# Gender Equitable Teaching and Advising Strategies (GETAS)

# SciGirls Strategies Implementation Evaluation Report

# May 2020

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# I. Background and Purpose

For the *SciGirls Strategies* supplement, ten educators were trained to be *SciGirls Strategies* trainers during June 2019 (see the Training Evaluation Report). During that time, they developed action plans for their local teacher training. The goal was for each Trainer to train ten or more teachers in their local schools/districts. Trainers could plan and schedule their workshops to fit their local context in order to accomplish the objectives of building teacher's confidence and skills in using gender equitable and culturally responsive teaching strategies. After the training workshop, the trainers met once a month virtually and had continual access to the facilitators of their training (University of Minnesota professor Dr. Barbara Billington and St. Kate professor, Dr. Siri Anderson, the project's Co-PI Dr. Brenda Britsch and two TPT staff members, Leah Defenbaugh and Alex Dexheimer).

This report characterizes the implementation of the local training using data from trainer interviews, trainer surveys, and teacher surveys. The data were analyzed to draw conclusions about the critical factors in the preparation and implementation of the Train the Trainer (TTT) model and its success with participating teachers.

The goal of the *SciGirls Strategies* project are:

1) To increase the number of high school girls, including ethnic minorities, recruited and retained in traditionally male CTE-STEM pathways;
2) To enhance the teaching and coaching practices of CTE educators, counselors and role models with gender equitable and culturally responsive strategies;
3) To research the impacts of strategies and role model experiences on girls' interest in STEM careers;
4) To evaluate the effectiveness of training in these strategies for educators, counselors and role models; and
5) To develop training that can easily be scaled up to reach a much larger audience.

The goals of the *SciGirls Strategies* supplemental TTT activity are to:

1) Leverage the existing accredited **SciGirls GETS** course, resources and best practices to a new educator population across ten school districts in Minnesota and Western Wisconsin by employing a Train-the-Trainer model
2) Support **SciGirls GETS** Minnesota and Western Wisconsin trainers as they deliver the educator curriculum to ten school districts and 120 educators and counselors for CEU and graduate credit;
3) Build additional significant long-term capacity around gender equitable and culturally responsive CTE and STEM education within each participating school district engaging 25,000 students.

Course resources may be accessed at: **Genderequitableteachingstrategies.weebly.com**

**Educator Assignments required for the Gender Equitable Teaching and Advising Strategies (GETAS) Course Completion (CEUs and Stipends)**

(Note that percentages for assignments refer to CEU requirements.)

1. Self-Assessments - CRP & GETAS (30%) - These both happen during the first 2-4 weeks: 1) GETAS Rubric (by reporting on the Self-Assessment on GETAS Google Form), 2) My Culturally Responsive Practices Rubric.

2. Portfolio - 4-6 submissions over the year (30%) - One required submission will be your praxis on Role Models. These postings will occur during the academic year. Final reflection due in May/June. These postings will include evidence collected in your class or school, examples of lesson plans you've modified to include GETAS strategies, student work samples, data analysis, recorded conversations with students, teachers, counselors.

3. Ongoing Accountability/Engagement/Participation (30%) - Your participation happens throughout the year and your team's monthly meetings and will be assessed through attendance, participation in F2F or/and online discussions, keeping up to date on postings/interactions on Facebook, providing feedback to peers, and communicating with your school's counselors about considering strategies to promote an increase in girls and students of color in STEM-CTE classes.

4. Responses to Surveys/ Class Reflections (10%) (Happens throughout the year).

## II. Evaluation Design, Methods, and Measures

The external evaluation examined both the TTT model and the effect on the trainees' teaching practice using a mixed-methods approach (Frechtling, 2010), collecting quantitative and qualitative data on the nature and extent of the effects. Each activity is described below.

- *Train-the-trainer workshops:* Conduct a needs assessment of trainers, analyze train-the-trainer model for best practices, analyze daily trainee surveys and provide feedback to facilitator.
- *Monthly webinars:* Data on offerings and attendance.
- *District training*: Analyze trainer's delivery of the professional development, analyze trainer and trainee end of year surveys, interview trainers in May (note three sites also had interviews of trainees)

The evaluation timeline is below:

| | |
|---|---|
| June 2019 | Needs Assessment by trainers signed up for TTT workshop |
| June 25-28 | TTT workshop daily surveys |
| May 2020 | Trainer course implementation survey |
| | Trainee implementation survey |
| | Focus groups with trainer and trainees from implementing sites |

## III. Results

Ten teachers were accepted into the program based on their applications to become *SciGirls Strategies* Trainers and offer workshops for their local teachers. They all planned to implement but seven were unable to during the 2019-2020 school year. The three sites that implemented are described with their critical success factors (teacher trainees were also interviewed). The *SciGirls Strategies* Trainers who were not able to implement this year (due to COVID-19 and other factors) are planning deliver their training over the summer of 2020 and during the 2021 academic fall semester. Interviews with those trainers were designed to better understand the barriers that prevented them from offering the course as they had intended.

### III.A. Trainers' Background

In the needs assessment completed before the TTT workshop, trainers reported they **signed up to be a trainer because** they were passionate about helping girls stay interested in STEM, wanting to be able to support girls and all learners, and wanting to be trained in ways that would benefit girls in STEM.

In the needs assessment completed before the TTT workshop, **trainers did not rate themselves proficient on the *SciGirls Strategies***. They rated their understanding on a scale of 1-3, where 1=exemplary, 2=proficient. 3=novice.

| | 1-3=novice | Rating |
|---|---|---|
| Empowering Girls in STEM/CTE and Thoughtful Communication | | 2.3 |
| Promoting Students' Solving Problems and Investigating Questions | | 2.4 |
| STEM/CTE are Collaborative and Learning is Social | | 2.4 |
| Cultural Awareness and Relevant Learning Experiences | | 2.7 |
| STEM/CTE Role Models | | 2.8 |
| Challenging STEM/CTE Stereotypes | | 2.9 |

The trainers reported that they were **not very experienced with using** *SciGirls Strategies* in the past, before the TTT workshop. 1-10, 1=no experience, 10=very experienced

| | N=10  1-10 | Rating |
|---|---|---|
| Emphasize that STEM is collaborative, social, and community-oriented. | | 6.7 |
| Empower girls to embrace struggle, overcome challenges, increase self-confidence in STEM. | | 5.6 |
| Support girls as they investigate questions and solve problems using STEM practices. | | 5.5 |
| Encourage girls to identify and challenge STEM stereotypes. | | 5.0 |
| Connect STEM experiences to girls' lives. | | 4.4 |
| Provide opportunities for girls to interact with and learn from diverse STEM role models. | | 3.8 |

Their **expectations** for the TTT workshop were that by the end of the week, teacher trainers would understand what they were being asked to do, be able locate and organize the resources their teacher trainees could use, have ideas for getting buy-in from their staff, and have a plan. All trainers had agreements signed by their school or district that allowed them to participate.

