels of interrater reliability on coding observations and videos.

Slack Conversations. At first, some partners found Slack challenging to use, while others felt it was extremely valuable and wanted all partners to use it exclusively and not use email for communication. Several people felt that their experience on Slack would be improved if there was a greater effort to ensure that comments were put in the correct thread and channel. Based on the feedback, more effort was put into clearly organizing the thread and channels, and with partners becoming more comfortable with the tool over time, the user experience did improve. One user stated, "We did a ton of Slack messaging so that worked too. Slack discussions and Slack sharing and so those tools did promote us feeling closer."

Concept Cafés. In January 2018, the partners began holding virtual "Concept Cafés," in which participants "shared resources and ideas to help develop guidelines that will help exhibit designers and education staff [to] be more intentional about incorporating bodily enactment/gestures in the development and facilitation of exhibits for young children." These meetings were voluntary, held monthly, and were open to everyone on the project. The first topic was about learning, and to prepare for the meeting, attendees were asked to complete a survey describing their views on the definition of learning, how it can be measured, etc. Later meetings included guests, such as project advisors. Most partners valued the Concept Cafés and they stated that they wished there had been more of these opportunities. As one partner stated, these were "wonderful" because they were about big ideas and were not agenda driven.

Dealing with Differences in Bureaucracy, Project Start/End Dates, and Accountability

During the planning phase of the project, with a planning grant funded by NSF, some of the Move2Learn team members worked together on the Move2Learn proposal that was ultimately funded by NSF and the Wellcome Trust. The project's proposal presented a clear vision, and the vision was further clarified in responses to questions by the funders before the grant was awarded. Despite this early work, team members disagreed at times about how closely they should follow the plan as described in the proposal, which was due, in part, to different expectations of the funders. Specifically, NSF program officers expect to be notified if plans described in the proposal change, and the funding agency requires grantees to periodically submit a detailed report describing their accomplishments. By contrast, Wellcome Trust's requirements were described by UK participants as "much different" (requiring far less information about the project's progress) than NSF. These differences in accountability had impacts on how partners prioritized project work, with US partners more concerned about meeting internal deadlines so their progress could be adequately described in the required annual reports. While appreciating the joint funding by both organizations, partners felt that "dealing with the different expectations, and the different timelines, and all those things…were certainly hard."

Differences in project start and end dates between the US institutions, funded by NSF, and the UK institutions, funded by Wellcome Trust also led to challenges. Specifically, the project activities in the US started before they began in the UK, primarily due to logistical issues associated with partner universities (e.g., delay in hiring of the UK research staff), which resulted in the UK partners ended up finishing the project later. This led to a mismatch between partners in the two countries as it relates to the overall project timeline for completing data collection, analysis, and reporting, which further complicated the alignment between two partnering teams.

Questions also arose about budgeting, since the budget was renegotiated with funders at the beginning of the project, and it "took a while for people to really understand who was funding what." Questions related to budgeting understandably led to occasional tensions between partners, since everyone wanted to have a fair share of resources for covering their project staff time. While it is often the case that costs tend to hit an upward trend as researchers dive deeper into the content and new ideas bubble up to the surface, this did not happen in Move2Learn. Partners worked successfully to avoid "scope creep" and its impacts on the budget, which was considered a success by partners.

An unexpected change in data security requirements in the UK shortly after the project began also had a significant impact on Move2Learn. As a result of this change, data collected about parents and young learners in the UK could not be shared with the partners in the US, which meant that data across international sites could not be aggregated for analysis. While this gave the US and UK some freedom with regard to the type of data they would ultimately collect and the research methods they would use, this restriction had other implications on the project. For example, it was challenging for everyone in the US partnership to know what UK sites were doing, what their findings were, and the types of analyses they were planning. One partner said that, "[Sharing of findings from different sites] was very much coming together toward the end [of the project] in bits."

Project Leadership and Management Structure Influenced the Partnership

Advantages and disadvantages of distributed leadership

As was described earlier, Move2Learn was led by two principal investigators (one in the US and one in the US), as well as four Co-PIs. Sometimes this distributed leadership structure made it difficult to make decisions in the Move2Learn project, since reaching a consensus often takes more time and effort within a large leadership team rather than a team that is led by a single PI. Despite this challenge, some team members felt that having a variety of project leaders was valuable, since each person brought different perspectives. Distributed leadership, in these partners' view, led to more collaboration since "in the end we are learning from each other and it's a richer experience." The lack of a "pecking order" in the project was particularly appreciated by junior staff, because they felt more comfortable sharing their ideas with more senior staff than they might have otherwise.

