Investigating the Implementation of the Be A Scientist! Project in New York City and Los Angeles

Formative Evaluation—Year Two

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INTRODUCTION

The Center for Children and Technology (CCT) at Education Development Center, Inc., a nonprofit international research and development organization (cct.edc.org), conducted the formative evaluation of the second year’s implementation of the Be A Scientist! (BAS) project, which is managed by Iridescent—a nonprofit afterschool STEM program (www.iridescentlearning.org). The goal of the BAS project is to provide high-quality afterschool science and engineering courses to underserved families in New York City and Los Angeles. The program specifically targets second graders and their families, though siblings and family members of all ages are welcome to attend.

Research Questions

The formative evaluation is guided by the following research questions:

1. Is the development and implementation of project materials, recruitment strategies, training, and course activities well designed and integrated into the project’s goals?
2. How do participants experience the project?
3. What is the impact of the project on families, undergraduate engineering students, and project partners (e.g., universities, museums)?
4. What are the programmatic and strategic recommendations for the improvement of the project?

METHODOLOGIES

To answer these questions, CCT researchers employed a multi-method research approach, using teachers’ logs, surveys, interviews, and site visits. The research instruments addressed four themes: families’ profiles and educational expectations, implementation success, implementation challenges, and impact on participants. In addition, the student survey asked participants to draw a picture of their favorite building/construction activity and describe what is happening in the picture, and to imagine and draw an engineer at work.

CCT researchers collected relevant project documents (e.g., meeting notes, videos), held biweekly meetings with the project’s staff, surveyed parents and students, conducted two site visits at the New York Hall of Science (NYSci) and two site visits in Los Angeles, and interviewed project staff and program partners. All surveys and consent forms were made available in English and Spanish.

CCT researchers employed both quantitative and qualitative methods of analysis on the data collected. For quantitative data (e.g., surveys), they used SPSS, a statistical software tool, to conduct descriptive data analyses. They read and coded the interviews, observation data, and drawings to identify the salience and substance of themes that surfaced around the project’s implementation, impact, and challenges.

CCT researchers reviewed what action was taken by Iridescent with regard to recommendations
contained in the Year One formative evaluation report, worked collaboratively with BAS staff to implement the evaluation, and helped BAS staff build internal evaluation capacity for data collection and management.

RESULTS

Results from the analyses of the collected data address participants’ background, the implementation of the key program components, participants’ experiences of the project, and the impact of the project on participants. Where appropriate and relevant, we report on data across two semesters of Family Science—fall 2011 and spring 2012. The data is from the spring 2012 semester unless otherwise mentioned.

Participant Background

A total of 67 parents and guardians completed the survey that was distributed during the final Family Science session in spring 2012. A significantly higher number of parents and guardians (249) completed the survey in fall 2011. During the fall semester, the survey was completed during the first Family Science session. Across the school sites and across semesters, the adults who participated in the Family Science program had similar background characteristics. In spring 2012, the majority of adults were parents (80.6%), and most often that parent was a mother (80.4%). Two-thirds of the families spoke Spanish at home (65.7%). Appendix 1 gives adult demographic information by school for both the fall and spring semesters.

Parental involvement at their child’s school was also similar across semesters. In spring 2012, more than two-thirds of parents agree that they are involved in their child’s school (68.3%). More specifically, they never miss a parent-teacher conference (86.2%), and regularly attend PTA meetings (49.2%).

A total of 123 children completed the survey that was distributed during the final Family Science session in spring 2012. More than twice as many children (261) completed the survey during the fall 2011 semester. Like their parents, they filled out the survey during the first Family Science session. The spring 2012 sample was split evenly between girls (50%) and boys (50%), and the average age of the students was between 7 and 8 years old. Parents reported that, on average, their children received mostly 4’s and 3’s (80.9%) on their academic scores and that, on average, their scores in science were either 3 or 4. These statistics were similar across the two semesters. Appendix 2 gives child demographic information by school for both the fall and spring semesters.

Background: Science Activities, Personal Interests

When asked what kinds of science-related activities they engage with, most parents agreed that they enjoy visiting zoos and museums (87.3%), watching science-related TV shows (87.3%), and reading books with scientific themes (74.6%).

Parents also were asked the frequency with which they engaged in similar activities with their children. Nearly two-thirds (65%) of parents engage in one or more science-related activities
with their children on a weekly basis, an increase from 60.7% in fall 2011. The science-related activities measured include reading science books, talking about science, and watching science shows. Almost a quarter of parents report engaging in all three science-related activities with their children (23.8%). Figure 1 shows the difference in number of activities that parents reported doing with their children in the spring and fall semesters.

**Figure 1: Science Activities**

![Bar chart showing the difference in number of science activities reported by parents in spring 2012 and fall 2011.](chart.png)

The children attending the Family Science program enjoy science activities both in and out of school, with 78.2% reporting that they like studying science in school. Two-thirds of children also reported that they like to ask a lot of questions in school (62.2%). These figures were slightly higher in fall 2011, with 86.7% of kids saying they liked studying science and 75.6% saying they like to ask lots of questions in school.

Outside of school, students enjoy participating in a number of activities, the most popular being visiting zoos and museums (82.3%) and watching television programs and movies about science topics (70.6%).

In addition to enjoying a number of concrete science and building activities, students also learn about their world through a variety of scientific inquiry approaches. The two most popular approaches include building things (79.0%) and touching things to learn about them (76.5%).

In fact, as part of the survey students were asked explicitly about their experience building things. In the fall of 2011, nearly three-quarters (73%) of the students participating in the Family Science program indicated that they had done building and construction projects in the past. When asked to draw a picture of their favorite building or construction activity, 79% of students drew an accompanying picture. The drawings fell into four major categories: physical environment (e.g., buildings, houses, schools), 29%; means of transportation (e.g., cars, boats, airplanes), 25%; natural environments (e.g., dinosaurs, animals, flowers, sea), 15%; or technology tools (e.g., robots, scientific instruments), 11%. Most of them described what they were doing in the picture as building or constructing a house, an apartment, a tower, a city, a car, a volcano, animals, natural settings, or technology tools used in science experiments. The sample quotes below illustrate their building/construction experiences.
“I am building a pyramid that shows a volcano.”

