



National Federation of the Blind STEM2U

Regional Program – San Francisco

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Introduction

As part of a grant from the National Science Foundation, the National Federation of the Blind (NFB) is conducting regional STEM workshops in partnership with local science museums, entitled NFB STEM2U, for blind youth [youth], grades 3 – 6 and 9-12 [apprentices]. During the fifth regional workshop in San Francisco, CA, the NFB operated two different programs simultaneously: one program for youth and a second program for their parents/caregivers. A third program, for the Exploratorium staff, was conducted earlier to prepare the museum staff to assist with the youth program. A separate report will focus on the teen apprentices (grade 9 – 12) that participated in the leadership academy and all regional programs.

The youth program involved small groups of youth working with blind teen apprentices to complete STEM-related activities. The parent/caregiver program focused on STEM resources that could help their children, connecting parents to the NFB network and the resources it offers, and sharing ideas on how parents/caregivers could advocate for their child's rights in the school and community setting.

The evaluation questions for this program were:

1. What happens in the regional programs for each of the audiences?
2. What are perceptions of each audience in terms of appropriateness, value, and intentions emerging from the regional program?
3. How does this experience affect the individual and their understanding of blind youth and STEM?

The Lifelong Learning Group was contracted to conduct an evaluation for the grant, focusing on the affective outcomes of the project through youth and adult perceptions of the efficacy and value of the training and experience from their perspective.

Methods

Data for this program evaluation were collected from three different audiences using two different methods. Data for the youth program were collected from the youth and their parents/caregivers; parent/caregivers and museum staff contributed the data for their program evaluations.

At the conclusion of the program, the younger participants were invited to respond to questions about the program using an oral questioning route. The adult participants were invited to respond to computer-based questionnaires tied to their program both at the final program meeting and via e-mail from the NFB staff.

Data were analyzed collectively. During analysis, categories of participant responses about their knowledge were developed inductively through the coding process (i.e., they emerged from the data itself rather than being prescribed). Quantitative data were analyzed using Excel and the

Statistical Package for the Social Sciences (SPSS); descriptive statistics were used to present overall patterns in the data.

Findings

The NFB STEM2U regional workshop in San Francisco consisted of two separate, but interwoven, programs. In this section, findings will be discussed for the San Francisco workshop by program and audience. Similarities and differences between this workshop and prior workshops will be made where applicable.

To better understand the youth program, data were collected from all 14 of the youth participants, and 11 of the 14 parents/caregivers (79% response rate).

All of the youth participants were good students (either A or B students in science) in grades 3 – 6. Slightly over half favor science and math classes (8 of 14). None of the parents/ caregivers considered themselves blind. No additional demographic data were obtained for the parents who attended the San Francisco program.

Youth Program

Like youth in prior programs, youth who attended the San Francisco program enjoyed attending NFB STEM2U because it was a fun, educational experience that included opportunities to interact with other blind children and to visit a science museum. The youth participating in the San Francisco program liked exploring the museum and successfully completing interactive STEM tasks with new friends. The majority of youth who attended the San Francisco event (11 of 12) would participate in another NFB STEM2U program—the one who would not participate in another program does not enjoy science. The majority would tell a friend they really liked the NFB STEM2U program (93% or 13 of 14). Additional ratings can be found in Appendix B.

During the program, youth stated they enjoyed several of the activities led by the NFB and museum staff. Youth enjoyed building cars out of recycled materials creating objects that could float in a wind tunnel with the NFB staff and building a membrane phone and exploring sound exhibits with the Exploratorium staff. The youth wanted more time to explore the Exploratorium, either in small groups with their apprentices or with their parents/caregivers. Additionally, youth valued the opportunity to be independent and work with other blind youth while their parents were in their own workshop.

The youth participants believed they improved their STEM skills and content knowledge; especially engineering and the engineering process. Youth felt they learned the most from building cars, flying objects, and exploring devices that make sounds.

In addition to science content, participants gained confidence in their abilities to “do science” and a sense of independence. Several youth shared that this experience gave them the confidence that they can participate in their schools’ science fair; prior to this experience they didn’t think that was

an option. One youth indicated she was ready to “take on challenges” and another child shared he was “independent” because his “parents [were] in a different room and we [were] by ourselves.”

The parents/caregivers who attended the San Francisco workshop appear to be in agreement with all the parents who attended the NFB Regional programs regarding the importance of each of the skill elements included in the program. The summated means of the five regional programs indicate that parents bring their children to these workshops to develop their science and social skills, in addition to the skills their child needs to be successful in society. As illustrated in Table 1, parents’ at all five programs indicated they were least concerned with the development of their child’s blindness skills when compared to science, social and skills necessary to be successful in society.