Advantages and disadvantages of distributed project management

In addition to issues related to project leadership, most of the project staff felt that project would have benefitted from having a more centralized project management setup. Although the project had a project manager in each country, some participants felt that there should have been one full-time project manager who worked across sites and countries to monitor task completion and help partners meet project goals.

Challenges with project management in Move2Learn were not due to a lack of effort. To start the project off on the right foot, an outside firm with expertise in project management was hired to facilitate the project launch; the plan was to have the team members agree to their assigned roles and responsibilities and to review the overall project timeline during this meeting. Unfortunately, the partners who organized the launch and hired the outside firm were unable to attend due to a hurricane that closed airports. Thus, they were unable to facilitate the meeting and to mediate the discussion when the approach that the outside management experts suggested was met with some resistance during the launch. As a result, the partners ended up leaving the launch without completing this task.

One issue that came up in several interviews over the course of the project is related to a lack of information about what different institutions were doing to "pull their weight." This issue was exacerbated by a lack of budget transparency (described below) as well as the UK's inability to share data with the US. Building in more transparency about the budget, the work each institution was doing, and the

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

timeline for task completion, would have helped people understand how each organization was working to reach project goals.

Over time, there were a number of attempts made to create an overall project timeline and to assign responsibilities for major tasks, but these attempts were "too complex and…weren't followed up on." Instead of having a project timeline that included an overall picture of what was taking place in the US and the UK, within each country informal education sites and researchers partnered to complete data collection and analysis at individual sites. While this arrangement allowed productive work to continue in each country, several partners felt that this decentralized management structure limited what one partner called "cross-pollination" between countries.

Ensuring sufficient staff and resources to do project work was difficult at some sites

While Move2Learn clearly made substantial progress over the course of the project in terms of conducting research and addressing the research questions presented in the proposal, several partners felt that there was insufficient budget to do what had been planned in the proposal. This is commonplace in large projects but contributed to some Move2Learn partners' reluctance to commit to sticking to a plan of action. In some partner institutions, partners stated that they had insufficient staff resources to do project work due to other commitments (e.g., teaching, other projects) and staffing changes (e.g., maternity leave; staff moving to different positions), among others. Attempts to lay out a reasonable work plan to which all partners could commit continued through the life of the project

How Did Differences Between Researchers and Practitioners, or Between the US and UK, Impact the Partnership?

In hearing about this partnership, one might assume that differences between researchers and practitioners and between partners living in the US vs. the UK would have had far greater impact on the partnership than the challenges discussed above, given the differences in individuals' past experiences, education, working environments, job goals, and perspectives.

Interestingly, the challenges described above—challenges that can plague any type of partnership—seemed to have more of an impact than perceived differences between researchers and practitioners, or between the US and UK. Alignment issues, for example, seemed to have more to do with difficulty that is inherent in studying a complex topic in complicated environments rather than the differences that might exist between practitioners and researchers, or between the US and UK, and many partners saw those issues resolve over time, as this quote illustrates:

> *"I think over the course of the project, there definitely was more convergence. . . And I think it just got better and better. . . And it was pretty normal honestly. When you first get together with the team and you discuss goals and things and you refine them and you look at them in the light of new data, it is going to usually evolve a little bit, and that definitely happened for us."*

Virtually all senior personnel interviewed as part of the evaluation felt that "bumps" they experienced in terms of alignment of goals were, in large part, due to differences in personality and working styles rather than perceived differences in individuals' positions (or roles) and the study location.

Compared to the challenges that senior personnel experienced, partners participating in Move2Learn seemed to expect, and were more likely to accept, their professional differences—even those that caused some tension between the partners. They acknowledged that all partners were working toward the same goals, regardless of their job or their country—to improve the experience of children visiting the exhibits—and were therefore able to find "common ground" through compromise.

Researchers and practitioners did acknowledge that some of their differences were inherent in their work. For example, on partner described an interesting example of a challenge associated with data collection.

