



Museums Empowered

Sample Application ME-255591-OMS-24
Project Category: Organizational Management

National Children's Museum

Amount awarded by IMLS:	\$162,145
Amount of cost share:	\$162,211

The National Children's Museum will conduct a professional development project for staff on facilitating Maker programs for children. The project team will collaborate with experts from the Scott Family Amazeum, the Children's Museum of Pittsburgh, and the Bakken Museum on effective and innovative approaches to facilitating high-quality Maker programs. Project activities will include conducting observational site visits, creating a curriculum to train current staff and onboard new staff, and developing and implementing an evaluation framework. The project will build a collaborative community of practice that will improve the quality of the museum experience and outreach activities offered to diverse community audiences.

Attached are the following components excerpted from the original application.

- Narrative
- Schedule of Completion

When preparing an application for the next deadline, be sure to follow the instructions in the most recent Notice of Funding Opportunity for the grant program to which you are applying.

Narrative

Project Justification

Program Goal/Category

National Children's Museum is requesting grant funding from IMLS to build an effective and resilient workplace community through professional development and training in making/tinkering facilitation and related pedagogies. Through the Museum Maker-Learning Environments Professional Development project, the Museum will generate systemic change that aligns with Goal 4, Objective 4.1 of the Museums Empowered grant program:

- Goal 4, Organizational Management: Strengthen and support museum staff as the essential part of a resilient organizational culture.
 - Objective 4.1: Develop comprehensive organizational learning opportunities that address one or more emerging priorities facing a museum.

Strategic Plan Alignment

As outlined in the Museum's strategic plan, titled "Vision for the Future," and developed as a post-opening guide for museum operations, the project addresses three of five priority goals, to:

1. Solidify world-class reputation as the **preeminent children's museum and science center** in one;
2. Provide equal education opportunities and promote learning for all children through comprehensive **inclusion, diversity, equity, and access programs** that touch every aspect of the Museum; and
3. **Bridge educational gaps in STEAM learning with on-site and virtual learning** and spark early interest in these core competencies before the age of 12 when dropoff in the sciences occurs.

The Museum Maker-Learning Environments Professional Development project aligns with goals one through three, supporting the Museum's strategic work to solidify its role as a world class children's museum and science center; provide equitable and inclusive museum experiences for children and families; and bridge educational gaps in STEAM learning by nurturing the maker mindset in early learners as a tool for future success.

The professional development project is critical to National Children's Museum's goal to strengthen its leadership role in the field, and a related strategic objective to "nurture a creative, collaborative culture and develop a diverse and inclusive staff." The Museum maker space is a core delivery method toward the Museum mission, as it facilitates the individualized, process-focused learning that nurtures the maker mindset—and ultimately the curiosity, passion, and future innovation that the Museum envisions for its audiences. The project will provide staff at all levels of experience and across departments with the tools to approach their positions in alignment with core organizational values and to interact with museum constituents from a perspective that is rooted in the fundamental theories that drive the work. The project will build a more aligned, collaborative internal staff culture that will strengthen the Museum's external reputation by producing a cohesive professional team as well as effective Tinkering trainers and facilitators.

The project will also improve the Museum's ability to provide equitable, quality education opportunities to children by building core competencies that improve the Museum's work. Focused efforts to improve accessibility to museum programs through increased community outreach events and partnerships have allowed museum content to reach broader audiences that may not otherwise have opportunities to visit the Museum onsite. By providing foundational training to all

staff, children throughout the region can take part in high-quality, facilitated maker experiences—free of charge—provided by staff across departments, both on- and off-site.

Additionally, tinkering fills the gap that exists in formal school settings by providing informal STEAM learning opportunities. The Museum Maker-Learning Environments Professional Development project strengthens the ability of all museum staff to support the provision of this critical service that sparks early interest in hands-on learning, develops the maker mindset, and promotes lifelong appreciation and learning in the sciences. Staff alignment around each of these strategic goals will be transformative.