Table 1 Parent’s mean ratings of program skill elements

	Baltimore	Boston	Columbus	Phoenix	San Francisco	Summated Means
	N=11	N=14	N=12	N=11	N=11	
Blindness skills	3.91	3.64	3.75	4.09	3.45	3.768
Science skills	4.09	3.86	4.17	4.45	4.09	4.132
Social skills	4.00	4.21	3.83	4.45	4.00	4.098
Skills to be successful in society	4.20	4.07	4.00	4.27	3.91	4.09

1(Strongly Disagree) to 5 (Strongly Agree)

Parents/caregivers in all five programs, including San Francisco, believed their children found this as an opportunity to have fun with other blind children. Additionally, post-experience questionnaires revealed that San Francisco parents believe their child valued visiting a science museum. Table 2 (below) includes mean scores for parent’s/caregiver’s beliefs of what their child felt were the most important elements of the program for the five programs to date, as well as the summated means from all five programs.

San Francisco program parents/caregivers believed their children valued the opportunity to “be part of a similarly abled peer group.” One parent/caregiver shared that her child “attends a mainstream school where there is no such interaction.” Parents/caregivers also acknowledged the importance of the teen apprentices. One parent/caregiver stated her child “valued learning from her [apprentices],” and another wrote “we know our daughter responds to what the older kids do/think/say/like etc.” Finally, one parent appreciated that one of the teen apprentices, “without any prompting . . . tried to motivate our daughter to continue/stick with her Japanese language studies.”

Table 2. Parent’s mean ratings of their belief of what children found important

	Baltimore	Boston	Columbus	Phoenix	San Francisco	Summated Means
	N=11	N=14	N=12	N=11	N=11	
Have fun	4.82	4.79	4.92	4.90	4.91	4.868
Spend time with other blind children	4.36	4.43	4.33	4.73	4.36	4.442
Learn science content	4.27	4.21	4.42	4.45	4.27	4.324
Spend time with teen apprentices	4.18	4.14	4.17	4.55	4.00	4.208
Visit a Science Museum	4.09	4	4.58	4.40	4.27	4.268
National Federation of the Blind Reputation	3.45	3.14	3.75	4.09	2.91	3.468

1 (Not At All Important) to 5 (Extremely Important)

San Francisco parents/caregivers, and all of the parents/caregivers who attended one of the five regional workshops, valued each of the elements that comprised the youth program of the NFB STEM2U workshop, as evidenced by mean ratings of 4 point or higher on a 5 point scale. In San Francisco, parents/caregivers valued the program for providing their child an opportunity to have fun, spend time with other blind youth, and learn science content. This is similar to parents who attended the previous regional workshops as illustrated by the summated means for the five regional programs. Table 3 (below) details parents’ ratings of the importance of workshop elements; parents’ at all five programs wanted their children who attended the program to:

- Have fun
- Spend time with other blind children
- Learn science content

Table 3. Parent’s mean rating of the importance of NFB STEM2U workshop elements

	Baltimore	Boston	Columbus	Phoenix	San Francisco	Summated Means
	N=11	N=14	N=12	N=11	N=11	
Child learn science content	4.82	4.71	4.83	4.82	4.73	4.78
Child had fun	4.64	4.93	4.92	4.73	4.91	4.83
Child spent time with other blind children	4.64	4.93	4.67	5.00	4.82	4.81
Child develop independence	4.55	4.64	4.83	4.45	4.64	4.62
Child spent time with teen apprentices	4.55	4.50	4.50	4.55	4.55	4.53

1 (Not At All Important) to 5 (Extremely Important)

Parents/Caregivers Program

Parents who attended the San Francisco NFB STEM2U program appreciated “the insights of Dave and Pat as parents who raised a blind child successfully... how they handled educational challenges, IEPs, getting Caroline to college, etc., the insights of Natalie as a successful blind woman and her life experience, how she handled challenges, etc., [and] the insights of blind professionals with whom we had lunch on Saturday--we sat with Jonathan who amazed us and really got us thinking.”

Parents/caregivers who attended the San Francisco NFB STEM2U program were more likely than parents at any prior program to report that the program increased their awareness of alternative techniques their child could use to succeed in STEM learning (4.55 on a 5 point scale). Table 4 illustrates how parent perception of learning regarding alternative techniques to succeed in STEM learning has changed from the first NFB STEM2U parent program. Parents who attended the first program gave this statement a mean rating of 3.64 on a 5 point scale while parents who attended this program, the fifth, rated the same statement 4.55, a positive mean difference of .91.

One parent, who attended a prior program, noted the evolution of the parent program in this regard, stating, “We didn’t talk about science last year; we only talked about blindness. [The program is] a lot more focused on topic this year, last year it was focused on disability.” Another parent appreciated “obtaining information that I otherwise didn't have or wasn't aware of. The tools available were of particular interest.”

A lot of the credit for the evolution of the parent program should go to NFB volunteers and staff. One parent stated, “I think the parents could have spent more time with Pat, Dave and Natalie going over the practical techniques and materials to help adapt 'sighted' science instruction for blind children. What they provided was great but we would have been comfortable if that block had been longer.”

