

Techbridge Girls

Final Evaluation Report

Prepared by
Shelley Stromholt
Aspect Research + Evaluation

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01 Techbridge Girls Evaluation Strategy

Introduction

The 2019-2020 evaluation set out, as in past years, to examine 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 aim to collect data from girls, educators, families, and role models in Oakland, Washington D.C., and the Seattle area. Because of school closures related to the 2020 COVID-19 pandemic, much of the evaluation was not completed. This report reflects data collected from girls and educators from the Inspire program prior to or early in the school closures, as well as a staff debrief of the Changemakers and Achievers programs in spring 2020. This debrief data was collected in place of the planned evaluation methods and gives some insights into the successes and challenges in 2019-2020.

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. *Because of changes to the evaluation plan due to COVID-19, not all these constructs were addressed in 2019-2020.*



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.

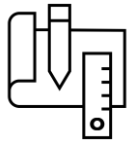
Data Collection

Girls Programs: Inspire



Girls Retrospective Pre-surveys measured select concepts focused on STEM pathways. This year, data was only collected from the Inspire program due to school closures related to the COVID-19 pandemic. 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.

Educators and Staff



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. Only Inspire educators completed the survey.



Staff Focus Group in May 2019 provided an opportunity for staff in both the Changemakers, and Achievers programs to give feedback and reflect on the successes and challenges of the programs this year.

Analysis + Reporting

Descriptive statistics were generated for survey data. 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 20% or more girls identifying with that group. Because of the school closures related to COVID-19, no comparison group data was collected as it had been in years past.

This report is organized by participant group and the guiding evaluation questions. To summarize and concisely report the data collected, survey results are reported as the sum of positive responses to Likert scale items (e.g., Agree + Agree a lot; To a very large extent + To a large extent). Some quotes 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 2019-2020 school year, 71 girls in Inspire took part in a retrospective survey. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Agree + Agree a lot).

Data Collection



Inspire Survey
n= 71

Focal Constructs for this Program



Interest in and Attitudes about STEM



Relevance



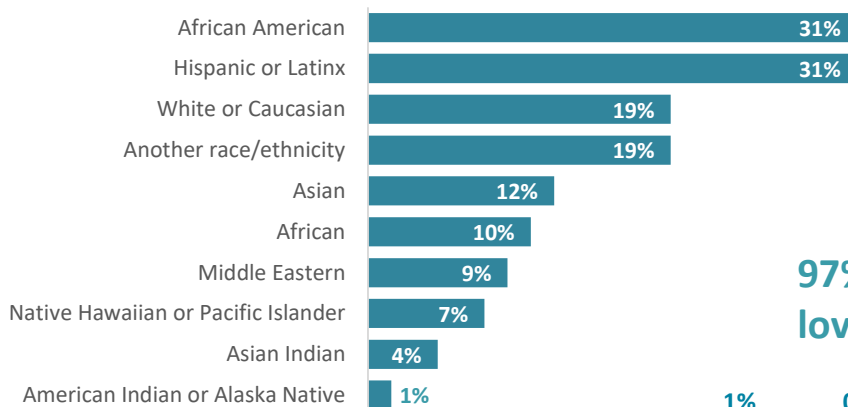
STEM Identity and New Possible Futures



Socio-emotional Learning

More on focal constructs on pg. 3.

Inspire Survey Respondent Demographics



97% of girls liked or loved Inspire.



