Techbridge Girls

Final Evaluation Report

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Aspect Research + Evaluation

Summer 2019

Techbridge Girls
Evaluation Report
2018-2019

ASPECT RESEARCH + EVALUATION

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Introduction

The 2018-2019 evaluation examined how Techbridge Girls supports elementary, middle school, and high school girls, especially girls from low-income communities and girls of color, to develop STEM pathways. The evaluation collected data from girls, educators, families, and role models in Oakland, Washington D.C., and the Seattle area.

The TBG team partnered with Aspect Research + Evaluation, to create a conceptual framework, identify desired program outcomes, develop data collection tools, and collect and analyze data.

Overarching Evaluation Question

To what extent do the TBG programs support STEM pathway development for girls, especially those from groups historically marginalized in STEM?

Conceptual Framework

The conceptual framework presented below describes the core desired outcomes for girls in the three TBG programs, as determined by the TBG team. To answer the evaluation question, data collection tools were developed based on a review of research and theoretical frameworks related to STEM pathways, as well as previously used tools. Across the data collection tools developed for each program, the concepts below were addressed.

Interest in and Attitudes about STEM (short- and medium-term)

A predisposition to reengage in activity (science, soccer) over time (e.g. Faber, 2013; Renninger, 2009).

STEM Identity and New Possible Futures

Who one is and who one wants to be in relation to STEM, now and in the future (e.g. Kang et al., 2018, Barton & Tan, 2009; Holland et al., 1998). Includes awareness of STEM opportunities and pathways, and navigating inequities in STEM.

Relevance

Access to, and sensemaking of, science relevant to girls' everyday lives (e.g. Feinstein et al., 2013).

Social Capital

Access to social relationships that can support girls as they make progress on STEM pathways (e.g. Harré et al., 2009).

Socio-emotional Learning

Managing emotions, setting goals, developing empathy, positive relationships, and responsible decision-making (e.g. https://casel.org). Includes confidence to realize dreams.

Science and Engineering Practices

Behaviors that scientists and engineers use in their professional work (e.g. NGSS, 2013; Rogoff, 1994).

21st Century Skills

Competencies in critical thinking, communication, and collaboration (e.g. www.p21.org).

01 Methods

The Techbridge Girls evaluation aimed to measure the extent to which the core desired outcomes for girls were met, as well as how educators, families, and role models were able to successfully engage with the program and support girls on their STEM pathways.

Data Collection

Girls Programs

Girls Retrospective Pre-surveys measured select concepts focused on STEM pathways. At the end of their program, girls responded to both *post-only* questions and *retrospective pre/post* questions that asked them to consider their thoughts both **before** and **after** this year with Techbridge Girls. For Changemakers and Achievers, a comparison group considered **before** and **after** *this school year*.

Exit Tickets measured short-term outcomes during Changemakers and Achievers sessions once per month. Demographic and comparison data were not collected for exit tickets.

Focus Groups in May 2019 provided a chance for girls in Inspire, Changemakers, and Achievers to give feedback and reflect on what was important to them in the program.

Educators, Families, and Role Models
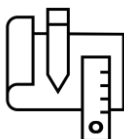
Educator Surveys measured educators' perceptions of their experience with TBG at the end of their program, including trainings, implementation, and outcomes for themselves and the girls.

Family Surveys measured families' perceptions of their and their girls' experience with Techbridge Girls at the end of their program.

Role Model Surveys measured role models' perceptions of their experience with Techbridge Girls, including trainings, visits with the girls' programs, and outcomes for themselves and the girls.

Analysis + Reporting

Descriptive statistics were generated for survey and exit tickets. Data visualizations were created that concisely and effectively illustrate the most important results. Where possible, the data collected from girls were disaggregated by demographics in order to better understand how girls from different groups might experience the program differently. To focus the evaluation questions, the Techbridge Girls team selected to disaggregate data collected from girls who identified as African American, Hispanic/Latinx, and American Indian/Alaska Native. In the girls' surveys, the data for these groups were disaggregated if there were eight or more girls identifying with that group. To better understand how the experiences of girls in the Techbridge programs differ from the experiences of girls not in the program, comparison group data on select survey items were collected for the Changemakers and Achievers programs. The comparison group was made up of girls who attended the same schools but did not experience the Techbridge Girls programs. Girls' focus group data is used throughout the report to support findings from the survey and exit ticket data.

This report is organized by participant group and the guiding evaluation questions. Each section begins with a summary section, followed by a more detailed findings section. To summarize and concisely report the data collected, survey results are reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree + Agree; To a very large extent + To a large extent). Some quote have been edited for clarity. Further details are presented in each report section.

Girls Results

02 Inspire Evaluation Overview

INSPIRE™
Elementary School

The Inspire program focuses on getting 4th and 5th grade girls from low-income communities excited about STEM through hands-on learning and introducing them to a wide variety of STEM careers . During the 2018-2019 school year, 384 girls in Inspire took part in a retrospective survey and about 10 girls participated in a focus group. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

Inspire Survey
n= 384

Focus Group
n= ~10

Focal Constructs for this Program

Interest in and Attitudes about STEM

Relevance

STEM Identity and New Possible Futures

Socio-emotional Learning

More on focal constructs on pg. 3.

Inspire Survey Respondent Demographics

Race/Ethnicity	Percentage
African American	35%
Hispanic or Latinx	30%
Another race/ethnicity	18%
White or Caucasian	15%
Asian	12%
African	9%
Native Hawaiian or Pacific Islander	6%
American Indian or Alaska Native	3%
Asian Indian	2%
Middle Eastern	2%

ASPECT RESEARCH + EVALUATION

02 Inspire Evaluation Summary
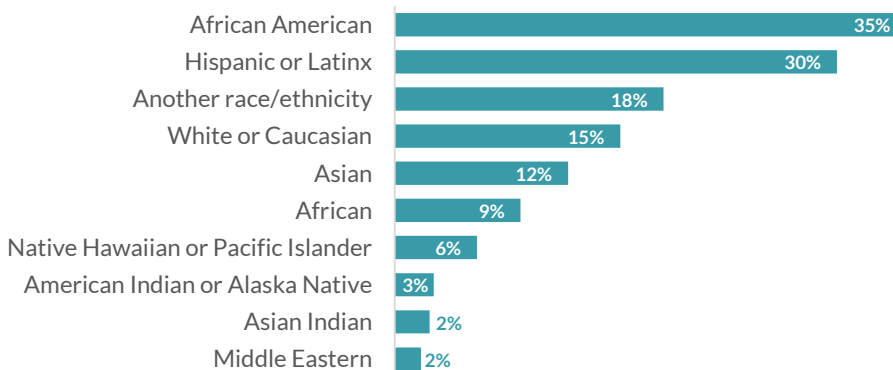
INSPIRE™
Elementary School

This section describes the highlights of the Inspire program evaluation, including a short summary of the findings, exemplary quotes, and an average score for each construct. To determine the average scores, positive responses for each post-item were summed (e.g., Strongly Agree + Agree) and the average across all items for each construct was calculated. It is important to note that in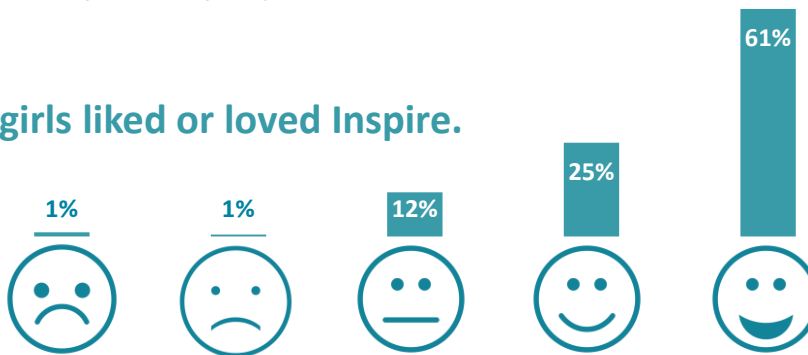 2018-2019, with the exception of the smile scale, item scales were changed from a 4-point to a 5-point scale to accommodate neutral responses and give girls more options to represent their thoughts. Comparisons to prior years should be made with this in mind.

86% of girls liked or loved Inspire.

1%   1%   12%   25%   61%

Girls in Inspire were asked to rate their feelings about Techbridge Girls on a five-point smiley face scale from "I really didn't like it " to "I loved it." The majority of girls in Inspire said, "I loved it" or "I liked it" (86%), with 61% of them giving Inspire the highest rating. Girls who liked or loved the program appreciated a variety of things about the program that were in line with the program's goals. Some of their reasons included that the program was fun, helped them make connections to their friends and other girls, was new and challenging, the teachers were nice and helpful, and they learned about what girls can do in STEM. Girls suggested changes such as more frequent meetings, longer meetings, and more science experiments.

Interest in and Attitudes about STEM	67% of girls developed interest in and positive attitudes about STEM.

Overall, girls in Inspire were engaged and interested in project work, with little difference between demographic groups. While neutral responses to items regarding interest and attitudes were somewhat common, negative responses made up fewer than 10% of the total.

"I enjoy Techbridge it made me love technology more than I already did and made more friends."

"In Techbridge by the way i really enjoyed because the projects interested me and it is my second year because the first year i enjoyed it the projects interest me."

STEM Identity and New Possible Futures	69% of girls made progress in the development of STEM identity and their understanding of new possible futures.

Many girls in Inspire gained increased awareness of STEM pathways and new possible futures, as well as increased in their intent to pursue STEM. There were some differences between demographic groups. Girls increased their identification as people who do well in STEM activities, with the biggest increases related to science activities. For the most survey items, negative responses made up fewer than 10% of the total. The exceptions were that girls were less likely to say they plan to study STEM in college or that TBG changed their mind about a future career.

"I give this Techbridge girls this rating because it gave us stronger thoughts on how much a women can actually succeed and do in life. "

"I loved Techbridge because I got to do fun projects and learned many things for the future in my life."

ASPECT RESEARCH + EVALUATION

INSPIRE™
Elementary School

| | Relevance | **85% of girls saw how the work they did in Techbridge Girls was relevant to them and their communities.** |

Most girls in Inspire saw the work they did as relevant to their everyday lives and to their futures. There were only small differences between demographic groups.

"I get to hang around my friends during projects and we have fun all the time and we also get to do projects for our families, for example making everyday stuff from recycled stuff."

"I really loved Techbridge and my teachers made it really fun and it helped me see what I want to be when I grow up. It helped me see that there is science in everything."

| | Socio-emotional Learning | **83% of girls made progress in the development of socio-emotional learning.** |

Overall, girls in Inspire reported important increases in their engagement with socio-emotional skills, especially in their confidence to understand complicated ideas. Additionally, most girls felt like they were part of a community in Inspire.

"I gave tech bridge girls this rating because everyone feels that belong and everyone gets to no each other and better and no one ever feels left out."

"I gave Techbridge this rating because I love how it made me feel like home because the girls where like sisters to me like a family and we had a lot of fun."

"I loved it because it was interesting and it helped me be a better person because it taught me that you didn't have to always be perfect."

02 Inspire

Evaluation Question 2.1: To what extent did the Inspire program influence girls' interest in and attitudes toward STEM?

Girls in Inspire were engaged and interested in project work. There were few differences between demographic groups.

Most girls in Inspire reported engagement, interest, and a recognition of their contributions to TBG work (Figure 1). While girls gave some neutral responses to items regarding interest and attitudes, negative responses made up fewer than 10% of the total. Girls were mostly consistent in their ratings across demographic groups. One exception was that girls who identified as American Indian/Alaska Native (AI/AN) were less likely to say time went by quickly, but more likely to say the teacher made sure they had fun. About half of the girls in Inspire reported that the activities they did were related to what they want to do for a career, which is consistent with the results in Changemakers.

In the focus groups, girls discussed their interest in a variety of projects, including Scratch, water filters, and cars. Across the projects, girls appreciated things like having clearly defined goals for success, opportunities for creative thinking, making things for other people, and getting to eat the cookies in the cookie challenge.

Figure 1. Inspire interest and engagement
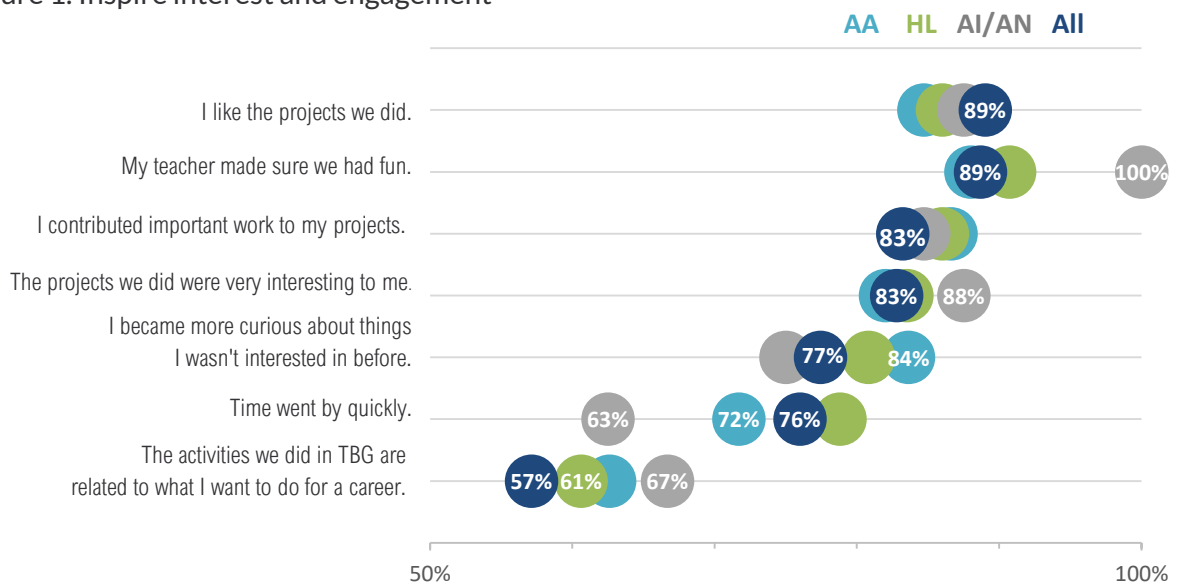
> *"I was so excited to come and before Techbridge I was not so up for science but after Techbridge Girls I love it!"*
>
> *--Techbridge Girls Inspire participant*

Evaluation Question 2.2: To what extent did the Inspire program influence girls' STEM identity?

Overall, girls in Inspire became more aware of STEM pathways and new possible futures and grew in their intent to pursue STEM. There were some differences between demographic groups.

Girls in all demographic groups reported increased awareness, intent to pursue, and vision for new possible futures in STEM. At the end of the program, girls who identified as African American were consistently more likely than other girls to say they know more about STEM pathways, are thinking of studying STEM in college, and can see themselves in a STEM career.

Figure 2. I know what kinds of science, engineering, or technology careers I could have in the future.
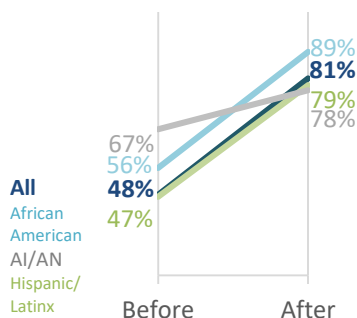
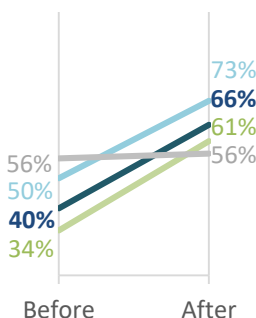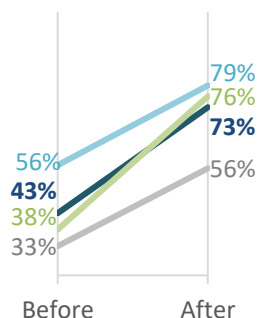Figure 3. I am thinking of studying science, engineering, and/or computer science in college.

Figure 4. I can see myself working in a career that involves science, technology, or engineering.

Techbridge Girls helped most girls in Inspire to see themselves in new ways in relation to STEM. About half of girls reported that Techbridge Girls changed their mind about a future career.

As one girl said, "It's a great way to show girls that even if they are not in the science girls/women can BE ANYTHING." Girls who identified as African American were slightly more likely than other girls to say that TBG helped them see themselves in a STEM career. Girls who identified as American Indian/Alaska Native were slightly more likely to report that TBG helped them see themselves as good at STEM. Several girls in the focus groups indicated that their plans for the future were already in place when they joined Techbridge Girls.

Figure 5. Inspire new possible futures

TBG helped me see I am good at science, technology, or engineering.

TBG helped me to see myself working in a career that involves science, technology, or engineering.

TBG changed my mind about what career I want to do in the future.
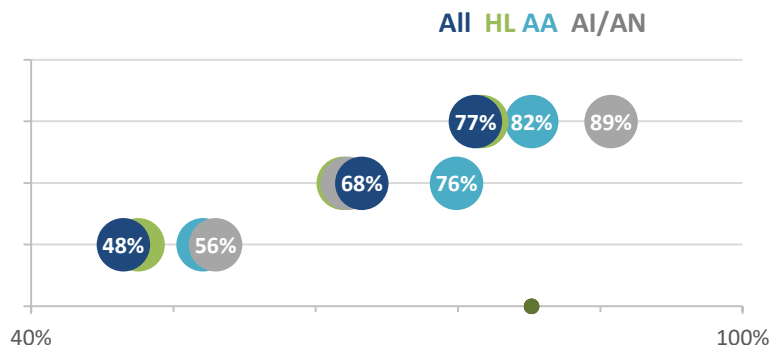
Evaluation Question 2.2 (cont.): Inspire STEM identity

Girls in Inspire grew in their identification as people who do well in STEM activities. The biggest increases were related to science activities.