Table 4. Parents mean rating of learning in NFB STEM2U parent program

	Baltimore	Boston	Columbus	Phoenix	San Francisco	Summated Means
	N=11	N=14	N=12	N=11	N=11	
Connecting with the NFB network	4.64	4.21	4.08	4.64	4.18	4.35
Their rights and the rights of the child in the school setting	4.27	4.07	3.67	4.45	3.73	4.04
Advocating if child’s rights are violated	4.18	4	3.58	4.00	3.64	3.88
Alternative techniques to succeed in STEM learning	3.64	4.21	4.25	4.45	4.55	4.22

1 (Strongly Disagree) to 5 (Strongly Agree)

Overall, parents/caregivers attending the San Francisco NFB STEM2U were satisfied with the program. Of the 14 parents/caregivers who attended the San Francisco program for

parents/caregivers, 11 completed the web-based questionnaire (79% response rate). Post-program mean scores were determined for several program elements, including staff, schedule, and meals. These statements were typically rated above 4 on a 5 point scale; mean scores for each element can be found in Appendix B. San Francisco NFB STEM2U parents/caregivers appreciated the work of the NFB Staff, giving them a mean rating of 5 on a 5 point scale. One parent wrote, “I am amazed at how the people involved organizing it (Mya, Natalie) made everything easy for us. From organizing logistics, making sure the schedule is running smoothly- the whole event was very successful.”

In the on-site interviews and post-workshop questionnaires, parents revealed they were very interested in support/network opportunities (See Table 5). One parent shared they valued, “Connecting with other families of blind children, learning what other families are doing to provide accommodations in everyday living with a blind child.”

Table 5. Parent’s mean rating of the importance of NFB STEM2U workshop elements

	Baltimore	Boston	Columbus	Phoenix	San Francisco	Summated Means
	N=11	N=14	N=12	N=11	N=11	
National Federation of the Blind Reputation	4.45	4.50	4.67	4.73	4.55	4.58
Opportunity to network with parents of blind youth	4.09	4.57	4.67	4.73	4.36	4.484

1 (Not At All Important) to 5 (Extremely Important)

When asked to suggest areas of improvement, many of the suggestions from San Francisco parents’ focused on logistics, i.e., more time in various activities, different hotel or days, etc.

Museum Staff Training

The museum staff training program elicited somewhat positive ratings from the staff (3.93 summated mean of all statements on a 5 point scale). The training increased staff’s comfort and confidence level with blind visitors (4.4 mean) and ability to determine and properly offer assistance to a blind visitor (4.2 mean) as illustrated in Table 6. Areas staff felt the training had less of an impact include helping staff describe STEM content to all visitors (3.2 mean) and altering everyday museum program and exhibit experiences (3.4 mean).

Museum staff were impressed with the NFB representative, Natalie. One staff member shared, “Natalie’s boundless energy, good humor, and straightforward approach to sharing her knowledge and insight about blind kids’ learning and blind visitors’ needs made a huge positive impression on all staff members who had the chance to work with her, including high school interpretive staff, field trip interpretive staff, frontline (admissions and store) staff, exhibit staff, educators, and wayfinding staff. She helped us accomplish the kind of cross-functional design approach that would have been hard to imagine without her help.”

Staff who shared about how the workshop might change their work at the museum shared about tactile maps, increased awareness of descriptive language, and strengthening partnerships with existing San Francisco groups that serve the blind. One staff member stated, “As a result of the NFB collaboration we have prototyped a tactile map and exhibit modifications that will further enhance a blind visitor's experience.” Another shared, “The program gave me great practice in thinking about how I communicate and explain activities or exhibits. I couldn't rely on ambiguous language (“this” or “that”) when explaining what was going on or what we were going to do.” Another staff commented on strengthening partnerships, stating, “Thanks to the STEM2U project, I have made solid contact with Lighthouse for the Blind in our city and have already visited their teen program once with hands-on activities. Their teen program will visit our museum in three weeks for a day of hands-on science, exploration of exhibits on the museum floor, and conversation with teens currently employed in our high school docent department.”

Table 6. Program impact on museum staff's abilities

	Mean	Std. Dev.	Range
Comfort level with blind visitors	4.4	0.548	4-5
Confidence level in working with blind visitors	4.4	0.548	4-5
Knowledge of accessibility and universal design and how it pertains to museums	3.8	0.837	3-5
Everyday museum program and exhibit experiences	3.4	0.548	3-5
Ability to describe STEM content to blind visitors	3.8	0.837	3-5
Ability to describe STEM content to all visitors	3.2	1.095	2-4
Ability to determine if assistance is needed by a blind visitor	4.2	0.837	3-5
Ability to properly offer assistance to a blind visitor	4.2	0.837	3-5

1 (No impact) to 5 (Completely Changed)

N= 5

Staff members shared several resources or services that the museum is working to add to facilitate full participation by blind visitors, including:

- Braille and tactile props at demonstration spaces
- Experimenting with QR codes to access exhibit labels for certain label-dependent exhibits.

Staff felt “every aspect of this project was wonderful.” One staff member shared, “From meeting the staff of the NFB, to planning and working with them over the past six months, to getting connected to our local Lighthouse organization, to eventually meeting and spending a day with the hilarious, intelligent, and thoroughly delightful children and teens who came to San Francisco to be part of this. The most important part of it all, however, has been how vocal my youth staff (all sighted) have been about the impact it has made on them and how jazzed they are about continuing to work with blind and visually-impaired children and teens.”