In the needs assessment, trainers **anticipated that the barriers** in offering the training in their local school and/or districts would be teachers finding time to participate, attracting and keeping teachers (particularly experienced and intransigent teachers), funding, and being knowledgeable enough to support the teachers during the training.

### III.B. Trainers' Success Factors
At the end of the TTT, trainers reported that they felt the face-to-face training would turn out to be very **important to their success**, followed by personal support from facilitators, the Weebly course materials, and district support for the course.

How important was each of the following activities in your success as a trainer? 1-10, 1=Not important, 10=critically important

| | N=10  1-10 | Rating |
|---|---|---|
| The face-to-face train the trainer workshop in June 2019 | | 9.7 |
| Personal support from facilitators | | 8.3 |
| Weebly course materials | | 8.2 |
| District support for the course | | 7.9 |
| Monthly webinars | | 6.7 |
| Other trainers | | 5.8 |

Eleven months later (May 2020), the seven trainers who did not offer courses **reported several problems**. These included: not having had time to get their action plan together so they didn't recruit teachers; only a few teachers expressing interest; district support was not there or changed; and heavier than expected course loads.  In March the COVID-19 pandemic closed all schools and prohibited trainers who had hoped to train in the spring from starting, as all teachers had to switch to distance learning for their students.

The three trainers who were able to offer the GETAS course **recruited widely**, but then asked people they knew or worked within a group (their Professional Learning Community, or PLC) or who were like-minded (value diversity, have a growth mindset). Trainees in those courses reported in the May 2020 focus group that the individual invitation from a trusted colleague with a specific plan and doable expectations on an important topic made them want to sign up.

All the trainers who did not offer a course **intend to offer one**, some beginning this summer, others in the fall. They have been addressing the problems they had last year, like talking to administrators, personally recruiting colleagues, planning to start this summer when teachers have more time. They are all still committed to the value of the program. **Six of the seven have changed their own classrooms because of their training.**

**Details of Successful Course Implementation**
Sites that implemented during the 2019-2020 school year had different formats. At one site the district paid for substitutes and food for two full days, SciGirls Strategies GETAS sessions were held during district staff development, plus stipends were provided for 18 hours of additional work done outside of the group training hours. This trainer was able to recruit ten teachers and all finished the course. At a second site, the group met once a month for an hour after school and during available professional development (PD) days; seven out of the nine teacher trainees finished the course. At a third site, the teachers do online only instruction. They used their PLC time for the course; all nine trainees finished.

| Dates offered | When, where, and how met |
|---|---|
| *September 2019-December 2020* | Face to face for 18 hours and up to 16 hours of prep, reflection, and work time. Training dates: <br> Thursday, Sept. 19, 8 – 3:30 (full day sub and lunch provided) |
| *10 started* <br> *10 finished* | Monday, Sept. 30, 2 sessions of district staff development <br> Friday, Nov. 1, 2 sessions of district staff development <br> Wednesday, Dec. 4, 8 – 3:30 (full day sub and lunch provided) <br> Plus, an additional staff development stipend of up to 18 hours for work done beyond the scheduled training hours. |
| *2019-2020* <br> *9 started* <br> *7 finished* | We would meet once a month for an hour after school and during available PD days in my classroom. |
| *9/19 - 4/20* <br> *9 started* <br> *9 finished* | We met as part of our PLC on line.  For some of the book groups, we met in person. |

The trainers identified the **most effective elements** of their courses. As in the TTT workshop evaluations, the teachers in the local courses valued discussion with colleagues, reflection, and resources:

- *Teacher discussion and work time for planning.*
- *Regular meetings and reflections*
- *Sharing with each other what we are trying in our classrooms. What is working, what is not working.*
- *The information about the SciGirls strategies.*
- *Meeting and discussing information with PLC.*
- *Touring Public Television.*
- *Having the book study groups.*

The trainers report the course resulted in **positive changes**.
- *Awareness, changes is lesson plans, changes in support practice, offering more class opportunities in STEM to more students.*
- *We had good discussions amongst the group, and teachers in the group would reflect upon their own practice and how they could incorporate more gender and cultural equity. I did not survey any change within the school or district as a whole.*
- *I feel like we have better discussions about how we approach STEM and student learning. We have new insight into working with students.*

**How likely are you to facilitate again?** 1=won't, 5=definitely will *N=10*
From May 2020 trainer surveys:

| Rating | N=10, # by rating | % by rating |
|--------|-------------------|-------------|
| 1 | 0 | 0% |
| 2 | 1 | 10% |
| 3 | 1 | 10% |
| 4 | 3 | 30% |
| 5 | 5 | 50% |

Please explain:
- *I can see myself leading smaller training on the strategies during our district staff development days.*
- *I don't have much experience running PD for adults, and it was very trying. It was tricky to consistently get people to come, and making the meetings meaningful was a challenge. I do not think I did a good job, and would prefer to run PD with some experienced teachers before trying again on my own.*
- *Now that I know how things work, I would be able to provide a better experience.*

**Suggestions for Improving Trainer Training from Trainers**
- *Make it longer but spread out*
- *Provide more practical examples of exemplary lessons*
- *Provide slide shows and agendas from past SciGirls courses to get us started*
- *Need ideas for recruiting*
- *Need access to research articles*

**Trainee Reflections on Their Course** N=23
Responding teachers were from three different schools teaching STEM in grades $6^{th}$ – $12^{th}$ and the subjects of Biology (17%), Physical Science (17%), and Math (13%) among others.

**Implementation**
Teachers reported that the **focus in their classrooms** varied from highlighting female scientists and role models (22%) to addressing STEM stereotypes (17%) and increasing classroom discussion and engagement (9%).