Across the board, girls were more likely to report that they do well in science, technology, and engineering activities after their experience in Inspire. At the end of the program, all girls who identified as American Indian/Alaska Native said they did well in science activities. Though these girls reported increased engineering abilities after the program, they were less likely than girls in other groups to say they did well in engineering activities overall, both before and after the program. At the start of the program, girls who identified as Hispanic/Latinx were less likely than most other girls to say they did well in STEM activities. By the end of this program, reported doing well in technology and engineering activities at a similar rate to girls in other demographic groups. For the most part, negative responses from girls overall made up fewer than 10% of the total.

After Inspire, about three-quarters of girls felt that someone like them could be a scientist, engineering, or work with technology. Almost all girls said that working in science, engineering, or technology is a good career for women. Girls who identified as American Indian/Alaska Native were the only exception, with no change over the program.

Figure 6. I do well in science activities.
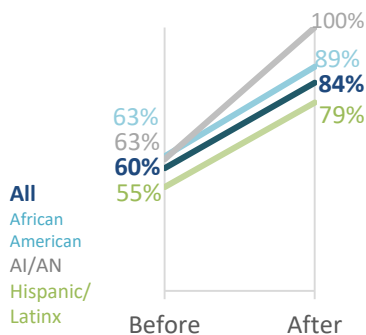
Figure 7. I do well in technology activities.
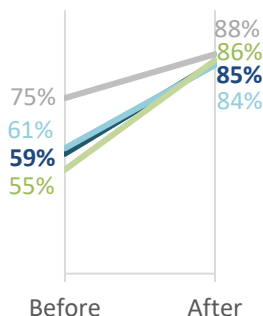
Figure 8 I do well in engineering activities.
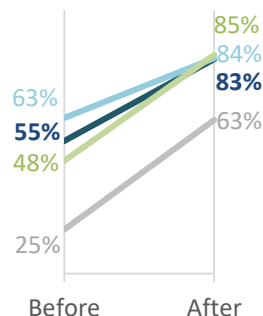
Figure 9. I think someone like me could become a scientist, engineer, or work in technology.
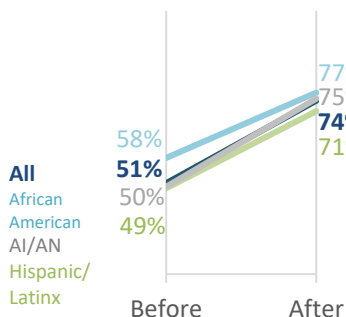
Figure 10. I think working in science, engineering, or technology is a good career for women.
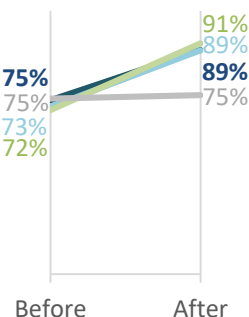
"[Techbridge Girls] gives you a chance to think about your [career] and it lets you have fun in a science way."

--Techbridge Girls Inspire participant

ASPECT RESEARCH + EVALUATION

02 Inspire

Evaluation Question 2.3: To what extent did the Inspire program help girls see the relevance of the work they did to their everyday lives?

Most girls in Inspire saw the work they did as relevant to their everyday lives and to their futures. There were only small differences between demographic groups.

About 84% of girls in Inspire reported that they could use the skills they developed in Inspire when they do other things (Figure 11). Additionally, girls were more likely to agree engineering is useful for solving everyday problems after the program (Figure 12). Girls who identified as American Indian/Alaska Native reported the largest changes in their thoughts about the relevance of engineering, from less than half of girls to almost 90% reporting agreement after the Inspire program.

Figure 11. Inspire relevance

All   AA   HL   AI/AN

In the future, I could use the skills I am developing at TBG when I do other things.

84%   89%

80%   100%
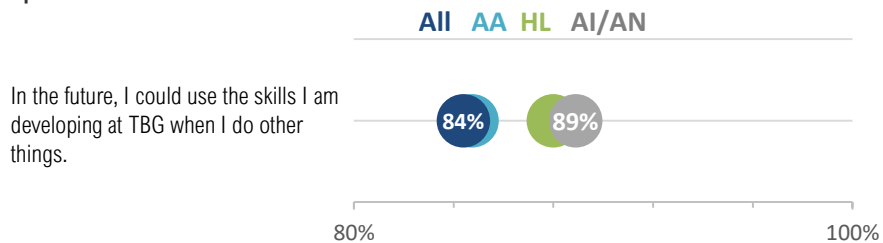
Figure 12. I think engineering is useful for solving the problems of everyday life.

89%
87%
87%
86%

63%
61%
61%

44%

All
African American
AI/AN
Hispanic/Latinx

Before   After
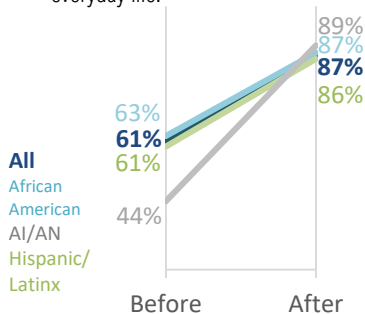
"[Techbridge Girls] helped me see that there is science in everything."

"Now I am inspired so I can try other stuff that [I can] think about at home."

--Techbridge Girls Inspire participants

ASPECT RESEARCH + EVALUATION

Evaluation Question 2.4: To what extent did the Inspire program influence girls' engagement in socio-emotional skills?

Overall, girls in Inspire reported important increases in their engagement with socio-emotional skills, especially in their confidence to understand complicated ideas.

After Inspire, four out of five girls felt confident that they could understand complicated ideas and try hard to understand others. Almost all girls ended the program confident that they could figure out how to learn things. Girls who identified as African American or American Indian/Alaska Native reported the most engagement with these two socio-emotional skills both before and after Inspire. In the focus groups, girls discussed how Inspire helped them practice communication skills, perseverance, and collaboration.

Figure 13. When complicated ideas are presented to me, I am confident that I can understand them.
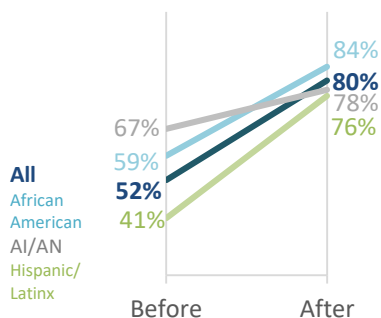
Figure 14. I try hard to understand what people are thinking or feeling.
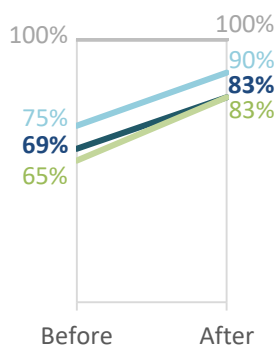
Figure 15. I can figure out how to learn things.
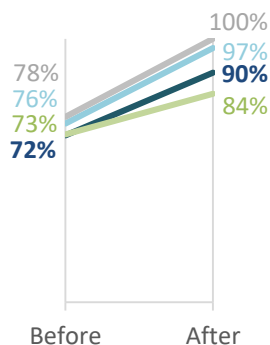
Most girls felt like they were part of a community in Inspire.

In all demographic groups, girls in Inspire reported feeling a part of a community in the program. One girl said, "I love how it made me feel like home because the girls [were] like sisters to me like a family and we had a lot of fun." In the focus groups, girls discussed how the sense of community helped them gain confidence in themselves. Girls were slightly less likely to report that they had gotten to know girls who like the same thing as themselves, which is consistent with the results in Changemakers. Additionally, girls who identified as American Indian/Alaska Native were slightly less likely than other groups to say they had gotten to know girls with common interests.

Figure 16. Inspire community

03 Changemakers Evaluation Overview
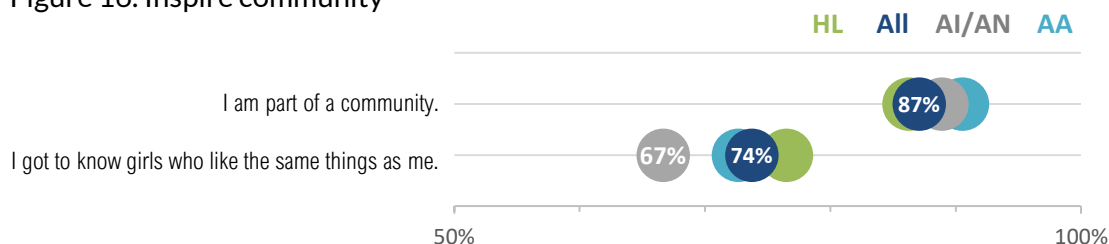
CHANGEMAKERS™
Middle School

The Changemakers program for 6th-8th grade girls from low-income communities focuses on strengthening STEM skills and 21st century skills, and continued exposure to a variety of STEM careers. They create year-end Community Impact projects, identifying a challenge in their community and prototyping a STEM solution, and share them at an end-of-year showcase. During the 2018-2019 school year, 139 girls in Changemakers took part in a retrospective survey, 297 exit tickets were completed, and about 15 girls participated in a focus group. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

Changemakers Survey
n= 139

Focus Group
n= ~15

Exit Ticket
n= 297

Focal Constructs for this Program

Interest in and Attitudes about STEM

STEM Identity and New Possible Futures

Socio-emotional Learning

21st Century Skills

Science and Engineering Practices

Relevance

Social Capital

More on focal constructs on pg. 4.

Changemakers Survey Respondent Demographics

| Category	Percent
Asian	31%
Hispanic or Latinx	29%
African American	25%
Another race/ethnicity	12%
African	11%
White or Caucasian	7%
American Indian or Alaska Native	2%
Asian Indian	2%
Native Hawaiian or Pacific Islander	1%
Middle Eastern	0%

03 Changemakers Evaluation Summary
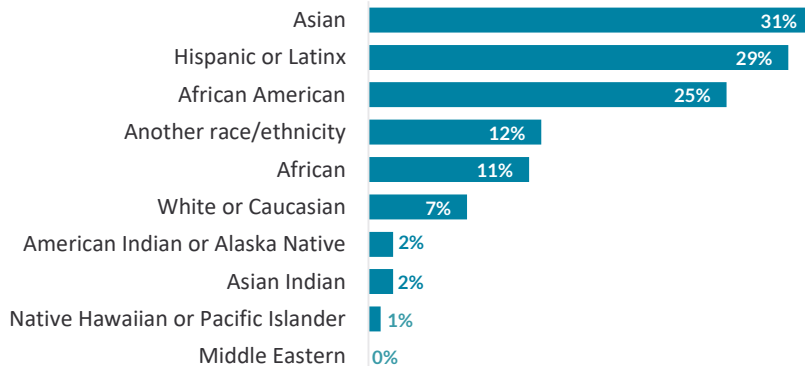
CHANGEMAKERS™
Middle School

This section describes the highlights of the Changemakers program evaluation, including a short summary of the findings, exemplary quotes, and an average score for each construct. To determine the average scores, positive responses for each post-item were summed (e.g., Strongly Agree + Agree) and the average across all items for each construct was calculated. It is important to note that in 2018-2019, with the exception of the smile scale, item scales were changed from a 4-point to a 5-point scale to accommodate neutral responses and give girls more options to represent their thoughts. Comparisons to prior years should be made with this in mind.

87% of girls liked or loved Changemakers.

| 0% | 2% | 11% | 35% | 52% |
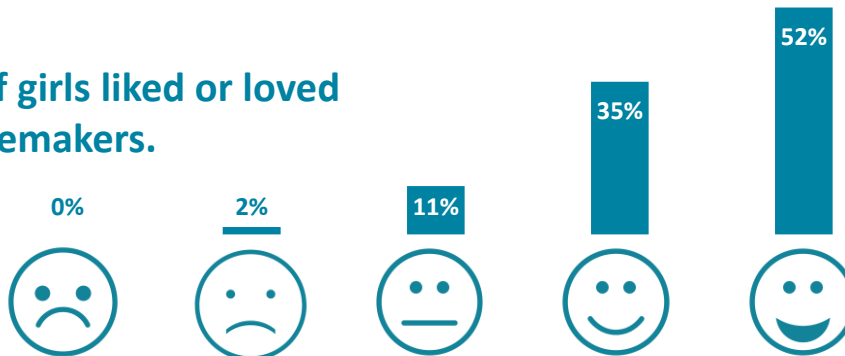
Girls in Changemakers were asked to rate their feelings about Techbridge Girls on a five-point smiley face scale from "I really didn't like it " to "I loved it." The majority of girls in Changemakers said, "I loved it" or "I liked it" (87%), with 52% of them giving Changemakers the highest rating. Girls who liked or loved the program appreciated a variety of things about the program that were in line with the program's goals. Some of their reasons included that the program was fun, helped them make connections to their friends and other girls, was girls only, was connected to what they want to do in the future, and they experienced new things. Girls suggested changes such as more frequent meetings, more field trips, and improvements to some activities to make them more fun. Girls returned to the program primarily because of the fun activities and to be with their friends.

Interest in and Attitudes about STEM

66% of girls developed interest in and positive attitudes about STEM.

Overall, girls in Changemakers increased in their interest in STEM, both over the course of the year and in contrast to the comparison group. While neutral responses to items regarding interest and attitudes were somewhat common, negative responses made up fewer than 10% of the total.

"Everything was fun and interesting and we did things I have never tried before it was a new experience for me."

"Because things that we do in TBG are mostly interesting, things that I always dream of to have a try, and the materials are free too."

STEM Identity and New Possible Futures

73% of girls made progress in the development of STEM identity and their understanding of new possible futures.

While focus group data showed that some girls were not yet sure what they wanted to do in the future, survey data showed that girls in Changemakers overall increased their STEM identity, including their awareness of STEM pathways and intent to pursue STEM, showing greater change than the comparison group. For the most part, negative responses made up fewer than 15% of the total. About two-thirds of girls in Changemakers reported that TBG had an impact on their perceptions of STEM careers and their possible futures. Girls who identified as African American were generally more likely to feel that TBG changed their perceptions of STEM careers and their possible futures, whereas girls who identified as Hispanic/Latinx generally reported lower rates of impact. About half of girls said TBG changed their minds about what they want to do in the future, which is consistent with Achievers results.

03 Changemakers Evaluation Summary (cont.)

CHANGEMAKERS™
Middle School

(Identity cont.)

"Because to be honest it expanded my opportunities in working and all the projects were great and made me even love experimenting and be more open minded about different jobs."

"Before, I knew what I wanted my career to be, but I had fun at Techbridge building stuff, that I might want a STEM career."

"Why I loved this program is because it makes me think and process information and me being able to see that I really do have a future."

♡ **Socio-emotional Learning**	**83% of girls made progress in the development of socio-emotional learning.**

Most girls in Changemakers increased their engagement with socio-emotional skills. Additionally, girls reported increased positivity about their futures and knowledge of steps to reach their goals. Girls in the comparison group showed similar gains across items related to socio-emotional learning. Eighty-four percent of girls in Changemakers felt they were part of a community. Negative responses for socio-emotional learning items were less than 10% of the total. Several girls in the focus groups talked about learning confidence, and "that girls can do anything."

"I gave Techbridge this rating because it helped me open up and learn new thing about people."

"Because it is just time for girls to be free and brave and fun."

"I gave them this rating because I feel really at home here in Techbridge and I feel safe in this space."

21st Century Learning Skills	**69% of girls made progress in the development of 21st Century Learning Skills.**

Girls in Changemakers showed both individual and group engagement in 21st Century Learning Skills. Girls who identified as Hispanic/Latinx were less likely to recognize these skills in their group work. The comparison group reported high levels of agreement over the course of the year and often described similar engagement in these skills to girls in Changemakers. Negative responses were less than 10% of the total, with the exception of "I am comfortable speaking in front of a group of people." Some girls in the focus groups described specific elements of teamwork and collaboration that they had learned, like not being bossy and taking turns.

"…we worked as a group to problem solve and I like building."

"I gave Techbridge Girls this rating because this program showed me how to communicate with others and share my ideas with others. It also taught more about engineering and science that I did not know."

Science and Engineering Practices	**69% of girls reported that they and their groups engaged in science and engineering practices.**

Many girls in Changemakers reported that they engaged in core science and engineering practices always or very often. Girls who identified as Hispanic/Latinx were less likely to report these practices.

"…the activities we do here at Techbridge are very fun, for example, I really loved when we built gingerbread houses as an example of engineering. Overall I love Tech bridge because of the community and the STEM activities that help me think about my career choices."

"It's because we get to learn new things and experiments."

"I would like to do more science experiments in Techbridge Girls because my preferred career is in science. "

CHANGEMAKERS™
Middle School

| | Relevance | 50% of girls saw how the work they did in Techbridge Girls was relevant to them and their communities. |

Most girls in Changemakers saw the relevance of the work they did for themselves and their own lives. They saw the relevance for other girls in TBG less frequently and fewer connections to their families and their community. In the focus groups, girls frequently talked about how great it was to be able to make something, like lip balm, bath bombs, or a bird house, that they can use in their daily lives.

"The activity that was my favorite was what's it called ... community impact because...we really got to help our, not only our community, but like a part of the world."

"...every single time you want some lip balm you can make some because you already know how because of Techbridge."

| | Social Capital | 77% of girls built social capital in STEM through their experience in Techbridge Girls. |

Many girls described ways they are building social capital around science, technology, and engineering. Almost all had talked with someone in a STEM career and many had talked with their family about their work in Changemakers. About half of girls knew someone outside of Techbridge Girls that could help them learn more about STEM.

"I loved it because I was encouraged to keep on trying to learn more about the STEM community."

"Whenever I am at Techbridge I feel like I can relate to so many people and also feel like I found many friends."

03 Changemakers

Evaluation Question 3.1: To what extent did the Changemakers program influence girls' interest in and attitudes toward STEM?

Based on monthly exit tickets, almost all girls in Changemakers were engaged and interested in project work during the year.

While girls gave some neutral responses to exit ticket items regarding interest and attitudes, negative responses made up fewer than 10% of the total. As one girl said, "Everything was fun and interesting and we did things I have never tried before it was a new experience for me." Girls liked doing activities such as the Community Impact Project, woodworking and green design.

