

PATRICIA AND PHILLIP FROST
MUSEUM OF SCIENCE

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**Early Childhood Hands-on Science (ECHOS)
Professional Development and Family Engagement
Program**

W. K. Kellogg Foundation Grant

**Year One Evaluation Report
2014-2015**



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ECHOS
Professional Development and Family Engagement Program
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Table of Contents

I.	Executive Summary.....	1
II.	Evaluation Methodology	2
III.	Responses to Kellogg Foundation’s Required Evaluation Questions# 1- 7	2
IV.	Recommendations.....	10
V.	Year Two Evaluation Plan	12

Executive Summary

From August 2014 through May 2015, the Patricia and Phillip Frost Museum of Science (the Museum) implemented the first year of a two-year project: Early Childhood Hands-on Science Professional Development and Family Engagement Program (ECHOS). The W. K. Kellogg Foundation is providing funding support for program implementation as well as an external evaluation.

Year one evaluation results are positive with evidence suggesting that ECHOS is an effective tool for engaging parents in their child's learning and that participation in ECHOS has positive outcomes for children, parents, and educators. A number of themes emerged from the evaluation data. These themes are highlighted below with additional detail provided in the body of this report. Specifically, in this first year of implementation:

- ECHOS has generated lots of excitement among Center administrators, educators, parents, and children. Children are excited about participating in ECHOS lessons and activities—both in and out of the classroom. Parents are excited about doing ECHOS activities with their child. Educators and administrators are excited about ECHOS as an instructional strategy to improve science teaching and learning as well as an effective tool to more deeply engage parents and families.
- ECHOS is increasing children's exposure to science concepts as well as their acquisition of science-related skills and knowledge. In a Year 1 pilot study the percentage of students who increased their unit assessment score varied by unit, ranging from 70% of students for the unit on blocks to 89% of students for the unit on magnets. Average post-test scores ranged from 87% to 92% on unit-related assessments.
- Everyone is learning – not just the children. Educators, administrators, and parent leaders all reported that they increased their interest in, comfort with, and knowledge of science.
- At each participating Center, staff and parent leaders have been utilizing ECHOS to support and enhance their family engagement goals. Throughout the year, Center staff and parent leaders developed and implemented their own ECHOS-related parent engagement activities—building upon the resources provided by the Museum—evidence of their excitement over ECHOS as a family engagement tool.
- A cadre of parents (parent leaders) has been developed at each Center that works with children in ECHOS related activities within classrooms. These parents enthusiastically support ECHOS and are interested in increasing their leadership role in parent engagement.
- At each Center, in addition to the parent leaders, a broader group of parents has been engaged through the Museum's Family Day as well as Center-generated activities (e.g., ECHOS home learning activities, newsletters, school displays, and parent meetings).
- Participating parents and children have increased their awareness of the Museum.
- Participating parent leaders, educators, and administrators at each Center have many excellent ideas for further strengthening ECHOS as a parent engagement strategy and are very eager to work with the Museum in this area.

II. Evaluation Methodology

An external evaluator is collaborating with Museum staff to conduct a two-year evaluation of the Museum's Early Childhood Hands-on Science (ECHOS) Program (the program). The purposes of the evaluation are to:

1. Learn more about participants' and partners' experiences for program improvement
2. Assess the achievement of program outcomes
3. Report program activities and outcomes to program funders for accountability purposes

The evaluation utilizes a participatory evaluation approach with the external evaluator working in close collaboration with program staff during the three phases of program evaluation: (1) developing the evaluation plan and measures; (2) collecting and managing data; and (3) analyzing, reporting, and utilizing data. In this first year of the evaluation, the focus was primarily on formative evaluation to guide program implementation as well as some initial forays into summative evaluation activities to identify, and begin to explore, the program's outcomes.