*Open-Ended Response Analysis*

| Focus | N | % |
|---|---|---|
| Female scientists/role models | 5 | 22% |
| Math/math skills | 4 | 17% |
| STEM stereotypes | 4 | 17% |
| Career awareness/exposure | 2 | 9% |
| Classroom discussions/engagement | 2 | 9% |
| Course opportunities | 2 | 9% |
| Strategies to increase collaboration/inclusion | 2 | 9% |
| Awareness of gender inequity | 1 | 4% |
| Growth mindset in students | 1 | 4% |

*Open-Ended Responses*
- *Strategy 4. I wanted to help girls see themselves as scientists.*
- *Girls in math*
- *My focus was on developing classroom discussion prompts to give everyone a voice in my classroom. My goal was to increase girls' participation in class and in their learning as a whole.*
- *My goal was to increase girls of color who see themselves as scientists. One piece of evidence is their attitude around science and beliefs about themselves.*
- *I focused on two things: strategies to increase collaboration and talk in my classroom as well as finding examples of female scientists that contributed to the understanding of our science standards.*
- *I focuses on finding more materials where the instruction or lead is by females, I focused on reading about bias and sharing articles that fight stereotypes, I focused on promoting females making history.*
- *I notice that in my coding classes, I consistently have more boys than girls. I also notice that as engineering courses (like flight, space, and electronics) become electives in high school the number of girls participating in these classes decreases. I would like to provide opportunities for girls to see the importance of these courses and to see females working in these fields, so girls know that science and coding are options for them as well.*
- *Engineering awareness of gender inequity and cool opportunities.*
- *Encourage girls to identify and challenge STEM stereotypes. This was chosen because I have female students that are forming ideas of what they want to study in the future and what jobs they pursue in the future. Acknowledging and incorporating women in STEM signals that my students can pursue STEM as an academic and professional path.*
- *To develop more inclusive teaching strategies*
- *For me, it was about exposure and helping students see what careers are out there. I also wanted them to see women doing these jobs. I picked this because it is something I could relate to. A lot of times women do not see other women doing the work, but see a man that is smart and strong. Women are smart and strong but we are also directed (verbally and nonverbally) to be feminine.*

*Finding successful women who do it all, at least for me, helps to break the stereotypes and challenge our thinking of what we can do. This is what I tried to do by exposing my students to women doing different careers.*

- *Connecting girls to STEM related careers. I decided to focus on this because even though girls are very successful in science classes, the number of girls entering a science field are still in the minority.*
- *I actually get a great deal of a boost to my feelings of self-worth when I see girls succeed and thrive in my classes.*
- *I wanted to focus on showcasing women in stereotypical male roles, as they relate to Science. I chose to focus on this, because if girls never see role models like themselves, they may feel limited in what career they can choose. For example, if a girl never sees a female astronaut, but is interested in becoming one, she may feel that she doesn't have what it takes to become one.*
- *My main focus this year has been to remove the stigma that they are 'no good' at math, and to change their mindset to one that they can be successful in math. The main reason that was my first focus is that it was something I noticed with my students. They were coming in to my class with the attitude they cannot be successful in math, and when they have the mindset they are not good at something, they are often not successful, because they choose to not put in the effort necessary to be successful.*
- *Developing a growth mindset in my students. Our school struggles with student engagement and I believe developing a growth mindset in student should increase student engagement levels.*
- *Help them see relevancy in learning math so that they can be intrinsically motivated.*
- *Being more conscious to include girls when using examples, pictures, videos, etc. Seems like a good first step to being aware of a more inclusive classroom.*
- *Linking the skills taught in SPED math to jobs available to girls. Focus on the link between math and science in different/unexpected careers. This was chosen since my math classes don't spend much time looking at career options.*
- *I wanted to focus on being more mindful in regards to the level of the girls' engagement in my classes. I chose to focus on this because I believe that being aware of your focus as well as being mindful is the first step toward improving or working toward any goal.*
- *To expose students to more female science role models and encourage girls to explore careers in science and technology.*
- *My focus of individual growth was to incorporate more activities/lesson in class that promotes girls in math and science. I want to expose my students to more female role models in class and come up with activities that allow female voices to be heard.*
- *The focus of my individual growth is to increase exposure to female scientist role models in our curriculum. I feel it is a gap that is glaring, and I hope for some students to find it inspirational.*

Most teachers (91%) felt they **had adequate support** for their individual growth finding the connections with the cohort (38%) and the reading materials and resources (31%) most valuable. Teachers wished they had more time to connect with other teaches and plan lessons (60%) while enjoying the regular meetings (40%) and meaningful activities and discussions (20%).

|  | N | % of Responses |
|---|---|---|
| Connections/Collaborations with Cohort | 6 | 38% |
| Reading materials/resources/SciGirls website | 5 | 31% |
| Different areas of focus | 1 | 6% |
| Feedback | 1 | 6% |
| Fieldtrip to TPT/PBS building | 1 | 6% |
| Meeting with instructor | 1 | 6% |
| SciGirls videos | 1 | 6% |

### *Open-Ended Response Analysis – Could have used more of*

|  | N | % of Responses |
|---|---|---|
| Time to connect/plan lessons | 6 | 60% |
| Specific classroom strategies/lessons/examples | 3 | 30% |
| Interactions with mentor | 1 | 10% |

### *Open-Ended Response Analysis – Liked*

|  | N | % of Responses |
|---|---|---|
| Regular meetings | 2 | 40% |
| Meaningful activities and discussions | 1 | 20% |
| Visiting PBS | 1 | 20% |
| More current female scientists | 1 | 20% |

### *Open-Ended Responses*

- *Yes, I have had adequate support. The most valuable experience was meeting with my cohort and sharing ideas and strategies. More specific strategies or ideas to try in the classroom would have enriched my experience.*
- *YES, the training was very thoughtful with time to explore areas of interest, I really liked the different areas of focus she brought forth*
- *I did have adequate support. Our team collaboration was very helpful in gathering our resources and sharing our strengths and knowledge with one another. The trainer was amazing. She supported us in making posters for our classroom that gave students speaking prompts to help students know what to say when talking about their learning. She also engaged us in meaningful activities and discussions.*
- *Yes, collaborating with the SciGirls cohort members was extremely valuable!*
- *I do feel I had adequate support for my growth focus. I really appreciate the time given to meet with our instructor as a whole group and collaborate together. Of course, I would have loved more time to do that consistently throughout the year. We met a lot in the fall and not as much in the spring and early winter.*
- *Yes, I feel the steps were broken down. The reading material supported the reflection. The amount of expectation was correct. Going to PBS and getting the PBS.org website as a resource was excellent. I could always use more time.*
- *Yes, I feel like I have adequate support. I was able to participate in the Sci Girls Training and we were able to meet on a regular basis and have access to a SciGirls Schoology course through our school.*
- *For sure. Our trainer was amazing.*
- *Yes, I feel I had adequate support. The videos on SciGirls were very valuable, our class watched one most Fridays as a way to wind down the week. We planned on bringing women in STEM fields from the community for a discussion but covid-related reasons caused us to cancel.*
- *Yes, I believe my cohort was great in providing feedback and other resources that I could use in the classroom. I really like the cohort model and working with colleagues. I feel that is where the best ideas and sharing come from.*
- *Yes, I liked that our trainer gave us information and directions but allowed us to personalize and make what we do in our classrooms our own. For me, if I can't make something my own, and have to teach it, the content feels insincere and forced. High school students can pick up on that. I enjoyed that he was open to discussing topics that are somewhat difficult to have and there were no judgments. In the last meeting, we all made slides to share about a scientist from a book we got. This was helpful. More useful and short strategies that are content specific would help.*