91% said they *liked the work they had done at TBG that day.*

84% said *the work they did that day was very interesting to them.*

72% said *time went by quickly at TBG that day.*

> *"Every Thursday has been the best day of the week for the whole year. I've had so much fun during the 2 hours each week that we get an [opportunity] for a better career in my life."*
>
> *--Techbridge Girls Changemakers participant*

Girls in Changemakers grew in their enjoyment of engineering and computer coding activities. The comparison group reported no important changes over the year.

Girls in Changemakers reported increased enjoyment in building, designing, and putting things together. Though the comparison group started the year higher, they showed very little change over the course of the year, whereas all demographic groups of girls in Changemakers reported increases of at least ten percentage points. While girls in all demographic groups described increased enjoyment of computer coding, they enjoyed coding less than building/designing activities. Only about one-quarter of the comparison group reported enjoyment in coding, and there was no meaningful change for the comparison group over the course of the year.

Figure 17. I like building, designing, and/or putting things together.
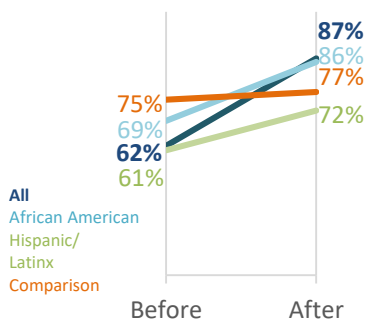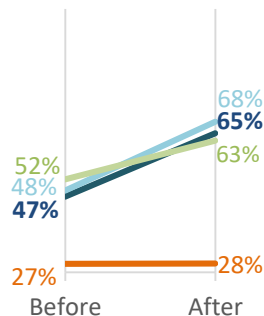
Figure 18. I like computer coding.

ASPECT RESEARCH + EVALUATION

03 Changemakers

Evaluation Question 3.1 (cont.): Changemakers STEM interest

Girls in Changemakers reported greater interest in STEM, both over the year and in contrast to the comparison group.

Girls in Changemakers showed some extended interest in STEM by doing more science or engineering experiments at home. In the survey, one girl said, "... the activities are very fun and make me feel like I can dig a little deeper into engineering and science..." Girls reported creating something with technology at home more often at the end of the year, but were less likely to do so than science/engineering. Girls who identified as Hispanic/Latinx were slightly more likely to have done science experiments at home than girls from other demographic groups.

While not all girls in Changemakers created things at home or plan to spend time learning more about STEM, they showed larger increases in their intent to pursue these projects than the comparison group. Additionally, girls in Changemakers were more likely than the comparison group to intend to continue to pursue STEM activities at the end of the year.

Figure 19. I have done science experiments or engineering activities at home, not for school.
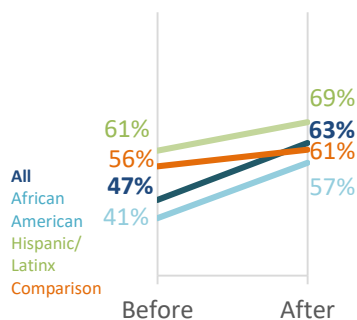
Figure 20. I have created something with technology at home, not for school (like a personal website or a videogame).
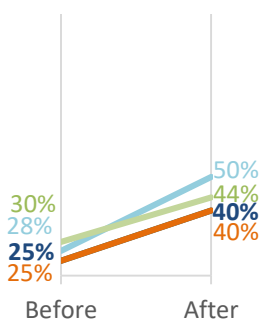
Figure 21. I want to know more about science, technology, or engineering.
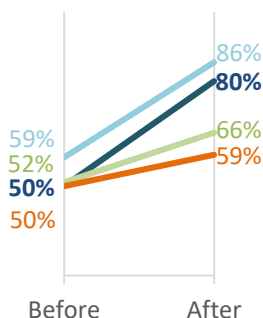
Figure 22. I plan to spend time outside of Techbridge Girls learning more about science, technology, or engineering.
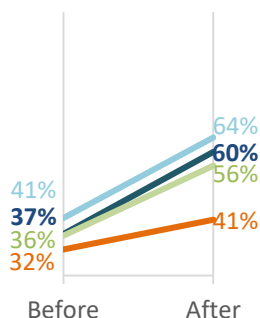
"I have already started ... animating on YouTube."

"My favorite activity is making bath bombs....It was fun. And if you ever run out of bath bombs you can just make some."

--Techbridge Girls Changemakers Participants

ASPECT RESEARCH + EVALUATION

03 Changemakers

Evaluation Question 3.2: To what extent did the Changemakers program influence girls' STEM identity?

Girls in Changemakers reported increases in their STEM identity, including awareness of STEM pathways and intent to pursue STEM. Girls reported growth over the course of the year and in contrast to the comparison group.

Girls in Changemakers generally reported greater awareness of STEM pathways. They learned the most about what scientists, engineers and people who work in technology do in their jobs. As one girl said, "I love Techbridge Girls because I get to do more things and get to experience new things and opportunities." Girls in the comparison group also reported increased awareness of STEM pathways and intent to pursue STEM in college, but were generally less likely than girls in Changemakers to know about career paths or plan to pursue STEM. In the focus groups, some girls had some specific ideas about future plans in STEM, while others were still figuring it out.

Figure 23. I plan to study science, engineering, and/or computer science in

All
African American
Hispanic/Latinx
Comparison

Before: 52%, 51%, 47%, 41%
After: 82%, 71%, 63%, 63%
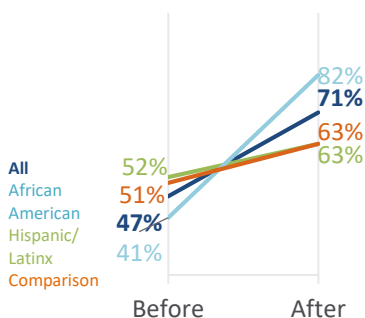
Figure 24. I know what to do to have the kind of career I want.

Before: 67%, 62%, 55%, 53%
After: 86%, 81%, 73%, 69%
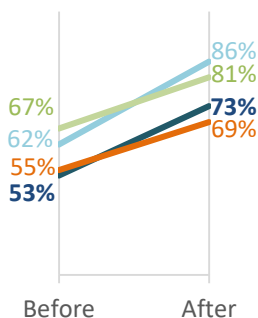
Figure 25. I know what scientists, engineers, and people who work in technology do in their jobs.

Before: 51%, 47%, 45%, 44%
After: 87%, 86%, 82%, 67%
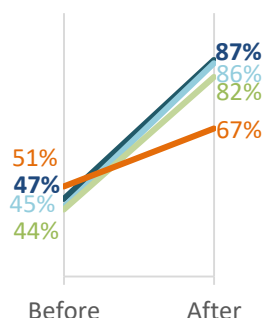
Figure 26. I know how to find information about careers in science, engineering, or technology.
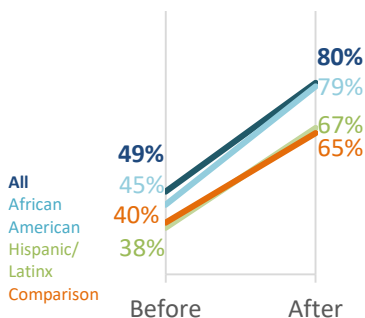
All
African American
Hispanic/Latinx
Comparison

Before: 49%, 45%, 40%, 38%
After: 80%, 79%, 67%, 65%

"All the projects were great and made me even love experimenting and be more open minded about different jobs."

--Techbridge Girls Changemakers Participant

Evaluation Question 3.2 (cont.): STEM identity

Many girls in Changemakers reported that Techbridge Girls had an impact on their perceptions of STEM careers and their possible futures. Girls who identified as African American were generally more likely to report this impact, whereas girls who identified as Hispanic/Latinx generally reported lower rates of impact.

Techbridge Girls helped most girls learned more about gender and racial stereotypes in STEM through and to think about their future and their career. Field trips and role models were generally effective in increasing girls' interest in working in science, engineering, or technology. As in Inspire, about half of girls reported that the activities they did related to what they want to do for a career. Generally, girls who identified as African American reported these impacts slightly more frequently than average, while girls who identified as Hispanic/Latinx were less likely to see these impacts.

Figure 27. Changemakers identity
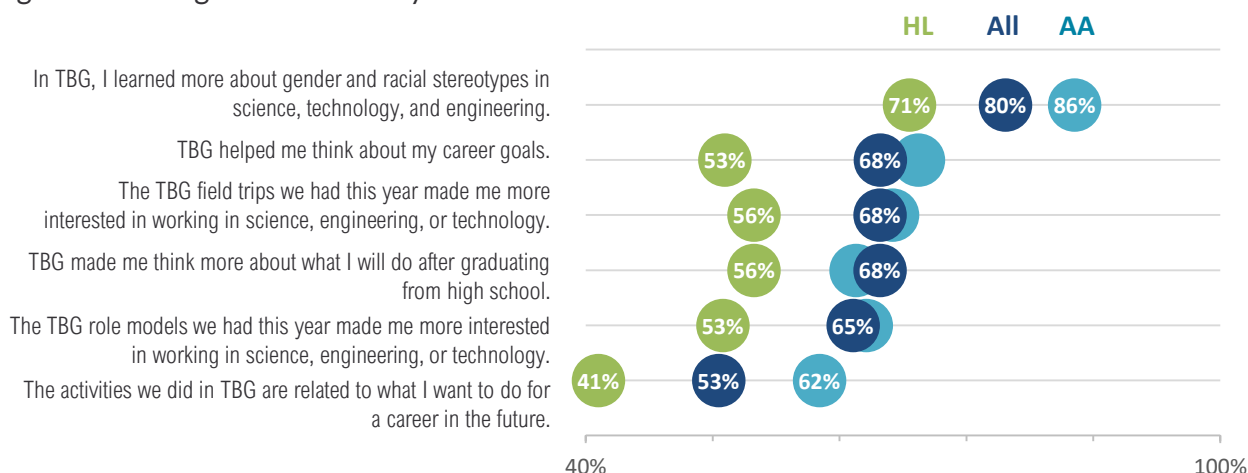
In exit tickets, about two-thirds of girls reported that the program helped them identify themselves in a career that involves science, technology, or engineering. About half of girls said Techbridge Girls changed their minds about what they want to do in the future, which is consistent with results across the girls' programs.

70% said *TBG was helping them see themselves in a science, technology, or engineering career.*

61% said they could *see themselves working in a career that involves science, technology, or engineering.*

53% said *TBG was changing their mind about what they want to do in the future.*

> "The field trips help me realize that jobs such as programming are actually a lot closer in my reach than it seemed before."
>
> --Techbridge Girls Changemakers Participant

ASPECT RESEARCH + EVALUATION

03 Changemakers

Evaluation Question 3.2 (cont.): STEM identity

Girls in Changemakers increased in their identification as people who do well in STEM activities. The biggest increases were related to science and technology activities.

Generally, all girls in Changemakers reported greater perceptions of themselves as good at science, technology, and engineering, both over time and in contrast to the comparison group. Girls who identified as African American reported STEM identification slightly more frequently than others, while girls who identified as Hispanic/Latinx were did so less frequently.

After Changemakers, about two-thirds of girls reported that someone like them could be a scientist, engineer, or work with technology. Most girls reported that working in science, engineering, or technology is a good career for women, but there was little change over time, possibly due in part to high start-of-year ratings. Again, girls who identified as African American rated their levels of agreement slightly higher than average. Girls who identified as Hispanic/Latinx rated their agreement with these items slightly lower than both the average and the comparison group for both of these items.

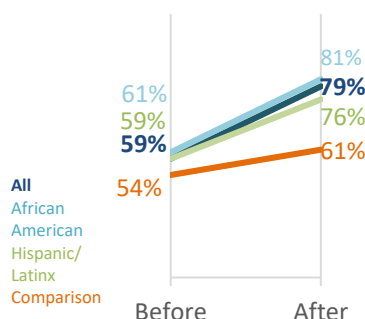Figure 28. I do well in science activities.

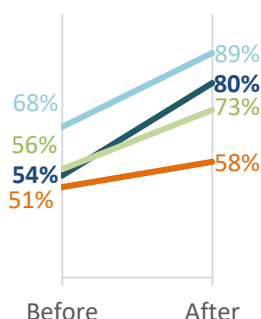Figure 29. I do well in technology activities.

Figure 30. I do well in engineering activities.
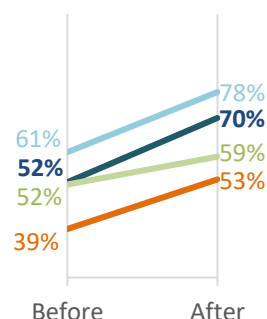
Figure 31. I think someone like me could become a scientist, engineer, or work in technology.
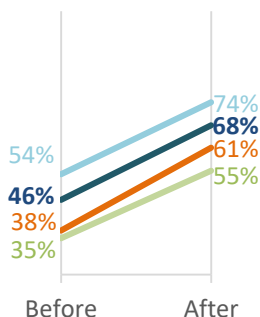
Figure 32. I think working in science, engineering, or technology is a good career for women.
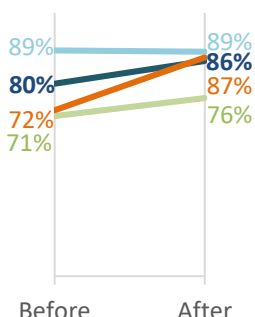
03 Changemakers

Evaluation Question 3.3: To what extent did the Changemakers program influence girls' engagement in socio-emotional learning?

Most girls felt like they were part of a community in Changemakers.

In all demographic groups, girls in Changemakers reported feeling a part of a community in the Changemakers program (Figure 33). One girl said, "…I feel really at home here in Techbridge and I feel safe in this space." Girls were slightly less likely to report that they got to know girls who like the same things they do, which is consistent with the results for Inspire. Finally, girls who identified as African American were slightly less likely to say they had gotten to know girls with similar interests.

Figure 33. Changemakers community

HL   All   AA

I am part of a community.
84% 89%

I got to know girls who like the same things as me.
59% 66%

50%   100%
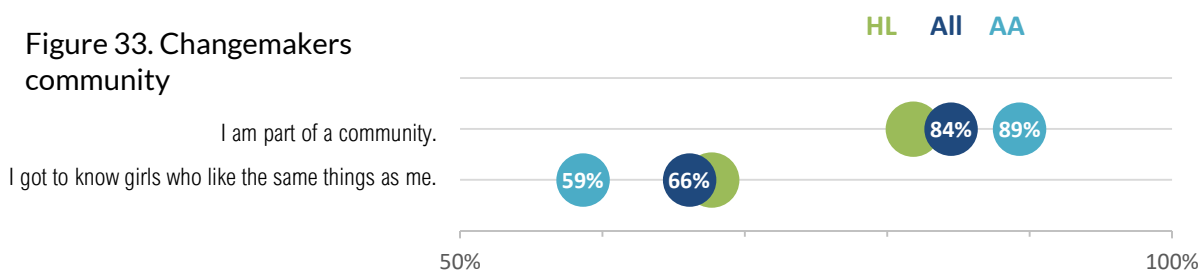
Changemakers Result: Overall, girls in Changemakers reported increased engagement with socio-emotional skills, similar to those in the comparison group.

After Changemakers, about two out of three girls felt confident that they could understand complicated ideas, an increase from fewer than half of girls before the program. Most girls ended the program confident that they could figure out how to learn things and understand other people. Negative responses for socio-emotional learning items were less than 10% of the total. Several girls in the focus groups talked about learning confidence, and "that girls can do anything." There were very few differences between demographic groups, thought girls who identified as Hispanic/Latino rated these items slightly lower than average. Girls in the comparison group reported similar engagement with socio-emotional skills overall.

Figure 34. When complicated ideas are presented to me, I am confident that I can understand them.

44% 67%
44% 69%
43% 69%
38% 64%

All
African American
Hispanic/Latinx
Comparison

Before   After
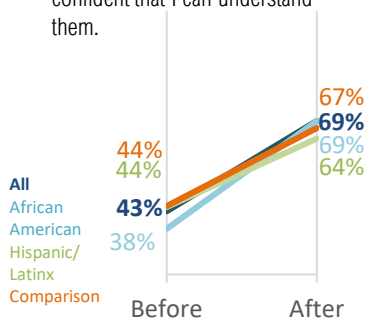
Figure 35. I can figure out how to learn things.

69% 82%
64% 82%
64% 74%
59% 70%

Before   After
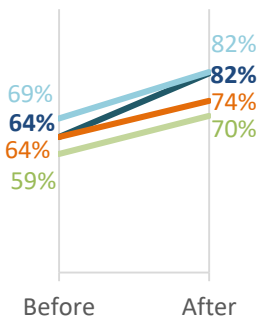
Figure 36. I try hard to understand what people are thinking or feeling.

85%
74% 82%
65% 82%
65% 81%
59%

Before   After

ASPECT RESEARCH + EVALUATION
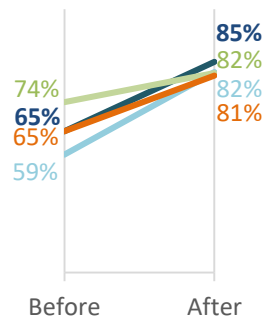
Evaluation Question 3.3 (cont.): Socio-emotional learning

♡ Girls in Changemakers reported increased positivity about their futures and knowledge of steps to reach their goals. These changes were similar to the comparison group.

Girls in all demographic groups reported feeling more positive about their future over the course of the year. They also consistently learned more about the steps to take to reach their goals. Girls who identified as African American reported the highest levels of agreement with both statements after the program. The comparison group reported similar outcomes.

Figure 37. I feel positive about my future.
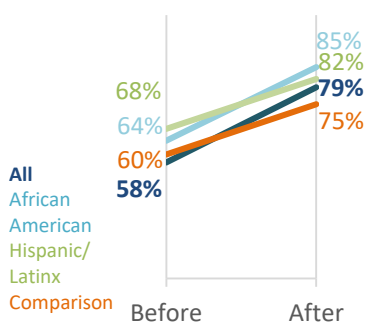
Figure 38. I know what I need to do to reach my goals.