Project Background/Need Addressed

National Children’s Museum has identified its maker-based programming as an essential component of carrying out its mission *to inspire children to care about and change the world* and achieve the aforementioned strategic goals. Making has the potential to engage young people in personally compelling, creative investigations of the material and social world (Blikstein, 2013; Martin & Dixon, 2013; Martinez & Stager, 2013), to democratize tasks and skills previously available only to experts (Blikstein, 2013), and to expand participation in STEM fields by leveraging the strengths of interest-driven, multi-disciplinary STEM learning environments (Brahms, 2014; Martin, 2014; Sheridan et al., in press). Making fills a void that exists in traditional classroom settings, offering informal STEM learning opportunities that promote lifelong learning and development of the maker mindset – a mindset that embodies curiosity, resilience, and an interdisciplinary approach to problem-solving. Museum maker-learning environments are unique and distinct still from other informal learning environments - less formal than a traditional classroom, yet less prescriptive than a workshop or digital fabrication lab. Time spent engaging in activities takes place in shorter, singular occurrences, with a single activity integrating multidisciplinary STEAM content. Making provides a playful approach to hands-on learning that is more about the journey than the destination, allowing for trial and error. These environments must also accommodate audiences that range in age, skill level, and abilities—often including mixed family groups.

Research indicates that facilitation plays a crucial role in maximizing the impact of making activities within makerspaces (Wardrip & Brahms, 2020), and yet, facilitation is an often overlooked component of interactive museum learning experiences (Pattison et al, 2017). Makerspace facilitation is less structured and more responsive to the learner than typically found in a classroom setting. It is grounded in *constructionist* experiential learning pedagogy—allowing visitors to learn by drawing their own conclusions through experimentation and making. To be effective, the facilitator must have a level of praxis in the tools and techniques of the activity, as well as in its facilitation, and must embody their own maker mindset. An immediate need for facilitation training has been identified and supported by recent, internal National Children’s Museum staff surveys, reflecting a desire among 100% of staff respondents to receive at least some additional professional development facilitation training.

Currently, visitor experience and satisfaction at the Museum is inconsistent and highly dependent upon the quality of the individual facilitator, as reflected in post-visit surveys. This is supported by observational data collection by the Education team in 2023 within the Museum’s Tinkerer’s Studio, which has revealed inconsistencies in staff engagement with studio visitors, particularly with staff abilities to ‘provide guests with appropriate responsive feedback, suggestions, and tips and use inquiry-based questioning techniques.’ In fact, of the five additional facilitation behaviors that were included in the observation rubric—encompassing initial touchpoints, circulation, engagement with the activity, maintaining the environment, and monitoring guest safety—not one behavior was consistently observed across the board among staff members. These inconsistencies can cause

the organization to fall short in meeting or sharing its mission and vision for world-class educational experiences rooted in STEAM. National Children’s Museum’s Museum Maker-Learning Environments Professional Development project proposes to meet this problem head-on, providing professional development for the Museum’s full-and part-time education staff, as well as full-time administrative staff that represent the Museum at various outreach events and often facilitate activities offsite to bring the Museum experience–free of charge–to diverse community audiences.

Target Group

The training will involve 34 current museum staff members, including 18 education staff (6 full-time and 12 part-time) and 16 administrative staff members. While 94% of the education team have at least 1 year of training or experience in either education pedagogy or STEM content areas, the grant project will develop a training curriculum that immerses the team in maker-specific pedagogies, including workshops and site visits with leaders in the field. Additionally, administrative staff–70% of whom have no experience with educational pedagogy or STEM content areas–will receive an introduction to maker-based learning and related educational theories. This will serve to connect all staff to the programmatic work of the Museum and to align organizational values across departments. It will also better prepare staff to represent the Museum and to facilitate activities as a part of outreach programs and partner events throughout the region. The training curriculum that is created as a result of the project will be an important onboarding tool for future museum staff members as well.

Ultimate Beneficiaries

Ultimately, the beneficiaries of the project will be the diverse families and community groups, students, and educators who interact with museum staff and participate in museum programs. Washington, DC residents have limited access to quality makerspaces designed for children and families. National Children’s Museum recognizes its role in serving local audiences, and plans to increase its reach in the coming years–toward its mission and vision for offering world-class educational experiences rooted in STEAM. As such, it is critical to have a staff trained to develop and facilitate consistently high-quality programs both at the Museum and offsite in the community.

By empowering all staff members with the knowledge and tools to facilitate maker activities, approximately 225,000 onsite visitors and more than 30,000 people who engage with the Museum at community outreach events–offered free of charge to local residents to ensure equitable access–will benefit.

Project Work Plan

Project Activities and Sequence *What specific activities will you carry out and in what sequence?*

National Children’s Museum will create a thorough maker-facilitation training program that will be developed by Museum staff in concert with industry experts that will be delivered to current and future Museum staff. All staff members will participate in basic training to become familiar with maker education history, relevant educational pedagogy, organizational values and the unique approach to facilitation and learning in informal maker learning environments. In addition, the Museum’s full-and part-time teaching staff will participate in in-depth maker education training focused on activity design, facilitation, and technical knowledge.