The results presented in this report emerged from the analysis of data collected between August 2014 and May 2015. Data collection activities included:

- Participant surveys administered throughout the year after each training workshop conducted by Museum staff for educators and parent leaders
- An end-of-year evaluator site visit to each Center which included an ECHOS lesson observation (at one site) and interviews (individual or small group) with parent leaders, educators (teachers/teacher assistants), and administrators. A total of 14 parent leaders, 12 educators, and 10 administrators were interviewed.
- Child pre and post-learning assessments (six ECHOS unit assessments developed by the Museum) administered to a sample of children at each Center.
- Teacher classroom practices survey administered in August 2014 (baseline) and May 2015. Unfortunately, these surveys could not be analyzed due to an insufficient number of pre/post matched sets.

III. Responses to the W. K. Kellogg Foundation's Required Evaluation Questions

As part of its national evaluation activities, the W. K. Kellogg Foundation requested all grantees to address a set of questions of importance to the foundation. These questions are presented below as well as the responses that emerged from the analysis of program evaluation data. Note that throughout this report, the term "parent" refers broadly to any caregiver involved in program activities.

Question 1 – Program Participant Information: How many families participated in the project? Please describe the demographics of the families participating in the program. Are there specific neighborhoods or family demographics that are being targeted? How was that determined? What methods were used to recruit families?

Target Populations: The program specifically targets families enrolled in three geographically diverse Head Start Centers in Miami-Dade County: LeJardin Community Center in Homestead (far southern Miami-Dade County), KIDCO Child Care (two sites in urban central Miami-Dade), and Family Christian Association of America’s D.D. Simpson Center (urban central Miami-Dade).

Participant Numbers

- 33 classrooms participating
- 67 parent leaders
- 650 children
- 33 teachers
- 31 teaching assistants
- 424 family members attended Family Days at the Museum

Demographics: Overall, participating families represent the demographics of each partner Center as described below.

<i>Partner Center</i>	<i>% White</i>	<i>% Black</i>	<i>% Hispanic</i>	<i>Economic Status</i>
LeJardin	1%	54%	40%	All Head Start families are low-income
KIDCO III	1%	12%	87%	
KIDCO IV	0%	87%	15%	
DD Simpson	2%	90%	7%	

Recruitment Methods

- Partner Centers were identified in partnership with Miami-Dade County’s Head Start central office based on Center administrators and teachers who expressed interest in participating in the program. The Museum has a long history on collaborating with Head Start to improve early learning outcomes for Miami-Dade’s most vulnerable children. Geographic distribution was also a criteria to ensure that these demonstration sites would be dispersed throughout Miami-Dade county.
- Parent leaders were nominated by participating teachers and selected by each partner Center.
- Families were engaged in the program through the efforts of parent leaders, educators (teachers/teaching assistants) and each Center’s administrative staff including:
 - Informal discussions about ECHOS with parents, often during child drop-off or pick-up
 - Development of at-home learning activities that engaged children and parents in science-rich learning experiences outside of Center hours
 - Use of ECHOS “Ask me about ...” stickers which were provided to children after each ECHOS unit. These stickers were a very popular means of encouraging children and their families to talk about what the child was learning.
 - Presentations by parent leaders about ECHOS at parent meetings
 - Recruitment of families to attend the Family Day at the Museum

- Creation of thematic displays for each ECHOS unit in classrooms and throughout the Center. The displays included children’s ECHOS related work and other science content.
- Inclusion of information about ECHOS in Center parent newsletter

Question 2 – Family Engagement: How were participating families organized and/or mobilized into formal or informal networks in communities? How has the organization and mobilization of families impacted the outcomes of the project? In what ways have these families and their networks influenced the system of early care and education?

During this first year of the program, families were organized into Center-based networks through the establishment of parent leaders in each participating classroom. Parent leaders were trained by Museum staff and then supported ECHOS implementation in participating classrooms. They also began initial efforts to reach out to and engage additional parents in ECHOS-related activities. This engagement of additional parents beyond the core of parent leaders will be the focus of year two efforts.

After year one of the program it is too soon to assess the impact of these networks on program outcomes. It is important to note that program outcomes are focused at the child, family, and organizational level. Outcomes are not anticipated at the systemic level of early care and education.