> *"When [practitioners] were trying to figure out what the child learned [in interviews for the project], they would sometimes start teaching the child what happened, or they would like start gesturing to help the child…. [Researchers] didn't want to say like, 'Stop helping that child.'…But with research...the interview was not supposed to be educational for the child. The interview is supposed to be collecting what the child learned. So, I think that distinction isn't super at the forefront of practitioners' thoughts, because…their work is about…how they can actually teach children better."*

Another individual talked about the differences in researchers' and practitioners' mindsets regarding sharing and using tools that were developed over the course of the project or disseminating information they gleaned from the research. In this individual's view, researchers tended to be hesitant about sharing their preliminary findings because they are concerned that their findings might not be "100% accurate," or that people might overgeneralize these findings to inappropriate contexts. In comparison, practitioners were eager to use "new learnings and tools into practice as quickly as possible to determine what works." Researchers' push for rigor, which counters practitioners' understandable desire for "efficiency" (and vice versa) seemed to cause some frustration on both sides, but this frustration did not seem to surprise anyone. Researchers tended to want to draft and redraft, build and rebuild, while practitioners were anxious to use the tools that were developed to collect data and do the analysis, even if they were "not perfect." Despite these differences, researchers and practitioners seemed willing and able to see things from each other's perspective. One researcher, for example, described his understanding of how practitioners might be frustrated to "work with academics who navel-gaze and want to re-look at things," in comparison to practitioners who "just want to get out there and do it." A practitioner agreed that differences between researchers and practitioners could be overcome by "just understanding each other's environment and working patterns."

Perceived Benefits of Participating in the Project

During interviews, researchers and practitioners were asked to describe any benefits they felt resulted from their work on Move2Learn. Their responses fell into three major categories: 1) benefits to them individually; 2) benefits to the education field and to the public; and 3) benefits to partners' institutions.

Benefits for individuals within the partnership. Staffing in the partnership involved a number of young researchers, including students working on their PhDs as well as recent graduates. Interview data

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

indicate that the project provided these staff with opportunities to learn skills related to qualitative research; inter-rater reliability; video coding; and project management, for example. They believed that they would be able to use these skills in their careers.

Practitioners and researchers with various levels of experience also discussed benefits related to gaining new perspectives about collaboration and partnerships as a direct result of participating in this project. Partners appreciated the opportunities they had to exchange ideas and hear different perspectives. One person, for example, discussed how Move2Learn "really opened [his] mind to…the role of…really good partnerships." Another partner described the value of working with professionals who were willing to admit that they were "not entirely sure" about a concept. Different professionals who work in different disciplines sharing their insights and knowledge was a significant strength of Move2Learn.

Partners also talked about changes in the ways that they viewed their work—from thinking about how their role as a researcher could help museums, to thinking more about how their role in a museum could contribute to research. In looking ahead, one practitioner, for example, talked about how Move2Learn would be helpful when participating in another research partnership, particularly in thinking about "what [it] means to get data that's useful in a research context."

When describing personal benefits they derived from the project, partners also discussed how their participation in this research has led them to look differently at children's interactions with museum exhibits. Several practitioners, for example, described how coding videos of interviews with children helped them to be more observant when watching children engage with the museum exhibits. Ultimately, they felt that this would improve their work on the museum floor, even if they never coded data again. Another person talked about putting more thought into how exhibits are designed and what gestures could be used to explain various science concepts given everything they learned from the project."

Not surprising given the topic of this research, the project has also changed how partners view movement and gesture. As an example, in one person's view, observing children interact with exhibits provided information about what they were learning. A second shared that Move2Learn would have a positive impact on other staff members at the museum in which she worked:

> *"I think when I'm explaining things to people, I can see the value of gesture.…If I'm mentoring …science communicators, to think about how people are using their body to explain things at a fairly basic level. If that's well trickled down to our staff, because we'll be doing a lot of training with our staff."*

Several participants in the project also cited potential benefits related to their careers as a result of working on Move2Learn. For example, Move2Learn provided networking and collaborative opportunities as well as publishing opportunities that would not have been available without the project. One researcher, for example, discussed how the partnership led him to think about new outlets for publication. Another described how expanding practitioner connections would be helpful in future work, even if only to be able to "ask…a trivial question about the museum world." While it is too early to determine if individuals within the partnership will continue to work together, interviews suggest that those who participated do value the relationships they have made.

Benefits for the education field. When discussing the benefits of the project during their interviews, partners discussed these topics: 1) creation of new tools; 2) dissemination to research and practitioner communities; and 3) professional development and training.