The Museum Maker-Learning Environments Professional Development project will occur in multiple phases and over a period of 24 months, from September 2024 through August 2026. The project activities will include:

Phase 1: Contract with Trainers, Planning, Develop Assessment Framework, & Co-develop Curriculum

Phase 2: Site Visits & Training

Phase 3: Reflection, Training Product/Module Development, & Conference Preparation

Ongoing: Collect Data on Staff Progress & Evaluation

Supported by staff surveys and observational data, the training curriculum should encompass—though is not limited to—content identified below:

- **Tinkering and Making 101 (All Staff)** - What is the value of Making; Why do we utilize Maker-based programming at the Museum? What educational theories are inherent in this approach to learning?
- **Environmental Design (Education & Experience Staff)** - This component seeks to understand the intentionality behind how the space is created and maintained to enhance the learning opportunities within.
- **Activity Design (Education & Experience Staff)** - This focus area helps to distinguish between activities that are rich maker experiences and those that are not, and how to scaffold an activity for different learners. It reinforces the Museum’s “style” of Making.
- **Facilitation Techniques (Education & Experience Staff)** - Reflect on how facilitators’ interactions with learners support or hinder the learning process. Learn strategies for engaging, sustaining, and deepening the engagement of participants; Recognize different learner types and strategies for engaging them; Learn questioning strategies and relevant inquiry process skills to employ; Recognize and identify learning behaviors and understand how to help learners progress.
- **Content and Technical Training (Education & Experience Staff/ All Staff optional)** This component will build greater comfort and competence among the facilitation staff by engaging them in project specific activities to build domain specific expertise with the processes, tools, and materials inherent in maker-based activities.

All staff will take part in making activities first-hand as learners to gain content knowledge and technical skills, plus grounding in important STEM concepts. Blikstein (2013) and others (Petrich, et. al., 2013) note the importance of teachers having opportunities to experience activities and tools as learners prior to and alongside engaging young people in making activities.

Education managers and trainers will also participate in field trips to partner organizations to experience groundbreaking maker spaces firsthand. These partners—the Scott Family Amazeum, the Children’s Museum of Pittsburgh, and the Bakken Museum—have been identified based on their particular expertise and strengths in the field, and will benefit from engaging with both National Children’s Museum staff and one another to help develop an informed and robust training product.

The final phases of the project will see key museum staff (Education managers and trainers) develop a comprehensive set of training tools that will be used for new and continuing NCM staff members. The group may adapt, develop, and deliver additional training modules based on practices learned from contracted experts and museum partners. The team will also seek to share the outputs of the collaborative project at the Association of Children’s Museums conference in 2026.

Risks

National Children's Museum anticipates that staff turnover/retention may be an issue throughout the project period. The Museum's making/tinkering learning environment is largely staffed by entry-level or early career professionals that have not obtained the competencies and expertise needed to facilitate in these environments. The development of a training program will help to mitigate this risk by providing professional development opportunities that will 1) empower and help retain current staff and 2) onboard new employees with the tools for success and longevity in their roles.

Project Team

The project team will include both internal museum staff as well as external, contracted specialists representing partner institutions and a professional evaluator. National Children's Museum President + CEO, Crystal Bowyer will have general project oversight to ensure goals are being met. Additional internal staff will include Erik Smith, Director of Exhibits and Education, who will serve as project director, serve as primary relationship manager with the partner organizations, and oversee NCM education team members.

Additionally, partner museum representatives will include:

- Scott Family Amazeum - Mindy Porter, Chief Learning Officer; Sarah Wiley, Professional Learning Initiatives Manager; and Meg Benedetti, Making and Tinkering Manager
- Children's Museum of Pittsburgh - Danielle Linzer, Senior Director of Education, Learning & Research; Rebecca Grabman, Manager of Maker Education; and Debbie Coppola, Manager of Professional Development
- Bakken Museum - Justin Spencer, Director of Education and Andre Phillips, Youth & Family Programs Manager

Museum strategist and evaluator Kate Haley Goldman (Principal, HG&Co) will work with National Children's Museum in the ongoing evaluation of staff progress toward project goals.

Team Structure

The project is structured to include the entire museum staff so that each team member will participate and benefit. The tiered training system will allow staff with the most direct responsibilities for facilitating maker activities to receive more intensive training, while others gain elementary knowledge that will allow them to be more effective in their roles and better aligned with museum priorities.