02 Inspire



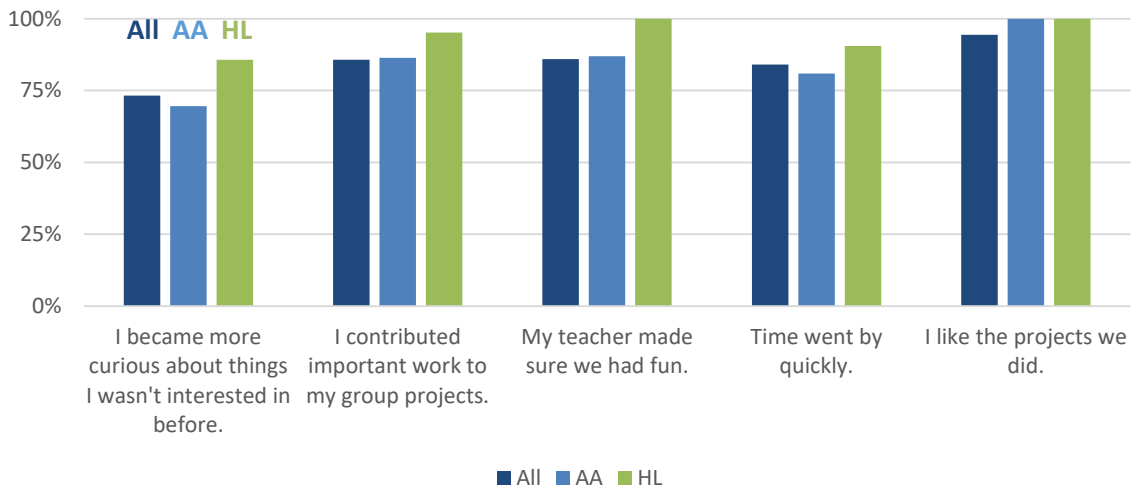
Evaluation Question 2.1: To what extent did the Inspire program influence girls' interest in and attitudes toward STEM?



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 negative 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.

Figure 1. Inspire interest and engagement



"I love Techbridge Girls because I meet different girls and experience new things. "

--Techbridge Girls Inspire participant

02 Inspire



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 (Figures 2 +3). There were some small differences between demographic groups.

Figure 2. I know what kinds of science, engineering, or technology careers I could have in the future.

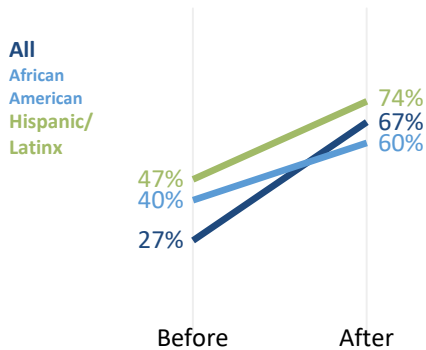
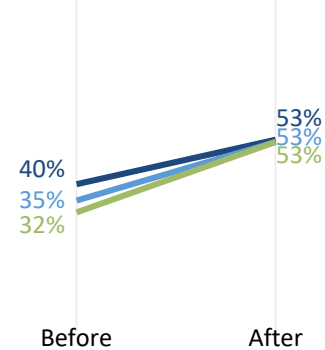
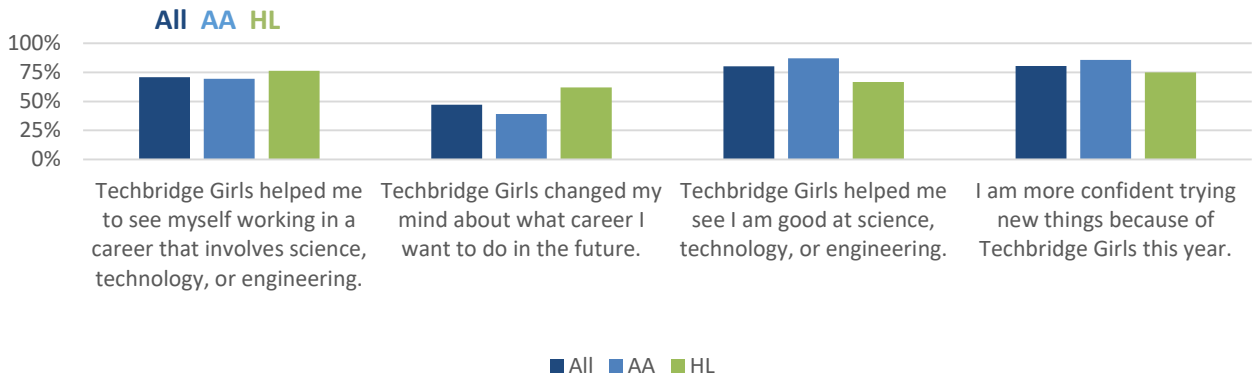


Figure 3. I am thinking of studying science, engineering, and/or computer science in college.



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, which is consistent with past years. (Figure 4)

Figure 4. Inspire new possible futures



02 Inspire

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 (Figures 5-9). For the most part, negative responses from girls overall made up fewer than 10% of the total. After Inspire, almost 90% of girls felt that someone like them could be a scientist, engineering, or work with technology. Most girls said that working in science, engineering, or technology is a good career for women.

