



# National Federation of the Blind STEM2U

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## Regional Program - Columbus

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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. During the third regional workshop in Columbus, Ohio, the NFB operated two different programs simultaneously: one program for youth, and a second program for their parents/caregivers. A third program, for COSI (science center) staff, was conducted earlier to prepare the museum staff to assist with the youth program. A separate report will discuss the teen apprentices (grade 9 – 12) that participated in a leadership academy and all three regional programs.

The youth program involved small groups of youth working with blind teen mentors 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 museum staff program focused on staff members' awareness of issues faced by blind visitors to the museum, and provided strategies to assist blind museum visitors explore STEM concepts.

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. In what ways does each audience see the program affecting their work (adult audiences) or their potential educational and career paths (youth)?
4. 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 various perspectives.

## Methods

Data for this program evaluation were collected from three different audiences using three methods. Data for the youth program were collected from the youth and their parents/caregivers. Data for the parent/caregiver and museum programs were collected from those specific audiences.

During the course of the regional programs, the evaluation team observed the parent/caregiver and youth programs in order to note the flow and intersections of the sessions and how different components serve the desired outcomes from a design perspective. During each program, evaluators did pulse interviews, asking participants questions in order to determine if participants were realizing the desired program outcomes.

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 each of the programs (parent/caretaker, and science-museum staff) 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 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 Columbus consisted of two separate, but interwoven, programs and involved three different audiences. In this section, findings will be discussed for the Columbus 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 at the Columbus workshop, data were collected from all of the youth participants (18), and 12 of the 18 parents/caregivers (67% response rate).

All of the youth participants were good students (either A or B students in science) in the fourth, fifth, or sixth grade (13 of 18) who favor science or math class (16 of 18). None of the parents/caregivers and museum staff considered themselves blind. No additional demographic data were obtained for the parents who attended the Columbus program.

Data were also collected from five COSI team members who attended a training presented by NFB staff and/or assisted with the program the day of the museum visit. The majority of museum staff considered themselves to be exhibit staff (3) or educators (2), with varying degrees of tenure in the informal science/museum field.

### Youth Program

Youth enjoyed attending NFB STEM2U because it was fun, science-based, included opportunities to interact with other blind children, and a visit to a museum. Additionally, teen mentors were considered an asset, most likely as positive role models for the children and in helping children develop blindness skills, such as cane techniques.

The youth participating in the Columbus program liked exploring the museum, the STEM activities, and meeting new friends. A complete breakdown of their ratings can be found in Appendix B. The majority would do the program again (89% or 16 of 18) and would tell a friend they really liked the NFB STEM2U program (94% or 17 of 18).

During the program, youth built towers out of foam blocks and a car out of recyclable materials. They also explored COSI, a science center. Additionally, youth learned blindness and life skills, sharing they learned how to be more independent using cane techniques.

The youth participants believed they improved their skills or content knowledge in the following areas:

- Teamwork

- Blindness skills, especially braille and cane skills
- Engineering process
- Building stuff out of recycled materials

These participants believe the STEM content and the activities they completed at NFB STEM2U will help them with their schoolwork. One child shared, “Engineering is good for math, how you can use equations to build. Like, how wide or tall to make something.” Another youth stated, “We had just started learning the engineering process at school, but now it’s more clear.”

In looking across all three regional program, many of the parents/caregivers who attended the Columbus workshop noted a strong motivation for bringing their child to the workshop was the focus on science skills (4.17 on a 5 point scale). This was similar to parents attending the Baltimore program (4.09). Parents who attended the Boston training were primarily focused on having their child develop social skills (4.21) and less interested in ensuring their children had science skills (3.86). A secondary factor that motivated all parents (Columbus, Boston, and Baltimore) was for their child to develop skills to be successful in society (See Table 1).

Table 1 Parent’s ratings of program skill elements, on a 5 point scale at the three sites

	<b>Baltimore Parents’ Mean</b>	<b>Boston Parents’ Mean</b>	<b>Columbus Parents’ Mean</b>
	N=11	N=14	N=12
<b>Blindness skills</b>	3.91	3.64	3.75
<b>Science skills</b>	4.09	3.86	4.17
<b>Social skills</b>	4	4.21	3.83
<b>Skills to be successful in society</b>	4.2	4.07	4.00

1(Strongly Disagree) to 5 (Strongly Agree)

Parents’ at all three 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; parents felt it was important that their child was “exposed to other kids like [them].” This interaction does appear to serve the blindness skills in a meaningful way. As an example, one parent shared her child, “learns what his braille note can do because someone else here has one and can share what he is doing with it. He is learning from others like him.”

Parents/caregivers in all three programs believed their children found this as an opportunity to have fun with other blind children while learning science content essential to the success of the program. These beliefs, as well as visiting a science museum, were revealed in both on-site pulse interviews and in post-experience questionnaires. 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 three programs to date.