Conclusion and Recommendation

The NFB STEM2U workshop for youth and parents/caregivers in San Francisco, California, appears to be successful.

Parents and youth valued the youth program because the children were able to:

- Have fun
- Spend time with other blind children
- Learn science content
- Visit a science museum

It appears the parent program met the needs of the parent participants. Parents believe they learned alternative techniques their child could use to succeed in STEM learning and how to connect with the NFB. Parents who have attended a NFB STEM2U in year one noted the increased focus on STEM and appreciated learning of resources and tools that would support their child.

Finally, it appears the museum staff program met the needs of the museum staff. The training increased staff's comfort and confidence level with blind visitors and their ability to determine and properly offer assistance to a blind visitor. Staff credit the workshop with a personal awareness of the importance of descriptive language, the development of tactile maps for the museum, and stronger relationships with existing San Francisco groups that serve the blind.

Appendix A: Instruments

NFB STEM2U Youth Post-Evaluation Questions

I'm going to read you a series of questions and responses. First I'll read the question, then I'll read all the answers, so you know what choices you have. Then I'm going to read the answer choices one at a time and ask you to stand up (by your chair) when I read the answer you agree with. Does that make sense? When you stand up to answer the question, I need to count, so stay standing until I tell you to sit down. Do you have any questions about what we are going to do?

Demographics

1. OK, the first question is—What grade are you in? Your answer choices are First, Second, Third, Fourth, Fifth, Sixth, Seventh, and Eighth. Is there anyone who isn't sure what grade you are in?

Stand up if you are in first grade. Second. Third. Fourth. Fifth. Sixth. Seventh. Eighth.

2. That went well, the second question is What is your favorite subject? I'm only giving you four choices, so you need to pick your favorite from one of these four—English, Math, Science and Social Studies. Think about it for a moment.

OK, stand up if your favorite subject of the four is English. Math. Science. Social Studies. Now I need you to sit in your seat. The next set of questions may have longer answers and each of you may have a different answer. So after I ask the question, if you'd like to answer it, please say your name and I'll call on you. Does that make sense?

Skills

3. What skills (things you can do) are you better at because of activities you did here at the NFB STEM2U program?

Value/Intention

4. How will what you learned here help you in your science or math class?
5. How will what you learned here help you outside of school, in your everyday life?

Importance

6. What was most important about the time you spent at the NFB STEM2U program? (This can be open ended or like the multiple choice questions above based on children's experiences at the NFB STEM2U program; i.e., time at the museum, building the car?)

Satisfaction

7. What was the best part of the NFB STEM2U program? Why?
8. What was the worst part of the NFB STEM2U program? Why?

Now we are going to move again. Like I did when we started, I'll read the question, then I'll read all the answers, so you know what choices you have. Then I'm going to read the answer choices one at a time and ask you to stand up (by your chair) when I read the answer you agree with. I hope you are you still with me, we'll be finished soon. These questions

9. Did you like what you ate? Your answer choices are
- I really didn't like it and I would never eat it again
 - I didn't like it but I would eat it if there was nothing else
 - It was OK
 - I liked it and would eat it again
 - I really liked it and I want to eat it again soon

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

10. Did you like where you slept?
- I really didn't like it, I didn't sleep well
 - I didn't like it, but I slept
 - It was OK
 - I liked it and I slept well
 - I really liked it and I want to come back and sleep here again

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

11. How did you feel about the STEM activities (anything to do with designing your recycled racer)?
- I really didn't like the activities, I never want to do them again
 - I didn't like it
 - It was OK
 - I liked it
 - I really liked it and I want to do more STEM activities

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

12. How did you feel about your time exploring the museum?
- I really didn't like it, I never want to do it again
 - I didn't like it
 - It was OK
 - I liked it
 - I really liked it and I want to go back to the museum tomorrow

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

13. Would you tell a good friend who is blind and likes science and math to sign up for this program?
- I really didn't like it, so I wouldn't tell a friend to sign up for it
 - I didn't like it
 - It was OK
 - I liked it
 - I really liked it and I think others will like it.

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

14. Would you do it again?

- a. I really didn't like it, I never want to do it again
- b. I didn't like it, but I might do it again.
- c. It was OK
- d. I liked it, but I don't want to do it again
- e. I really liked it and I don't want to leave

Stand up if you really didn't like it. Didn't like it. It was OK. You liked it. You really liked it.

15. And for the last question, let's do this a little differently. This time, instead of standing, just raise your hand when you hear the answer you most agree with. And remember, like with all the other questions, if you feel uncomfortable answering, you can choose not to. Now I'd like to know the kind of grades you usually get in science? Once again, I need you to raise your hand to help me understand your answer. Your answer choices here are A, B, C, D. Is there anyone who doesn't get grades? Or gets grades by numbers instead of letters?

Raise your hand if you usually get an A in Science. B. C. D.

Thank you very much!

NFB STEM2U Parent Post-Program Evaluation

To help the organizers of the NFB STEM2U program better understand your experience, please take 10 minutes to answer the following questions.