- *I felt adequately supported in my goal. The resources on the SciGirls website were very valuable along with having a community of learners to collaborate with helped. Having more connections for classroom speakers or whole school presentations would have been beneficial to girls in my school.*
- *Yes, I enjoyed the reading material, and got benefit from it.*
- *Yes, I do feel that I've had adequate support from both my facilitator and SciGirls. The most valuable part of this experience, to me, was a field trip and discussion that our facilitator arranged to the TPT/PBS building. There we were provided with great resources. What I could have used more of was time, but I'm sure a lot of teachers would say that. Planning new lessons takes time, and extra time is hard to come by.*
- *I do. Our school as a whole is always looking for the best tools available to utilize with our students, including videos and resources.*
- *I feel like to support individual growth was a bit lacking. Clearer expectations and better focus on how to enter into the course would have been valuable. I found the book study groups that we were in very useful.*
- *Could have used more examples, I kind of felt like I was told what to do, but with no follow up and no or few examples given, so I was left with reinventing the wheel.*
- *Resources were good that were provided but I would have liked more examples of exactly what a lesson would ideally look like or how to focus a lesson applying the strategy.*
- *I felt I had adequate support. The facilitator was always available to answer questions, provide support and lead the team. I would have liked more time to spend developing activities and samples in our setting.*
- *I do feel that I had adequate support for my focus, but I would have liked to have more time. I found the online resources to be the most effective as well as just being more mindful in regards to girls in my classes and how I am portraying and engaging them.*
- *Our trainer did a fantastic job of giving examples of female role models and science careers and walked us through the SciGirls site and tools available.*
- *Yes, we developed a bank of resources for teachers in our program to use. In the resources are lessons, videos, and activities to use in class. As with all teachers, I could really just use some more time in class to implement more of these things!*
- *Yes, I felt I had good support. The biggest downfall in implementation was time in planning implementation, and of course the content curriculum that needed to be covered. I especially found the book 'Women in Science' to be particularly valuable in my own education of the topic. I would have liked to include more current female science professionals, which we were attempting to bring in speakers this spring, but...*

Participation in the GETAS course **affected the teachers' personal practice** by increasing their awareness (33%), helping them elevate female voices and examples (29%), and being intentional in their efforts (21%).

*Open-Ended Response Analysis N=23*

|  | N | % of Responses |
|---|---|---|
| Personal awareness | 8 | 33% |
| Elevating female voices/examples | 7 | 29% |
| Resource awareness/intentionality | 5 | 21% |
| Intentional support | 2 | 8% |
| Proactive planning/curriculum development | 2 | 8% |

***Open-Ended Responses***
- *I am more aware of females in science feeling disenfranchised.*
- *Elevating female voices, naming that they are underrepresented*
- *I am more purposeful about giving girls a voice in my classroom. I encourage them more directly to use their voice and share their understanding with one another. This is turn is helping them build their confidence!*
- *My perception of the way I treat my female students and the ways I provide opportunities for the them to see themselves as scientists.*
- *I am more intentional in the supports I provide for my students during group discussion and lab work. For example, I now assign roles when doing lab (writer, data checker, procedure expert and on-task master). I've also had my students provide reflect on their own contributions in group work and discussion as well as provide feedback for others in their group.*
- *Just picking resources without more thought about using the learning moment as a time to challenge bias or represent underrepresented groups.*
- *I am finding more ways to bring in examples of female contributions to both flight and space and coding. I have also been more cognizant of groups and the roles girls play in groups. I want to give them the opportunity to take on leadership roles within groups.*
- *Researching the engineers behind the project and share their stories. Definitely looking for females.*
- *My girl students' voices. They are louder in claiming science is not gender-specific.*
- *I am more proactive in planning lessons that make overt connections between under represented populations and STEM.*
- *No saying alright guys when talking to my whole class. I also try not to always call on the boy students. I also try to keep an open mind when discussing the future with female students. I did not realize that I was a part of the problem and would not suggest female students continue on with science education and classes. This was shocking to me but now that I am aware, I try to encourage female students into science jobs and classes regardless of their biology grades.*
- *Because of this course, I have become more cognizant of which scientists I use to represent different areas in science. I am now more likely to search out the back story of discoveries to highlight some of the female and underrepresented scientists lost to history.*
- *I do a lot of curriculum development. The course has enabled me to have multiple points of view in the forefront of my mind when I write a course.*
- *The biggest change I've made is just being cognizant about including more female role models in my curriculum.*
- *While looking for videos as resources in my class, I am not just using the first ones I can find, but am actively looking for videos that will show diversity with the instruction.*
- *Looking at how I communicate with students and what message students take away from what I am saying or not saying especially in how it develops either a growth or fixed mindset in student.*
- *Added math videos that show a woman doing the math.*
- *I think it's just being aware of when building a lesson to not always have the same types of people, be aware to include a whole variety of individuals.*
- *The biggest change is to be purposeful to address girls in science in both math and careers.*
- *I feel like the biggest thing I have changed as a result of this course, again, is increasing my awareness and thinking about my teaching and learning and how it relates to girls.*
- *As a result of this course, I am exposing all of my students to more career opportunities in science and technology as well as highlighting the importance of females in science, both their past and future contributions.*

- *The biggest thing I have changed is connecting STEM to girls' lives and giving students female role models in STEM fields. I tried to add SciGirls videos or small presentations about woman in math to my lessons.*
- *It probably sounds cliché, but the increased awareness is probably the biggest change. In a practical manner, how questioning techniques can be improved. That, and working to encourage girls to relish the challenge STEM offers.*

Teacher reported **changing the way they think (mindset)** about engaging the girls in their classes through encouraging leadership (29%), purposeful actions (24%), and being aware of stereotypes (19%).