Table 2. Parent's belief of what children found important, on a 5 point scale at the three sites

	<b>Baltimore Parents' Mean</b>	<b>Boston Parents' Mean</b>	<b>Columbus Parents' Mean</b>
	N=11	N=14	N=12
<b>Have fun</b>	4.82	4.79	4.92
<b>Spend time with other blind children</b>	4.36	4.43	4.33
<b>Learn science content</b>	4.27	4.21	4.42
<b>Spend time with teen mentors</b>	4.18	4.14	4.17
<b>Visit a Science Museum</b>	4.09	4	4.58
<b>National Federation of the Blind Reputation</b>	3.45	3.14	3.75

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

Parents/caregivers who attended one of the three workshops (Baltimore, Boston, or Columbus) 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 Columbus, parents/caregivers wanted their children to have fun, learn science content, and develop independence. This is similar to parents in Boston and Baltimore. Parents' at all three programs wanted their children who attended the program to:

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

Table 3 (below) details parents' ratings of the importance of workshop elements.

Table 3. Parent's rating of the importance of NFB STEM2U workshop elements at the three sites

	<b>Baltimore Parents' Mean</b>	<b>Boston Parents' Mean</b>	<b>Columbus Parents' Mean</b>
	N=11	N=14	N=12
<b>Child learn science content</b>	4.82	4.71	4.83
<b>Child had fun</b>	4.64	4.93	4.92
<b>Child spent time with other blind children</b>	4.64	4.93	4.67
<b>Child develop independence</b>	4.55	4.64	4.83
<b>Child spent time with teen mentors</b>	4.55	4.50	4.50

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

## Parents/Caregivers Program

Parents attend NFB STEM2U with an intention to learn alternative techniques their child could use to succeed in STEM learning and have opportunities to network with other parents of blind youth. Overall, parents were satisfied with the NFB STEM2U program. Of the 18 parents who attended the Columbus program for parents/caregivers, 12 completed the web-based questionnaire (67% 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.

As with the other two programs, parents/caregivers who attended the Columbus workshop had high praise for the NFB Staff (4.92 on a 5 point scale). One parent shared, “This is one of the few times I feel comfortable letting someone else take my son.” Another parent shared, “I loved Natalie! I think she talked at our level and respected all the different opinions of parents. I enjoyed listening to her and her personal stories. I wish Natalie did everything! She can relate to people, blind or not, and that is a gift!”

In the on-site interviews and post-workshop questionnaires, parents revealed they were interested in support/network opportunities (See Table 4). Although parents had several opportunities to do this, including the Friday night icebreaker activity, parents indicated they desire more. One parent stated, “Being able to share experiences with other parents is always invaluable.” When asked what they would change, two of seven (29%) parents/caregivers responding to the question wanted additional time to interact with other parents/caregivers. A specific improvement suggested by a parent was nametags, including the child’s name and hometown, to facilitate discussion between parents, especially at the onset of the program.

Table 4. Parent’s rating of the importance of NFB STEM2U workshop elements at the three sites

	Baltimore Parents’ Mean	Boston Parents’ Mean	Columbus Parents’ Mean
	N=11	N=14	N=12
<b>National Federation of the Blind Reputation</b>	4.45	4.50	4.67
<b>Opportunity to network with parents of blind youth</b>	4.09	4.57	4.67

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

Parents/caregivers at the Columbus program were more likely than parents at the Baltimore program to report they were more aware of alternative techniques their child could use to succeed in STEM learning (4.25 compared to 3.64 on a 5 point scale). Table 5 illustrates how parent perception of what they learned at the NFB STEM2U parent program has changed. While the STEM content was more likely to meet the parents/ caregivers need, the delivery method continued to be a challenge as in Baltimore and Boston for parents/caregivers with kinesthetic, haptic, or other non-directed learning styles and preferences. One parent shared, “I want more hands on activities, more activities like the Marshmallow activity.” Another parent shared that she would like, “A little more active time for parents - by day 2, it’s hard to sit and listen all day.”

Parents in Columbus indicated they did not believe they learned as much about advocating for their child in the school setting as parents in Baltimore and Boston may have (3.58 for Columbus parents

compared to 4.18 for Baltimore parents). One parent shared during the Friday night icebreaker that “I don’t expect to learn a lot [about] IEP’s, I’m pretty well versed after 11 years.” However, near the close of the program, this same parent shared that the different tools presented during the parent program gave her ideas on educational strategies that she could advocate for in future IEP meetings.