All
African American
Hispanic/Latinx
Comparison

Before — After
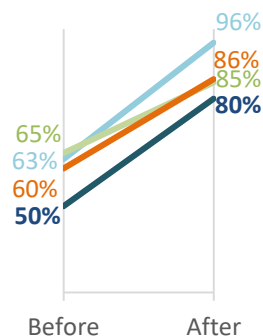
Evaluation Question 3.4: To what extent did the Changemakers program influence girls' engagement in 21st Century Learning Skills, as individuals and in group work?

Many girls in Changemakers reported that their group engaged in core 21st Century Learning Skills, though girls who identified as Hispanic/Latinx were less likely to recognize these skills in their group work.

In the focus groups, girls in Changemakers discussed the opportunities that Techbridge Girls gave them to practice teamwork, working with people they had never worked with before, problem-solving and the challenges of group decision-making.

Figure 39. Changemakers 21st Century Learning Skills

HL   AA   All

Everyone got to contribute something.   56%   66%   72%

My groups found solutions to problems.   53%   70%   76%

My groups met our goals.   62%   69%

50%   100%
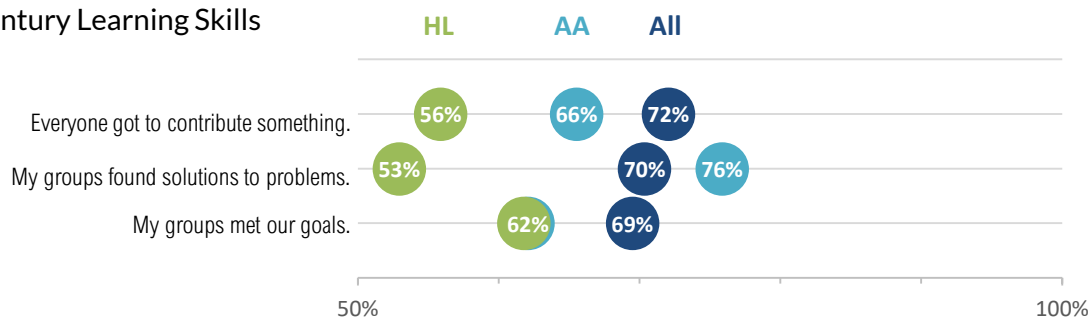
Evaluation Question 3.4 (cont.): 21st Century Learning Skills

Over the year, girls reported increased engagement in 21st Century Learning Skills for individuals. The comparison group reported high engagement in 21st Century Skills and often described similar engagement in these skills to girls in Changemakers.

Girls in all demographic groups reported growth in all dimensions of individual engagement in 21st Century Learning Skills, such as working well with others. Girls were less comfortable speaking in front of a group of people, but all groups of girls in Changemakers felt more comfortable over the course of the year. At the end of the year, almost all girls said it can take many tries to solve a problem. For all items but public speaking, negative responses were less than 10% of the total. The comparison group started the year with higher agreement levels than the girls in Changemakers on all items and ended with similar or higher ratings.

Figure 40. I work well with different types of students.
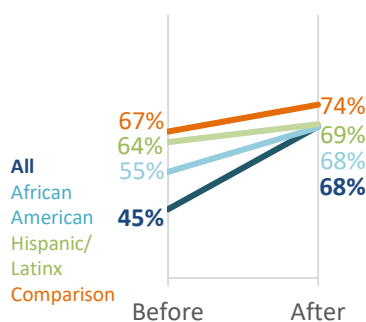
Figure 41. I often get to choose how to communicate my ideas to others (writing, drawing, talking, etc.).
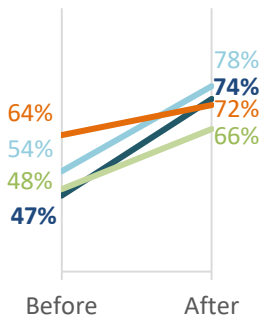
Figure 42. I am comfortable speaking in front of a group of people.
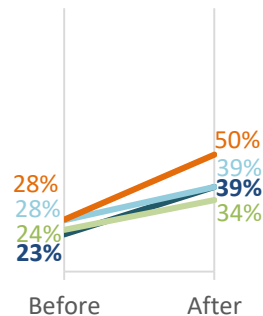
Figure 43. I take risks and try new things.
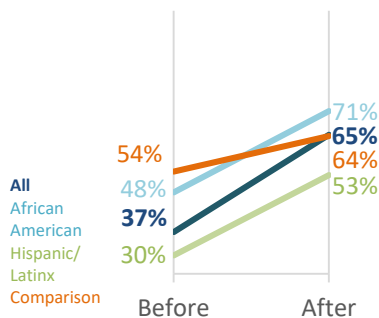
Figure 44. I like doing work that I'll learn from even if I make a lot of mistakes.
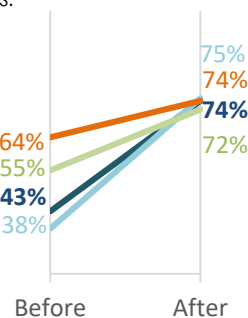
Figure 45. I keep trying even when the task is challenging.
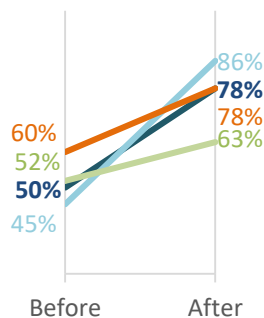
Figure 46. I know it can take many tries to solve a problem.

ASPECT RESEARCH + EVALUATION
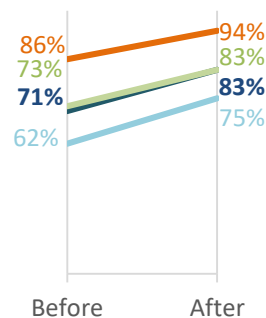
03 Changemakers

Evaluation Question 3.5: To what extent did the Changemakers program influence girls' engagement in science and engineering practices?

At the end of the program, many girls in Changemakers reported that they engaged in core science and engineering practices *always* or *very often*.

Of the science and engineering practices measured in the survey, girls in Changemakers reported that they had opportunities to brainstorm and test solutions most often. They saw slightly fewer opportunities to share their work with others or make revisions based on something they learned. Girls who identified as Hispanic/Latinx recognized opportunities to engage in these practices less frequently than other girls.

Figure 47. Changemakers practices:

	HL	AA	All
We tested out a solution.	62%		76%
We brainstormed solutions.	48%		73%
We revised part of our project based on something our group learned.	47%	66%	
We shared our work with others.	39%	52%	61%

30%   100%
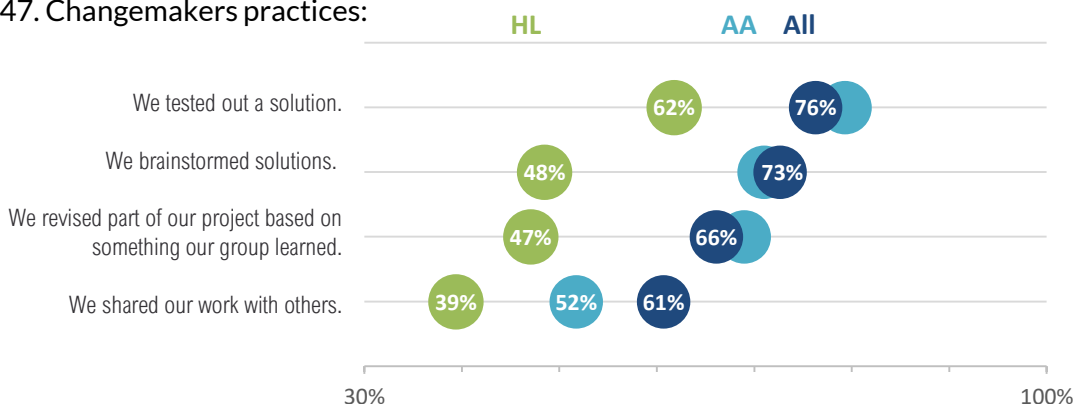
Evaluation Question 3.6: To what extent did Changemakers help girls see the relevance of the work they did to their everyday lives?

In exit tickets, most girls in Changemakers saw the relevance of the work they did for themselves and their own lives. They saw the relevance for other girls in Techbridge Girls less frequently and fewer connections to their families and their community.

Figure 48. Changemakers relevance

Me	74%
The other girls in Techbridge Girls	49%
My family	30%
The community	45%

"The activity that was my favorite was...community impact because...we really got to help our, not only our community, but like a part of the world."

--Techbridge Girls Changemakers Participant

03 Changemakers

Evaluation Question 3.7: To what extent did Changemakers help girls build social capital around science, technology, and engineering?

Many girls in Changemakers described ways they are building social capital around science, technology, and engineering, including talking with their family and others who work in those fields.

At the end of the year, almost all girls in Changemakers had talked to an engineer, scientist or someone who works in technology about their job. About two-thirds had spoken with their family about their own work in Techbridge Girls. About half know someone outside of Changemakers who can help them learn more about STEM. These results are generally consistent with Achievers results. In the program, girls also developed social relationships that may support their STEM pathways: "... whenever I am at Techbridge I feel like I can relate to so many people and also feel like I found many friends."

Finally, girls were more likely to be encouraged by their family to think about a career in science, engineering, or technology at the end of the year (Figure 50). However, girls in the comparison group reported a similar increase and comparable rates of family encouragement. Girls who identified as African American said they were more likely than average to have family encouragement, while girls who identified as Hispanic/Latinx were less likely.

Figure 49. Changemakers social capital
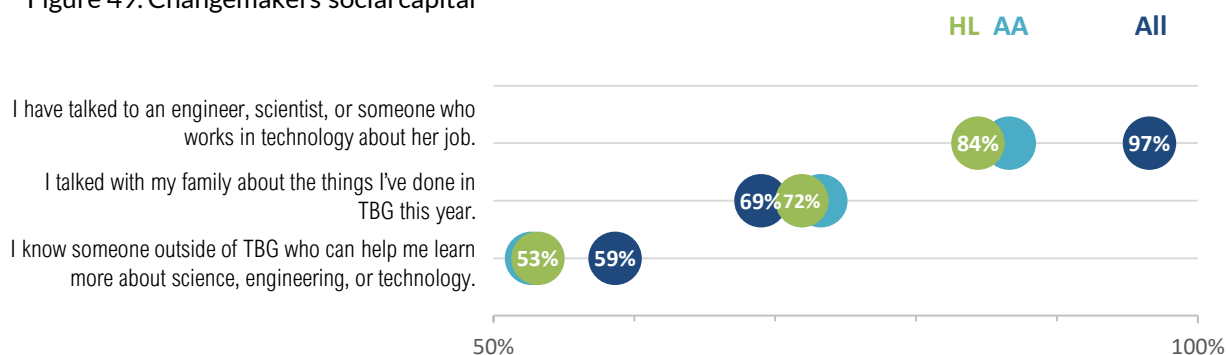
Figure 50. My family encourages me to think about a career in science, engineering, or technology.
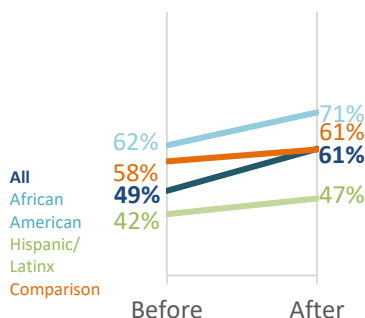
"I loved [Techbridge Girls] because I was encouraged to keep on trying to learn more about the STEM community."

--Techbridge Girls Changemakers Participant

04 Achievers Evaluation Overview

ACHIEVERS™
High School

The Achievers program focuses on preparing girls to persist in STEM in college and their careers. It serves grades 9-12. "Navigators" and other TBG staff connect girls to academic resources. During the 2018-2019 school year, 29 girls in Achievers took part in a retrospective survey, 58 exit tickets were completed, and about 10 girls participated in a focus group. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

Achievers Survey
n= 29

Focus Group
n= ~10

Exit Ticket
n= 58

Focal Constructs for this Program

Interest in and Attitudes about STEM

STEM Identity and New Possible Futures

21st Century Skills

Science and Engineering Practices

Relevance

Social Capital

More on focal constructs on pg. 4.

Achievers Survey Respondent Demographics

Asian	46%
African American	31%
African	19%
Hispanic or Latinx	15%
American Indian or Alaska Native	4%
Another race/ethnicity	4%
Asian Indian	0%
Native Hawaiian or Pacific Islander	0%
Middle Eastern	0%
White or Caucasian	0%

ASPECT RESEARCH + EVALUATION

04 Achievers Evaluation Summary
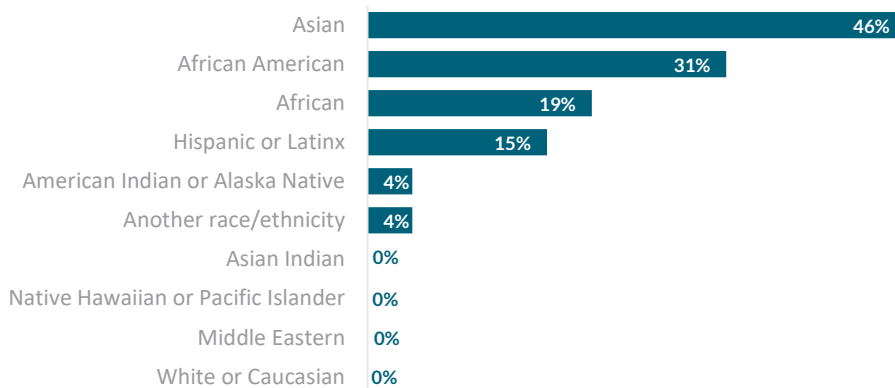
ACHIEVERS™
High School

This section describes the highlights of the Achievers program evaluation, including a short summary of the findings, exemplary quotes, and an average score for each construct. To determine the average scores, positive responses for each post-item were summed (e.g., Strongly Agree +Agree) and the average across all items for each construct was calculated. It is important to note that in 2018-2019, with the exception of the smile scale, item scales were changed from a 4-point to a 5-point scale to accommodate neutral responses and give girls more options to represent their thoughts. Comparisons to prior years should be made with this in mind.

88% of girls liked or loved Achievers.

| 0% | 8% | 4% | 50% | 38% |
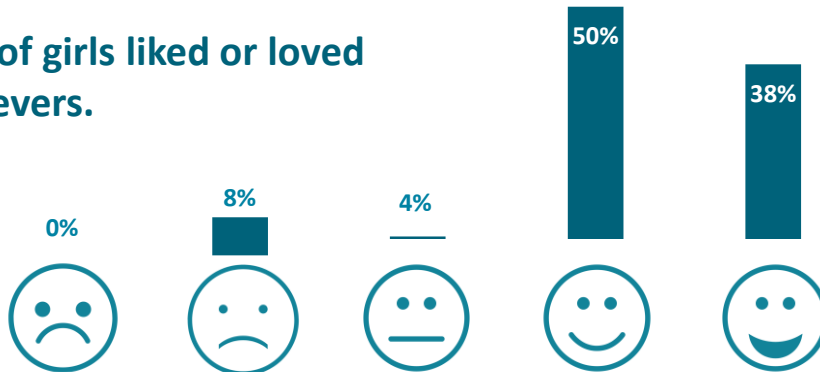
Girls in Achievers were asked to rate their feelings about Techbridge Girls on a five-point smiley face scale from "I really didn't like it " to "I loved it." The majority of girls in Achievers said, "I loved it" or "I liked it" (88%), with 38% of them giving Achievers the highest rating. Girls who liked or loved the program appreciated a variety of things about the program that were in line with the program's goals. Some of their reasons included that the program was fun, they were inspired to do new things, and they found a sense of community with girls who shared their interests. Girls suggested changes such as more frequent meetings, more field trips, and improvements to some activities to make them more fun. Girls returned to the program because of the environment, the people, and the projects.

| Interest in and Attitudes about STEM | 61% of girls developed interest in and positive attitudes about STEM. |

Most girls in Achievers were engaged and interested in project work. They reported modest increases in their enjoyment of engineering and computer coding activities, while the comparison group reported no important changes. Interestingly, while girls in Achievers only reported small changes in their interest in learning more about STEM, their intention to spend time learning more about these topics increased. This may be due to high starting interest. While there were a moderate number of neutral responses to items regarding interest and attitudes, there were relatively few negative responses for these items.

"I liked it because I found everything we have did and learned interesting. I honestly would have never though that stem was something I would see myself doing in the future. It really opened my mind and that is why I liked it."

ASPECT RESEARCH + EVALUATION

ACHIEVERS™
High School

STEM Identity and New Possible Futures

82% of girls made progress in the development of STEM identity and their understanding of new possible futures.

Overall, girls in Achievers increased in their sense of STEM identity, including awareness of STEM pathways and intent to pursue STEM. Girls reported growth in many aspects of identity both over the course of the year and in contrast to the comparison group. TBG especially had an impact on girls who identified as African American's perceptions of STEM careers and their possible futures.

Most girls in Achievers reported seeing themselves in a STEM career because of their experience in Achievers. About half of girls said that TBG changed their minds about what they want to do in the future, which is consistent with Changemakers results. Most girls in Achievers believe that someone like them could work in science, engineering, or technology and that these are good careers for women. Negative responses for identity were less than 10% of the total.

"I love Techbridge girls because of the inspiration it gives me to advance in a career related to STEM."

"I came into Techbridge thinking that I would like coding more, but it was the opposite. Before I came to Techbridge this year, I wanted to be a software engineer, then after, and like currently, I found out that I like cooking and making sweets and making people happy with them, and that is more enjoyable for me, so I'm going to be... I want to run my own restaurant or something."

21st Century Learning Skills

82% of girls made progress in the development of 21st Century Learning Skills.

Almost all girls in Achievers reported engagement and growth in 21st Century Learning Skills, both as individuals and in their group work. Girls in the comparison group reported they were less likely to take risks and try new things than girls in Achievers. In the focus groups, girls described gaining confidence and public speaking, tenacity (including patience and learning from struggle), coding skills, and how to think about applying for things like college. Negative responses were less than 6% of the total.

"[Techbridge Girls] helped me learn more about how I should achieve my goals."