Figure 5. I do well in science activities.

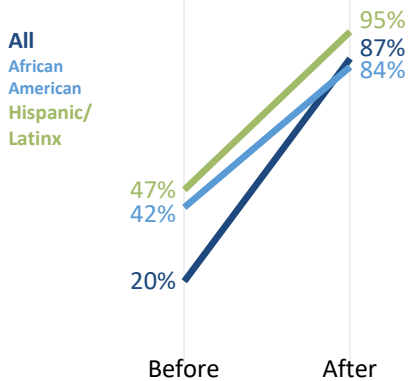


Figure 6. I do well in technology activities.

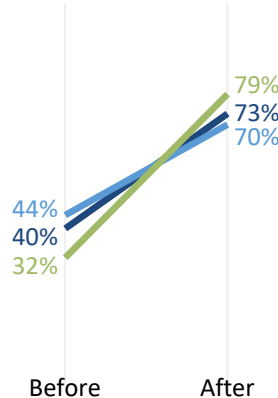


Figure 7. I do well in engineering activities.

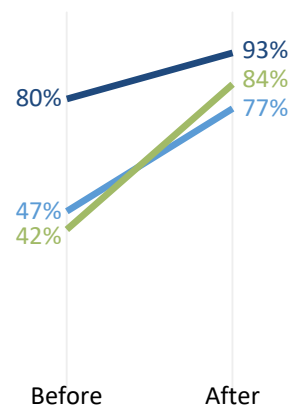


Figure 8. I think someone like me could become a scientist, engineer, or work with technology.

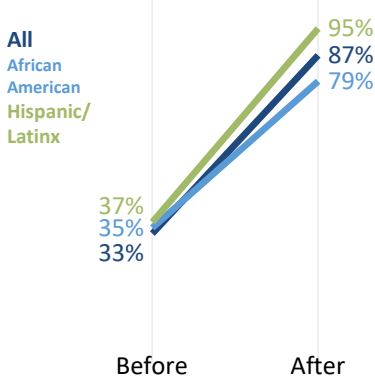


Figure 9. I think working in science, engineering, or technology is a good career for women.

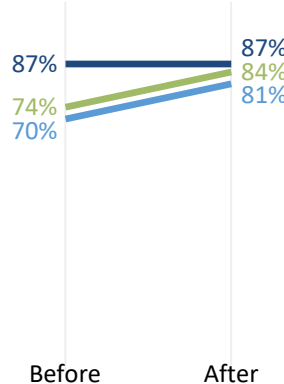
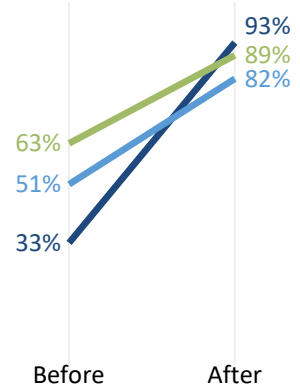


Figure 10. I think engineering is useful for solving the problems of everyday life.



Almost all girls saw the relevance of engineering to everyday life: 93% said that engineering is useful solving the problems of everyday life (Figure. 10).

02 Inspire



Evaluation Question 2.3: 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, most girls felt confident that they could understand complicated ideas and try hard to understand others (Figure 11). Most girls ended the program reporting that they tried hard to understand others and confident that they could figure out how to learn things (Figures 12 + 13).

Figure 11. When complicated ideas are presented to me, I am confident that I can understand them.

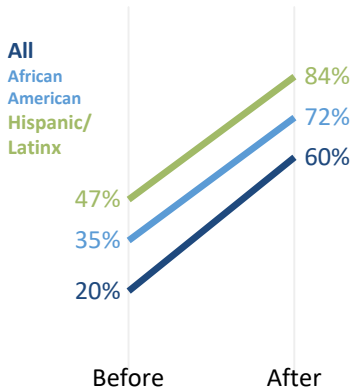


Figure 12. I try hard to understand what people are thinking or feeling.