### *Open-Ended Response Summary* N=21

|  | N | % of Responses |
|---|---|---|
| Encourage engagement/leadership | 6 | 29% |
| Purposeful actions | 5 | 24% |
| Awareness of challenges and stereotypes | 4 | 19% |
| Affirmed personal behaviors | 2 | 10% |
| Allowance for multiple capabilities | 2 | 10% |
| Praise effort | 2 | 10% |

### *Open-Ended Responses*
- *Because I was interested in science, I assumed girls and students of color were also confident in their skills and abilities in STEM. I realize that this might not be true and these groups of people need encouragement to feel empowered in STEM subjects.*
- *I seek ways to encourage them to enter the conversation*
- *Again, this process has helped me to be much more purposeful about getting girls to use their voice in my classroom. I use this lens when I assign seating charts, call on people to give responses and plan activities for student discussion.*
- *I see way more opportunities to speak truth and encourage female students.*
- *My mental model is to remember to praise effort and to encourage risks and persistence. I want my girls to feel safe in trying hard things and to know that it's okay to be wrong.*
- *I have always held equal expectations for my students and consistently attempt to check bias when working with students. This work only affirms that those actions need to continue.*
- *I have realized how important it is to show girls that they can take on leadership roles and to show them examples of people working in STEM related fields. To be able to dream it, they have to see it.*
- *My constant message has changed. Gender doesn't determine whether you can be an engineer.*
- *At first, I was not sure if there would be backlash from any boy students that we deliberately showcased female students in class every Friday. While I did have some comments from boy students, overall students were very receptive to the fact that females are underrepresented in our curriculum.*
- *My Human Anatomy classes tends to attract more female students so it has helped me frame my lessons with more emphasis on female role models in class.*
- *It is all about noticing my errors and thought patterns and trying my best to change them. I try to stay positive with the female students, encourage them, and help them see themselves as scientists. Telling the female students that they are good at biology and telling them I can see them working in a lab or doing science as a career has been helpful. If anything it gets them thinking and challenging their own beliefs about women in science.*

- *I have certainly had my class become more based in collaboration. I changed my whole class set up to help students and girls feel more connected to others as they go through the problem solving process.*
- *My mental model now includes the allowance for multiple capabilities and strengths of girls in my classes.*
- *I'm not sure I've changed how I think. I've always been aware of this issue, since I am a female science teacher.*
- *As a woman teaching math, I really do not see that my thinking has changed. Also, as a special education teacher, I notice the same struggles with all of my students, not just the girls.*
- *The biggest change in how I think is related to how intentional I need to be in interactions with students as they may be taking away messages from how I communicate that may not be my intended message.*
- *Hasn't changed. Honestly, girls typically do better in my course in general since they ask questions more than boys in general.*
- *I have definitely tried to be MORE positive and encouraging to them. Never let them give up and give them the confidence they need to complete their math!*
- *I have increased a general mindfulness of the importance and the realization that I am currently not doing enough to embed girl supportive lessons in my classes.*
- *My thinking has changed when it comes to working with girls in my classes by making sure I am incorporating more time in class to share and discuss what's going on in the kids' lives (both girls and boys). The content/academics are important, but if you do not allow students to share, engage, and build relationships, nothing else will be successful.*
- *Girls need encouragement to reach for higher goals. Case in point, my daughter wanted to be a nurse, wonderful career choice, but why not a doctor or engineer? She is now in her second year of chemical engineering and is doing an amazing job. I can't wait to have her back in my classroom, encouraging others to do the same.*
- *I don't think I have changed much. As a female in a STEM field, I was aware of the stereotypes of females in STEM as I have experienced them throughout grade school, college and teaching. Throughout my career as a teacher, I have worked to encourage female students to pursue STEM fields and been deliberate in my actions in class to make their voices heard.*
- *I find myself struggling with consistency, as I revert to old habits easily, but just trying to drop myself into their shoes to be reminded of a different perspective. I think that helped with encouraging grit, determination, and perseverance.*

**"Ah-ha" moments and insights** for the teachers happened with increasing female and diverse role models and images in their classrooms (55%) and giving all students the opportunity to lead (18%).

*Open-Ended Response Summary N=12*

|  | N | % of Responses |
|---|---|---|
| Increase female/diverse role models and images | 6 | 55% |
| Underrepresented leadership | 2 | 18% |
| Increased transparency | 1 | 9% |
| Personal challenges | 1 | 9% |
| Positive student feedback | 1 | 9% |

*Open-Ended Responses*
- *Just to be more transparent about inequities in STEM practices*

- *I didn't realize until this class how our typical models of mathematicians and scientists were mainly men, and white men for that matter. This class has shown me how important it is to give girls visuals of women in these fields and how important it is to show girls they have an important role and voice in my classroom.*
- *My 'ah-ha' moment came after spending time researching female scientists to share with my students and realizing that I had never heard of them before and then getting mad that I've been teaching geology for about 10 years and never came across them in any literature. This made me upset and I promised to change that for my female students.*
- *Use the chance to push in underrepresented leadership and game changers.*
- *The female astronauts on the space station. What a great story!*
- *A couple female students overheard my facilitator and I discussing SciGirls and yelled 'SciGirls rocks!' This happened a couple months into using SciGirls in our curriculum and reinforced how important and effective this is.*
- *That I didn't spend enough time looking for a diverse representation of ALL people in science*
- *I did, but I do not remember it. I guess realizing my own errors and my own misguided stereotypes have helped me. As a female biology teacher, I need to encourage females.*
- *I think my biggest ah-ha moment came as I looked into how many woman scientists had their discoveries and research overshadowed by a male scientist taking credit for the work.*
- *There was not specific 'ah-ha' moment, but I did find value in the weekly discussions and collaboration with peers during weekly meetings. This is when I discovered that our program as a whole does not focus specifically on girls in science related fields.*
- *This year, my teacher's assistant, who was my student for two years said it was her teachers that encouraged her to be more than she thought she could be. Her statement really hit home for me.*
- *How could I have been so blind to not notice that every single bit of science history I would incorporate into class would be of a white male.*

Teachers reported statistically significant (p<0.01) **changes in how they used the *SciGirls Strategies*** in their classroom from before the course to after, including empowering girls, encouraging them and emphasizing that STEM is collaborative, social, and community-oriented.