First, partners felt that the tools that had been developed as a result of the project, including surveys, interview protocols, common frameworks, code books, and observation tools, would be useful to both researchers and practitioners to use in the future. Moreover, the partnership resulted in development of short, animated videos that explain the project and its findings that could be used in conferences and trainings. These tools were developed through highly collaborative efforts.

Rather than disseminating solely through research publications, from the early stages of the project, partners wanted to share information about the project using a variety of channels, including conferences, videos, a website, professional development, news articles, and other means. Partners were pleased with their contribution to knowledge in the educational field and hoped that their efforts to continue disseminating late in the project would benefit researchers and practitioners alike, as well as other professionals, such as exhibit designers and methodologists.

> *"One of the most important things was to shine a light on this idea that we have as a society. We have a limited view of learning, and museums are not perhaps taken as seriously as large institutions of learning because they don't give degrees, they don't give grades…. And I think our project overall has pushed back on that and helped express the idea that these are important places, these experiences that frame schooling, that frame science discussions and public debates. I feel like that's been a positive [aspect] of our project."*

Professional development and training and materials that were produced for these events provided opportunities for the partnership to spread the word about the project. For example, after partners created training materials to train those who would be observing students, they developed an observational toolkit that can be used by others in informal education settings. Partners whose work is based on informal learning would know that "practitioners don't read research journals." Thus, the researchers in the partnership worked with practitioners to "identify outputs or things that really will be useful for practitioners."

Finally, one of the practitioners in the partnership noted that the project had benefits for some members of their community, as this quote illustrates: "Without this project some of those families never would have come to the museum," since many of the parents who participated were from underserved communities and have never been to a museum before. Moreover, "We provided novel opportunities for the public to participate in NSF research. To find out this kind of work actually happens and that museums are connected to research" was a benefit of the partnership, stated one partner.

Benefits for partnering institutions. A total of six informal education institutions and three research institutions participated in Move2Learn. Partners felt that the project had a number of benefits for their institutions, including: 1) positioning of their staff to work on other research projects; 2) increased prestige and credibility within their own institutions; 3) changes in signage and exhibits; and 4) opportunities to train their staff and volunteers.

Several practitioners commented in interviews that they would consider working in other research/practitioner partnerships in the future given there was a change in how they view collaborations like this and the benefits they can potentially derive from them. Rather than simply "hosting" research by providing researchers with access to observe or interact with visitors, practitioners reported that they were now

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

"open to being more involved in social science projects." One practitioner felt that the partnership left their institution well-positioned to look for other funding opportunities to work in another partnership.

In the UK, a researcher viewed the partnership in the UK as "a real strength for us," particularly since the university was awarded additional funding by Wellcome Trust for a follow-up project. This person felt that this award would not have been given to the university "if the relationship between researchers and practitioners hadn't worked in the UK."

Other practitioners indicated that working in the partnership provided them with greater credibility and prestige within their institutions. One person, for example, talked about having increased confidence when making suggestions to exhibit designers—and even to the CEO at the institution—and discussing research-based changes to improve the exhibits. "I have firmer ground to stand on because of our research [in Move2Learn]," this person explained. The museums benefitted from the visibility associated with being part of an international initiative, which was valued by their board of directors and others in positions of power within the organizations.

At one institution, participating staff were able to cite the initial Move2Learn research findings in conversation with the Vice President of Exhibits, which resulted in changes to the signage on the exhibit that was part of the research (i.e., to encourage parents to explore the exhibit with their child). Moreover, at two other institutions, two new exhibits were developed under the auspices of the partnership to be used in the study. Additionally, on one team an exhibit designer was "really involved in this project as well." The partners at this museum felt that this person's involvement would "have an impact moving forward in [their] exhibits."

Partners also shared that having multiple research universities and museums involved was a benefit to their institutions, since this led to "more respect and authority," according to one partner. Having a network of research institutions involved boosted "what [they] were able to say and the impact that [they] were going to have." At another site, a practitioner felt that working within the Move2Learn partnership allowed their institution to move beyond "what [they] normally do, which is front-end evaluation before [they] develop the exhibit [or] …. a little bit of remedial evaluation" where designers "make some tweaks to [the exhibit post-development]." Instead, the practitioner explained, the intensity of the data collection and analysis involved in Move2Learn resulted in changes to the signage and facilitation— something that "just wouldn't have happened" without the project.