“I am building a robot.”

“I am making a Lego police station.”

“I am making a tower with stuff I recycled.”

“I build a city made out of juice and milk cartons.”

“I built 3 tiny racing balls so I can see the speed of a boat.”

“I built a stethoscope.”

In the spring of 2012, 85% of the students drew a picture of themselves doing their favorite building/construction activities. These drawings fell into five unique categories: 30% in means of transportation (e.g., cars, boats, airplanes, rocket ship); 16% in experiments and explorations (e.g., electricity, testing something, traveling to space); 12% in physical environment (e.g., buildings, houses, schools); 10% in social events (e.g., going to places, working with others); and 6% in natural environments (e.g., animals). The sample quotes below illustrate some of their building/construction experiences.

“It was about the solar power.”

“In my picture I am making a boat and testing it if it floats and up to how many.”

“Estuvimos haciendo aerodinamicos de caros.”

Background: Science Careers

The adults suggested that, since taking the Family Science course, they have a better understanding of the jobs that exist in science and engineering (71.4%); two-thirds of the children in Family Science agreed (67.2%). Participants were most likely to describe STEM careers as being interesting (83.5%), and secure (76.1%). Adults were asked to describe how they felt about STEM careers using a five-point scale. A higher value indicates that more participants agree that the adjective describes STEM jobs. Figure 2, below, shows how adult participants in Family Science described STEM careers in both fall 2011 and spring 2012. The scores are consistent across the two semesters, though more adults described STEM jobs as secure and stable in the spring than they did in the fall.
Nearly all parents (88.9%) agreed that their child would go to college, and more than three-quarters of parents (77.8%) said they would encourage their child to pursue a career in science or engineering. Three-quarters of children agreed that they would be a good scientist or engineer (73.1%).

In order for CCT researchers to better understand how students conceive of engineering jobs, students were asked to imagine what an engineer at work might look like and to describe the activity. In the fall of 2011, 85% of students drew and described a picture of what they imagined an engineer does for work. Some of the most common images included either the depiction of a physical environment (e.g., buildings, houses, schools, hotel, pool, bridge, power plant) (30%); means of transportation (cars, boats, airplanes, helicopters, train, rocket) (24%); exploring and experimenting (e.g., light, lamp, battery, electricity, space, trying to hear someone’s heart) (12%); technology tools (stethoscope, robot, phone, vacuum cleaner, computer) (7%); social events (helping other to learn, painting, beach, writing) (7%); and natural environments (animals, flowers, sea) (5%). By explaining what their imagined engineers were engaged in—such as building, fixing, making, driving/conducting, designing, teaching, experimenting, inventing, and exploring—students demonstrated that they understand what engineers do. The sample evocative quotes below show this understanding.

“Engineers make cars, and mostly anything, so I drew a car. It's part of an engineer job.”

“The engineer does mechanical stuff on cars.”

“The engineer is building a vacuum without a controller.”

“The engineer is fixing a computer chip. She is a computer engineer.”

“The engineer is fixing an electric tower.”
“The engineer made a solar power car.”

“The engineer is thinking of how much space is the skyscraper going to take.”

“The engineer is building a rocket because it is going to space.”

“The engineer is looking at the earth.”

“The engineer is looking at things in the moon.”

“The engineer is trying to build a new invention.”

Similarly, in spring 2012, 86% of students drew a picture of what they imagined to be an engineer at work. These pictures were similar to the earlier drawings, and included destroying, fixing, building, designing, and testing means of transportation (cars, boats, airplanes, rocket ship) (38%); physical environment (buildings, houses, schools) (13%); experimenting (12%); social events (7%); natural environments (dinosaurs) (6%); and technology tools (6%). The sample quotes below describe what the students drew.

“She is fixing the airplane.”

“He is fixing a rocket ship.”

“The engineer is building a plane for the army.”

“He is at space in the moon fixing the spaceship.”

“She is going to fix a car. If she thinks she is done, she will test it.”

Participant Experiences

In general, families had a very positive experience at Family Science. The undergraduate students in the Engineers and Teachers (EasT) class also had a positive experience working with the families.

Participant Experiences: Families

Families from eight different schools participated in Los Angeles. Six of the Family Science programs were held at the schools, one was held at the Iridescent Studio, and one was held at the Los Angeles Natural History Museum (NHM). Across the sites, attendance fluctuated among the five sessions, with a total of 312 participants in the first session and 219 in the fifth and final session, a 30% drop in attendance. In New York City, families from three schools participated in the program. All five of the sessions were held at the New York Hall of Science. Attendance held steady around 39 participants, with only a small drop on the last day to 36.

Most parents heard about the Family Science program through their child’s school or their child’s teacher. Two-thirds of the families (68.3%) indicated that they had attended Family Science in the past, and 25.4% said they were participating for the first time. Parents decided to attend the program for a variety of reasons, including: fostering creativity; developing an interest
in math, science, and engineering; spending more time as a family; and encouraging current interests like inventing, experimenting, and asking questions. One parent said she specifically wanted her daughter to be exposed to a hands-on learning environment that she felt was usually reserved for boys. Most parents understood the main goals of the Family Science program. When asked to explain, they mentioned increasing children’s interest in science and engineering, or increasing their content knowledge in the field. Other parents wrote that the goal was to inspire children to actually become engineers or scientists. A handful of parents also talked about increasing parent/family involvement in children’s science learning. One father articulated the program goals particularly succinctly: “[The goals are to] promote science throughout elementary school in communities that are underrepresented in science careers, encourage families to get actively involved in science inquiry and experimentation, increase confidence amongst students in math/science.”