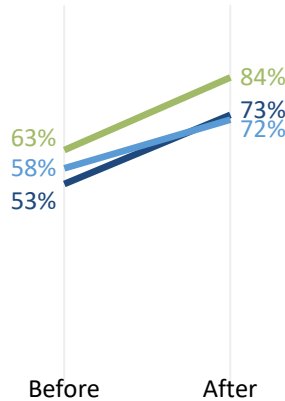
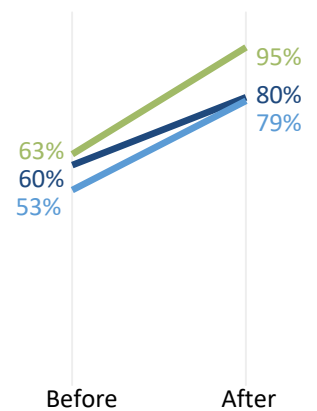


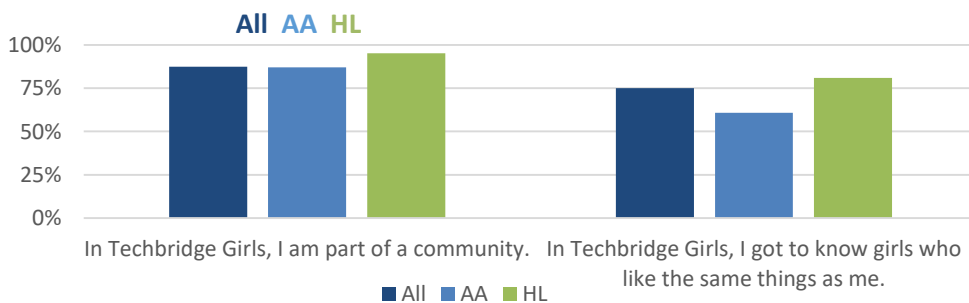
Figure 13. I can figure out how to learn things.



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 (Figure 14). One girl said, "We did a lot of fun activities. I got to know more girls that I wasn't interested in talking to before." Another said, "It's really fun and I got to meet other girls that like the same thing as I do."

Figure 14. Inspire community



03 Changemakers and Achievers Staff Debrief



Evaluation Question 3.1: To what extent were the Techbridge Girls goals for Changemakers and Achievers met?



During a May 2020 focus group with four program managers for Changemakers and Achievers, we discussed their perceptions of the successes and challenges of running those programs during the 2019-2020 school year, prior to school closures due to Covid-19 in March 2020. This memo briefly outlines the highlights.

Successes

Program activities.

- Even students who were really excited, “sometimes they had stuff going on with their parents and either like a miscommunication or they forgot which day program was like came in late super upset....” I missed it. Is it okay, can I still come? Are you guys still here?”
- Girls came to be with their friends (and continuing to be present in the online offerings)
- Girls were especially excited about and engaged in activities that resulted in products they could take home (lip balm, portable phone chargers). They sometimes chose to work individually instead on these projects in order to have something of their own to take home.
- Girls in the PNW programs especially liked the activities where there was “a very evident kind of scientific thing happening,” such as growing bacteria.
- In Oakland, having the opportunity to share and process things that were going on in their own lives seemed to be meaningful to the girls and contribute to successful relationship and community building.
- Girls had opportunities to learn about new opportunities in STEM and how those are complementary to things they already enjoy. TBG created space for girls to dream together.
- In Achievers, a lot of girls had great leadership opportunities.

For example: One girl is working to create a Youth Advisory Board right now for Techbridge Girls.

- Girls took opportunities to help each other learn how to do things.

For example: Girls were cutting the phone charger tins using the nibble errs, and one of them figured out how, and then helped another student who couldn't.

- Girls had opportunities to interact with peers that they otherwise wouldn't interact with, including people that were outside of their friend groups or their class schedule, building interactions with people who are different from them and people outside of their circles.

Successful program manager experiences.

- For new staff, it took some time to get into the swing of things, but the other staff were supportive and helpful.
- Going through the activities with partner teachers was very helpful.

Role model visits.

- Role models were successful to varying degrees– those with relatable stories were most engaging for girls.
- Some role models were able to bond with girls through outside interests, shared experiences.

For example: One role model attended the same middle school was a Techbridge Girls alumnae. She bonded with the girls over a shared love of anime and manga.

Field Trips.

- Field trips were also successful to varying degrees-- those that organized interactive activities for girls were more successful.
- Panels were less interesting and engaging.

For example: One group visited Bates White, an economic consulting firm. Staff reported that Bates White did a really nice job of engaging the girls in several ways. For example, they broke the day into chunks, planned structured interactive activities and games, and female employees sat with the girls the first half of the day.