Question 3 – Organizational Family Engagement Planning: How many organizations developed specific plans to implement family-Centered engagement strategies? What was the process for developing the family-Centered engagement strategies? How were families and communities included in the design, development, and implementation of the strategies?

The Museum, as well as each of its ECHOS partners, had family engagement strategies in place prior to the onset of this program. Partners reported that the ECHOS program has been an effective and engaging enhancement to their ongoing efforts. Museum staff reported that the program is enabling the Museum to expand their family engagement efforts more deeply into Miami-Dade’s underserved communities as well as to expand the Museum’s “toolbox” of family engagement strategies.

Each partner Center has an established parent advisory committee that was included in the program design process. Additionally, at the end of each training workshop, participants completed a program evaluation survey that collected information on their program experiences and recommendations for improvement. On an ongoing, informal basis, program staff are also in communication with partner Centers to discuss improvements to program design and implementation. Annually, the evaluator conducts a visit to each Center which includes observation and extensive discussions with parent leaders, educators, and administrators. The information from all of these sources is utilized for program refinement.

Question 4 – Respect and Cultural Competence: To what extent have early childhood organizations/schools/community-based organizations (i.e., the Museum) developed respectful relationships with families and communities? What are the characteristics of those relationships?

Cultural competence and respect are reflected in several elements of program design and implementation:

- ECHOS concepts and themes reflect children’s daily lives.
- Unit-specific ECHOS storybooks not only address specific science content but also include characters and family structures that mirror the student and family population.
- Program staff are knowledgeable of the cultures represented at participating Centers, speak Spanish, and have extensive experience working in multicultural settings. Evaluation results indicate that Museum staff are effective at working within each Center’s specific cultural and educational contexts.
- Input is collected, and utilized, from parents and Center staff during the program evaluation process
- Parent-oriented materials are available in English and Spanish

Question 5 – Organizational Changes in Family Engagement: To what extent and in what ways has the organization improved their family engagement programs, policies, or procedures as a result of the respectful relationships? Has the change in the approach to family engagement impacted the culture of the organization?

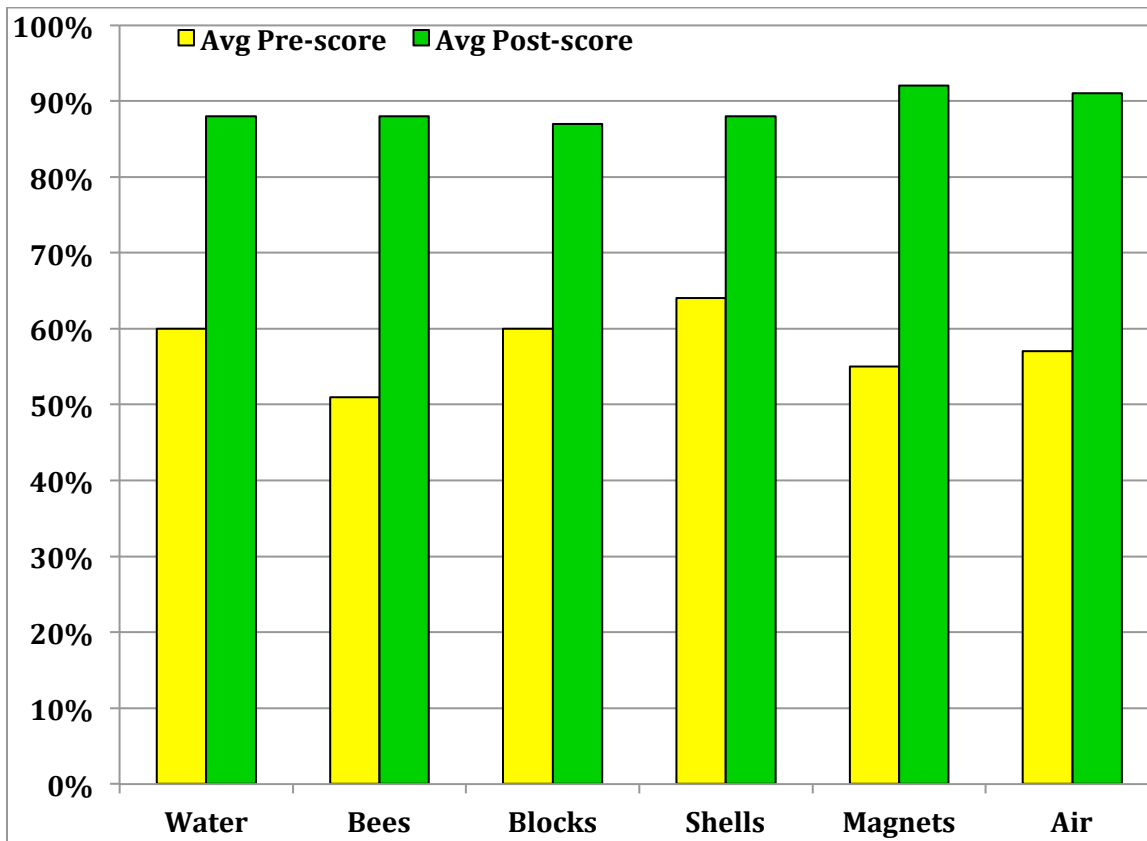
Through this program, the Museum is expanding its science-rich learning experiences more deeply into underserved communities—introducing new families to the Museum and to family-oriented hands-on science experiences. Additionally, the Museum is enhancing its validated ECHOS curriculum so that it serves as an effective tool to support family engagement in early learning environments.