Children were mostly accompanied by their parents to the sessions and, more specifically, by their mother. The sessions started with 30 minutes for dinner or breakfast while families settled in, filled out paperwork, and chatted with each other. In New York City, families were given some materials to play and experiment with while they ate. This allowed them to become familiar with the topic of the lesson and formulate questions and hypotheses before the session started. It also served as a pre-assessment for the engineer teaching the course, who could observe how families interacted with the materials. She was then able to incorporate some of what she saw into the opening remarks of her lesson. She could deduce what misconceptions the families had by the ways in which they assembled the materials and used this as a starting point for introducing the content of the session. During the next part of the session, families would listen to a 10–20 minute interactive lecture by the team of EasT students before beginning their design challenge. In Los Angeles, the designs were different every week, and while the content was connected, the design challenges were not linked. At the New York site, not only was the content continuous across the sessions, but also design challenges were related. The families would build on and improve their designs as they learned more about electricity each week.

Both parents and children described Family Science as “fun,” and enjoyed socializing with their peers. But the highlight of the Family Science sessions for all participants was the building, testing, and redesigning of the models. This process afforded children the opportunity to ask a lot of questions about the quality and strength of different materials and to make certain decisions about the design of their machine. Though it varied by family, parents and children worked together, with the parent asking questions and guiding the child to improve his or her design. Iridescent staff and outside visitors were impressed with the high level and complexity of the content being taught to students. A guardian at the New York site commented that Family Science taught her little sister content and vocabulary that she remembered for weeks after the course.

In addition to the designing and building aspect of the program, parents appreciated the opportunity to spend more time with their children and share in a unique learning experience. Participants of all ages were able to learn something during each lesson. Parents also found the format of instruction useful, particularly the methods of using games and examples to explain complex concepts and creating lessons that built on each other from week to week. Finally,
parents very much appreciated that food was provided and that the program was free; these are unique to Family Science and make it an attractive afterschool option.

Participant Experiences: EasT Students

The 22 undergraduate engineering students spent an average of a little over four hours per week preparing for Family Science session. As they gained experience teaching, the undergraduate also became more adept and efficient at planning and organizing their lessons, gradually spending less time each week to prepare. Preparation activities included reviewing content and selecting a lesson topic, creating slideshow presentations and developing the design project, selecting and preparing materials, practicing with members of their teaching group and translators, and setting up before and cleaning up after the Family Science class.

The Family Science sessions in Los Angeles were taught by a group of three undergraduate engineering students, while the sessions in New York were taught by one undergraduate student who is an Iridescent fellow; this was her third time teaching for the EasT class. These undergraduates taught on average 1 hour and 30 minutes per week.

The undergraduates created a total of 40 lesson plans (35 in Los Angeles and 5 in New York City), addressing seven topics: Water Engineering, Aerodynamic Engineering, Space, Racecar Engineering, Fluid Dynamics, Electrical Engineering and Biomechanics of Dinosaurs (two groups taught this topic). Lessons were typically organized in the following instructional sequence: (a) direct instruction (Power Point Presentation, lecture, and demonstration); (b) experiment (build, test, re-design); and (c) share-out and reflection.

In general, students had a very positive experience in the EasT course. Motivation for taking the course varied among students; some said they wanted to improve their communication skills, others wanted a break from their regular and rigorous academic schedule, and others saw it as a unique outreach opportunity and wanted to inspire an interest in math and engineering in young people.

Many students saw the class as “a break from normal engineering work” and enjoyed getting to use a different skill set than they were accustomed to using in their more technical classes. EasT students learned to step out of the college realm, where people get things done and where things go according to plan. From participating in this course they learned flexibility and gained an understanding that, in teaching, things often take longer, that some kids will not follow instructions, or unexpected questions might take them off track. They learned to incorporate extra time and to stay relaxed and fluid, instead of getting angry or wound up.

The undergraduate engineers liked learning about the community surrounding their campus and gaining insight into how public school systems work. They appreciated having the opportunity to give something back to these communities, and they liked doing something that benefited someone else. In New York, the EasT students chose to have their classes at the Iridescent Studio in the Bronx rather than at their university in Manhattan because they wanted to spend more time in the community where they would be working. Along with this came a sense of responsibility to put their “best foot forward” to really inspire the families participating in the class.
EasT participants also enjoyed watching families learn and grow over the course of the Family Science sessions. The engineers liked seeing the children’s enjoyment as well as their learning. They liked seeing when an idea registered for an individual and when a concept clicked for the entire class. The engineers enjoyed seeing the families take risks to ask questions and try new ideas even when they were uncertain of the outcome. One engineer said her biggest success was when she saw children wanting to know more, not just because someone told them to, but because they were actually interested in the content. The EasT students saw themselves as mentors and were eager to inspire an interest in the field of science and engineering. All the EasT students said they learned a lot and would recommend the class to their peers.

In addition to the many positive experiences, the EasT students also faced a number of challenges over the course of the semester. Some students misjudged the amount of preparation time required to create a presentation and simplify complex concepts. It took a lot of time to think of worthwhile, creative, and interesting lessons and activities that fit within time constraints and utilized only the available materials. Especially after struggling through the first Family Science session, students realized they would have to make a number of adjustments to their lessons, particularly around content, delivery time, classroom management, and the design challenge. It was challenging to create design activities that could be done in a half an hour and that would challenge the kids to think for themselves, but not be so hard that they would give up after a few attempts. Finally, adjusting to a non-engineering audience was a challenge for most of the students. They would have liked the opportunity to present in front of a group other than their peers or engineering teachers to gauge the understandability of the lessons they were creating.

Program Progress

Iridescent and their partners have improved the BAS project in some major ways this year. The improvements included determining critical program components for scalability, ensuring completion of courses and adequate staff support, devising recruitment strategies, and providing quality training to EasT students and instruction to families. Iridescent staff continue to figure out the promising and scalable program components such as the EasT training and Family Science sessions. As one of the program leaders indicated, they are dealing with logistical issues and how to maintain program quality, and also creating a sustainable parent co-investment model. She perceives the project as an investment in the community, which will eventually be taken over by the community through access to different resources. Iridescent’s ultimate goals are to provide value to the informal science community, to get more minority families involved in the program, to help parents develop their skills, to figure out how can informal science centers and museums can benefit from this project, and to increase minority participation at these informal institutions.