**To what extent did you use the *SciGirls Strategies* BEFORE this course? How much have you used them NOW as a RESULT of this course? 1-10, 1=not at all, 10=extensively**

| 1-10 | Before | Now |
|---|---|---|
| 1. Connect STEM experiences to girls' lives. | 3.1 | 6.7* |
| 2. Support girls as they investigate questions and solve problems using STEM practices. | 4.7 | 6.9* |
| 3. Empower girls to embrace struggle, overcome challenges, and increase self-confidence in STEM. | 5.0 | 7.3* |
| 4. Encourage girls to identify and challenge STEM stereotypes. | 3.6 | 7.1* |
| 5. Emphasize that STEM is collaborative, social, and community-oriented. | 4.4 | 7.0* |
| 6. Provide opportunities for girls to interact with and learn from diverse STEM role models. | 2.6 | 5.9* |

*Indicates a significant difference from "Before" and "Now" responses (p<0.01)

Teachers also reported statistically significant **changes in their confidence** (p<0.01) from before to after the course in the *SciGirls Strategies*.

**How confident are you NOW, compared with AFTER the SciGirls PD, in using each of the** *SciGirls Strategies***? 1-10, 1=Not at all confident, 10=Extremely confident**

| 1-10 | Before | Now |
|---|---|---|
| Connect STEM experiences to girls' lives | 3.6 | 7.1* |
| Support girls as they investigate questions and solve problems using STEM practices | 4.6 | 7.2* |
| Empower girls to embrace struggle, overcome challenges, and increase self-confidence in STEM. | 4.8 | 7.3* |
| Encourage girls to identify and challenge STEM stereotypes. | 4.5 | 7.7* |
| Emphasize that STEM is collaborative, social, and community-oriented | 4.6 | 7.3* |
| Provide opportunities for girls to interact with and learn from diverse STEM role models | 3.7 | 7.1* |

*Indicates a significant difference from "Before" and "Now" responses (p<0.01)

Teachers felt the **greatest impacts** of the course on them were becoming more interested in learning more strategies (8.3/10), becoming more aware of resources for teaching and learning STEM for all (8.1), connecting with other educators, and learning to think about their own practice (7.4).

**How much of an impact did the course have on you? 1=no effect, 10=very strong effect**

| 1-10 | Rating |
|---|---|
| Research on gender equitable strategies | 6.8 |
| Awareness of the six research-based SciGirls strategies | 7.0 |
| Improvement of my knowledge of effective strategies | 7.0 |
| Enhancement of my skills in gender equitable strategies | 7.3 |
| How to think about my practice in terms of gender equitable strategies | 7.4 |
| How to collect data on the effects of using different strategies | 5.5 |
| Interest in learning more strategies | 8.3 |
| Connecting me with other educators interested in this topic | 7.4 |
| Making me more aware of resources for teaching and learning STEM for all | 8.1 |

**Impacts**

The **impacts on students** were reported to be identifying with STEM and STEM careers (36%), increased collaboration and discussion (18%), and more active (14%) and confident students (14%).

*Open-Ended Response Analysis N=23*

| | N | % of Responses |
|---|---|---|
| Identify with STEM/STEM Fields/Careers | 10 | 36% |
| Collaboration/discussion | 5 | 18% |
| Active student involvement/engagement | 4 | 14% |
| Confidence/empowered | 4 | 14% |
| Performance | 3 | 11% |
| Greater student voice | 1 | 4% |
| Increased awareness | 1 | 4% |

### *Open-Ended Responses*

- *Students and myself were more aware of females especially in science. We also worked more collaboratively this year.*
- *See themselves as members of STEM fields.*
- *All students were given more of a voice in my classroom based on the SciGirls strategies I used in class. Students were more actively involved in their learning based on the classroom activities I did based on the Sci Girls Strategies I used in class.*
- *I noticed a shift in the performance of my African American girls' attitudes, performance, and perception of science. I saw improvements in their learning as well!*
- *SciGirls strategies helped all my students gain confidence in their abilities. The strategies also provided structure for them during class discussions which was appreciated.*
- *I am not sure they would notice exactly but I know the material is better suited to empower.*
- *I feel like I have incorporated more activities into my classes with role models from diverse backgrounds.*
- *To look at each other as engineers, not boys/girls.*
- *Female students definitely are more connected to STEM now. I would also say they feel more empowered and they recognize the inequity in science curriculum in regards to gender.*
- *My students began to appreciate the overt connections that I made in class to females and female role models in medicine.*
- *I feel like this is hard to gauge. If anything it got conversations going and got the students to think about science and the world around them.*
- *The way that this can be implemented in the classroom should be beneficial to all students. Many of the students who need it most resonate with the message. Empowering a student never takes away from another student. The girls in my classroom appreciated the connection they made to career options presented. The history of women in science subtracted from no students.*
- *I will have to leave the following responses blank, as I have just this week been able to incorporate what I have done into my courses, and have not collected that data as yet.*
- *My students are now more aware of women in stereotypical male roles, and can see themselves succeeding in those roles.*
- *My students are learning that anyone is able to do math.*
- *The realization that students take unintended messages away for everything you do unless you are very deliberate about everything*
- *Haven't seen much impact.*
- *I can't make that call yet, this will take months or even years to really answer.*
- *The impact was bigger in my career exploration course compared to the math classes. Although students did not change future career goals, girls (and boys) had an opportunity to spend more time researching science related industries - specifically health care and engineering. Through discussion, students were able to link the necessity of understanding science and math to many career options.*
- *I teach a special education Language Arts class. We focused more on the empowerment, relationship building, engaging, and confidence pieces of SciGirls strategies. These, I found, had the most impact.*
- *The SciGirls strategies are very straight forward so the impact was direct and easy to see. You could see students sitting up straighter in their chairs.*
- *Students really enjoyed the collaboration strategies I used. I allowed for more student talk in the classroom and help students take a little more ownership over their learning. I feel like students understood the material better when they were talking about their math with their peers. I also think students enjoyed when I highlighted female mathematicians. It gave students (male and female) ideas on careers in the STEM.*

- *I don't know that we can ever answer that question thoroughly right now. Let's see how some of these kids' lives play out. But I would say there was definitely some appreciation of the concerted effort to push SciGirls ideas.*

Please **share a story** or two about students who were greatly affected by these strategies.