Finally, participating in the partnership provided partners with the opportunity to develop and implement research-based training at their sites for teachers, volunteers, guest services, and early childhood museum staff. Partners felt that being able to present ideas in the training that are supported by research would increase the likelihood of a positive impact. Again, being involved in a research-based training provided partners with more credibility, as this person shared: "We were able to actually say, 'We've learned from research that if you do this, it'll enhance the experience of the children and the parents are having.'"

Was the Partnership Successful?

When asked in interviews whether they thought the partnership was successful, everyone said that it was, but they defined "success" in a variety of ways, and people felt differently about the extent to which it was successful—from "moderately" to "very." Some partners felt that it was successful on

multiple levels, from offering opportunities to learn new skills to producing useful information for museum practitioners.

Completing the scope of work. According to several individuals, one measure of success related to doing what was laid out in the proposal. Accomplishing what they set out to do as described in the proposal and providing useful data to the field gave a number of partners satisfaction, even though they acknowledged that they did not complete everything they had hoped. On the flip side, project success was also defined as not taking on tasks beyond the original scope of work. Some projects are not successful because participants get distracted, but Move2Learn partners were able to "stay focused on what's going on in museums with kids and with partners in terms of how they experience and communicate their museum experiences."

Building a foundation of research that they and others can build on, and that can influence practice. Not surprisingly, many of the research partners described success in terms of the data that they collected—although data analysis had not yet been completed at the time of the final interviews—and they were optimistic that further analysis of the data would yield interesting results.

Observations and interviews of partners indicated that Move2Learn data were difficult to collect, which was not surprising given the age group on which on which the project focused and the informal settings where data collection took place. Move2Learn researchers and practitioners at each site managed to capture rich sets of data as these young children interacted with the exhibits and with their parents, and as they participated in interviews—and collecting these data were seen by partners as an accomplishment in and of itself.

Moreover, since the topic of embodied learning has not been broadly researched, partners hoped that their work would be foundational and that it would become "increasingly important" in the field. A particular strength of this research has been the involvement of "experts from a wide range of fields to study a phenomenon that touches each and every one of us—embodiment" and the fact that this project aimed to explore the meaning and the practice of embodiment in the context of informal learning environments.

Contributing to practitioner knowledge and practice. Partners also discussed success in terms of how their work might improve teachers' understanding of the value of movement when it comes to student learning. Partners hoped that Move2Learn research highlighted how educators should "encourage movements that allow kids to explain and represent ideas" rather than moving for the sake of moving. In addition, Move2Learn partners believe that the project will influence the way that informal and formal educators "frame" learning for their students:

> *"So, the achievement will be that… people in the future will…say, 'Well, how do you know children are learning?' [and] a practitioner will be able to draw on expressions like embodiment, embodied learning, to be able to say what children are learning and how they look at that."*

Sustaining the collaboration and continuing work related to embodied learning. Since a major goal of this project was to develop an international collaboration between researchers and practitioners, partners understandably gauged project success, in part, on how well they felt partners worked together. Despite the challenges discussed above, the vast majority of partners who were interviewed

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

felt that they had ultimately developed strong working relationships as a result of the Move2Learn project and believe this to be a measure of project success. In the words of one person, partners "learned how to work with each other." Several partners felt that a good indicator of having a successful collaboration in Move2Learn was people's willingness to work together on new projects and hoped that this opportunity would arise in the future.

Judging success will take time. Several individuals were hesitant to make judgments about the success of the project, saying that, "It remains to be seen," and that it would depend on the extent to which their work gets disseminated in research and practitioner journals and used by researchers, practitioners, and exhibit designers. One partner felt a personal sense of success but was not yet sure how the project would inform the field. Another partner felt the project was already fairly successful and was confident that "some of the best stuff that can come out of this collaboration" would take place over the next six months to a year. These partners highlighted that publishing, especially in peer-reviewed journals, takes months—if not years—to accomplish and that creating resources for practitioners and designers is "hard to achieve" because the partnership's research "needs to be translated into quite specific guidelines, which isn't necessarily very straightforward."