Program Progress: Family Recruitment and Retention

Iridescent’s recruitment in New York City and Los Angeles continues to be a success, but retention remains a challenge, especially in LA. It appears that families with kids interested in science, schools with better support system for families, and quality of instruction have positive impact on better attendance and retention. This was demonstrated at one the schools, Vermont,
which had the best retention between semesters. The retention challenges continue to persist despite Iridescent’s development of various family-engagement strategies, including parent orientation, parent workshop, hiring a new parent leader (PL), and publishing an iridescent engineering design book to share with families.

The role of the PL in LA is to recruit and retain families who participate in the Family Science program. The PL collaborated with volunteers, school staff, and the Iridescent Family Science director to help run the Family Science sessions. He coordinated the operations of the Family Science courses at some of the sites with the appropriate school staff and studio, ensuring that each session had a welcoming environment and addressed the participants’ needs. He promoted and signed up families for special Iridescent offerings, such as field trips and studio programs.

To track attendance and make the sign-in process more efficient across Family Science sites, Iridescent developed and instituted the keytag registration program and worked to ensure data were uploaded immediately after each session for sites still using pencil and paper. The keytag card functions like a library book check-out card; adults get a keytag during the first introductory session and an Iridescent volunteer scans the card to record that family’s attendance at subsequent sessions. Currently, the scanner has to be connected to the Internet in order to gather data, but eventually there will be a version that works offline. Right now, data such as phone numbers and mailing and email addresses is being stored by “household.” Iridescent program managers can then query to get the necessary information about individuals in each household. Iridescent is following all the required security codes to keep personal information safe. At this stage, the database is updated yearly by contacting families directly, but Iridescent hopes to make this process more efficient going forward. As a result of this tool, the Iridescent team reports that sign-in time has been reduced and that they can more easily track family attendance over time.

The implementation of an introductory Family Science session is another effort to improve family involvement and retention. This new approach allows the Iridescent program coordinators to go over program goals and expectations, as well as paperwork, with the parents. The success of this approach is apparent when examining the parent responses in the fall 2011 and spring 2012 surveys. Not surprisingly, parents’ understanding of the program goals is much deeper in the last session of spring semester than it is in the first session of the fall semester. Parents more consistently and accurately articulate the goals of the Family Science program and are less likely to describe tangential or vague goals, such as “learn about science” or “have fun” or “prepare children for the future,” which were more common in the fall.

Another initiative being developed by Iridescent to sustain family involvement beyond the Family Science sessions is the “Curiosity Machine.” This website brings into one portal Iridescent content that is currently housed across the Internet on blogs, websites, YouTube, and in their instructional book. The goal of the site is to create broader access and expand participation beyond a one-mile radius of USC and the New York Hall of Science. To upload content to the site, Iridescent will target a group of engineers, many of whom are former USC engineering students who were trained through the Iridescent Engineers as Teachers undergraduate course. The Iridescent team will recruit families to be part of the pilot research around the use of this website.
In addition, Iridescent made available a text message system to remind families of the date and time of each session. However, very few people signed up to get the text message reminders.

Iridescent is starting a Parent Science Club to increase family support at each school. This will provide more consistent support on the ground. The club would eventually help fundraise for the program.

Iridescent plans to populate its summer program with Family Science children this year.

Challenges:
- Iridescent staff believe that the critical question that remains is whether these intense outreach efforts to improve retention are sustainable in the long term.
- Family Science is competing with sports programs, other spring activities, and remediation at schools.
- The fall program is better for the schools, but the spring program is better for the EasT instructors because of scheduling and course availability.
- It is hard to maintain communication links with families who have inconsistent phone service.

Program Progress: Management

The program management has improved this year. To alleviate staff workload, Iridescent hired one full-time and four part-time (translators) and recruited 100 volunteers (most of them were one-time volunteers) in LA; made transparent the process of implementation of the project via biweekly meetings; relied on the support of the parent leader coordinator and part-time staff (translators and a part-time parent leader); conducted check-in meetings with all partners; facilitated two partner meetings; developed operational plans six weeks ahead of the first week of Family Science; and provided clear management and implementation guidance to BAS staff and partners. Iridescent provided additional support for the videotaping of the Family Science sessions and the preparation of the instructional materials. Iridescent developed a dissemination team, led by two staff members, and each Family Science session was filmed weekly.

Challenges:
- Some staff are overworked, and responsibilities/roles are not clear among staff. The fact that all staff report to the CEO and founder of the organization does not help with this situation.
- Most Iridescent staff are focused on their day-to-day tasks and are not focused on big-picture issues facing the organization and project. The CEO would like to change this situation by providing more opportunities to reflect on their work and to share with the broader informal science community.

Program Progress: Training and Program Structure

Iridescent has figured out that the EasT program is at the core of their Family Science program, and has spent a lot of time this year to improve how the undergraduates are prepared for teaching quality Family Science sessions in underserved communities. Iridescent has made major strides in improving the structure of the training program in New York and Los Angeles.
The New York EasT students took their classes at the Iridescent studio in the Bronx and hired two New York University graduate students to help with recruiting students from Cooper Union and NYU. They recruited a total of 14 students from Cooper Union (n=4) and Polytechnic Institute of New York University (NYU-Poly) (n=10). An equal number of male and female students participated in the program.

The training of the NY EasT students consisted of familiarizing them with the neighborhood in which the families they planned to serve were living and participating in seven four-hour sessions prior to teaching Family Science. The NY EasT students received feedback about their lesson plans and instruction from three Cooper professors. They made videos of their designs and a 3-4-minute instructional video on how to create their design. In the videos, they incorporated small instructional components about the concepts or principles behind the designs and how they fit together. The videos might also be used in LA, so that those engineers can use some of the NY designs in Family Science, afterschool, and for the Curiosity Machine.