The following set of questions deal with your satisfaction of various aspects of the NFB STEM2U program

How satisfied were you with the application process for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the application process for the NFB STEM2U program
- 2. I was dissatisfied with the application process for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the application process for the NFB STEM2U program
- 4. I was satisfied with the application process for the NFB STEM2U program
- 5. I was very satisfied with the application process for the NFB STEM2U program

What did you think about the pre-visit information for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the pre-visit information for the NFB STEM2U program
- 2. I was dissatisfied with the pre-visit information for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the pre-visit information for the NFB STEM2U program
- 4. I was satisfied with the pre-visit information for the NFB STEM2U program
- 5. I was very satisfied with the pre-visit information for the NFB STEM2U program

What did you think about the meals for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the meals for the NFB STEM2U program
- 2. I was dissatisfied with the meals for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the meals for the NFB STEM2U program
- 4. I was satisfied with the meals for the NFB STEM2U program
- 5. I was very satisfied with the meals for the NFB STEM2U program

What did you think about the sleeping arrangements for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied

- 1. I was very dissatisfied with the sleeping arrangements for the NFB STEM2U program
- 2. I was dissatisfied with the sleeping arrangements for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the sleeping arrangements for the NFB STEM2U program
- 4. I was satisfied with the sleeping arrangements for the NFB STEM2U program
- 5. I was very satisfied with the sleeping arrangements for the NFB STEM2U program

What did you think about the schedule for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the schedule for the NFB STEM2U program
- 2. I was dissatisfied with the schedule for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the schedule for the NFB STEM2U program
- 4. I was satisfied with the schedule for the NFB STEM2U program
- 5. I was very satisfied with the schedule for the NFB STEM2U program

What did you think about the social time activities during the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the social time activities for the NFB STEM2U program
- 2. I was dissatisfied with the social time activities for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the social time activities for the NFB STEM2U program
- 4. I was satisfied with the social time activities for the NFB STEM2U program
- 5. I was very satisfied with the social time activities for the NFB STEM2U program

What did you think of the staff for the NFB STEM2U program? Enter a 1 if you were Very Dissatisfied, 2 for Dissatisfied, 3 for Neither Dissatisfied or Satisfied, 4 for Satisfied, and 5 for Very Satisfied.

- 1. I was very dissatisfied with the staff for the NFB STEM2U program
- 2. I was dissatisfied with the staff for the NFB STEM2U program
- 3. I was neither dissatisfied or satisfied with the staff for the NFB STEM2U program
- 4. I was satisfied with the staff for the NFB STEM2U program
- 5. I was very satisfied with the staff for the NFB STEM2U program

In the next set of questions you will be asked to consider how important aspects of the NFB STEM2U program were to you.

How important is it to you that your child learn science content? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important for my child to learn science content
- 2. It is Unimportant for my child to learn science content
- 3. It is Neither Unimportant or Important for my child to learn science content
- 4. It is Important for my child to learn science content
- 5. It is Extremely Important for my child to learn science content

How important is it to you that your child experience independence by visiting a science museum? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not AT All Important that my child experience independence by visiting a science museum
- 2. It is Unimportant that my child experience independence by visiting a science museum
- 3. It is Neither Unimportant or Important that my child experience independence by visiting a science museum
- 4. It is Important that my child experience independence by visiting a science museum
- 5. It is Extremely Important that my child experience independence by visiting a science museum

How important Is it to you that your child experience fun activities as part of the program? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important..

- 1 It is Not At All Important for my child to experience fun activities as part of the program
- 2. It is Unimportant for my child to experience fun activities as part of the program
- 3. It is Neither Unimportant or Important for my child to experience fun activities as part of the program
- 4. It is Important for my child to experience fun activities as part of the program
- 5. It is Extremely Important for my child to experience fun activities as part of the program

How important is the NFB reputation to you when choosing programs for your child? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important..

- 1. The NFB reputation is Not At All Important when choosing a program for my child
- 2. The NFB reputation is Unimportant when choosing a program for my child
- 3. The NFB reputation is Neither Unimportant or Important when choosing a program for my child
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- 4. The NFB reputation is Important when choosing a program for my child
- 5. The NFB reputation is Extremely Important when choosing a program for my child

How important is it to you that your child participates in programs with other blind youth? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important..

- 1. It is Not At All Important that my child participates in programs with other blind youth
- 2. It is Unimportant that my child participates in programs with other blind youth
- 3. It is Neither Unimportant or Important that my child participates in programs with other blind youth
- 4. It is Important for my child to participate in programs with other blind youth
- 5. It is Extremely Important for my child to participate in programs with other blind youth

How important is it to you that you participate in programs with parents of blind youth? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important..