03 Changemakers and Achievers Staff Debrief

Evaluation Question 3.1 (cont.)

Challenges

Recruitment and registration.

- Online registration was an issue for some.
- Lots of competition from other clubs across sites.

Attendance.

- In several programs, attendance went down over as the year progressed, for a variety of reasons.
 - Daylight saving meant that girls were walking home in the dark.
 - Schools that had attendance problems continued to have them.

For example, at one school that the program manager described as “rigid.” The school environment wasn’t inviting for students to stay afterschool.

School support was an issue in some sites.

- Getting meetings with the principal or the OST person was difficult.
- It would have been helpful to table or share at events.
- Relationships with school staff might have helped with attendance.

Challenges for program managers.

- There were challenges around well-defined roles. It wasn’t always clear to staff what was within and outside of the scope of each job. In some situations, program managers were left out of conversations that would have been helpful (such as field trip logistics in one case, resulting in miscommunication with bus driver and shortened field trip experiences)
- Building consistent relationships with the girls is so important. It takes time to do and the turnover in staff can be challenging for girls

“...and I feel like it gives them a space to like, find a future where they could pursue STEM and feel encouraged in that because there's a lot of other girls hoping for the same thing. Or like dreaming of a potential with the same thing. So whether they actually do that, or it leads them in another direction...I feel like it gives them a space to have like full permission to dream about those sorts of things. And then to start to make plans to pursue them as well. ”

--Techbridge Girls Staff Member



Inspire Educators

04 Inspire Educators Evaluation Overview



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.

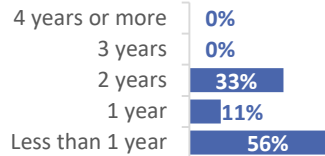
During the 2019-2020 school year, 9 Inspire educators took the educator survey. To concisely present the data collected, survey results are generally reported as the sum of positive responses to Likert scale items (e.g., Agree + Agree a lot).

Data Collection

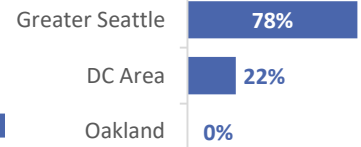


Inspire Educator Survey
n= 9

Years served as a Techbridge Girls Inspire teacher



TBG Inspire Regions



04 Inspire Educators Evaluation Summary

Overall, as in 2018-2019, Inspire educators felt comfortable and supported to run the Inspire program in 2019-2020. 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.

Inspire educators reported that they accomplished the Techbridge Girls goals in almost all their programs. Educators were less likely to describe making connections to STEM beyond the program. Finally, Inspire educators reported improvements in their abilities to engage girls in equitable STEM experiences and help girls understand more about STEM careers. As in years past, there is some room for improvement in their knowledge of other STEM resources and programs available to girls.

“The girls were able to talk about the positives and negatives throughout each activity. They would go through the activity and if they messed up they would try again or try in a different way. The girls were helping each other and really pushing each other to try their best. It wasn't about finishing it was about how they got through each challenge. This program allowed them to have fun and allowed them to encourage each other. I just am so excited to keep it going.”

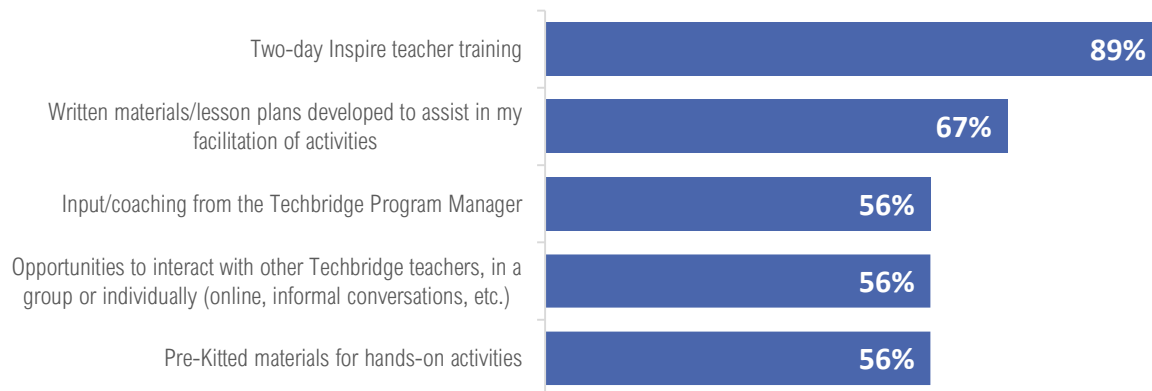
--Inspire Educator

04 Inspire Educators

Evaluation Question 4.1: To what extent were educators prepared for their involvement with Techbridge Girls?