Iridescent supported program trainers in LA by offering them more program development support (creation of syllabus), sharing syllabi, providing feedback on their teaching of the undergraduate courses, and allowing more time to prepare for this upcoming year. In addition, Iridescent paid alumni engineers to teach an early EasT class in the spring. That served as a demonstration classroom for the new EasT students. The core EasT instructor had an extra person in the class to help as student groups were developing content. A new, promising practice in the EasT program is that content is being developed in class so that students can make changes as they go along. The instructors taught the same content that they had taught in the fall. Iridescent plans to provide all the lessons created during the fall and spring sessions online so that families can access missed lessons.

Program Progress: Partnerships

While overall relations between Iridescent and program partners have improved drastically this year as compared to last year, it is still challenging to coordinate and integrate their resources.

Museum Partnerships

The program ran very well in New York City, despite the limited involvement of NYSci staff with the program this year. The NYSci program coordinator attended four out of the five sessions. He took photos, dealt with set-up logistics, handed out materials, and assisted families at individual tables. As a result of this limited involvement, Iridescent and NYSci staff met to discuss a plan for next year. They outlined a plan whereby NYSci staff will be more involved in designing curriculum and co-facilitating learning and content in a museum setting, including how to incorporate their exhibits into Family Science lessons.

There has been some improvement in communication between Iridescent and NHM staff. NHM staff feel that they better understand the program needs, and are working hard to align the Family Science and EasT program content into their museum exhibits. Family Science families visited the LAH museum halls/exhibits, engaged in a more dynamic activity (such as moving like dinosaurs outside), and made dinosaur-jaw imprints that they were able to take home. The EasT
students are putting their lessons on a Google Doc/Backpack so the museum staff can access and review them. Museum staff met with six EasT students, who taught the biomechanics of dinos class. They reached out to one of the schools to make bone replicas available to them, but have not heard back.

Museum Challenges:
- Integrating NHM experience into the Family Science Lesson. On one hand, the NHM does not usually engage immediate community or adults; school field trips are the most common way that local communities are engaged. Family Science is a hybrid program that works with schools and families, and spans the museum’s different programs. On the other hand, the museum already offers training in interpretive facilitation, which is the type of facilitation that Family Science wants to move towards.
- Providing Spanish translation for Family Science session held at the NHM.
- Find more time for NHM to be proactive with participating schools and the EasT program.
- Clarifying many challenges around the instructional resource component or EasT component. Museum staff are not pushing hard because they are not sure what the students are getting, how much EasT needs the museum, or whether Iridescent is responsible for giving all the informal science instruction.
- Providing some evaluation support in order to prove the added value of the NHM component to the rest of the museum or informal science community.
- Drawing on a lot of resources to bring underserved families to the NHM. What is innovative is the abundance of resources being used to get the families to the museum, but whether the families will visit the museum without the support provided by the Be A Scientist! project is yet to be determined.
- Expanding pre-session development workshops and involving NYSci staff more in the content and curriculum to help make the activities appropriate for both parents and children.
- Inviting Cooper Union students to NYSci to observe Family Science facilitation at the museum.
- Providing Spanish and Asian translation for the Family Science session held at NYSci.

USC Engineering Graduate Students: Automation of the Coding of Best Instructional Practices
Iridescent staff and the USC engineering graduate students have made tremendous efforts in developing online codes to analyze the Family Science videos. The students are developing a systematic way to gather data about Family Science student engagement using engineering techniques and visual technology. These graduate students have improved their videography techniques by using a mounted camera that is facing participants. The graduate students are trying to figure out how to analyze the interactions they capture on film using unobtrusive measures. They are not aiming to completely automate the assessment or evaluation process, but rather to provide another set of metrics that might provide useful feedback for the EasT students and Iridescent staff.

USC Film Students: Creating a Documentary about Family Science
The USC has figured out three clear program themes to document over time:
- 2011: family identities and parent leader
For the filming of Family Science, the USC team collected good material about two instructors in the fall of 2011. The instructors are both women: one is Chinese-American, and the other is half Latina. While the USC program coordinator is working with one of the graduate students to script pieces about the instructors from the fall, he is not clear about what they can and cannot do because of the program’s limited funds.

For the spring of 2012, the filming focused on the interactions of parents and children during five sessions. It documented the development of children’s learning skills with the support of their parents, who helped them to scaffold their learning through Q&A’s and guided them through the design and redesign process. The USC team is hoping to follow some of the families over the period of the five-year grant to highlight how they have grown and developed and what skills they have gained.

The USC program coordinator believes that the BAS project has had a positive impact on USC graduate students, who are learning about documentary shooting, writing, and directing. One of the students is drawn to making social impact through media, and is thinking of taking skills he learned in this project back to Nicaragua to improve conditions for underserved communities.

Challenges: While one of the strengths of the BAS project is its myriad of dedicated partners that are eager to contribute to the success of its program, it faces some challenges in maintaining this web of partnerships with different priorities and interests and meeting the needs of everyone involved.

- Intermittent and inconsistent communication among partners.
- Limited funds for the production of quality documentaries.
- A couple of the USC students, who have been with the program for some time, are graduating this year; the USC program coordinator needs to find a new editor and cinematographer.

Impact

Impact: Parents

Parents thoroughly enjoyed participating in the Family Science course. Many of the parents had attended Family Science in either the spring or fall of 2011 and were returning because they had such a positive experience. Specific outcomes are listed below.

- Parents are able to spend more time with their children, and it brings the family closer together.
- Parents learn about how common objects and machines function. They are better able to explain how things work to their children and other family members. According to the survey, 77.8% of parents reported that they understand science and engineering better, and 66.6% said they were more confident talking about science and engineering topics with others.
There are more science-related activities going on at home such as building things out, playing with science kits, watching science programs, and going to museums and zoos. On the survey, 88.9% of parents also say they will read more science books with their children.

Parents are more confident because their children see them as people who know things, who can build things, and who can solve problems.

Impact: Children

The Family Science course also has had a number of positive impacts on the children attending the sessions. Like their parents, this was the second or sometimes third semester that children had participated in the program. Parents, the EasT teachers, and students themselves reported some of the specific positive outcomes, which are listed below.