In addition, each of the engaged partner organizations has a longstanding commitment to implementing maker initiatives at their respective organizations, and will contribute diverse strategies and perspectives. By including these partners, the project—along with each individual organization—will benefit from observing, examining, learning, and distilling these best practices into an inclusive and transformative facilitator training program at National Children's Museum.

Project Resources

The project will take place over a period of 24 months, including planning, development, and training implementation. The project team will allocate individual portions of their time to help realize the project results; see budget justification for further detail.

In order to experience the diverse maker initiatives at partner sites, the project team will be required to travel to the various partner locations in Bentonville, AR; Pittsburgh, PA; and Minneapolis, MN. Onsite workshops will also require related supplies, materials, and meals for participants.

Throughout the project, the Museum will engage museum evaluation specialist Kate Haley Goldman to ensure that project goals are being addressed and that staff input is considered throughout the process. Once the training instrument is developed, the Museum will employ a contract writer to help produce the final training materials.

Tracking Progress Toward Intended Results

National Children's Museum will use a variety of indicators to track progress toward the intended project results. Tools will include survey instruments and observational data to document visitor interactions in the Tinkerers Studio. These efforts will include the implementation of a pilot framework for facilitation assessment; peer-to-peer review and critique of staff engagement with visitors in the learning environment; staff interviews; and direct observations of facilitation.

Project Results

Intended Results

The Museum Maker-Learning Environments Professional Development project will create systemic change at National Children's Museum by educating and empowering current and future Museum staff members to improve the quality of the maker space experiences offered to Museum audiences. The project will result in a changed Museum culture, in which staff are aligned around clear, common goals, with improved ability to provide consistent, high-quality experiences when engaging with visitors and community members. The results of the project will also be reflected in improvements to the overall quality of activity design and the Museum's ability to provide equitable, high-quality maker-based learning opportunities to all. Building these core competencies is essential to carrying out the strategic work of sparking early interest in STEAM concepts through well-facilitated, hands-on activities.

Changes Among Target Group

Upon successful completion of the project, the target group should experience improved confidence in their understanding of maker education pedagogies and their important role in realizing the Museum's work. Staff should have a better understanding of effective facilitation strategies and improved confidence supporting learning in maker education environments.

Additionally, teaching staff will demonstrate effective, efficient, and evidence-based practices specific to their role as informal maker educators by demonstrating responsive facilitation techniques with visitors and demonstrating increased subject matter knowledge and technical skills in domain-specific areas.

Staff will engage in reflective peer-to-peer learning to evaluate the effectiveness and efficiency of their practice and make changes to improve wherever possible. This improved self-assessment capability and personal empowerment will result in increased job enjoyment among the Museum staff. Pre- and post- project assessments will help to determine outcomes.

Resulting Products

As a result of the Museum Maker-Learning Environments Professional Development project, the Museum will create and adopt training modules and a framework for facilitation co-developed with

contracted experts representing other informal learning organizations. The thorough, multi-part training program will be developed for continued use within the Museum.

A framework for facilitation combined with observational indicators for evaluation of staff will be developed as part of the project evaluation process. This framework, along with a practice of peer-to-peer observation and critique will enable staff to enhance mastery of the advanced skills needed for impactful facilitation within makerspaces.

With these training and self-evaluation tools, the Museum will deliver more consistent onboarding and ongoing training for staff in maker-based learning environments. The final training and evaluation curriculum may be contained in multiple formats, and adapted for use at other institutions. These could be very useful tools for other museums given that professional development for museum educators more generally is important since they are typically trained on the job rather than in college, like classroom teachers (Bevan et al, 2008). A presentation at the 2026 Association of Children's Museum's (ACM) conference will be a resulting product intended to share out project results and lessons learned for the benefit of the field.

Sustained Benefit

The resulting training and evaluation tools will provide lasting benefit to Museum staff, both current and future. In addition to practical skills and knowledge that will empower staff across departments, the Museum Maker-Learning Environments Professional Development project unifies the staff with a common understanding of programmatic goals and intended impacts, promoting a more creative and collaborative culture that allows space for diverse perspectives and backgrounds.

This project will also form a small collective of museums with a major focus on making/tinkering initiatives. National Children's Museum is committed to sustaining and growing this cohort of museums in the future for the mutual benefit of each museum partner as well as the field at large. A presentation at the 2026 ACM conference will both share the work of this initial cohort of museum partners and provide future opportunities to build out the collective to improve maker-education outcomes among institutions with makerspace initiatives across the nation.