- 1. It is Not At All Important for me to participate in programs with parents of blind youth
- 2. It is Unimportant for me to participate in programs with parents of blind youth
- 3. It is Neither Unimportant or Important for me to participate in programs with parents of blind youth
- 4. It is Important for me to participate in programs with parents of blind youth
- 5. It is Extremely Important for me to participate in programs with parents of blind youth

How important is it to you that your child participates in programs with blind teens as group leaders? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important for me that my child participates in programs that have blind teens as group leaders
- 2. It is Unimportant for me that my child participates in programs that have blind teens as group leaders
- 3. It is Neither Unimportant or Important for me that my child participates in programs that have blind teens as group leaders
- 4. It is Important for me that my child participates in programs that have blind teens as group leaders
- 5. It is Extremely Important for me that my child participates in programs that have blind teens as group leaders

In the next set of questions you will be asked to consider how important aspects of the NFB STEM2U program were for your child.

How important do you think it is to your child that s/he learn science content? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important to my child that s/he learn science content
- 2. It is Unimportant to my child that s/he learn science content
- 3. It is Neither Unimportant or Important to my child that s/he learn science content
- 4. It is Important to my child that s/he learn science content
- 5. It is Extremely Important to my child that s/he learn science content

How important do you think it is to your child that s/he visit a science museum? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important to my child that s/he visit a science museum
- 2. It is Unimportant to my child that s/he visit a science museum
- 3. It is Neither Unimportant or Important to my child that s/he visit a science museum
- 4. It is Important to my child that s/he visit a science museum
- 5. It is Extremely Important to my child that s/he visit a science museum

How important do you think it is to your child that fun activities were part of the program? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important to my child that fun activities were part of the program
- 2. It is Unimportant to my child that fun activities were part of the program
- 3. It is Neither Unimportant or Important to my child that fun activities were part of the program
- 4. It is Important to my child that fun activities were part of the program
- 5. It is Extremely Important to my child that fun activities were part of the program

How important do you think the NFB reputation is to your child? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. The NFB reputation is Not At All Important to my child
- 2. The NFB reputation is Unimportant to my child
- 3. The NFB reputation is Neither Unimportant or Important to my child
- 4. The NFB reputation is Important to my child
- 5. The NFB reputation is Extremely Important to my child

How important do you think it is to your child that s/he participate in programs with other blind youth? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important to my child that s/he participate in programs with other blind youth
- 2. It is Unimportant to my child that s/he participate in programs with other blind youth
- 3. It is Neither Unimportant or Important to my child that s/he participate in programs with other blind youth
- 4. It is Important to my child that s/he participate in programs with other blind youth
- 5. It is Extremely Important to my child that s/he participate in programs with other blind youth

How important do you think it is to your child that s/he participates in programs with blind teens as group leaders? Enter 1 for Not At All Important, 2 for Unimportant 3 for Neither Unimportant or Important, 4 for Important, 5 for Extremely Important.

- 1. It is Not At All Important to my child that s/he participate in programs that have blind teens as group leaders
- 2. It is Unimportant to my child that s/he participate in programs that have blind teens as group leaders
- 3. It is Neither Unimportant or Important to my child that s/he participate in programs that have blind teens as group leaders
- 4. It is Important to my child that s/he participate in programs that have blind teens as group leaders
- 5. It is Extremely Important to my child that s/he participate in programs that have blind teens as group leaders

At the NFB STEM2U program, my child developed blindness skills (braille, cane travel, self-advocacy). Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: My child developed blindness skills at the NFB STEM2U program
- 2. I disagree with the statement: My child developed blindness skills at the NFB STEM2U program
- 3. I neither disagree or agree with the statement: My child developed blindness skills at the NFB STEM2U program
- 4. I agree with the statement: My child developed blindness skills at the NFB STEM2U program
- 5. I strongly agree with the statement: My child developed blindness skills at the NFB STEM2U program

At the NFB STEM2U program, my child developed science skills. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: My child developed science skills at the NFB STEM2U program
- 2. I disagree with the statement: My child developed science skills at the NFB STEM2U program
- 3. I neither disagree or agree with the statement: My child developed science skills at the NFB STEM2U program
- 4. I agree with the statement: My child developed science skills at the NFB STEM2U program
- 5. I strongly agree with the statement: My child developed science skills at the NFB STEM2U program

At the NFB STEM2U program, my child developed social skills. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: My child developed social skills at the NFB STEM2U program
- 2. I disagree with the statement: My child developed social skills at the NFB STEM2U program
- 3. I neither disagree or agree with the statement: My child developed social skills at the NFB STEM2U program
- 4. I agree with the statement: My child developed social skills at the NFB STEM2U program
- 5. I strongly agree with the statement: My child developed social skills at the NFB STEM2U program

At the NFB STEM2U program, my child developed skills to be successful in society. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: At the NFB STEM2U program, my child developed skills to be successful in society.
- 2. I disagree with the statement: At the NFB STEM2U program, my child developed skills to be successful in society
- 3. I neither disagree or agree with the statement: At the NFB STEM2U program, my child developed skills to be successful in society
- 4. I agree with the statement: At the NFB STEM2U program, my child developed skills to be successful in society
- 5. I strongly agree with the statement: At the NFB STEM2U program, my child developed skills to be successful in society

At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting.
- 2. I disagree with the statement: At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting.
- 3. I neither disagree or agree with the statement: At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting.
- 4. I agree with the statement: At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting.
- 5. I strongly agree with the statement: At the NFB STEM2U program, I learned my rights and the rights of my child in the school setting.