- Children are learning new concepts and vocabulary and actually remembering them weeks and months after the class is over. In fact, three quarters of children (74.8%) reported that they have a better understanding of science and engineering since taking Family Science.
- Children said they share their knowledge with their siblings and friends after they learn something interesting in the Family Science class. The children feel empowered to share what they know with others.
- Some children have been inspired to become scientists. They have gained confidence in their scientific knowledge and ability.
- Three-quarters of children (74.8%) reported now being more interested in science at school.
- At home children are eager to seek out more information about various scientific topics on the Internet. They are going to more science-specific websites, such as Sid the Science Kid and Electric Company to learn more about science and engineering.
- Children are more creative. Instead of just drawing, they now want to build and invent things. They want to experiment and make more things at home. Two-thirds of children (64.7%) reported that they are doing more science related activities with their families.
- According to one of the EasT students, over the course of the class, children begin thinking more outside the box, moving away from copying one image or product. They are more adept at creating and inventing their own designs.
- Children reported being less averse to challenges and challenging activities (74.0%). Nearly all of these children also reported that they would be more likely to keep trying to complete a project even if they couldn’t figure something out on the first attempt.

Impact: EasT Students

Most of the undergraduates in the Engineers as Teachers class did an excellent job working with the families. They reported a number of positive outcomes from their experience in the semester long course.

- Students commented that they learned practical skills, such as critical thinking, creativity, public speaking, and collaboration skills that they didn’t necessarily learn in other classes.
Because they were communicating with an audience with little engineering background, the EasT students learned how to simplify their language and break down complex content into simpler concepts.

Instead of building to create a set of results, which they often do in their other classes, the EasT engineers felt that teaching this course helped them understand that there can be many solutions to one problem. Students were “inspired” by the multiple and varied designs created by the children in the Family Science class; it reminded them that there is rarely just one right answer to a problem.

Seeing the children’s excitement and fascination with building and designing reminded some of the EasT students of why they became engineers in the first place. It reminded them of the fundamental enjoyment of creating things and taking them apart. Being reminded of these basic emotions was inspiring and motivating for the USC engineers.

CONCLUSION and RECOMMENDATIONS

Overall, the implementation of the BAS project is on target. The BAS staff and partners successfully completed the following proposed tasks:

- Maintained partnerships with Cooper Union, NYU-Poly, the University of Southern California, New York Hall of Science, and the Natural History Museum of Los Angeles
- Recruited underserved families
- Trained undergraduate engineering students
- Supported the implementation of the Family Science courses
- Ensured that participating families were fed before each session
- Monitored families’ attendance at each site systematically
- Refined key program components (e.g., EasT) and reflected on best practices

The BAS leadership and staff have done an excellent job of integrating CCT’s Year One evaluation recommendations into this year’s implementation of the program. For example, they instituted the “family science orientation session” at the beginning of each semester to introduce parents to the project’s long-term objectives and strategies and to ensure their long-term involvement in the program. In addition, the collaboration between BAS staff improved from last year. They met to discuss implementation processes and outcomes, clarify roles and responsibilities around specific implementation tasks, and provide better coordination among program operations.

Although the number of challenges that faced the program in Year One has decreased drastically, the program has to deal with two critical challenges: retention and communication. To address these two challenges in the complex context of the BAS project, we recommend that Iridescent and partners address the suggested recommendations below.
Family Recruitment and Retention
- Decrease families’ dependence on program staff to attend classes.
- Continue to offer an introductory session at the beginning of the program to help parents better understand program goals, participation expectations, etc. It would be helpful to have the kids (or a more computer-literate person) come for the first 30 minutes of this session to help parents set up their email.
- Gather formal data from families who drop out of the program to better understand their reasons for leaving, and develop responsive strategies for sustaining family involvement and retention.
- Conduct a mailing or home visits, and offer the Making Machines book as an incentive to encourage parents to continue doing projects with their children and to return to the program.
- Get rid of text message reminder calls to avoid having families be dependent on that call to attend sessions.
- Build something exciting into the EasT course to give families an incentive to come back.
- Categorize families into different levels of attendance and engagement, and then provide appropriate support. Recruit EasT alumni and other volunteers with the appropriate expertise to be Level 2 and 3 instructors.
- Create a sense of community among participants to encourage continued and sustained family engagement. The returning families who constitute the base of the Family Science program should receive continuous support.
- Add disaggregated school data to the database since there are retention issues that are varied at each school. This will help with creating recruitment and retention strategies by school. Iridescent staff knows what supports are available at each school.

Program Management
- Create co-investment models among participating schools, museums, and families to help them manage the program. To accomplish this task, Iridescent should work more closely with school administrators and parent groups.
- Set up quarterly team meetings with key project stakeholders.
- Administer the program only in the spring.
- Create a parent co-investment model: parent science club at children’s school, professional development for parents in technology, etc.
- Attend to issues of overworked staff and responsibilities/roles.

Training and Program Structure
- Create a more sustainable stream of Family Science instructors by looking toward graduate students who would have more inherent interest in sharing their own research.
Many also are interested in service learning, a component of the program that could be emphasized in order to attract more students to the course.

- Develop a mentoring program where undergraduates who have already taken the *Engineers as Teachers* course pair up with new students in the beginning to give them guidance and support.
- Allow potentially interested undergraduate engineers to observe the Family Science sessions the semester before they join the course to get a sense of what they are getting involved with.