- *I had a student who was interested in pacing faster in class. I asked her what she might be interested in doing as an extension project with her extra time. I guided her toward writing stories and drawing pictures about women in science. She enjoyed the project and learned a lot.*
- *I've encouraged two girls who were very quiet to speak up, and now they are very comfortable doing so in my class and others.*
- *I had one student ask me to give her a letter of recommendation to a transportation camp for the summer. I thought it was really cool that: 1) this student is interested in the engineering components of transportation and 2) that she saw me as someone that encouraged her and supported her in this way enough to write her a letter of recommendation.*
- *I had put up posters in my room of females in STEM. During class, I had one boy stop and ask why they were all female. Right away about five girls raised their hands ready to articulate the reason why. After that, a bunch of the boys wanted to go back and learn more about the scientists and everyone agreed that they were women that we should all know about.*
- *I got back some amazing clear summaries after reading an article on seven ways girls are pushed out of science. They were paying attention.*
- *I feel like I have helped my students problem solve more and encouraged more students to continue with STEM classes.*
- *I have a girl who was very passive and not great in math. Thus, in her mind, she was bad at design robotics. I kept encouraging her. She saw the space station woman spacewalk and just lit up. Then as we were doing robotics via sphero block code, she was amazing in doing math for planning, even though she is in math support. So cool.*
- *My favorite story is the one shared above. Two female students overheard my facilitator and I discussing SciGirls and they both yelled 'SciGirls Rocks!'*
- *I had one student that took advantage of a female STEM workshop that the Perry Initiative sponsored last fall at the U of M. She came back from this experience so excited about Orthopedics after she had great female speakers on the subject.*
- *I would try to put a slide of females doing STEM jobs on the PowerPoint when the students were coming into class. I also have senior girls that stop in my room, eat lunch in my room, and are my student assistants. Those students were taking biotech and human anatomy. They would talk about the jobs on the PowerPoint. Some did not know a few of the jobs and others would tell me that is what they want to do when they are older. For the seniors, they were at a place where they were looking to the future and seeing the different jobs were helpful. For the 10th graders, they talked about the jobs but were more interested in the paid then the work.*
- *Towards the end of the SciGirls program our school offered a Girl Power program with woman who are successful in many areas including science. This year, we had a NASA engineer present to the school. This has always been optional for students to attend and I have always had a few students interested, but this year I had more female students interested in going than I have ever had before.*
- *My students came in with the mindset they cannot do math, and throughout the year, have discovered that they are capable of being successful in math.*
- *I feel like have better tools to improve my courses but haven't made significate improvements yet.*
- *Not applicable. I teach online so I have very limited access to student reactions.*
- *We just started implementing it this semester so I don't have a story.*

- *One student who is considering going into cosmetology after graduation was able to make connections between why understanding basic chemistry will be important on the job as she mixes chemicals (dies etc.). Although this is traditionally a female dominated industry, she was able to see the 'science' behind her career choice.*
- *One student, Mary, was very shy at the beginning of the year. By the end of January, Mary was able to share her thoughts and beliefs in a positive way.*
- *Several of my students were affected by our Draw a Mathematician activity. We had a really good discussion on the reasons most of them drew male mathematicians. It really opened the eyes of some students of how females have been underrepresented in the history of math.*
- *We had a gallery walk of women scientists, and a group of three girls I eavesdropped on were discussing the pros/cons of the lifestyle of one of the scientists (the specific one I don't even remember). And while one was still convinced that she 'was not very good at science', they were inquisitive about what that life might look like, and how they might fit in.*

Teachers reported mostly moderate effects on their students as a result of using the *SciGirls Strategies* including their interest in STEM careers (6.5/10), their confidence in doing STEM (6.4), and their course selection in later terms (6.1).

**How much effect did you see on your students as a result of using the *SciGirls Strategies* in each of the following areas? 1=no effect, 10=extensive effects**

|  | 1-10 Rating |
|---|---|
| Interest in STEM careers | 6.5 |
| Confidence they can do STEM | 6.4 |
| Course selection in later terms (more STEM, upper level classes) | 6.2 |
| Interest in STEM topics in your class | 6.1 |
| A STEM identity | 6.1 |
| Academic performance (grades) | 6.1 |
| Questions asked by students (more, better) | 5.9 |

**Overall Findings**

Nearly all of the teachers (**95%) would recommend** the *SciGirls* GETAS PD to another teacher describing it as challenging their thinking and practice (28%), fun/impactful/amazing (22%), and reframing for them (22%).

If the course was offered **online only**, about half (52%) of the teachers would still recommend it to others. Concerns from the other half were that the discussions would be limited, might not appeal to everyone, and stories and difficult conversations might not happen.

**Suggestions for improvement** included offering more strategies and resources (45%), allowing for additional time for discussion and interaction (18%), and making the website and videos easier to navigate (18%).

*Open-Ended Response Analysis*

|  | N | % of Responses |
|---|---|---|
| Strategies/resources | 5 | 45% |
| Additional time for discussion/interaction | 2 | 18% |
| Website/videos difficult to navigate | 2 | 18% |
| Align strategies to other areas of study | 1 | 9% |
| Specific collaborative group scaffolds | 1 | 9% |

*Open-Ended Responses N=15*

- *Continuing to share resources with others will make this information more accessible for others.*
- *More time to discuss strategies we are using.*
- *I would have liked to see more specific collaborative group scaffolds in the form of sentence stems and other culturally responsive teaching tools.*
- *I wish we could have had even more meetings and interactions as a group. I found the process very valuable.*
- *I sometimes thought the website with the videos was hard to navigate but it worked out fine.*
- *More useful and short strategies that are content specific would help. Shorter strategies make the content feel less forced.  A few boy students did not like the name SciGirls.*
- *From the standpoint of a science teacher, this course was amazing. I would have to believe that the information could be applied to other areas of study as well.*
- *I think it would be useful to have had a larger set of reference material to choose from.*
- *Do the best you can to get good knowledgeable facilitators.*
- *Provide more examples for implementation in an online setting.*
- *I just wanted more examples of what a high quality lesson would look like implementing the SciGirls strategies.*
- *Provide more teacher resources in a digital format.*
- *I was asked to join the course by invite.  I think it would be great to open it to the whole school. Even teachers who are not in STEM can learn more about gender inequities in education.*
- *Flexibility is always key – Our trainer was extremely flexible which was great.*

## IV. Discussion

The *SciGirls* original GETAS training implemented from 2016-2019 trained 49 CTE/STEM educators to improve their practice for girls. It was successful in changing both teachers' mindsets and their pedagogical practices. Teachers became more explicit in involving, supporting, and praising girls. They noticed when girls were not engaged, or not performing, and adjusted change that. They were proactive in providing STEM projects and experiences that girls prefer:

- Embrace collaboration
- Are personally relevant
- Offer hands-on, open-ended participation
- Accommodate preferred learning styles
- Provide specific, positive feedback
- Allow for critical thinking
- Involve role models and mentors

In 2018, the GETAS Framework of creating a supportive and culturally responsive learning environment became part of the revised *SciGirls* model. This was used in the 2019 Train the Trainer model and training.