"Techbridge Girls gave me an opportunity to do something new and things I wanted to do or try."

"During my time with the program, I've learned to speak up. I became more confident in public speech. I feel like I'm a lot more confident with that, because I have my accent, and I don't really talk English with my family, so I've been mostly speaking Vietnamese and Chinese, that whole ...with anybody, and Techbridge, it made me more professional talking, you know?"

Science and Engineering Practices

91% of girls reported that they and their groups engaged in science and engineering practices.

The majority of girls in Achievers recognized their engagement in core science and engineering practices *always* or *very often*.

"I love Techbridge girls because of the inspiration it gives me to advance in a career related to STEM. I love how we actually get to do hands on activities."

"Techbridge Girls provides girls the steps needed to get a better understanding about, engineering, technology, and science."

04 Achievers Evaluation Summary (cont.)

ACHIEVERS™
High School

| | Relevance | **67% of girls saw how the work they did in Techbridge Girls was relevant to them and their communities.** |

Most girls in Achievers saw the relevance of the work they did for themselves and their own lives. As in Changemakers, they saw the relevance for other girls in TBG less frequently and fewer connections to their families and their community. For girls in Achievers, discussions of relevance were mostly about how the program supported them to make progress on STEM pathways, as highlighted in the section on Social Capital below.

| | Social Capital | **74% of girls built social capital in STEM through their experience in Techbridge Girls.** |

Many girls described ways they are building STEM social capital, both by getting to know other girls with similar interests and by participating in activities through Techbridge Girls that are helping them build their experience and meet professionals. For Achievers, Techbridge Girls played an important role in that it provided a source of social capital through experiences and relationships that support girls to pursue STEM further. In the focus groups, girls described their goals to explore different STEM disciplines and career fields. They were enthusiastic about the career and college readiness workshops, including public speaking and presence, writing personal statements and resumes, and planning.

"It was is really fun hanging out with other girls who have the same interest. Also, going to field trip were really fun."

"I enjoyed stepping out of my comfort zone often and getting to meet new people that play a role in the development for women and girls in STEM fields."

ASPECT RESEARCH + EVALUATION

Evaluation Question 4.1: To what extent did the Achievers program influence girls' interest in and attitudes toward STEM?

Overall, girls in Achievers were engaged and interested in project work. In exit tickets, they especially reported enjoying the work they did.

In the focus groups, girls described the Arduino and candy-making projects as their favorite, because they were both hands-on. While girls gave some neutral responses to exit ticket and survey items regarding interest and attitudes, there were relatively few negative responses.

88% said they *liked the work they did at Techbridge Girls that day.*

76% said *the work they did that day was very interesting to them.*

67% said *time went by quickly at TBG that day.*

> *"I found everything we have did and learned interesting. I honestly would have never though that stem was something i would see myself doing in the future. It really opened my mind."*
>
> *--Techbridge Girls Achievers Participant*

Girls in Achievers reported some increases in their enjoyment of engineering and computer coding activities. The comparison group reported no important changes over the course of the year.

While most girls ended the year enjoying engineering activities, only about half ended the year enjoying computer coding. Some girls suggested including more non-engineering activities. Girls who identified as African American reported lower than average enjoyment at both the start and end of the year. However, they showed larger increases in how much their enjoyment improved over the year. The comparison group reported only very small changes in these items over the year.

> *"I've always seen technology and computer science from the outside, like, 'Wow, I can't do that. That's really hard.' And [here], they taught me a lot about computer science. And now I feel more like anyone can do it. You just have to learn about it. It's not a skill that you're just born with."*
>
> *--Techbridge Girls Achievers Participant*

Figure 51. I like building, designing, and/or putting things

All
African American
Comparison

	Before	After
All	85%	92%
African American	75%	88%
Comparison	73%	74%
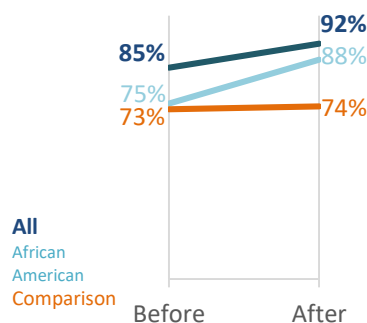
Figure 52. I like computer coding.

	Before	After
All	48%	56%
African American	38%	50%
Comparison	25%	31%
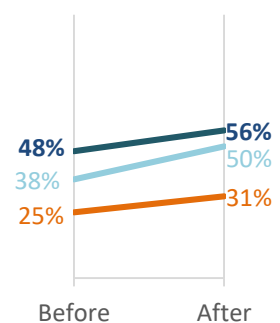
Evaluation Question 4.1 (cont.): STEM Interest

Girls in Achievers reported important increases in some measures of STEM interest, both over the course of the year and in contrast to the comparison group.

Girls in Achievers extended their interest in STEM to some extent by doing activities at home related to their work at Techbridge Girls. While girls generally reported only a very small increase in doing science or engineering at home, they were more likely at the end of the year to create something at home with technology than at the beginning. In the focus groups, girls described their goals for Achievers related to exploring STEM disciplines and careers, which may mean they spend more time outside of the program focused there than on experimenting or building things. Girls who identified as African American reported that they did more science and technology at home by the end of the year. The comparison group showed similar changes over time but were less likely to do these things than girls in Achievers.

Girls' interest in learning more about science, technology or engineering increased only a small amount. However, they did report large increases in their intention to spend time learning more about these topics. This may be because girls started with relatively high interest at the beginning of the year, leaving only some room for growth. Girls who identified as African American started with relatively high interest in spending time learning more about science, technology, or engineering, and all of them ended the year with this intention. The comparison group was less likely to plan to spend time learning more and became slightly less interested over the year in knowing more about science, technology, and engineering.

Figure 53. I have done science experiments or engineering activities at home, not for school.

All — 58% → 61%
African American — 50% → 63%
Comparison — 39% → 47%
Before / After
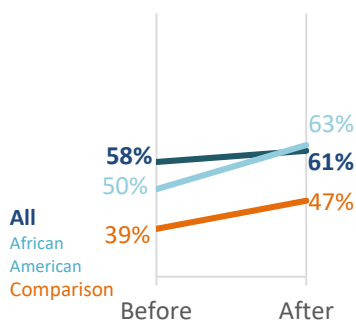
Figure 54. I have created something with technology at home, not for school.

50% → 63%
46% → **57%**
39% → 47%
Before / After
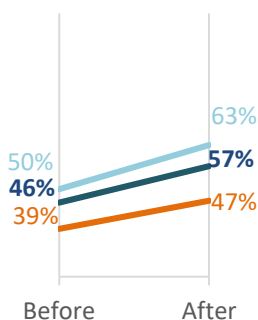
"I think it's really cool to see parts of STEM that we have not known, or thought of."

--Techbridge Girls Achievers Participant

Figure 55. I want to know more about science, technology, or engineering.

88% → 88%
77% → **83%**
77% → 73%
Before / After
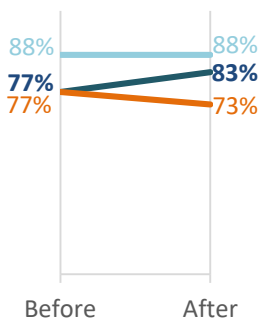
Figure 56. I plan to spend time outside of Techbridge Girls learning more about science, technology, or engineering.

75% → 100%
59% → **79%**
55% → 63%
Before / After
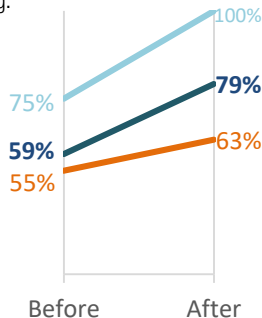
04 Achievers

Evaluation Question 4.2: To what extent did the Achievers program influence girls' STEM identity?

Girls in Achievers reported important increases in their STEM identity, including awareness of STEM pathways and intent to pursue STEM. Girls reported growth both over the course of the year and in contrast to the comparison group.

By the end of the year, girls in Achievers had much greater awareness of STEM pathways, especially knowledge of the kinds of science, engineering, and technology careers open to them, what people in those jobs do, how to find more information about, and what classes to take to prepare themselves. Three-quarters of girls knew what kind of career they wanted at the end of the year. Girls who identified as African American started the year with much lower awareness of STEM pathways but experienced much more growth in this area than other girls. Negative responses for identity items were less than 10% of the total. Girls in the comparison group also reported growth in some aspects of their awareness of STEM pathways, but they were generally less likely than girls in Changemakers to know how to find more information or know what classes to take.

Figure 57. I know what kinds of science, engineering, or technology careers I could have in the future.
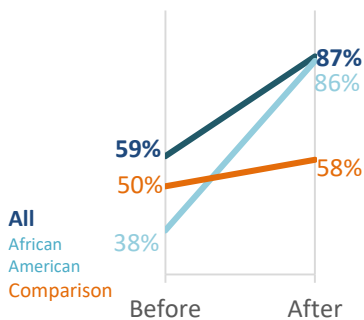
Figure 58. I know what to do to have the kind of career I want.
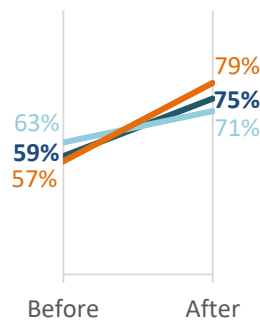
Figure 59. I know what scientists, engineers, and people who work in technology do in their jobs.
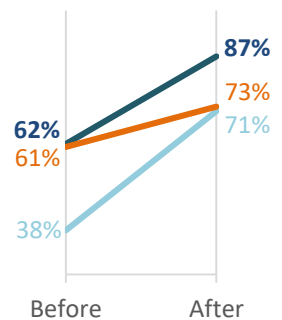
Figure 60. I know how to find information about careers in science, engineering, or technology.
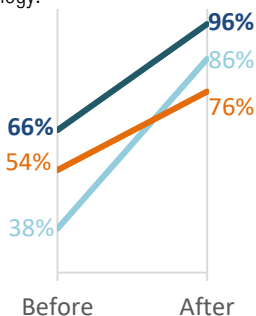
Figure 61. I know what high school classes I should take to have a career in science, engineering, or technology.
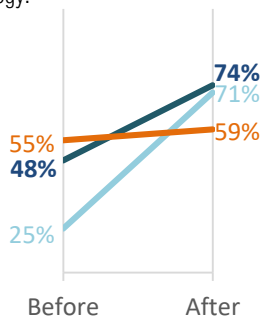
Evaluation Question 4.2 (cont.): STEM Identity

Most girls in Achievers, especially girls who identified as African American, reported that Techbridge Girls had an impact on their perceptions of STEM careers and their possible futures.

The Techbridge Girls program helped most girls think about their future and their career goals. About three-quarters of girls found the field trips increased their interest in working in science, engineering, or technology. Role models were more likely than field trips to be important to girls' interest. Three-quarters of girls reported that they learned more about gender and racial stereotypes in STEM through the program.

Overall, girls were less likely to see the activities they did in Achieve as related to what they want to do for a career in the future, which is a fairly consistent outcome across the programs. However, girls who identified as African American were much more likely than other girls to report that the activities were related to careers they want to have in the future *and* that the fieldtrips and role models were important to their interest in that work.

Finally, girls in Achievers were much more likely to plan to study science, engineering, and/or computer science in college than those in the comparison groups (Figure 63). All of the girls who identified as African American stated this intent at the end of the year.

Figure 62. Achievers identity

	AA	All
TBG made me think more about what I will do after graduating from high school.		88%
TBG helped me think about my career goals.		88%
The TBG role models we had this year made me more interested in working in science, engineering, or technology.	85%	100%
I learned more about gender and racial stereotypes in science, technology, and engineering.	77%	
The TBG field trips we had this year made me more interested in working in science, engineering, or technology.	73%	100%
The activities we did in TBG are related to what I want to do for a career in the future.	69%	100%

Figure 63. I plan to study science, engineering, and/or computer science in college.

100%
75%
72% 83%
44% 50%

All
African American
Comparison

Before   After
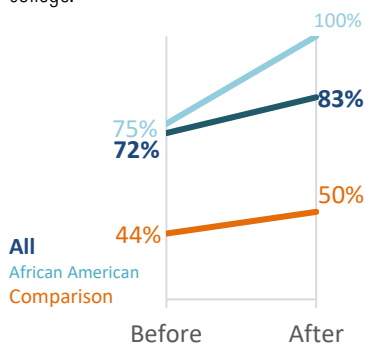
"I want to go to a four-year university and major in computer science... There's like so much you can do with computer science.“

--Techbridge Girls Achievers Participant

04 Achievers

Evaluation Question 4.2 (cont.): STEM Identity

Techbridge Girls helped most girls in Achievers see themselves in a STEM career. In exit tickets, about half of girls said that Techbridge Girls changed their minds about what they want to do in the future, which is consistent with results across the girls' programs.

82% said they *could see themselves working in a career that involves science, technology, or engineering.*

80% said TBG *is helping them see themselves in a science, technology, or engineering career.*

72% said they *could see themselves reflected in the TBG role models.*

56% said TBG *is changing their mind about what they want to do in the future.*

> *"I love Techbridge girls because of the inspiration it gives me to advance in a career related to STEM."*
>
> *--Techbridge Girls Achievers Participant*

Most girls in Achievers believe that someone like them could work in science, engineering, or technology and that these are good careers for women.

After Achievers, seven out of eight girls felt that someone like them could be a scientist, engineer, or work with technology and that working in STEM is a good career for women. Girls who identified as African American reported large growth over the year in this area. The comparison group reported similar growth over time but were less likely to report that someone like them could work in STEM. They were more likely than girls in Achievers to see these as good careers for women.

Figure 64. I think someone like me could become a scientist, engineer, or work in technology.

All
African American
Comparison

Before — After
50% → 100%
68% / 60% → **87%** / 73%
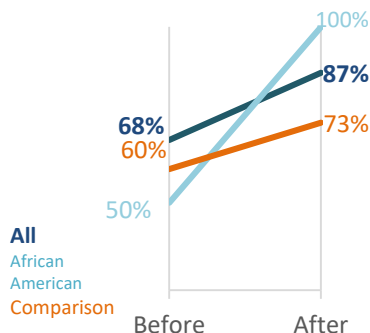
Figure 65. I think working in science, engineering, or technology is a good career for women.

Before — After
87% → 94%
79% → **87%**
63% → 86%

ASPECT RESEARCH + EVALUATION
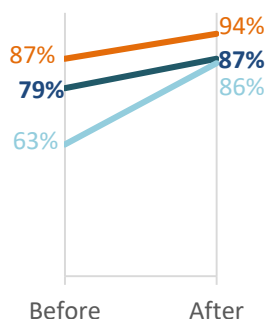
Evaluation Question 4.3: To what extent did the Achievers program influence girls' engagement in 21st Century Learning Skills?

In exit tickets, almost all girls in Achievers reported that their group engaged in core 21st Century Learning Skills.

Girls who identified as African American were more likely to say that their group found solutions to problems and everyone got to contribute. Girls overall, including those who identified as African American, were less likely to report that their groups met their goals.

Figure 66. Achievers 21st Century Learning Skills

All **AA**

Everyone got to contribute something.		93% 100%
My groups found solutions to problems.		89% 100%
My groups met our goals.	57% 73%	

50%   100%
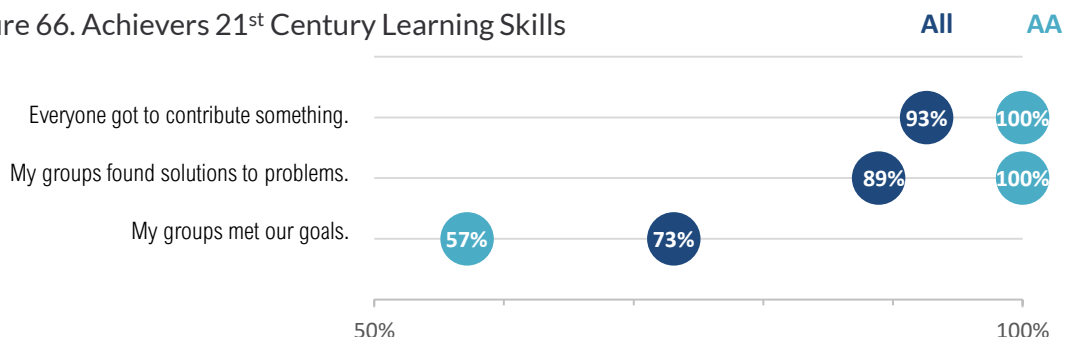
Girls in Achievers reported important growth in most aspects of their individual engagement with 21st Century Learning Skills over the year. Girls in the comparison group reported they were less likely to take risks and try new things than girls in Achievers.

Techbridge Girls provided opportunities for girls in Achievers to engage and grow in their 21st Century Learning Skills. Three-quarters of girls reported working well with different kinds of students and said they often were able to choose how to communicate their ideas. The comparison group reported similar rates of growth of the year but started and ended with higher levels of agreement on these items.

Overall, girls in Achievers were slightly less comfortable speaking in front of others, but felt much more comfortable than at the beginning of the year. Girls who identified as African American were especially likely to report growth in these areas over the year. In the focus groups, girls described gaining confidence and public speaking, tenacity (including patience and learning from struggle), coding skills, and how to think about applying for things like college. Negative responses were less than 6% of the total.

Figure 67. I work well with different types of students.

76% → 91%
50% → 75%
38% → 75%

All
African American
Comparison

Before   After
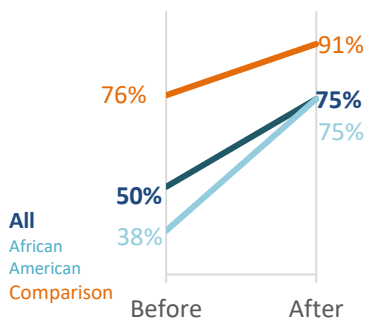
Figure 68. I often get to choose how to communicate my ideas to others.