Lessons Learned About Developing International Researcher-Practitioner Partnerships

In interviews, partners were asked what they had learned through their experience with Move2Learn related to building a partnership between researchers and informal educators. The most common lessons mentioned relate to the importance of 1) communication and understanding perspectives of the different groups involved in the project; 2) effective management; 3) collecting data; 4) dissemination; and 5) sustainability.

The Importance of Communication

- The importance of clear, frequent communication cannot be underestimated when building a partnership. Consider having a variety of different types of communication avenues — face-to-face interactions (if budgets and public safety allow); synchronous and asynchronous online sessions; and actually working in each other's institutions. In addition to meetings about logistical and management issues, have optional meetings to have rich conversations about the concepts under study (i.e., Concept Cafés).

- If the partnership involves a significant number of institutions, consider breaking into smaller cross-site teams to make communication about specific tasks easier.

- Spend time early in the project to share data to help each other understand the phenomena under study and to develop a shared perspective. Watching visitors accessing different exhibits (either in person or on a video) and having conversations about these observations can contribute significantly to creating a shared understanding of concepts under study.

- Schedule regularly occurring meetings months in advance, preferably at the same time each month, so people will commit in advance to attending, rather than trying to find times that work for a dozen or more people each time a meeting needs to be held. Since university partners

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

often have changes in their schedule each semester or quarter, this may only be possible for a semester/quarter at a time.

- While having shared definitions and aligned goals are crucial, be flexible, open-minded, and be willing to compromise. Reaching perfect agreement on definitions and goals may take time or may not even be possible given that partners often come to the table with widely different perspectives.

Understanding the perspective and context of your partners

- Invite researchers on your team to spend time on the museum floor, either working with the staff or simply observing. Visit the museum at different times, since children on a school field trip during the week will likely have a different experience than children visiting with their parents on a weekend. Invite practitioners to the university to meet research colleagues and to present their work.

- Understanding differences between museum exhibits used in a study is just as important as understanding differences between museums across and between national and international partners. "These differences will have important implications for data collection and for using comparable research methodology."

Management

- Consider hiring one full-time project manager, separate from the project leadership, who can manage timelines, project deliverables, and other logistical tasks for all sites so that everyone in the partnership can be informed about the project's progress and have a central person to go to for logistical questions. This project manager can help track assigned tasks in order to ensure that there is a fair allocation of project responsibilities.

- If initial attempts to clarify roles, responsibilities, and a project timeline fail, consider hiring a mediator who can help partners reach an agreement about task allocations and timelines. A lack of agreement can have a detrimental impact on the project and on the partners' impression of the project's success. However, recognize that these roles and responsibilities may change over time.

- Early in the project, be transparent about each participating staff's time commitment for completing project work. Since practitioners and researchers have different work cultures, sharing one's time limitations and expectations with the team can help avoid missed deadlines and workload-related conflicts across sites.

- When choosing partners, be aware that larger collaborations can be difficult to manage. In Move2Learn, engaging six museums and three universities added to the complexity of the partnership.

Collecting data

- Engaging visitors to help with the research on the museum floor can be challenging, but it can be as simple as asking for volunteers. Even though they are paying customers, museum staff in

the project were able to recruit participants for the research and the staff reported that, "They loved it."

- If your team is interested in learning about the data and the findings from other sites in the partnership, make sure to put data sharing agreements in place at the beginning of the project or even during the proposal stage. This step will ensure that each team within the partnership will have access to the full data set.

Dissemination

- To improve public engagement, include practitioner conferences as a way to share your research, and make sure to include these costs in the budget.

Sustainability

- If staff at your organization hope to sustain a partnership that goes beyond a specific project, make sure to network with other staff members beyond those in the immediate circle of the project, since attrition of staff will impact partnership connections.

Conclusions

Results from the evaluation suggest that the challenges faced by Move2Learn partners in creating a strong partnership, such as mutual agreement on a timeline for task completion and structured processes for decision making, had little to do with the fact that the project was international and involved both practitioners and researchers. While having two countries as well as six different informal education institutions and three universities involved did lead to "bumps" along the way, by the end of the project partners felt that the partnership was "moderately" to "very successful." Partners learned new skills, produced useful information for practitioners and researchers, disseminated information about the project, and so forth. In fact, many of the partners felt that one of the greatest successes of the partnership, including these "bumps," was hearing multiple perspectives about relevant theories, what constitutes evidence in informal learning environments, new perspectives on collaboration, and how to best disseminate to reach a wide audience.