Prior research on Train the Trainer (TTT) model shows it to be more effective than lecture (Levine, Brett, Robinson, Stratos, Lascher, & Granville, 2007; Orfaly, Frances, Campbell, Whittemore, Joly, & Koh, 2005). Some important attributes are that it:

- Equips the trainers with the knowledge and skills to be effective (Tobias, Downes, Eddens, & Ruiz, 2011)
- Encourages feedback, models key concepts/techniques, provides financial support, and faculty support (Tobias, et al., 2011)
- Is flexible and responsive to the individuals in the group (Orfaly et al., 2005)
- Gives trainers time for assimilation of essential knowledge, skills, philosophies, and concepts (Pancucci, 2007)
- Provides a toolkit with templates, models, and resources (Levine, et al. 2007)
- Has a supportive colleague at their location to share recruiting and training (Yarber, Brownson, Jacob, Baker, Jones, Baumann, Deshpande, Gillespie, Scharff & Brownson, 2015)

There is evidence that the four-day in-person workshop was an important element of the TTT model in that the trainers became aware of many valuable resources, had productive discussions with each other, and got some feedback on their initial plans from the facilitator. They felt the workshop was interesting, modeled responsive teaching, and provided a good balance of information, discussion, and planning time.

At the end of the four-day workshop, the trainers wanted more time to plan, more time to work with other teachers, feedback on their plans from the facilitator, reassurance, specific lesson plans for each module, scope and sequence, ideas for training lessons, and actual research papers. At the end of the workshop, the trainers anticipated potential problems with being prepared to offer the course, time to review all the resources, recruiting, and support from their administration. So even though most had had a good learning experience, most of them had not assimilated what they had learned and were not prepared to offer the course.

Later, in May 2020, the trainers who did not offer the course, reiterated that they had not had the time to assimilate all that they had learned into a viable plan. The COVID_19 pandemic further eliminated the possibility of trainers teaching the course during the 2020 spring semester which some were considering. Unlike the trainers who did implement, those who did not implement did not have a supportive colleague in their local districts, another critical factor in the TTT approach. Several said they would have appreciated having a "toolkit" of models, templates, and resources that would have jumpstarted their planning. Although they felt they could ask for help from the facilitators of the TTT workshop, they did not ask for the help they needed to launch their course.

Another critical factor is that trainers have to feel they have the skills and knowledge to offer their own course. Although they felt they benefitted from the TTT workshop, they were very clear that they were not proficient in using the GETAS strategies themselves and were not sure

they would be able to offer what their fellow teachers needed and wanted. Making the local course a "conversation among colleagues" helped with the deficit in experience and knowledge.

The teacher trainees benefitted from their locally delivered GETAS courses. They reported changes in their practice and mindsets and positive effects on their students. This is evidence of the effectiveness of the TTT model. Next year these data will be collected from the other seven locally implemented courses to confirm the positive effect.

## V. Conclusions and Options for the Future
Successful Train the Trainer models have multiple factors that make them successful. The GETAS TTT model had some of those elements:
- Engaging, collegial, responsive, informative and skill-building workshop
- Financial support through stipends, money for resources, and graduate or CEU credits
- Facilitator support through feedback during the workshop on plans and in monthly webinars

What trainers reported that they needed more of was:
- Time to assimilate what they had learned
- Time to plan and get feedback on their plans
- A toolkit of templates, models, and resources for a local course
- A dedicated colleague in their local district to provide support for recruiting and training

**Options for the future to improve the GETAS TTT model:**
- Establish a community of practice with all of the SciGirls/GETAS trained educators to support their growth over time.
- Make it a pre-requisite for trainers to take the GETAS training and implement it in their own classrooms to give them experience and confidence.
- Hold a pre-training kickoff meeting so trainers know what they will be doing and share that back in their district to recruit people so when they come in the summer for the training, they have the logistics done and can focus on the content.
- Require colleagues to sign up together, to make a commitment to delivering the local course, which could increase the number of trainees with this additional support.
- Hold weekly webinars following the four-day workshop to complete assimilation and planning with all kinds of practical things, like examples of how to change common routines, modify lessons, and teach about inequity explicitly to continue to inspire trainers.
- Assign facilitators as mentors to trainers at each school to be sure each one is getting what they need to move forward in a timely way with a lifeline and mentor.
- Provide a toolkit of templates, models, and resources created by the facilitators as a starting point for new trainers, e.g., the best of 2016-2019 training and other resources including daily agendas, module resources, slide shows, videos by facilitator like the SciGirls Snapshots (https://vimeopro.com/user10550772/scigirls-snapshots)
- Provide exemplary lesson plans in different STEM and CTE subject areas for the trainers to use with their teachers. Many are already available and more can be generated as part

of training, then added to the website. Consider having a way repository that everyone could add to all the time connected to the community of practice.

- Develop a rubric (like the EQuIP for NGSS) to evaluate the quality of gender equitable and culturally responsive lessons. Include activities in the summer workshop and webinars in which people bring up a routine or a lesson and everyone works on revising it to make it more equitable, then checks on their success with the rubric.
- Have a hard deadline for trainers to have their recruiting and course plans completed before school starts.

In summary, the GETAS TTT pilot model was successful with three very different trainers; one who does a lot of professional development in district, one who had never done a professional development, and one who teaches in a virtual school who involved her PLC.

The non-starters also provided valuable lessons about how to support adults who really want to do it to become trainers. All seven of them still want to do the training but were derailed by personal commitments, their own need to be an "expert", changes in their school or district, COVID-19 closures and not knowing how to recruit.

This group included a range of prior experience with *SciGirls* as well as professional development. Through this pilot of the Train-the-Trainer model, the SciGirls/GETAS team can make refinements to the model will allow for scale up in the future.

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