74% → 84%
46% → 75%
25% → 75%

Before   After
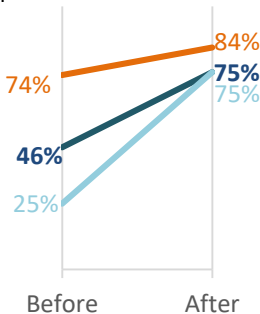
Figure 69. I am comfortable speaking in front of a group of people.

67%
36% → 67%
35% → 58%
13%

Before   After
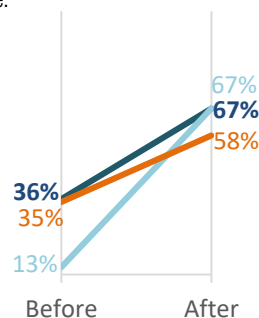
04 Achievers

Evaluation Question 4.3 (cont.): 21st Century Learning Skills

    Almost all girls in Achievers ended the year feeling confident about taking risks and trying new things, persisting at challenging tasks, and knowing that it can take many tries to solve a problem. About four out of five girls reported that they enjoyed doing work even if it means learning from mistakes.

    Only one girl who identified as African American started out the year taking risks and trying new things, but by the end of the year, all reported that they did so. They also showed especially important changes in their persistence with challenging tasks. The comparison group started out the year with similar or higher agreement levels than the girls in Changemakers on these items.

Figure 70. I take risks and try new things.

All
African American
Comparison

Before — After
100% / 92% / 78% / 67% / 54% / 13%
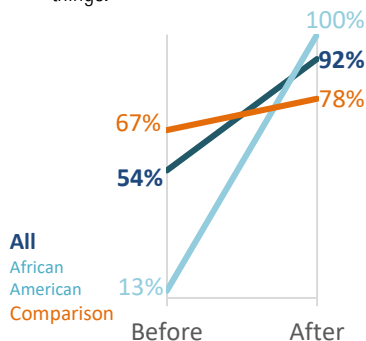
Figure 71. I like doing work that I'll learn from even if I make a lot of mistakes.

Before — After
79% / **79%** / 80% / 75% / 64% / 63%
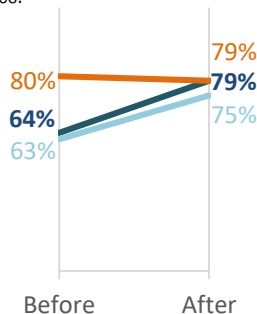
Figure 72. I keep trying even when the task is challenging.

Before — After
88% / **88%** / 88% / 73% / 68% / 38%
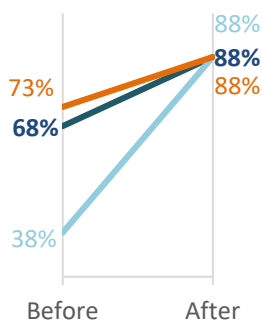
Figure 73. I know it can take many tries to solve a problem.
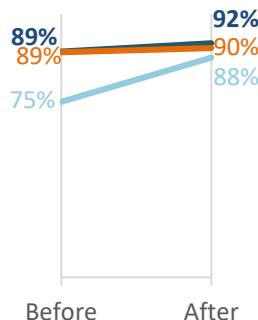
Before — After
92% / 90% / 89% / 89% / 88% / 75%

> *"During my time with the program, I've learned to speak up. I became more confident in public speech ... because I have my accent, and I don't really talk English with my family."*
>
> *--Techbridge Girls Achievers Participant*

ASPECT RESEARCH + EVALUATION

04 Achievers

Evaluation Question 4.4: To what extent did the Achievers program influence girls' engagement in science and engineering practices?

At the end of the program, most girls in Achievers reported that they engaged in core science and engineering practices *always* or *very often*. Girls who identified as African American were slightly less likely to identify opportunities to test solutions or share their work with others.

Figure 74. Achievers practices

	AA	All
We brainstormed solutions.	88%	93%
We shared our work with others.	71%	92%
We tested out a solution.	75%	89%
We revised part of our project based on something our group learned.		89%

50%   100%
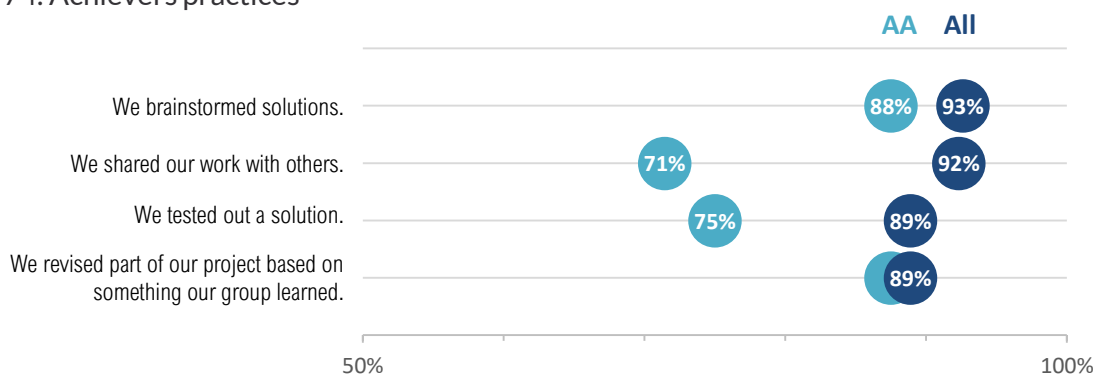
Evaluation Question 4.5: To what extent did Achievers help girls see the relevance of the work they did to their everyday lives?

In exit tickets, most girls in Achievers saw the relevance of the work they did for themselves and other girls in Techbridge Girls. About half saw connections in the work they did to their families and the community.

Figure 75. Achievers relevance

Me	81%
The other girls in Techbridge Girls	81%
My family	50%
The community	56%

ASPECT RESEARCH + EVALUATION

Evaluation Question 4.6: To what extent did Achievers help girls build social capital around science, technology, and engineering?

Many girls in Achievers described building social capital around science, technology, and engineering, including talking with their family and others who work in those fields.

At the end of the year, most girls in Achievers had an opportunity to talk to an engineer, scientist or someone who works in technology about their job. Three-quarters of girls had spoken with their family about their work in Techbridge Girls. Fewer girls, about half, reported that they know someone outside of Achievers who can help them learn more, which is generally consistent with Changemakers results.

Finally, there was a very slight decrease overall in encouragement by girls' families to think about a career in science, engineering, or technology at the end of the year (Figure 77). Girls who identified as African American reported being a bit more likely than average to have family encouragement. This result stayed stable over the year. The girls in the comparison group were much less likely to have family encouragement.

Figure 76. Achievers social capital
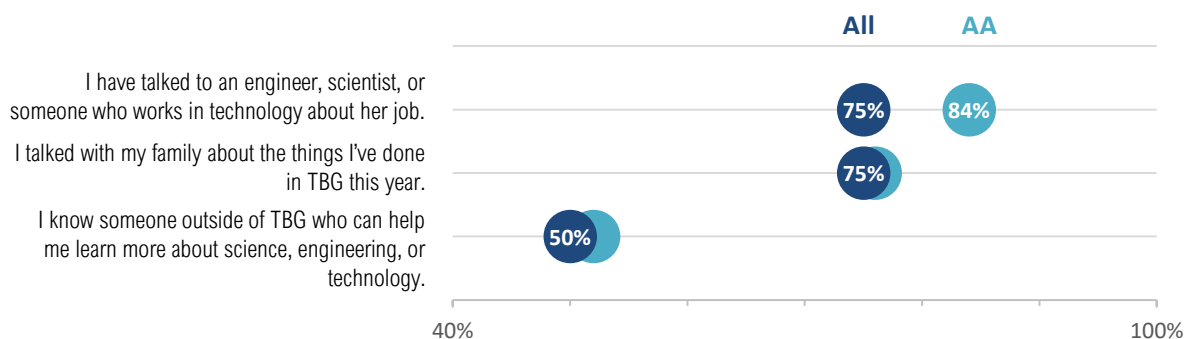
Figure 77. My family encourages me to think about a career in science, engineering, or technology.
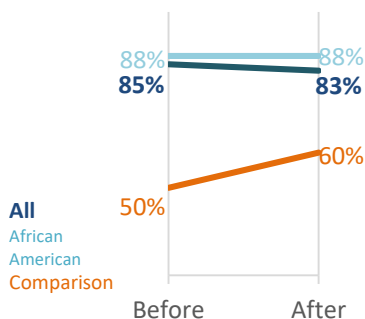
> *"[One of the women on a field trip] told me about how she became, first she told me about her childhood and how she was struggling with speaking English…. She told me about what she does and how long it takes her to finish coding. She also made me feel comfortable about talking about my own self. And that's what I really like."*
>
> *--Techbridge Girls Achievers Participant*

ASPECT RESEARCH + EVALUATION

Evaluation Question 4.6 (cont.): Social Capital

Most girls felt that Achievers supported them with skills and activities that would help them pursue STEM further.

The Achievers program provided a variety of supports for girls to continue on their STEM pathways. For example, almost all girls reported that the Achievers program helped them to get connected to other resources that support their STEM learning and learn what they need to do to have a future in STEM. The results for girls who identified as African American were generally consistent with the average results for all girls, with small exceptions. For example, girls who identified as African American were considerably more likely to learn more about what college would fit them and their goals than most girls.

In the focus groups, girls described their goals to explore different STEM disciplines and career fields. They were enthusiastic about the career and college readiness workshops, including public speaking and presence, writing personal statements and resumes, and planning.

Figure 78. In Achievers I felt supported to…
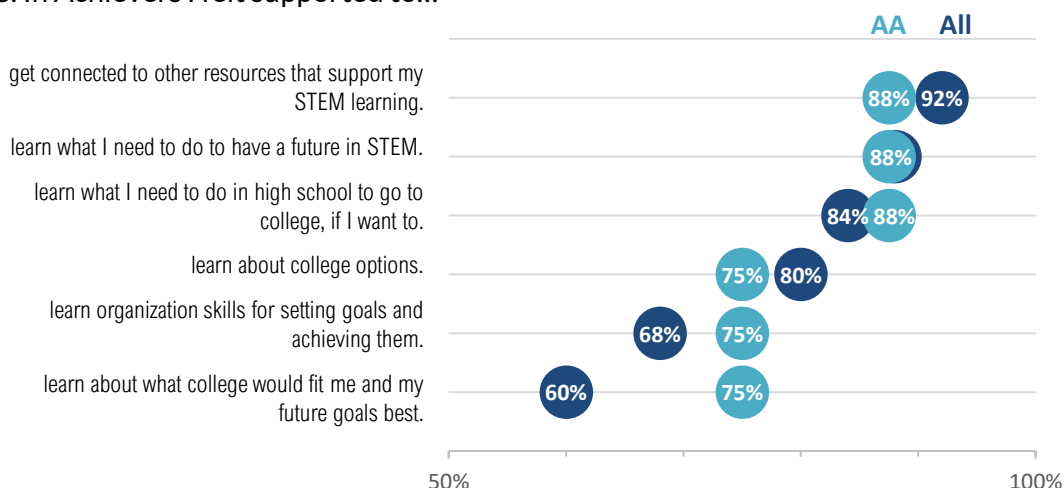
> *" I love going [to TBG] after school and being accepted by a community of girls who care and work hard towards their futures in STEM. "*
>
> *--Techbridge Girls Achievers Participant*

Educators, Families, and Role Models

Educator Results

"During our training, I was challenged by one of the co leaders to include a student that didn't normally participate in after school activities. I worked with the Special Education Department and social workers so that I could provide the supports this student needed in order to participate in the program. I got to develop a stronger relationship with both the parent and student and she participated in both semesters of the program and made new friends outside of her class. It was a great success! I truly appreciate that leaders for challenging me."

--Inspire Educator

05 Inspire Educators Evaluation Overview

INSPIRE™
Elementary School

The goals for Techbridge educators focus on supporting educators through training and program implementation. Techbridge Girls aims to help educators feel prepared, comfortable, and successful in understanding STEM careers and pathways and engaging girls in high-quality, equitable STEM. The educator survey evaluates these goals by asking educators to reflect on their own experience and the experiences of girls in their program.

During the 2018-2019 school year, 23 Inspire educators took the educator survey. At the time of writing, responses rates from Changemakers and Achievers educators were low. If more responses are collected, an update may be made to this section to include educators across all three programs. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

Inspire Educator Survey
n= 23

Years as a TBG Inspire teacher

4 years or more	13%
3 years	0%
2 years	26%
1 year	17%
Less than 1 year	43%

TBG Inspire regions

Greater Seattle	35%
DC Area	52%
Oakland	13%
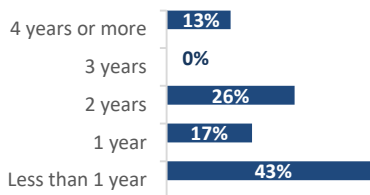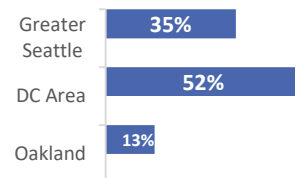
05 Inspire Educators Evaluation Summary

Overall, Inspire educators felt comfortable and supported to run the Inspire program. They felt the curriculum was sufficient to implement the program and they had what they needed and understood their role in the program. The pre-kitted materials, written materials, and the two-day training were most used and most helpful. Suggested improvements included extra materials, more science background, support with for working with school administrators, and supports for logistical concerns, such as sibling care.

Inspire educators reported that they accomplished the Techbridge Girls goals in almost all of their programs. As also demonstrated in the girls' survey data, educators were less likely to describe making connections to STEM beyond the program. Role models visits happened much more frequently than field trips and educators found them to be effective in engaging girls in STEM learning and careers.

Finally, Inspire educators reported improvements in their abilities to engage girls in equitable STEM experiences and help girls understand more about STEM careers. There is some room for improvement in their knowledge of other STEM resources and programs available to girls. Only one educator said they would not plan to return to Techbridge Girls, due to a lack of time.

"We have girls in our program who are finally talking about potential careers they'd like to pursue. STEM field or not, there are girls that now have goals and aspirations."

--Inspire Educator

ASPECT RESEARCH + EVALUATION

05 Inspire Educators

Evaluation Question 5.1: To what extent were educators prepared for their involvement with Techbridge Girls?

All Inspire educators used the pre-kitted materials, written materials and participated in the two-day training—and almost all found them to be extremely or very helpful.

Most educators found the input/coaching helpful, though three educators said it was only slightly helpful. Opportunities to interact with other TBG teachers and virtual meetings were much less frequently used. Only half of those who used virtual meetings found them to be extremely or very helpful.

Figure 79. Educator trainings and supports
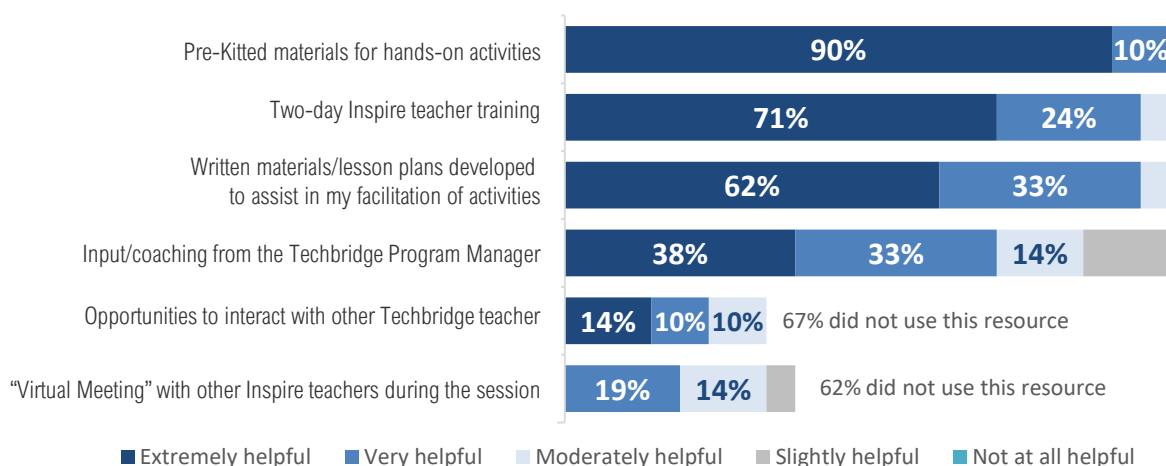
When asked to describe the most valuable aspect of the TBG training and support, educators overwhelmingly cited the opportunity to try out the activities, troubleshoot, and practice techniques for engaging girls. One educator said, "I felt fully prepared to implement the program. I was especially glad that I attended the two-day training. It was very helpful to make the projects ahead of time and troubleshoot any issues. I really appreciate having all the materials set up by week. It made it so much easier to implement."

Figure 80. Outcomes of educator trainings and supports
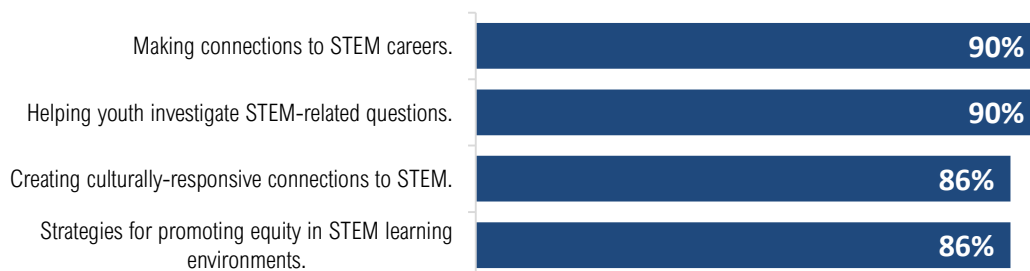
05 Inspire Educators

Evaluation Question 5.2: To what extent were educators comfortable running programs?

Overall, Inspire educators felt comfortable and supported to run the Inspire program. All educators felt that the curriculum was sufficient to implement the program. Almost everyone reported that they had what they needed and understood their role in the program.