**Partnerships**

- Iridescent needs to create a museum program based on Family Science that is more tightly linked to what the museum has to offer. They should work with museum partners to bring the program to the wider community of underserved families in Los Angeles and New York City.
- EasT and NHM must agree to common outcomes and collaborate closely to implement the program. For example, invite EAST students to attend NHM’s interpretation classes and learn how the museum works.
- In order to increase collaboration with NHM, the partners should come into the EasT classroom to inform the development of the curriculum from the beginning. This will foster a side-by-side relationship with the undergraduate instructors and the museum education managers. This type of partnership can provide scaffolding and help the undergraduate instructors brainstorm some of the content.
- Iridescent staff might want to show some of the family interaction videos during the College Bound workshops.
- It will be valuable to have the PI at the USC Cinematic Arts School share what he sees through the videos with the larger Iridescent team, as a way to contribute to the development and improvement of the program. He has an intimate knowledge of some things that other Iridescent staff and USC engineering students might not see or have access to.
- Bring a guest scientist/engineer during Family Science orientation day to talk about his/her experience and be videotaped. The PI at the USC Cinematic Arts School would like to fold it into some of the video.
- Document the museum coordination piece and tell the story of the museum and its learning curve in accommodating a big group and engaging in this type of collaboration.
- Co-PIs should review their roles as set out in the original proposal to clarify what the actual leadership parameters are. In order to expedite partner communication, co-PIs have to know that they can call meetings in order to discuss challenges, make decisions or clarify implementation.

**Engineers as Teachers Course**

- Work with alumni to teach the course in early spring.
- Provide more follow up, structured feedback, and positive reinforcement for the USC undergraduate engineers as they move through the course. These students need guidance to make decisions and improve their instructional practice. Providing more time during the Engineers and Teachers course for them to reflect on their sessions, ask questions, and get feedback from their peers and the course instructor would help improve their pedagogy and build camaraderie in the class.

- Provide an opportunity for students to present their lesson plans to a non-engineering audience. Presenting to a group that is not already familiar with engineering concepts will help the students more appropriately modify and simplify their presentations.

- Provide additional assistance and support to the undergraduate engineer instructors on the first night of the program. During the first session, an Iridescent staff member should be in the classroom with the USC engineer instructors to help ensure a safe environment and foster a productive learning experience for all participants.

- Invite former students from the Engineers as Teachers program to talk to the class and share strategies and approaches that worked for them. Current students will get a jump-start on designing their curriculum and thinking through their teaching approach. It will also build a deeper knowledge base and foster a community of individuals with a shared experience.

- Purchase portable speakers for the various school sites to ensure that all participants can hear the lesson, or ask participating schools to provide portable speakers.

- Use more visuals to avoid language barriers. Iridescent is experimenting with simultaneous translation and is figuring out what works best. The simultaneous translation has challenges with being synched up, and when questions are asked, there must be more wait time to allow Spanish-speaking parents to answer and ask questions. Schools have to pay for simultaneous translation, and they are still figuring out the best way to proceed.
APPENDIX

List of Items:

1. Parent demographic data tables
2. Student demographic data tables
3. Parent survey
4. Student survey
5. Engineers as Teachers interview
6. Student interview
7. Parent interview
## Parent Demographic Data

### Table 1: Parent Demographic Data Fall 2011

<table>
<thead>
<tr>
<th>School</th>
<th>Surveys</th>
<th>Gender</th>
<th>Relation</th>
<th>Home Language</th>
<th>Heard about FS</th>
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<td>Male</td>
<td>Parent</td>
<td>Other</td>
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<td>1</td>
<td>17</td>
<td>2</td>
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<td>2</td>
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<td>16</td>
<td>8</td>
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<tr>
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<td><strong>53</strong></td>
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### Table 2: Parent Demographic Data Spring 2012

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<th>Gender</th>
<th>Relation</th>
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<td>Parent</td>
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<td>5</td>
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<tr>
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### Table 3: Student Demographic Data Fall 2011

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<th>School</th>
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<th>Average Grades</th>
<th>Science Grade</th>
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<td>4</td>
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<td>N/A</td>
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<td>41</td>
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<td>127</td>
<td>122</td>
<td>7.74</td>
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### Table 4: Student Demographic Data Spring 2012

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<th>Surveys</th>
<th>Gender</th>
<th>Age</th>
<th>Average Grades</th>
<th>Science Grade</th>
</tr>
</thead>
<tbody>
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<td>Female</td>
<td></td>
<td></td>
<td>A's</td>
</tr>
<tr>
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<td>8.25</td>
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</tr>
<tr>
<td>Frank del Olmo</td>
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<td>9</td>
<td>7.86</td>
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</tr>
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<td>7</td>
<td>7</td>
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<td>123</td>
<td>58</td>
<td>58</td>
<td>7.85</td>
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</tbody>
</table>
Parent Survey (Spring 2012)

1) Full name of your child’s school: ________________________________

2) Relationship to child:  __ Parent    ___Other (specify): _________________________

3) Are you:  ___ Male    ___ Female

4) What is the primary language spoken in your home?
   ___English  ___Spanish  ___American Sign Language  ___Other (specify):____________________________

5) How did you hear about this program? (Select all that apply)
   ___ Participation in another Iridescent program  ___ A friend
   ___ Child’s school  ___ Walk by the Iridescent studio
   ___ Teacher  ___ Science Festival
   ___ The internet, email  ___ Iridescent staff member
   ___ A flyer  ___ Child mentioned it to me

6) Have you attended Family Science before? ______ Yes  ______ No

7) If yes, when? _______ Spring 2011 _______ Fall 2011

8) What do you understand are the goals of the Iridescent Family Science program? ____________________________
___________________________________________________________________________________________
___________________________________________________________________________________________
___________________________________________________________________________________________

9) Please make an X on the continuum closest to the word that describes how you feel about science, math, engineering and technology jobs/careers?

   Science, math, engineering and technology jobs/careers are...

   a) ________________________________ Hard to find  Easy to find

   b) ________________________________ Not interesting  Very interesting

   c) ________________________________ Not social  Very social

   d) ________________________________ Very complicated  Very easy

   e) ________________________________ Not secure/not stable  Very secure/stable

EDC Center for Children and Technology
10) Please read and mark an X in the box of the choice that most truthfully tells how you feel about that statement.

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Not sure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to watch television programs about science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to visit zoos, science museums, nature centers, science fairs, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to talk about science topics with friends and family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to read books with scientific themes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I never miss a parent teacher conference.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I check my child’s grades online.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I regularly attend PTA meetings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am involved in my child’s school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11) Please read and mark an X in the box of the choice that most truthfully tells how often you do the following activities with your child/children?