This program is also part of a larger Museum comprehensive community engagement strategy to more deeply engage the many communities that comprise Miami-Dade—a large, diverse county. According to Museum reports, in the 2014 fiscal year, nearly 20,000 community members were engaged through off-site activities, special events, and student programming. In this next year, the Museum intends to scale up community engagement activities as well as add library programming and additional online efforts. Community engagement activities are designed to be accessible to all socio-economic and multi-cultural demographics, found in more remote areas of Miami-Dade County, and also serve to activate developing areas such as Downtown Miami’s Museum Park.

Participating Centers are gaining additional strategies to engage parents. Additionally, creation of a cadre of parent leaders has empowered these parent leaders and provided them with opportunities to play a leadership role at their Centers in both science instruction and family engagement. Parent leaders report that they are making a difference at their Center in terms of quality instruction, children’s learning, as well as serving as role models and facilitators for parent engagement. Parent leaders welcomed and expressed appreciation for their involvement in shaping ECHOS parent engagement strategies.

Question 6 – Program Outcomes: What is the evidence, if any, of the project’s positive impact on children in terms school readiness or early school success?

Early evaluation results indicate that ECHOS increases children’s knowledge of science concepts. During year one, a pilot study was conducted in which a sample of five children from each classroom (n=165) completed pre and post-tests for each of the six ECHOS curriculum units. The percentage of students who increased their unit assessment score varied by unit, ranging from 70% of students for the unit on blocks to 89% of students for the unit on magnets. Average child pre and post-scores for each of the six ECHOS units are depicted in the graph below. Average post-scores ranged from 87% to 92%.



Progress on Program Outcomes

Outcome 1: 3 geographically distributed Head Start Demonstration Centers established.

Progress to date: Achieved.

Outcome 2: 64 parent leaders prepared to lead small group ECHOS activities in their children's classrooms, increasing their workplace skills and advancing their marketability with respect to future teaching assistant employment positions

Progress to date: Achieved. Parent leaders participated in three training workshops held both at the Museum and on-site at partner Centers. These trained parent leaders then provided a total of 2,838 hours of support.

Outcome 3: 64 educators (32 teachers and 32 teacher assistants) trained in ECHOS science lessons and integration activities, thereby increasing the frequency and quality of science-related activities for participating children.

Progress to date: Achieved. Educators participated in three training workshops held both at the Museum and on-site at partner Centers.