When given the chance to describe improvements that could be made to support educators before or during program delivery, respondents said they would like extra materials, more science background, support with for working with school administrators. One educator wrote extensively on the need for meaningful support from school administrators, families, and program staff. Educators asked for supports for logistical concerns, such as childcare for siblings and safe modes for girls to get home after Inspire. One educator asked for more support around the student application process, including pre-printing materials and providing more information for them on the process. More than one person cited the need for all stakeholders to understand the STEM focus and help girls who have, or may develop, that interest to apply.

Many educators asked for more opportunities to meet or collaborate with other Techbridge Girls educators during the year. One educator said, "It would be great to connect with other Techbridge teachers throughout the program to discuss common issues, share tactics that work, and feel more connected."

Figure 81. Educator outcomes

The TBG written curriculum was sufficient to allow me to implement the program.	100%
I was comfortable facilitating the curriculum by myself.	95%
I had the equipment and materials to implement the program successfully.	95%
I knew what TBG expected of me.	95%
The workload associated with being a TBG teacher was reasonable.	86%
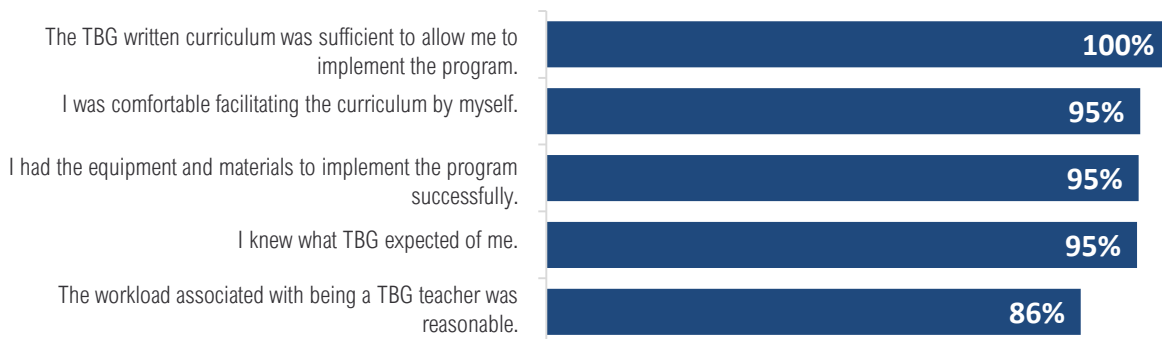
> *"Although it can be a lot to manage, I find it very rewarding to be a Techbridge teacher. The mission and values that Techbridge promotes are so important!"*
>
> *--Inspire Educator*

ASPECT RESEARCH + EVALUATION

05 Inspire Educators

Evaluation Question 5.3: To what extent were educators able to successfully implement their programs?

From the Inspire educators' perspectives, the goals were accomplished in almost all of their programs. However, educators were less likely to help girls make connections to STEM beyond the program.

All educators reported that in their program, the TBG curriculum engaged girls and that they promoted a growth mindset. Almost all programs emphasized the design process over completion and promoted positive peer relationships. Additionally, almost all educators said that the TBG curriculum was appropriate and relevant for the girls. Educators were less likely to make help girls make connections to STEM beyond the program, such as talking about career opportunities, talking with families and others outside the program, and other STEM learning opportunities to participate in or do at home.

Figure 82. Educator perspectives program implementation
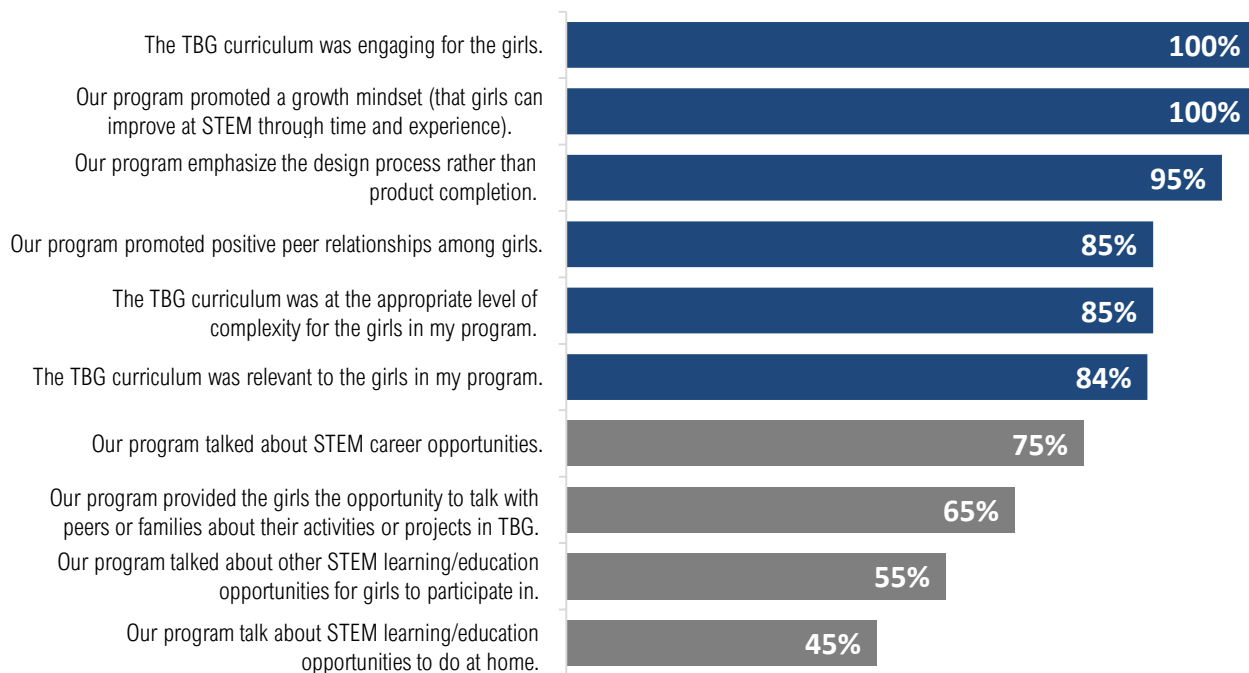
> *"The biggest success of the program this year was the improvement in persistence and problem solving. On the last day of the program, a few of the girls' initial rockets did not make it very far. Instead of me saying something or the girls getting upset (as happened at the beginning of the program), other girls who were watching started offering problem-solving ideas and suggestions. The girls then took their feedback and tried again!"*
>
> *--Inspire Educator*

ASPECT RESEARCH + EVALUATION

Evaluation Question 5.4: How often did educators take part in field trips and role model visits? How effective were these activities?

Field trips are not a part of the Inspire model, and though most Inspire educators took part in role model visits, only three did field trips (one each). Sixty seven percent of educators found the role model visits to be effective in engaging girls in STEM learning and careers.

Figure 83. Program activities
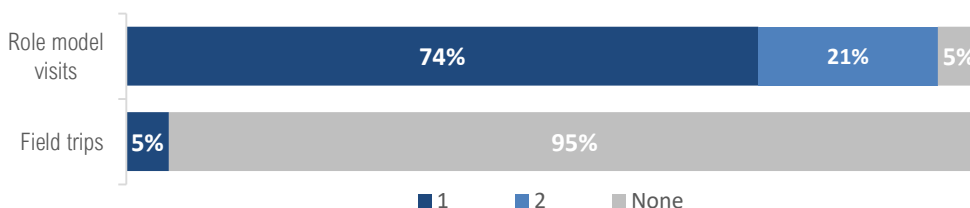
> *"My girls this year LOVED their role model visit. She did a great job giving them a little information about herself, her job, and her interests, and then she answered a TON of questions. It was great for them to see her job and her life and connect to different aspects of her experience."*
>
> *--Inspire Educator*

05 Inspire Educators

Evaluation Question 5.5: To what extent did educators believe the goals for girls were met in Techbridge Girls?

Inspire educators reported that girls in their programs improved in some areas of 21st Century Learning skills and have room to grow in others.

Almost all educators reported that most girls in their program had gained a better understanding that it can take many tries to solve a problem and improved in their persistence, collaboration, and comfort in taking leadership roles. They were a bit less likely to report that girls improved in problem-solving, but three-quarters still agreed with this statement. Educators were less likely to report improvements in girls' comfort speaking in front of others and constructing arguments.

Educators outlined some improvements they would make next year, including managing time better to fully engage in the icebreakers and curriculum without rushing, working to build a culture of learning and collaboration, and reviewing materials and activities in detail in advance. A few educators mentioned that capping the number of participants at a smaller number would help them better manage materials and activities.

Figure 84. Educator perspectives on girls' outcomes

…understand better that it can take many tries to solve a problem.	89%
…are more persistent in the face of challenges.	84%
…are better able to collaborate with their peers.	84%
…are more comfortable taking a leadership role in any activity (TBG or elsewhere).	84%
…are better at problem solving.	74%
…are more comfortable speaking in front of a group of people.	58%
…are better able to construct arguments on their point of view.	53%

Evaluation Question 5.5 (cont): Goals for girls.

Most Inspire educators reported that girls in their programs made gains in their understanding of engineering practices, STEM relevance, identification in STEM, and awareness of STEM pathways. Educators were slightly less likely to report that girls improved in their knowledge of what STEM professionals do and the path to get to those careers.

Figure 85. Educator perspectives on girls' outcomes

Girls…

…increased their ability to use the engineering design process.	89%
…understand better how STEM is relevant to their own lives.	89%
…are more likely to believe they can improve their abilities in STEM with time, practice, and effort.	89%
…have more knowledge of gender inequities in STEM.	84%
…are more confident about their STEM abilities.	84%
…are more knowledgeable about what STEM professionals actually do.	79%
…have increased knowledge of what education they need for a career in STEM.	79%

> *"The [girls] were super excited about the cookies and loved that they could chuck the package off a 1 story balcony without their cookies breaking. They were really excited about the circuits and continued modifying their design during other aftercare meetings. The stomp rockets worked so well. All of us were surprised. They were so independent and continued modifying their designs and stomping technique so that they could make their rocket better. I had a second stomp rocket so that helped with our challenge."*
>
> *--Inspire Educator*

ASPECT RESEARCH + EVALUATION

05 Inspire Educators

Evaluation Question 5.6: To what extent were the Techbridge Girls goals for educators met?

Most Inspire educators reported that because of their experience as an Inspire educator, they had improved their abilities to engage girls in equitable STEM experiences and help girls understand more about STEM careers. Only about half reported an increase in their knowledge of other STEM resources and programs available to girls. Only one person said they would not return to Inspire, due to a lack of time.

Figure 86. Educator outcomes

I increased my…

…knowledge of strategies to engage girls in STEM.	78%
…ability to provide academic guidance for girls to pursue STEM.	68%
…ability to help girls develop growth mindset	63%
…skill in delivering gender responsive instruction.	63%
…skill in delivering culturally-responsive instruction.	63%
…ability to ask good questions when leading a hands-on STEM activity	63%
…awareness of STEM careers.	63%
….knowledge about other STEM resources and programs available for girls.	47%

99% of educators said they would return to Inspire next year.

"Techbridge has been a great experience for me and my students the last two years. I enjoy the program, and I love having the opportunity to talk to girls about STEM."

--Inspire Educator

ASPECT RESEARCH + EVALUATION

Family Results

"Techbridge made a big difference in my girl, she is not afraid to make mistakes, she is confident to work with more girls, and share her ideas"

--Techbridge Girls Family Member

06 Family Evaluation Overview

Techbridge Girls aims for families to recognize their girls' engagement in STEM, and to understand STEM careers and pathways so that families can support their girls' interest in STEM. The family survey evaluates these goals by asking families to reflect on their experiences and the experiences of their girls.

During the 2018-2019 school year, 59 Changemakers and Achievers family members took the family survey. Most of the respondents identified themselves as girls' mothers, but fathers and other family members also responded. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

**Family Survey
n= 59**

Relationship to your Techbridge Girl

Mother	74%
Father	16%
Guardian	3%
Prefer to describe:	7%

Relationship to STEM

We have STEM hobbies in our family.	38%
We have a STEM career in our family.	42%
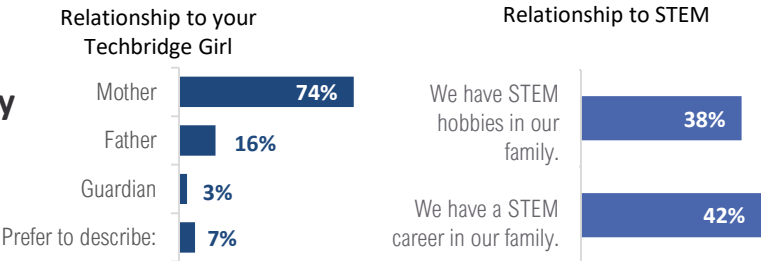
06 Family Evaluation Summary

Family members noticed several outcomes for their girls that they attributed to Techbridge Girls. For example, their girls were more interested in STEM and in pursuing further study in high school and college after their experience. Some families only noticed small changes but attributed that to girls' high interest when they joined Techbridge Girls. Families were especially likely to notice that their girl made gains in their beliefs about their STEM competencies and their willingness to try new things.

Techbridge Girls helped families learn about ways to extend girls' STEM work at Techbridge Girls to home and other settings, as well as learn about what professionals in STEM fields do in their work. Family members supported their girls in STEM in various ways, including talking to their girls about their work in the program and about studying STEM in the future.

.

> *"My girl attending Techbridge made her more interested in other interests and subjects, more outgoing, more responsible."*
>
> *--Techbridge Family Member*

Evaluation Question 6.1: To what extent did families believe the goals for girls were met in Techbridge Girls?

After Techbridge Girls, almost all family members said their girls were more interested in science, technology, and engineering and in pursuing further study in high school and college.

Families members saw a small increase in their girl talking about a job in science, engineering, or technology after the program (Figure 87). One family member said, "[My girl] was already interested but [Techbridge Girls] made her even more interested and open to science and how things work." Family members were more likely to say they were not sure than to disagree with any statement.

Figure 87. Family perspectives on girls' outcomes because of TBG

	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
My girl is more interested in science, engineering, and/or technology.	53%	43%			3%
My girl is more interested in taking science, engineering, or technology classes in high school.	45%	47%			7%
My girl is more interested in studying science, engineering, or technology in college.	42%	37%			19%

Figure 88. My Techbridge girl talked about having a job in science, engineering, and/or technology.

66% Before TBG

75% After TBG
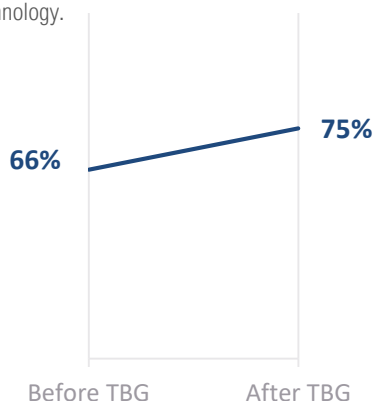
"Because of Techbridge, my daughter has taken a more interested approach to science and engineering. She enjoys going to class and learning how things are made."

"My daughter has been saying she wants to be a scientist for years. I generally encourage such things. Techbridge is nice in that it gives kids practice seeing a plan through, a letting the girls have a lot of input in the process."

--Techbridge Girls Family Members

ASPECT RESEARCH + EVALUATION

06 Families

Evaluation Question 6.1 (cont.): Goals for girls.

Almost all family members said that their girl made gains in their confidence in STEM, 21st Century Skills, and ability to prepare for a future STEM career.

From the perspectives of family members, girls especially made gains in their beliefs about their STEM competencies and their willingness to try new things (Figure 89). One family member said, "[My girl] is more confident in giving speeches to large groups. She is comfortable and trusting her studies and capable in her research." Again, family members were often more likely to say they were not sure than to disagree with any statement.

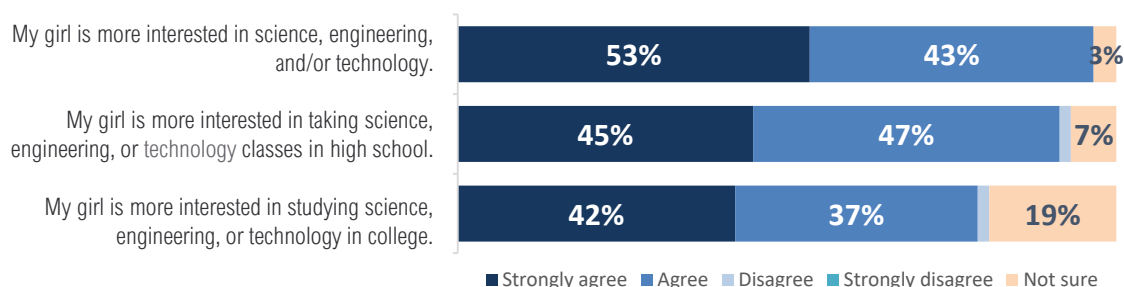Figure 89. Family perspectives on girls' outcomes

	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
My girl believes that with hard work she can be better in science, engineering and/or technology.	44%	53%			
My girl is more willing to try new things.	46%	47%			5%
My girl is better able to communicate her ideas to other people.	32%	53%			14%
My girl does not give up as easily when facing something difficult.	42%	41%			8%
My girl is more likely to share her ideas or opinions with others.	37%	46%			14%
My girl knows more about how to prepare for a career in science, engineering, and/or technology.	25%	56%			17%
My girl appears more comfortable speaking in front of a group of people.	36%	41%			12%

"Esta mas motivada y habla mucho de los proyectos que realizan en el programa."

"She is more motivated and talks a lot about the projects they carry out in the program."

--Techbridge Girls Family Member

ASPECT RESEARCH + EVALUATION

Evaluation Question 6.2: To what extent were the Techbridge Girls goals for families met?