Creating a partnership does not involve simply bringing together people from different institutions with different roles, of course. Rather than creating a static model of an international practitioner/researcher partnership, Move2Learn instead illustrates the *evolution* of a dynamic partnership, and how people with different experiences, perspectives, skills, and knowledge can successfully work together to carry out complex work in complicated settings. The learning that has resulted from this partnership, presented briefly in this report, can enhance and enrich future efforts of this nature.

References

Kania, J., and Kramer, M. Collective impact. *Stanford Social Innovation Review, 9*(1), pp. 36–41.

Kontra, C., Goldin-Meadow, S., and Beilock, S. L. (2012). Embodied learning across the life span. *Topics in Cognitive Science*, *4*(4), pp. 731-739.

Lindgren, R., and Johnson-Glenberg, M. (2013). Emboldened by embodiment: Six precepts for research on Embodied Learning and mixed reality. *Educational Researcher*, *42*(8), pp.445-452.

Sobel, D. M. & Jipson, J. L. (2015). Cognitive development in museum settings: Relating research and practice. NY: Routledge.

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

WestEd
WestEd.org

Appendix: Example of Interview Protocol

Roles and Responsibilities

Why don't you tell me first a little bit about your role in the project? Briefly, what are your responsibilities? How, if at all, have your role or your responsibilities changed over the course of the project?

Briefly, to what extent did you have the resources that you needed to carry out your responsibilities?

Project Goals and Alignment

In a few sentences, tell me how you would describe the overall goals of this project.

This is an unusual partnership in that it's both international and it combines researchers and practitioners.

- How would you describe the *project goal alignment* among UK and US partners?
    - Did this alignment change over time?
        - (If so, probe for why)
- What about with regard to *project goal alignment* between researchers and practitioners?
    - Did this alignment change over time?
        - (if so, probe for why)

Do you think that this type of partnership is beneficial to your work? Why or why not?

Communication/Collaboration

Do you think that the different partners effectively communicate with each other? Why or why not?

With which organizations within the partnership did you collaborate most extensively? Do you think the fact that there were different groups within the partnership working together had an impact on the success of the project as a whole?

Barriers

I'd like to talk about some of the barriers that were mentioned in earlier interviews and in meetings that I attended. Can you comment about the extent to which you saw these as barriers within the project?
- Defining and measuring student outcomes: Defining embodied cognition, learning, etc. was problematic, according to some people. What do you think?
- Project leadership: Some people felt that the project would have benefitted from a different leadership structure, such as having one PI.
- Staffing issues: practitioners and researchers seem to have different views. For example, practitioners typically have to account for their time on a weekly basis, while researchers in universities do not. This sometimes had an impact on people's roles and responsibilities. What do you think?

- Different institutions in this partnership have different organizational structures. How, if at all, did this impact the partnership?
- Push to disseminate: researchers are expected to use some of their time and resources to disseminate their work in journals and at conferences, which can take months. Practitioners seem to want to have a more immediate impact, such as conducting professional development for facilitators.
- Feelings of accountability: NSF seems to be more stringent about grantees doing what is laid out in the proposal than Wellcome Trust. Did this have an impact on the work?
- Communication barriers: Some people felt that the communication strategies were not effective.

If you were going to do it all over again, what would you do differently?

What milestones did you not reach?

Project Success/Accomplishments

How would you define and measure success with regard to this project as a whole? Do you think the project as a whole has been a success?

What about success with regard to creating a successful partnership?

What do you believe has been the partnership's most significant accomplishments thus far? What factors contributed to these accomplishments?

What do you think might have made the partnership even more successful than it has been thus far?

Learnings/Benefits

What have you learned related to building a partnership between academics and informal educators/practitioners as a result of this project?

How, if at all, will you be able to use what you have learned in your work (as a researcher) or (as a practitioner)?

Given what you have learned, what advice would you give to practitioners? Museum facilitators? Researchers?

What benefits, if any, have you had for you, as an individual, by being a part of this collaboration?

What about benefits to your institution? Do you feel like any benefits have accrued to the institution as a result of working with the partnership?

What do you think resulted from this project that will have an impact on the field of education?

Closing

Any questions that I should have asked that I didn't? Any more comments about the partnership and the work that you're doing that I should know about?

Challenges and Successes: The Evolution of an International Partnership Between Museum Practitioners and Learning Researchers

— 23 —