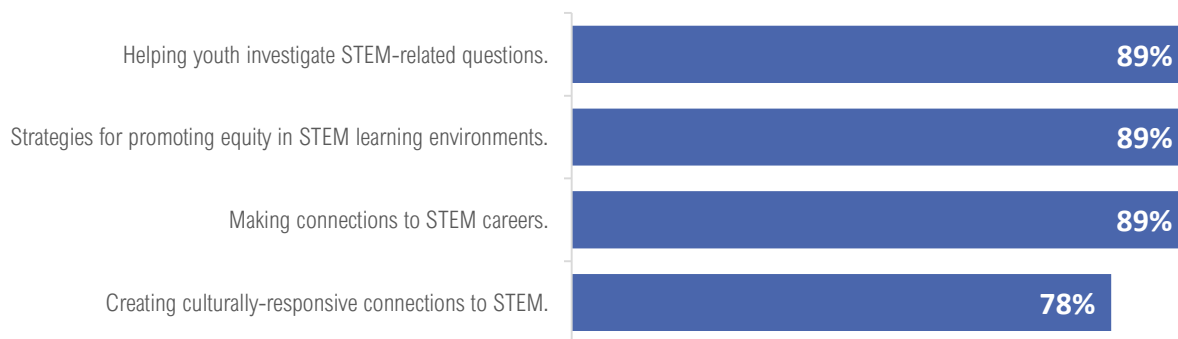
Most Inspire educators found the two-day training and the written materials/lesson plans to be helpful (Figure 15).

Figure 15. Which trainings/supports were helpful? (Respondents could select N/A if they did not participate)



Most Inspire educators found the training helpful for gaining strategies for helping youth investigate STEM-related questions, promoting equity in STEM and making connections to STEM careers (Figure 16).

Figure 16. How helpful has the Techbridge Girls training and support been to you for the following aspects of this year?

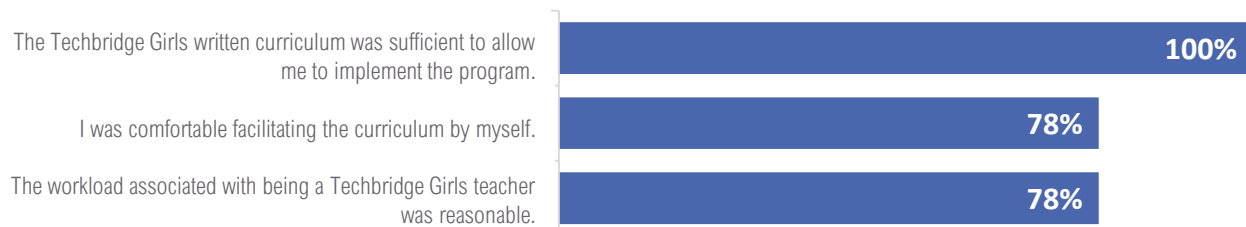


04 Inspire Educators

Evaluation Question 4.2: 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 (Figure 17). Almost everyone reported that were comfortable and the workload was reasonable.