Most family members reported that they learned more about how to extend the Techbridge Girls activities to home and other settings and what professionals in STEM fields do in their work. Family members described supporting their girls in STEM in various ways.
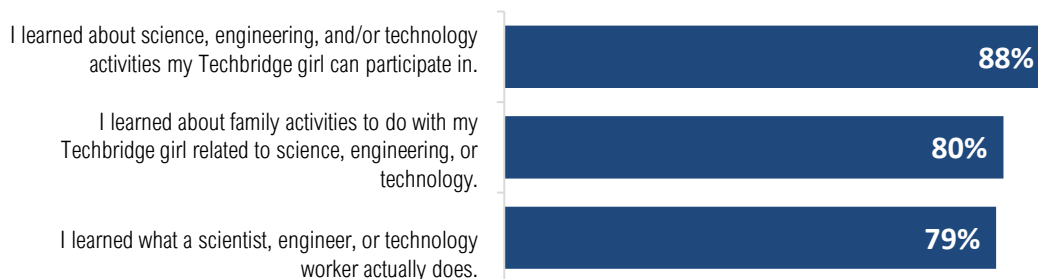
Additionally, participants noted several changes in their family's attitudes toward or interest in science, technology, and engineering. One family member said, "Ayudo a mi hija aprender una careera en ingenieria. [I help my daughter learn about a career in engineering.]"

Figure 90. Family outcomes

I learned about science, engineering, and/or technology activities my Techbridge girl can participate in.	88%
I learned about family activities to do with my Techbridge girl related to science, engineering, or technology.	80%
I learned what a scientist, engineer, or technology worker actually does.	79%

98% of family members tell their girls they want her to go to college.

90% said because of TBG they are more able to talk to their girls about careers in science, technology, and engineering.

88% have encouraged their girl to study science, engineering, or technology.

79% have encouraged their girl to participate in STEM activities outside of school.

"Techbridge is one of my daughter's favorite times of the week. She has really enjoyed working on the various project she's done over the year."

"[My girl] is more outgoing and is much more interested in science."

"[My girl] likes science a lot more."

--Techbridge Girls Family Members

Role Model Results

"I enjoyed bonding with the girls and encouraging them to keep trying to solve the solar car problem when they said they had no idea. I helped to break down the task into smaller sequential bites and solve each little step. It was challenging to teach them about more technical aspects of Applied Materials as I don't have a good reference for a person's capabilities or knowledge at their age (I don't work with kids much). I quite enjoyed chilling with them at lunch, sharing our mutual interest in dance. "

--Techbridge Girls Role Model

07 Role Model Evaluation Overview

The goals for Techbridge role models focus on supporting them through training, field trips, and visits to programs. Techbridge Girls aims to help role models feel prepared, comfortable, and successful in understanding how to share their experience with STEM careers and pathways and engaging girls in STEM. The role model survey evaluates these goals by asking role models to reflect on their experiences this year.

During the 2018-2019 school year, 32 role models took the survey. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Strongly Agree and Agree).

Data Collection

Role Model Survey
n= 32

78% of role models served for the first time this year.

61% visited a Techbridge Girls program.

39% hosted a field trip at their work or school.

07 Role Model Evaluation Summary

Role models felt generally prepared for their experience with Techbridge Girls. They understood the mission of Techbridge Girls, its goals around equity, and how to effectively interact with girls toward these goals. Most role models understood the expectations for their role within Techbridge Girls, but there is some room for improvement. They found the training and materials to be generally helpful– those who accessed materials online were a bit more likely to find them helpful than webinar users found the webinars.

Role models were engaged in a variety of activities through visits to Techbridge Girls programs or field trips at their work or school. Almost all said that they were able to offer content or participate in activities that were relevant to their area of expertise. Role models engaged girls in open-ended questions to encourage girls' critical thinking, answered girls' questions, and described their job in accessible ways. They were less likely to feel confident making connections between their jobs and the girls' everyday lives.

Finally, most role models are very likely to return to Techbridge Girls. They are more likely to return because they had such a positive experience with the girls in the program and have a desire to give back to the community than because of specific program supports.

> *"In every Techbridge session I've attended, I've seen the girls build each other up and support each other, even when the activity is hard or someone is getting frustrated. With the limited support for women in STEM, even from other women, it is so encouraging to see how that may change in a few generations."*
>
> *--Techbridge Role Model*

07 Role Models

Evaluation Question 7.1: To what extent were role models prepared for the involvement with Techbridge Girls?

Webinars, online materials, and a phone call with Techbridge Girls staff were the most used resources for role models. Generally, they found the training or supports they engaged in to be helpful.
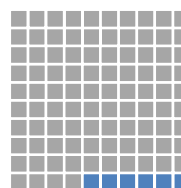
Figure 91. Role model trainings

81% of role models prepared through a webinar/web meeting. Of those, 60% agreed it was helpful extremely or very helpful.

26% of role models accessed materials online. Of those, 88% agreed that it was extremely or very helpful.
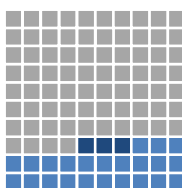
Only two role models (6%) attended an in-person training. Both agreed that the training was extremely helpful.

98% of role models understood what equity is and how TBG programs work to create equitable programs for their girls.

90% understood what Techbridge Girls' mission is.

88% felt prepared to respond to a variety of behaviors and questions that they experience during a volunteer visit.

79% understood the TBG expectations for role models.

> *"Techbridge is one of the very few outreach activities I truly enjoyed and felt like I was making a real impact."*
>
> *"This past week, I volunteered with my fellow graduate students from UW department of chemical engineering with Techbridge Girls and we discussed what data science means in our modern world today. This is a positive experience because I was able to expose to the high schoolers the world of coding and how machine learning can be used as a tool."*
>
> *--Techbridge Girls*
> *Role Models*

ASPECT RESEARCH + EVALUATION

07 Role Models

Evaluation Question 7.2: To what extent were the role models able to participate in Techbridge Girls program activities?

Role models were engaged in a variety of activities through visits to TBG programs or field trips at their work or school. Almost all said the content or activities were relevant to their area of expertise.

Nineteen of the role model survey respondents (61%) visited a TBG program at least once (Figure 92). Eleven role models hosted one field trip at their work or school and one person hosted three or more field trips. Ninety percent of role models said their own work or expertise was at least somewhat related to the activities the role models did with girls on the visit.

During role model visits and field trips, role models engaged girls in a variety of ways, including question/answer sessions and facilitating hands-on activities (Figure 93). All role models encouraged girls to ask them questions and facilitated hands-on activities. Most frequently, role models shared their educational pathway and how they decided to work in STEM. Fewer conducted icebreakers or led tours of their worksite/school.

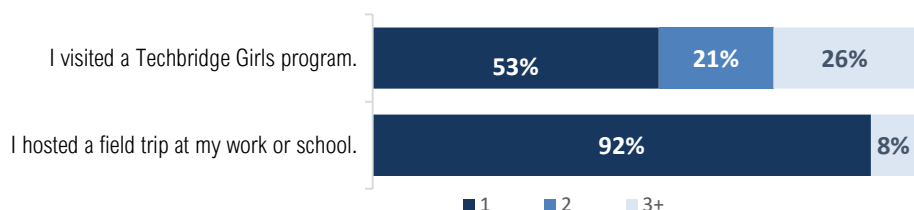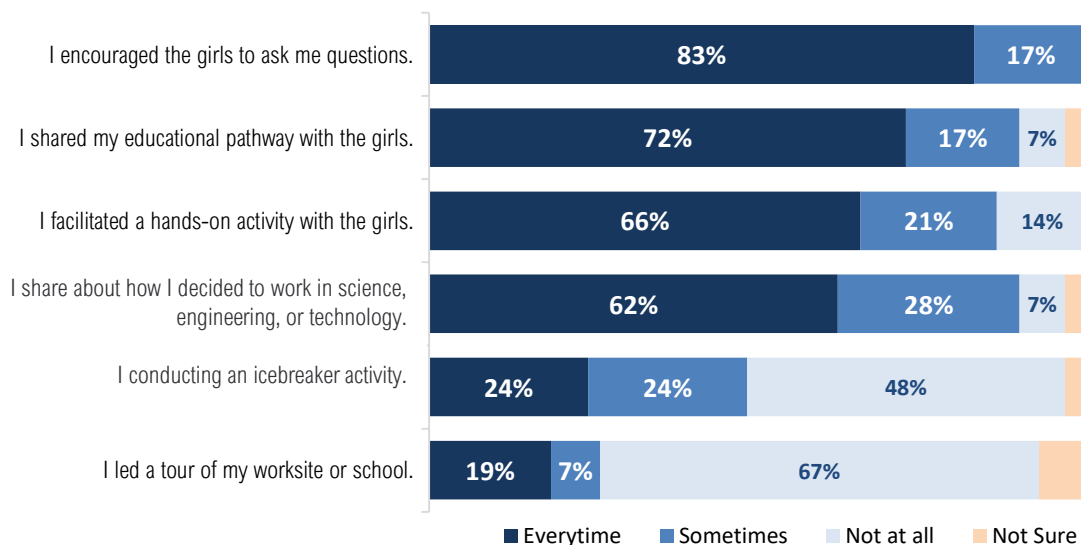Figure 92. Role model program activities
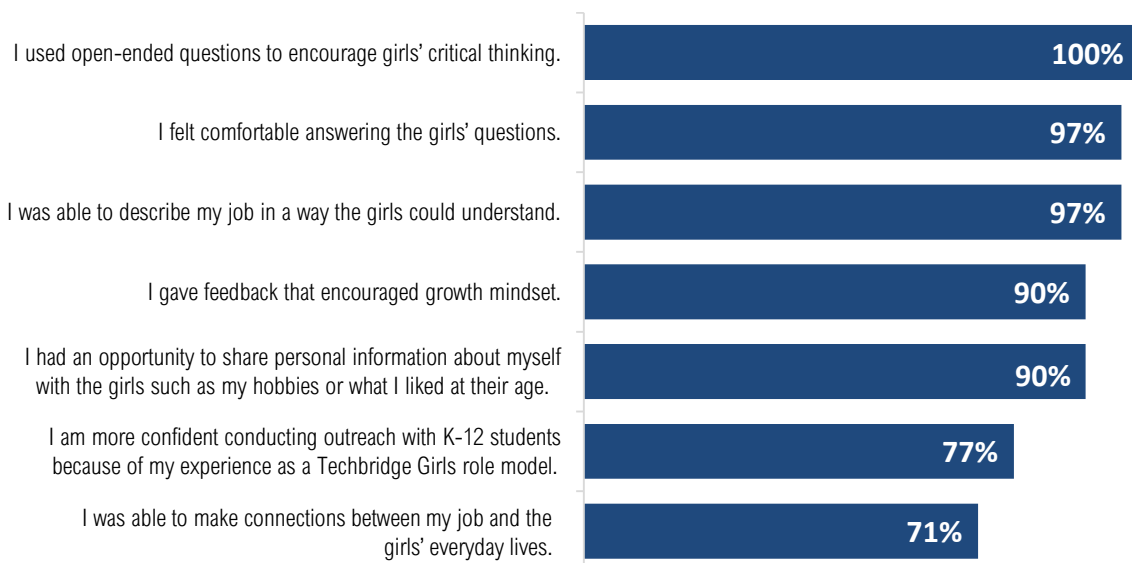

Figure 93. Role model activities

07 Role Models

Evaluation Question 7.3: To what extent were role models able to successfully participate in programs?

Overall, role models felt that they were able to engage in Techbridge Girls in important ways, including using open-ended questions to encourage girls' critical thinking, being comfortable answering questions, and describing their job in accessible ways.

Most were able to give feedback to girls that encouraged a growth mindset and share personal information about their own background and pathways. About three-quarters gained confidence this year to conduct K-12 outreach because of their experience.

Figure 94. Role model activities

Activity	Percentage
I used open-ended questions to encourage girls' critical thinking.	100%
I felt comfortable answering the girls' questions.	97%
I was able to describe my job in a way the girls could understand.	97%
I gave feedback that encouraged growth mindset.	90%
I had an opportunity to share personal information about myself with the girls such as my hobbies or what I liked at their age.	90%
I am more confident conducting outreach with K-12 students because of my experience as a Techbridge Girls role model.	77%
I was able to make connections between my job and the girls' everyday lives.	71%

100% of role models said that overall, the experience of being a Techbridge Girls role model has been worthwhile.

"I was extremely impressed by the project the girls were doing and it made me even more excited to find additional ways to volunteer with Techbridge Girls and similar outreach programs."

--Techbridge Girls Role Model

07 Role Models

Evaluation Question 7.4: In what capacity do role models expect to continue their service with Techbridge Girls?

Sixty-five percent of role models (22) expect to return to Techbridge Girls next year. Eleven are not sure yet and only one said they would not return, due to a move out of the area.

Most role models are likely to return because they had such a positive experience with the girls in the program (Figure 95). As one role model said, "Inspiring young girls with STEM is both rewarding and priceless. I genuinely enjoy working with them!" Most also have a desire to give back to the community. The convenience of the trainings and quality of the materials play less of a role in their decision to come back next year (Figure 96).

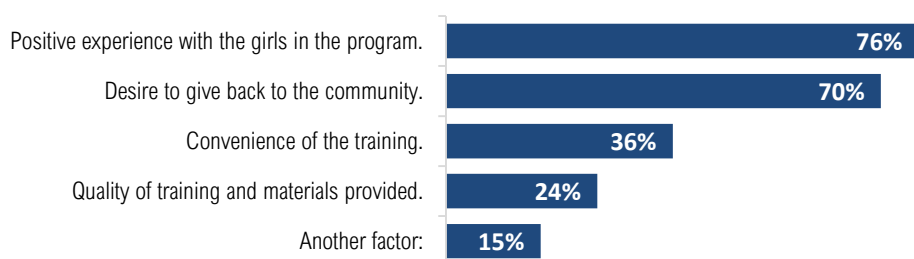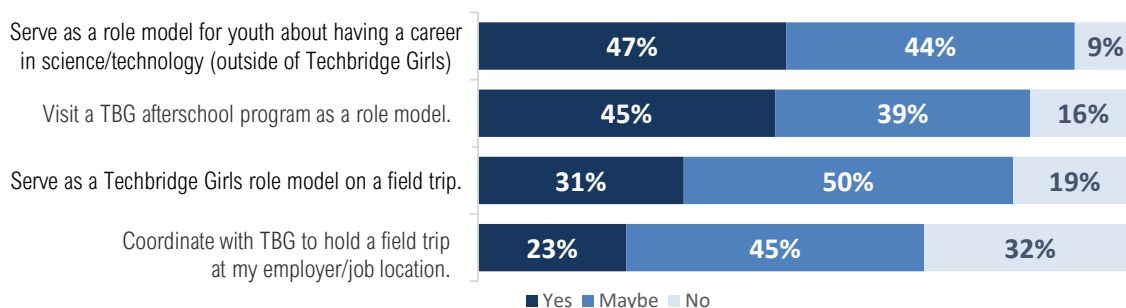Figure 95. Factors affecting role models' decision to return

- Positive experience with the girls in the program. — 76%
- Desire to give back to the community. — 70%
- Convenience of the training. — 36%
- Quality of training and materials provided. — 24%
- Another factor: — 15%

Figure 96. Role model plans for next year

	Yes	Maybe	No
Serve as a role model for youth about having a career in science/technology (outside of Techbridge Girls)	47%	44%	9%
Visit a TBG afterschool program as a role model.	45%	39%	16%
Serve as a Techbridge Girls role model on a field trip.	31%	50%	19%
Coordinate with TBG to hold a field trip at my employer/job location.	23%	45%	32%

> *"The girls were very engaged and willing to learn and participate. I really enjoyed sharing my experiences with them at the beginning of the program. Its been a very well-organized program, and its been very easy to volunteer and organize the visits."*
>
> *--Techbridge Girls Role Model*

ASPECT RESEARCH + EVALUATION

04 Conclusions

In summary, Techbridge Girls programs supported girls to develop their STEM pathways, especially those from groups historically marginalized in STEM. Girls who took part in Techbridge Girls in 2018-2019 found community, shared interests, opportunities for exploration and identity building, and developed their 21st Century Learning Skills and socio-emotional learning. Some high-level themes emerge across the programs that may be further examined for implications in future programs.

First, girls were generally engaged and interested in the activities they did in Techbridge Girls across the programs. Techbridge Girls programs helped about half of girls change their minds about their future. Additionally, about half of girls saw the activities as related to their future plans. When girls talked about the program, they especially talked about the sense of community, the fun projects, the opportunities for collaboration and persistence, and learning about future possibilities they did not know existed.

Girls in Changemakers and Achievers learned more about STEM, STEM careers, and themselves than the comparison group. Girls in the comparison group had similar outcomes related to socio-emotional learning and positivity about their futures and rated themselves more highly in their engagement with 21st Century Learning Skills. Additionally, though girls in Changemakers and Achievers were more positive about STEM overall, girls in the comparison group were just as likely at the end of the year to say that STEM is a good career for women. The additional supports for girls in Achievers such as resume writing, exploring college options, and support for organizational skills, were appreciated by the girls.

There were some differences for girls who identified with specific demographic groups. On average, girls who identified as African American were very positive in their perceptions of the program and its impact on them, especially related to interest and identity and their plans to spend more time outside of TBG learning about STEM. Girls who identified as Hispanic/Latinx were less likely to report gains in areas such as socio-emotional skills, perceptions about STEM careers, and their engagement in practices. Girls who identified as American Indian/Alaska Native were more positive than other girls in some areas (e.g., socio-emotional skills) and less positive in other areas, such as identifying with other girls in the program and seeing STEM as a good career for women. In some cases, only a few girls who identified with these groups completed the survey. Further examination should be considered to see how much these findings correspond with the experience of other girls in the program and how much cultural norms and expectations around feedback and data collection may impact girls' responses to the survey.

Next, families felt that Techbridge Girls programs had an important and positive impact on their girls. While some girls came into the program with interest and enthusiasm for STEM, families reported that the Changemakers, and Achievers programs strengthened their girls' interests and helped girls to see themselves in STEM. Techbridge Girls also supported families to extend STEM experiences to their family activities.

Finally, Inspire educators and role models across the programs were effectively trained and supported to run programs and support girls in the development of STEM pathways. Both educators and role models found their experience with Techbridge Girls to be rewarding and worthwhile. They described important outcomes for themselves and for the girls they interacted with.

ASPECT RESEARCH + EVALUATION