At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting.
- 2. I disagree with the statement: At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting.
- 3. I neither disagree or agree with the statement: At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting.
- 4. I agree with the statement: At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting.
- 5. I strongly agree with the statement: At the NFB STEM2U program, I learned how to advocate for my child if their rights are violated in the school setting.

At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren). Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren).
- 2. I disagree with the statement: At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren).
- 3. I neither disagree or agree with the statement: At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren).
- 4. I agree with the statement: At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren).
- 5. I strongly agree with the statement: At the NFB STEM2U program, I learned how to connect with the NFB network to acquire information for myself and my child (ren).

At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning. Enter a 1 if you Strongly Disagree, 2 if you Disagree, 3 if you Neither Disagree or Agree, 4 if you Agree, and 5 if you Strongly Agree.

- 1. I strongly disagree with the statement: At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning
- 2. I disagree with the statement: At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning
- 3. I neither disagree or agree with the statement: At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning
- 4. I agree with the statement: At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning
- 5. I strongly agree with the statement: At the NFB STEM2U program, I learned alternative techniques my child can use to succeed in STEM learning

What was the most valuable aspect of the NFB STEM2U program for you, as a parent?

What do you think was the most valuable aspect of the NFB STEM2U program for your child?

If there was one thing you would change about the NFB STEM2U program, what would that be?

Are you blind or low vision?

Yes

No

One last question, is there anything else you would like to share about your experience with the NFB STEM2U program?

Thank you so much for answering our questions. Have a great day!

NFB STEM2U Museum Staff Post-Program Evaluation

To help the organizers of the NFB STEM2U program better understand your experience with the museum staff training, please take 10 minutes to answer the following questions.

The next two questions deal with your satisfaction of various aspects of the NFB STEM2U museum staff training program

Please rate your level of satisfaction with NFB STEM2U Museum Staff Training Program Schedule. Enter a 1 if you were Very Dissatisfied, 2 if you were Dissatisfied, 3 if you were Neither Dissatisfied or Satisfied, 4 if you were Satisfied, and a 5 for Very Satisfied.

- 1. I was very dissatisfied with the NFB STEM2U Program Schedule.
- 2. I was dissatisfied with the NFB STEM2U Program Schedule.
- 3. I was neither dissatisfied nor satisfied with the NFB STEM2U Program Schedule.
- 4. I was satisfied with the NFB STEM2U Program Schedule
- 5. I was extremely satisfied with the NFB STEM2U Program Schedule.

Please rate your level of satisfaction with Staff and Volunteers of the NFB STEM2U Museum Staff Training Program. Enter a 1 if you were Very Dissatisfied, 2 if you were Dissatisfied, 3 if you were Neither Dissatisfied or Satisfied, 4 if you were Satisfied, and a 5 for Very Satisfied.

- 1. I was very dissatisfied with Staff for the NFB STEM2U Program.
- 2. I was dissatisfied with Staff for the NFB STEM2U Program.
- 3. I was neither dissatisfied nor satisfied with Staff for the NFB STEM2U Program.
- 4. I was satisfied with Staff for the NFB STEM2U Program.
- 5. I was very satisfied with Staff for the NFB STEM2U Program.

What was the most important aspect of the NFB STEM2U Museum Staff Training program for you?

In the next set of questions, you will be asked to reflect on the NFB STEM2U programs impact on your work at the museum.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program changed your comfort level with blind visitors in your museum? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely changed your comfort level with blind visitors in your museum.

- The NFB STEM2U Program had no impact on my comfort level with blind visitors in my museum.
- The NFB STEM2U Program had little impact on my comfort level with blind visitors in my museum
- The NFB STEM2U Program had some impact on comfort level with blind visitors in my museum
- The NFB STEM2U Program had a great deal of impact on my comfort level with blind visitors in my museum
- The NFB STEM2U Program completely changed my comfort level with blind visitors in my museum

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program altered your confidence level in working with blind visitors in your museum? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely altered your confidence level in working with blind visitors in your museum.

- The NFB STEM2U Program had no impact on my confidence level in working with blind visitors in my museum.
- The NFB STEM2U Program had little impact on my confidence level in working with blind visitors in my museum.
- The NFB STEM2U Program had some impact on my confidence level in working with blind visitors in my museum.
- The NFB STEM2U Program had a great deal of impact on confidence level in working with blind visitors in my museum.
- The NFB STEM2U Program completely altered my confidence level in working with blind visitors in my museum.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program expanded your knowledge of accessibility and universal design and how it pertains to museums? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely expanded your knowledge of accessibility and universal design and how it pertains to museums.