Educators, administrators, and parent leaders frequently remarked on the quality of the ECHOS program and that "ECHOS makes it easy to do science." Specific comments included:

- Quality and "user friendliness" of the ECHOS curriculum (i.e., interdisciplinary nature, developmentally appropriate, detailed instructions, scripted talking points, is extendable – can supplement activities, on topics within children's everyday experiences, easy to implement, hands-on, fun – kids like doing it/anticipate it/ask for it/get excited about it)
- Comprehensiveness of the materials provided to implement the curriculum
- Quality of Museum training and support

Outcome 4: 640 preschool children ages 3-5 with increased school readiness in the cognitive domain, specifically with regard to increased science use of process skills.

Progress to date: In year one, 650 children participated in ECHOS activities. Early evaluation results indicate that ECHOS increases children's knowledge of science concepts. During year one, a pilot study was conducted in which a sample of participating children completed pre and post-tests for each of the six ECHOS curriculum units.

Outcome 5: A minimum of 320 family members and caregivers with increased familiarity of the Museum as an educational community resource.

Progress to date: In year one, 424 family members participated at a Family Day held at the Museum. One Family Day was held for each of the three partner Centers.

- Parent leaders and educators introduced children to the Museum during each Center's Museum fieldtrip. In total 910 children and 182 adults (teachers, teacher assistants, and parent leaders) participated in field trips to the Museum in advance of the Family Days.
- During the Museum Family Day, children took the lead and were excited to introduce their families to the Museum. (It is recommended that this sequence of exposure to the Museum is maintained.)
- Staff at each Center reported that for most parents and children it was their first visit to the Museum. Some parents may have visited during their own childhood but had not returned as an adult.

Outcome 6: A minimum of five parents employed part-time at the Museum as Early Childhood Discovery Room facilitators by the end of the project.

Progress to date: Too soon to assess.

Question 7 – Program Implementation: What are the unexpected results (positive and/or negative) of the project? What were some of the challenges encountered? How have the challenges been addressed? What lessons have emerged to help the W.K. Kellogg Foundation advance its mission of supporting vulnerable children, families, and communities? Please make sure the lessons/challenges emerge from data analysis.

Unexpected Results: Overall, the program was implemented as proposed and the Museum is well on its way to achieving program objectives and outcomes. While Museum staff anticipated that program participants would embrace the ECHOS program the level of excitement and engagement that the program has produced has surpassed Museum expectations. One example was the very large turn-out at the Family Days. One Center reported that it was the highest turnout they have had for a family event.

Challenges: During this first program year, the main challenge encountered was the logistics of managing a program in a large county (the geographic size of the state of Delaware). Museum staff addressed this challenge by providing some training on-site at partner Centers as well as providing transportation to the Museum for each Center's Family Day.

One of the partner Centers is moving its location and it is unknown at this time if, and how, this might impact the program. There is a possibility that a few teachers and parents currently participating may no longer participate for this reason. The Museum is monitoring the situation and will add new teachers and parent leaders as needed.

Additionally, in preparation for the opening of its new facility in Fall 2016, the Museum will close its current site in August 2015. To address this challenge, the Museum will be conducting more activities at partner Centers as well as introducing families to other local museums.

Lessons Learned: Museum staff reported that an important lesson learned this year was the effectiveness of text messaging communications with parent leaders as opposed to email communications. This lesson will be applied as the program more deeply engages a broader set of parents at each Center during year two.

Progress on Program Objectives

Objective 1: Advance family engagement in science-rich early childhood learning experiences.

Progress to date: Early evaluation results indicate that ECHOS can be an effective family engagement tool for early childhood centers. The focus during this first year was on engaging 67 parent leaders in the classroom and teaching them about ECHOS. By all accounts, this was successful. Parent leaders engaged in 2,838 hours of ECHOS-related classroom support and are very enthusiastic about the program and their involvement. This first program year, parent leaders primarily focused their efforts on conducting ECHOS related activities in classrooms with children. Additionally at each site, parent leaders and staff engaged additional parents in ECHOS to varying degrees through a variety of strategies: informal conversations, ECHOS presentations at parent meetings, ECHOS information in parent newsletters, and take-home ECHOS-related family activities. In addition, each partner Center participated in a Family Day at the Museum.