<table>
<thead>
<tr>
<th>Activities</th>
<th>Never</th>
<th>A few times a year</th>
<th>At least once a month</th>
<th>At least once a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read science books</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk about science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watch science shows</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go to zoos, science museums, nature centers, science fairs, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12) On your child’s last report card, what grades did s/he mostly get? (Please check only one.)

___ Mostly 4’s       ___ Mostly 3’s       ___ Mostly 2’s       ___ Mostly 1’s       ___ Mostly 0’s

13) On your child’s last report card, what grade did s/he get in science? (Please check only one.)

___ 4       ___ 3       ___ 2       ___ 1       ___ 0

14) I think my child will go to college. _____ Yes     _____ No     _____ Not Sure
15) Please read and mark an X in the box of the choice that most truthfully tells how you feel about that statement.

<table>
<thead>
<tr>
<th>After participating in this program, ...</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Not sure</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand science/engineering better.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am more interested in science/engineering.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a better understanding of the jobs in science and engineering.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that my child could someday have a career in science or engineering.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will do more hands on activities with my child(ren).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will ask my child(ren) more questions about his or her science class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will take my child(ren) to more zoos, science museums, nature centers, science fairs, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will watch more science related TV shows with my child(ren).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will read more science books with my child(ren).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will encourage my child(ren) to pursue an education or career in science or engineering.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am more confident talking about science/engineering topics with others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for completing this survey!
Student Survey (Spring 2012)

1) Your full name: ________________________________________________

2) Your school name: ____________________________________________

3) How old are you? ____ years

4) What grade are you in? ____________

5) Are you: ___ Boy ___ Girl

6) Who brought you to Family Science today? Please list their name and relationship to you.

______________________________________________________________________

6a) Please draw a picture of your favorite building/construction activity in the box below.

______________________________________________________________________

6b) Tell us what is happening in your picture. __________________________

______________________________________________________________________

7a) Have you attended Family Science before? _____ Yes _____ No

7b) If yes, when? _______Spring 2011 _______Fall 2011

7c) If yes, who brought you to Family Science most frequently? __________________________

6a) Close your eyes and imagine an engineer at work. In the space below, draw what you imagined.

______________________________________________________________________
7a) Describe what the engineer is doing in this picture. ____________________________________________

8) Please read the following to the students and ask them to circle the choice that most truthfully tells how they feel about that statement. Tell them there are no right or wrong answers; we just want their opinion.

<table>
<thead>
<tr>
<th>Statements</th>
<th>agree</th>
<th>disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to watch television programs or movies about science.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I like studying science in school.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I like to visit zoos, museums, nature centers and parks to observe things.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I like to ask a lot of questions in school.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I like to touch different things to learn more about them.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I like to build things.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td>I think I would be a good scientist or engineer.</td>
<td>😊😊😊😊😊😊😊😊</td>
<td></td>
</tr>
<tr>
<td><strong>After participating in this program, ...</strong></td>
<td>agree</td>
<td>disagree</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>I understand science and engineering better.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I am more interested in science at school.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I have a better understanding of the jobs in science and engineering.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I am more likely to keep trying if I don’t figure something out after the first attempt.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I do more science related activities with my family.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I ask more questions about what is happening in the world around me.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
<tr>
<td>I am more excited about doing challenging activities.</td>
<td>![Smiley Faces]</td>
<td>![Sad Faces]</td>
</tr>
</tbody>
</table>
Engineers as Teachers Interview

Experience
1. Tell us generally about the class and the coursework.
2. How would you describe your experience in the class?
3. Why did you decide to take this class?

Successes
1. What worked well in this class?
2. What did you learn in this class?
3. What did you find most rewarding about the class?
4. What was your biggest success while teaching the Family Science course?
5. Would you recommend this class to a peer? Explain your answer.

Challenges
1. What was challenging about this class?
2. What do you wish the teacher had done differently?
3. What do you wish YOU had done differently?
4. What was challenging about being in the field and teaching?
5. What recommendations would you make to the teacher to help improve the class for next semester?

In closing, is there anything you would like to talk about that we did not ask?

Thank you for the information!
Student Interview

Introduction

Number of participants: ________________
Boys: ____________ Girls: _____________
Age of students: ___________________________________________________________
Student grade levels: _______________________________________________________

Background/Experience

1. How many times have you come to family science before? _________________
2. Why did you decide to participate in Family Science?
3. Who did you come with tonight? Who from your family usually comes with you?
4. In general, what do you like most about the Family Science program?

Impact

1. How does your science experience here at Family Science compare with your science experience at school?
2. Since coming to Family Science do you like learning about science more, less or the same?
3. What can you do now that you couldn’t do before?
4. Do you do these kinds of projects at home? If yes, who do you do them with?
5. What do you want to be when you grow up?

Challenges

1. What is hard/challenging about coming to the Family Science class?
2. Is there anything you wish you could have done in Family Science but didn’t do?

In closing, is there anything you would like to talk about that we did not ask?

Thank you for the information!
Parent Interview

Introduction

Number of participants: ______________________
Male: _________ Female: ___________

Background/Experience

1. How many times have you come to family science before? ______________________
2. Why did you decide to participate in Family Science?
3. Who did you come with tonight? Who from your family usually comes with you?
4. In general, how has your experience been at Family Science?

Impact

1. What do you enjoy most about coming to Family Science?
2. How has participating in the program impacted your children? What changes, if any do you see in him/her/them?
3. Do you find that you are doing more hands-on projects at home since you started coming to the program? If yes, please describe the projects.
4. Since you started coming to Family Science do you find that you are doing more activities with your child(ren)? (Probe: reading more science books, watching more science related TV shows, going to more zoo, science museums, or nature centers, etc.)
5. Are you spending more time doing other activities with your children? If yes, what are those activities?

Challenges

1. What has been most challenging about participating in the program?
2. Do you wish the program were different in any way? If yes, how so?
3. Would you recommend this program to your friends? If yes, why?

In closing, is there anything you would like to talk about that we did not ask?

Thank you for the information!