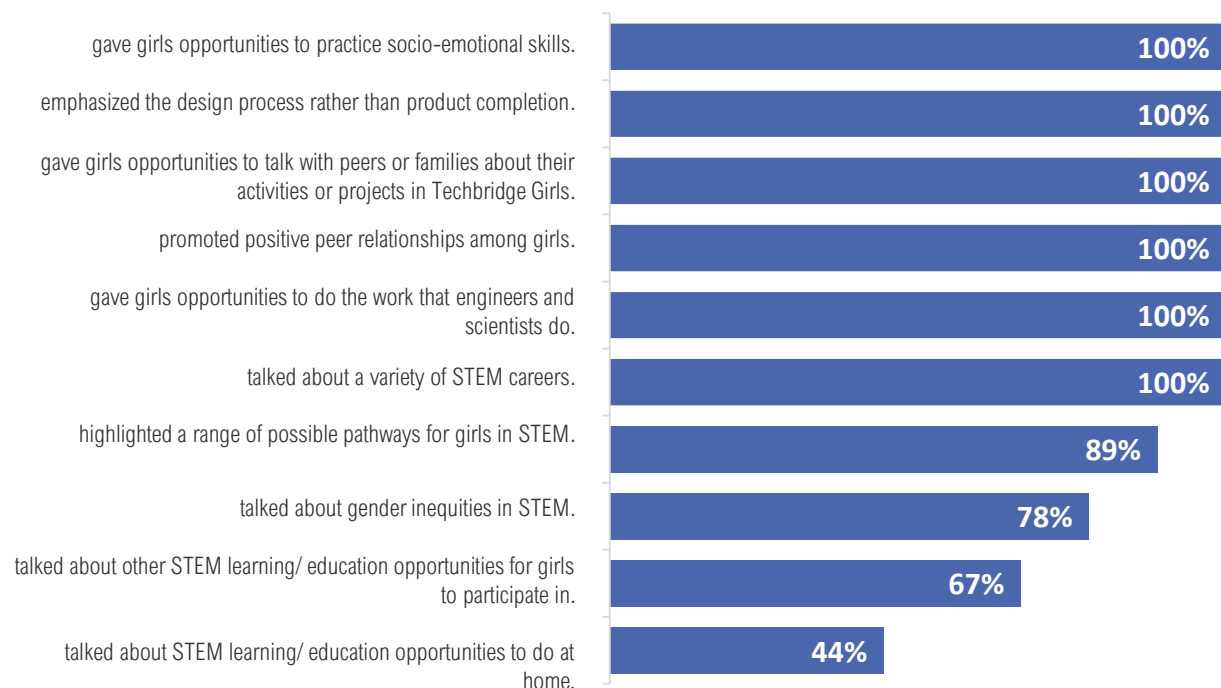
Figure 17. Program supports



Evaluation Question 4.3: To what extent were educators able to successfully implement their programs?

From the Inspire educators' perspectives, the goals were accomplished in almost all their programs (Figure 18). However, educators were less likely to help girls make connections to STEM beyond the program.

Figure 18. Program implementation



04 Inspire Educators

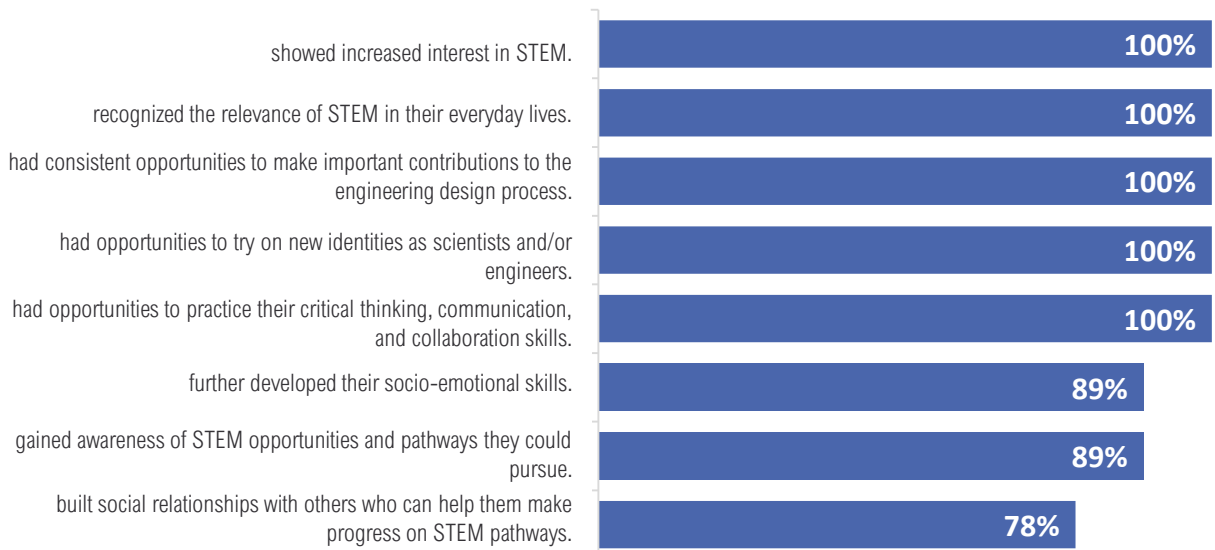
Evaluation Question 4.4: To what extent did educators believe the goals for girls were met in Techbridge Girls?