Objective 2: Increase the frequency and quality of science-rich early childhood learning experiences at ECHOS model demonstration sites through professional and parental leadership development.

Progress to date: Educators and administrators report that as a result of participating in the ECHOS program, children are increasingly exposed to science-rich learning experiences both in and out of the classroom. Refer to Kellogg evaluation question 6 above for more details.

Objective 3: Develop the capacity of parent leaders to conduct small group ECHOS activities in their children's classrooms and at home, engage other families, while at the same time increasing their workplace skills.

Progress to date: During this first program year, parent leaders were trained in conducting small group ECHOS activities and provided 2,838 hours of support conducting a variety of activities including:

- Preparing materials for ECHOS lessons
- Reading ECHOS theme related books to children
- Assisting or independently leading small groups of students using ECHOS materials such as ECHOS lesson plans and iCards. Of note, while each Center had parent classroom volunteers prior to ECHOS, typically these volunteers did not assist with instruction.

Year two plans include involving parent leaders more actively in engaging other families in science-rich learning experiences.

Objective 4: Enhance the capacity of preschool teachers and assistants to provide quality science-rich early childhood learning experiences.

Progress to date: During this first program year, teachers and assistants were trained in implementing the ECHOS curriculum and each also received a complete set of ECHOS lessons and materials. All participating teachers and assistants conducted ECHOS lessons as well as created dedicated science areas in their classrooms.

Objective 5: Raise family awareness of the Museum as an educational community resource and the importance of out-of-school learning opportunities for children’s development and school readiness.

Progress to date: 424 family members from participating Centers participated in an ECHOS Family Day at the Museum. Transportation was provided by the Museum to facilitate family participation. For most families, this was their first visit to the Museum.

IV. Recommendations

At each Center during the evaluation site visit, parent leaders, teachers, and administrators provided recommendations for how to extend and enhance the parent engagement component of ECHOS. They also expressed eagerness and excitement about working with the Museum during the next year’s program implementation to bring these recommendations to fruition. The recommendations, arranged by recommendation area, are presented here for consideration by the Museum.

Parent Engagement

Overall: Provide additional means for more parents to get involved in ECHOS-related activities. Center staff and parent leaders reported that parents have been asking about ECHOS and expressing curiosity. They believe that at least some parents would become more engaged – both in and out of the classroom - if provided the opportunity. And at each Center, the parent leaders indicated interest in playing a leadership role in this effort. Specific recommendations include:

- Conduct an ECHOS family day/evening at each Center using thematic ECHOS activities at learning/activity stations. This could be held at the beginning of the school year to increase parent comfort “doing science” and also be used to launch ECHOS home learning activities.
- Conduct more trips to the Museum and other science-related sites to increase parent awareness of where else they can go for family-oriented science enrichment experiences.
- Expand parent training so that all parent volunteers at each Center have access to ECHOS training – not just the parent leaders.
- Provide opportunities for additional parents to volunteer as ECHOS volunteers.

- Facilitate opportunities for parent leaders to formally invite and engage more parents in organized and structured ECHOS-related activities.
- Train parent leaders to conduct ECHOS-related trainings for other parents (e.g., replicate the Play workshop for parents at their Center and/or conduct “mini-workshops” or demonstrations of home learning activities at drop-off time).
- Consider the use of incentives to further engage parents (e.g., food, small gift cards)
- Regarding the provision of a stipend for parent leaders: At one Center with high levels of prior parent volunteering in the classrooms, administrators would prefer to repurpose the parent leader stipend funds to support the training of additional parent volunteers and additional materials. At other Centers, administrators would prefer for the stipend to remain as it is needed to ensure the consistent parent leader engagement needed.
- Note that Saturday may be a better day than Sunday for family events.
- Provide Museum family passes to each Center for distribution to parents.

ECHOS Curriculum and Materials

Overall theme: Enhance the ECHOS curriculum to further support parent engagement.