- The NFB STEM2U Program had no impact of my knowledge of accessibility and universal design and how it pertains to museums.
- The NFB STEM2U Program had little impact on my knowledge of accessibility and universal design and how it pertains to museums.
- The NFB STEM2U Program had some impact on my knowledge of accessibility and universal design and how it pertains to museums.
- The NFB STEM2U Program had a great deal of impact on my knowledge of accessibility and universal design and how it pertains to museums.
- The NFB STEM2U Program completely changed my knowledge of accessibility and universal design and how it pertains to museums.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program will alter your everyday museum program and exhibit experiences? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it will completely change the way your everyday museum program experiences.

- The NFB STEM2U Program had no impact on our everyday museum program experience.
- The NFB STEM2U Program had little impact on our everyday museum program experience.
- The NFB STEM2U Program had some impact on our everyday museum program experience.
- The NFB STEM2U Program had a great deal of impact on our everyday museum program experience.
- The NFB STEM2U Program completely changed our everyday museum program experience.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program changed your ability to describe STEM content to blind visitors? Enter a 1 if it had no impact, 2 if it had little

impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely changed your ability to describe STEM content to blind visitors.

- The NFB STEM2U Program had no impact on my ability to describe STEM content to blind visitors.
- The NFB STEM2U Program had little impact on my ability to describe STEM content to blind visitors.
- The NFB STEM2U Program had some impact on my ability to describe STEM content to blind visitors.
- The NFB STEM2U Program had a great deal of impact on my ability to describe STEM content to blind visitors.
- The NFB STEM2U Program completely changed how I describe STEM content to blind visitors.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program changed your ability to describe STEM content to all visitors? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely changed your ability to describe STEM content to all visitors.

- The NFB STEM2U Program had no impact on my ability to describe STEM content to all visitors.
- The NFB STEM2U Program had little impact on my ability to describe STEM content to all visitors.
- The NFB STEM2U Program had some impact on my ability to describe STEM content to all visitors.
- The NFB STEM2U Program had a great deal of impact on my ability to describe STEM content to all visitors.
- The NFB STEM2U Program completely changed how I describe STEM content to all visitors.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program changed your ability to determine if assistance is needed by a blind visitor? Enter a 1 if it had no impact, 2 if it had little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely changed my ability to determine if assistance is needed by a blind visitor.

- The NFB STEM2U Program had no impact on my ability to determine if assistance is needed by a blind visitor.
- The NFB STEM2U Program had little impact on my ability to determine if assistance is needed by a blind visitor.
- The NFB STEM2U Program had some impact on my ability to determine if assistance is needed by a blind visitor.
- The NFB STEM2U Program had a great deal of impact on my ability to determine if assistance is needed by a blind visitor.
- The NFB STEM2U Program completely changed my ability to determine if assistance is needed by a blind visitor.

To what extent, if at all, do you believe the NFB STEM2U Museum Staff Training Program changed your ability to properly offer assistance to a blind visitor? Enter a 1 if it had no impact, 2 if it had

little impact, 3 if it had some impact, 4 if it had a great deal of impact, and a 5 if it completely changed my ability to properly offer assistance to blind visitors.

- The NFB STEM2U Program had no impact on my ability to properly offer assistance to a blind visitor.
- The NFB STEM2U Program had little impact on my ability to properly offer assistance to a blind visitor.
- The NFB STEM2U Program had some impact on my ability to properly offer assistance to a blind visitor.
- The NFB STEM2U Program had a great deal of impact on my ability to properly offer assistance to a blind visitor.
- The NFB STEM2U Program completely changed my ability to properly offer assistance to a blind visitor.

Identify and explain 2 examples of tools, resources, services and/or environmental features that currently exist at your museum that can facilitate full participation by blind visitors.

Identify and explain at least one tool, resource, or service that you believe your museum is considering adding that can facilitate full participation by blind visitors.

Will anything you observed or learned during the NFB STEM2U Museum Staff Training Program change your work at your museum? If so, please share specific examples.

Finally, we'd like to find out a little bit about you and your museum environment. With which museum do you work?

- Arizona Science Center
- Exploratorium
- Science Museum of Minnesota

Are you blind or low vision?

- Yes
- No

How would you describe your role at your museum (check all that apply)

- Educator
- Exhibits Design/Development
- Marketing
- Finance
- Visitor Services

Including this year, how long have you worked in the informal learning/museum field?

- This is/was my first year
- 2-5 years
- 6-10 years
- 11-15 years
- More than 15 years

Is there anything else you would like to share about your experience with the NFB STEM2U program?

Thank you for answering our questions. Have a great day!

Appendix B: San Francisco Participant Satisfaction Ratings

Mean satisfaction ratings on a 5 point scale
1 (Very Unsatisfied) to 5 (Very Satisfied)

	Youth	Parents/ Caregivers	Museum Staff
Meals	3.93	3.91	
Sleeping Accommodations*	4.14	4.10	
STEM Activities	4.57	N/A	
Museum Visit	4.62	N/A	
Staff	N/A	5.00	4.8
Application Process	N/A	4.00	
Pre-Visit Materials	N/A	4.00	
Social Opportunities	N/A	4.45	
Program Schedule	N/A	4.27	4.6

Youth n varies between 13 - 14

Parent n varies between 10-11

Museum staff n=5