**Table 4. Parents learning in NFB STEM2U parent program**

	Baltimore Parents' Mean	Boston Parents' Mean	Columbus Parents' Mean
	N=11	N=14	N=12
<b>How to connect with the NFB network to acquire information for myself and my child (ren).</b>	4.64	4.21	4.08
<b>Their rights and the rights of my child in the school setting</b>	4.27	4.07	3.67
<b>How to advocate for my child if their rights are violated in the school setting</b>	4.18	4	3.58
<b>Alternative techniques their child could use to succeed in STEM learning</b>	3.64	4.21	4.25

1 (Strongly Disagree) to 5 (Strongly Agree)

## Museum Staff Program

The museum staff program somewhat impacted COSI staff members’ ability to properly offer assistance to a blind visitor (3.8 on a 5 point scale), and slightly affected confidence level in working with blind visitors (3.4 on a 5 point scale) and perceived ability to determine if assistance is needed by a visitor who is blind (3.4 on a 5 point scale), as illustrated in Table 5. Staff who shared about how the workshop might change their work at COSI were most likely to mention they will stress descriptive language when they facilitate educational programs, “because this helps all guests participate in the activity.” COSI staff appreciated the practical advice, e.g., hand-over-hand guiding, and the opportunity to “ask the instructor personal questions about being blind.”

**Table 5. Program impact on museum staff’s abilities**

	Mean	Median	Range
Comfort level with blind visitors	3	3	2-4
Confidence level in working with blind visitors	3.4	4	2-4
Knowledge of accessibility and universal design and how it pertains to museums	3.2	3	2-4
Everyday museum program and exhibit experiences	3.2	3	2-4
Ability to describe STEM content to blind visitors	3.25	3	2-4
Ability to describe STEM content to all visitors	3.2	3	3-4
Ability to determine if assistance is needed by a blind visitor	3.4	4	2-4
Ability to properly offer assistance to a blind visitor	3.8	4	3-5

N=5

1 (No impact) to 5 (Completely Changed)

COSI staff cited the following examples of tools, resources, services and/or environmental features that currently exist at the museum that facilitate full participation by blind visitors:

- Braille signage, primarily wayfinding
- Tactile elements/exhibits throughout the museum
- Individual activities/tours can be pre-arranged

While tactile elements at COSI are available for all visitors; COSI staff did not create 3-D models to help blind visitors better understand science concepts, as the MOS in Boston did to help blind visitors understand the van de Graaff generators, suggesting they did not completely understand that element of the workshop.

Staff shared several resources or services that the museum might consider adding to facilitate full participation by blind visitors, including:

- Beacons that help individuals who are blind navigate the museum
- Planetarium programs with tactile elements/better audio descriptions

## Conclusions and Recommendations

The NFB STEM2U workshop in Columbus, Ohio appears to be successful overall.

Parents and youth in all three workshops valued the youth program because the children were able to:

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

Additionally, parents attending all three workshops valued the parent program because it provided opportunities to learn alternative techniques their child could use to succeed in STEM learning and network with other parents of blind youth. The efforts of the NFB staff to strengthen the STEM content in the parent/caregiver program were evident in Columbus as Columbus parent/caregivers were more likely than parents at the Baltimore program to report increased awareness of alternative techniques their child could use to succeed in STEM learning.

Finally, COSI staff believes they are slightly better able to offer assistance to a blind visitor, have a somewhat increased confidence level in working with blind visitors and a slightly enhanced ability to determine if assistance is needed by a visitor who is blind.

## Recommendations

As every child attending the program has different needs, so do their parents. Consider assessing parents needs before the program to better ensure the program will meet the needs of the parents in attendance.

NFB STEM2U staff might consider making explicit connections between STEM tools and IEP meetings to help parents understand how the information about different science tools provided at the NFB STEM2U program may be useful in IEP meetings while focusing less on the IEP itself



For future parent programs, consider increasing the number of interactive presentations. While the STEM content was more likely to meet the parents/ caregivers need, the delivery method was still a challenge for Columbus parents/caregivers with kinesthetic, haptic, or other non-directed learning styles and preferences.

## 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
- 
- 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?

- Port Discovery
- Museum of Science
- COSI

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: Columbus Participant Satisfaction Ratings

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

	Youth	Parents/ Caregivers	Museum Staff
<b>Meals</b>	3.53	4.75	N/A
<b>Sleeping Accommodations*</b>	3.50	4.58	N/A
<b>STEM Activities</b>	4.47	N/A	N/A
<b>Museum Visit</b>	4.61	N/A	N/A
<b>Staff</b>	N/A	4.92	4.25
<b>Application Process</b>	N/A	4.55	N/A
<b>Pre-Visit Materials</b>	N/A	4.36	N/A
<b>Social Opportunities</b>	N/A	4.17	N/A
<b>Program Schedule</b>	N/A	4.45	4.25

Youth n varies between 15 - 18

Parent n varies between 11-12

Staff n = 5