- Develop multilingual home learning activities related to the ECHOS themes including activity cards, books, and materials kits. Related activities could include nutrition, crafts, etc. (Note: At each Center, some teachers and parent leaders took the initiative to develop their own ECHOS home learning activities and to also supplement ECHOS in-class activities with their own activity ideas. These might be a rich source from which to build a full array of activities).
- Create a newsletter page/flyer for each ECHOS theme that Centers can integrate into their parent newsletters. The page could have information about the theme as well as what parents can do related to the theme, a book title, web resources, etc.
- Increase the number of book titles for each ECHOS theme. Reading is an easy means to get more parents involved in the classroom. With more book titles more parents can come into the classroom and read on an ECHOS theme.
- Add learning extensions to the current ECHOS lessons and iCards for children who have participated in ECHOS activities in prior years (e.g., additional activities, expanded vocabulary and learning concepts). An additional idea to engage children who have prior experience with ECHOS is to conduct a science fair for these older children with a rewards ceremony and display of projects at the Museum in conjunction with an ECHOS Museum Family Day. Children more experienced in ECHOS could also be given the role of peer mentor to help other kids with ECHOS.
- Develop apps related to ECHOS themes.
- For each ECHOS lesson, add a resource section (i.e., for additional information, specific resource websites).
- Develop more outdoor activities for each ECHOS theme.
- Add theme-related puppets to the materials kits.
- Continue with the ECHOS stickers!
- Add an ECHOS unit of planets and space.

ECHOS Training

- Conduct a summit with each Center’s participating staff and parent leaders to develop an individualized ECHOS family engagement plan– recognizing that each Center has different assets, constraints, etc.
- Transition the focus of training to move from instructional training to peer learning. Create a Community of Practice at each Center to work on the further development of ECHOS as a parent engagement tool as well as to continue to build participant skills.
- Involve each Center’s curriculum specialist in ECHOS training. Curriculum specialists don’t have time to specifically mentor in ECHOS but increasing their knowledge of ECHOS can help support implementation at the Center.
- Consider providing on-site mentors to educators to assist applying in the classroom what is learned during training.
- Extend training to all educators at partner Centers.

Miscellaneous

- Create online forms for ECHOS administration (e.g., logs, child assessments, etc.). This would reduce the administrative burden to Centers of participating in the program.
- One Center is creating an ECHOS summer program.
- Further increase awareness of the Museum at each Center through more visible branding and more close association between ECHOS and the Museum.

V. Year Two Evaluation Plan

Year two evaluation activities will entail utilizing both qualitative and quantitative methods to collect data on the experiences of those involved with the program. This mixed methods approach will enable the Museum to best assess program outcomes and objectives and will additionally provide the types of data needed for the evaluation questions of interest to the Kellogg Foundation.

Analysis of primarily qualitative evaluation data in year one indicated that there are a multitude of program outcomes occurring at many different levels: child, teacher, parent, Center, and Museum (see list below). During year two, evaluation activities will enable the Museum and its partners to examine these project outcomes in more detail.

Child Outcomes

- Increase children’s science-related assessment scores
- Increase children’s access to science in the classroom (i.e., increased science instruction, dedicated science area, science displays posted on the walls)

Parent Outcomes

- Improve parent leader perceptions of, and comfort with, science
- Increase parent leader science-related interest and knowledge
- Increase parent leader interest in a science or education career (e.g., two parent leaders at one partner site have been motivated to continue their education)

- Increased parent leader workplace skills such as leadership, organizational, and instructional skills
- Increase parent awareness of the Museum as a family resource

Teacher Outcomes

- Increase teacher interest in, and comfort with, science
- Increase teacher science-related knowledge
- Increase the quality of science instruction

Early Childhood Center Outcomes

- Increase the number of trained adults who support children's science learning within the classroom
- Provide Centers with additional, effective tools by which to engage families
- Increase the engagement of families in supporting their child's learning and development
- Increase the quality and frequency of STEM-related learning activities (science, technology, engineering, mathematics)

Museum Outcomes

- Increase partnerships with community organizations
- Increase awareness of the Museum as a community resource