All Inspire educators reported that girls in their programs made gains in their understanding of engineering practices, collaboration, their interest in STEM and their recognition of the relevance of STEM (Figure 19). They all reported that girls had consistent opportunities to contribute to engineering, to practice new identities, and 21st Century Skills such as communication skills (Figure 20). Educators were slightly less likely to report that girls improved in their ability to construct arguments or comfort taking a leadership role (Figure 19).

Figure 19. Outcomes for girls



Figure 20. Outcomes for girls

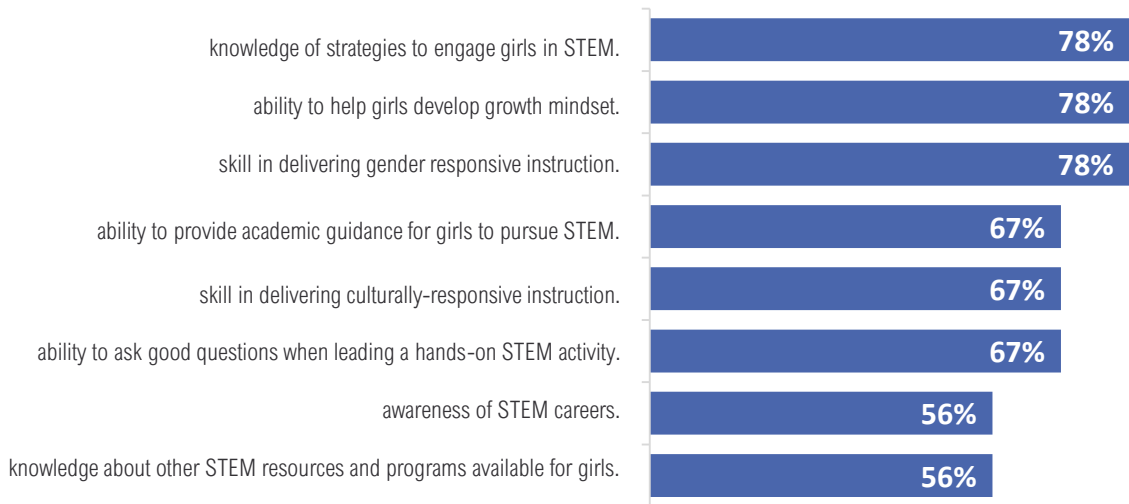


04 Inspire Educators

Evaluation Question 4.5: 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 knowledge of strategies to engage girls in STEM, to help girls develop a growth mindset and to deliver gender-responsive instruction. Only about half reported an increase in their knowledge of STEM careers and other STEM resources and programs available to girls (Figure 21).

Figure 21. This year, Techbridge Girls increased my...



8 out of 9
educators
said they
would return
to Inspire next
year.

“I really enjoyed facilitating it. My students really loved it and got a lot out of it. I really think it is life changing for girls. I am really excited to get to do it again.”

--Inspire Educator

05 Conclusions

In summary, Techbridge Girls programs supported girls in the Inspire, Changemakers, and Achievers programs to develop their STEM pathways, especially those from groups historically marginalized in STEM. Though there are gaps in the data this year due to COVID-19, there is evidence to suggest that girls who took part in Techbridge Girls in 2019-2020 found community, shared interests, opportunities for exploration and identity building, and developed their 21st Century Learning Skills and socio-emotional learning.

As in years past, girls were generally engaged and interested in the activities they did in Techbridge Girls across the programs. Most girls in Inspire reported engagement, interest, and a recognition of their contributions to TBG work. Overall, girls in Inspire became more aware of STEM pathways and new possible futures and grew in their intent to pursue STEM. Girls in Inspire grew in their identification as people who do well in STEM activities. The biggest increases were related to science activities.

Changemakers and Achievers staff reported general successes in the program activities. They said that girls were especially excited about and engaged in activities that resulted in products they could take home (lip balm, portable phone chargers). Staff faced some challenges, including registration challenges, and challenges working with their school site contacts.

Finally, Inspire educators 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.

Overall, Techbridge girls made progress toward meeting the goals for girls in their programs. Because of the gaps in this year's data due to COVID-19 closures, continued analysis next year will provide further insights into the program outcomes.