



SciGirls Code

Year 2 Evaluation Findings August 2016 to July 2017

PREPARED FOR

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Executive Summary

The *SciGirls* Code evaluation is being conducted by an external organization, Education Development Center.

- Evaluation activities during Year 2 included:
 - Working closely with the project team to finalize the scope of work. IRB approval was obtained and evaluators have been working with the researcher on the project to coordinate data collection and sharing when appropriate.
 - Attending project planning meetings and activities (such as the educator webinars and in-person training) and communicating with the educators about the goals for the evaluation and their role in helping with data collection.
 - Instrument design and data collection, including a “pre-survey” to the educators from partner sites, post-webinar and post-training surveys to educators, an interview with the project team members, and gathering of other metrics and statistics such as webinar participation and web site statistics.
 - Providing summaries of each evaluation instrument have been provided to the project team and discussing at meetings to provide formative information about the project implementation.

- During Year 2 of the pilot project, *SciGirls* Code developed and refined three strands of a connected learning curriculum on computational thinking and coding. They engaged with 16 partner sites across the U.S., including informal and formal education organizations, each of which will reach 10 girls over nine months.
 - Each partner site has two trained educators who will be implementing the curriculum with the girls¹ and many sites have a project lead or administrator on the *SciGirls* Code contact list who are invited to attend webinars and receive emails and resources to stay up-to-date on *SciGirls* Code implementation details, including meeting requirements, curriculum, technology, and pedagogical strategies, to be able to support the implementation at their site.

- Partner organizations and their *SciGirls* Code Educators had varying degrees of experience with computer science.
 - A third of educators had completed high school classes in computer science or coding and a little more than half had completed college courses related to computer science.
 - While more than 90% of educators had led basic technology or digital literacy activities with youth, they had comparatively less experience leading computer science or coding activities with youth (only 67% of educators).

¹ Note that one site is still selecting a second educator to replace their original designee. When selected, the educator will be asked to view the webinar recordings, review the curriculum, and learn more from their colleague who participated in the in-person training.

- Fourteen of the 16 partner sites had offered coding or computer science-related programming within the last three years.
- To prepare educators to implement the computer science curriculum, *SciGirls Code* offered monthly webinars starting in February 2017, had online learning resources assigned via the “LRNG” learning platform and conducted a three-day in-person training in April 2017.
 - Webinars had between 23 “live” attendees (February 2017) and 8 attendees (June 2017), with a general decline in “live” attendance through the year. Educators could also view a recording of the webinar anytime. Based on available data, which underestimates participation², an average of about 11 educators viewed the recording each month, without too much variation.
 - Available webinar participation data show that nine out of the 16 sites sent at least one representative to all of the webinars (attending live or watching the recording). Webinar recordings are archived and can be viewed anytime.
 - The in-person training was attended by 31 educators from the 16 sites³. In-person training attendees were more likely to have participated in monthly webinars than educators who did not attend the training.
- Educators were generally very satisfied with the quality of the training and support from *SciGirls Code* and felt it was effective preparation for their role as a *SciGirls Code* educator.
 - The *SciGirls Code* monthly webinars were consistently rated as high quality: Nine out of ten of educators responding to the post-surveys agreed or strongly agreed that the webinar was high quality for four out of the five webinars. The highest rated webinar was the May 2017 session on using role models and digital meet-ups. The lowest rated webinar for overall quality was in March 2017 on Connected Learning and the *SciGirls Seven*, though still 85% of respondents agreed it was high quality.
 - The in-person training featured many hands-on activities that engaged educators and many opportunities to work together with other educators. By the end of the training, they felt highly knowledgeable and prepared to implement most aspects of the project. They felt most prepared for the Mobile Apps strand, which was a focus of the training as it will be at the beginning of the program.

² Webinar participation is tracked with online logins to the “live” version (though participants in one location might share a login) as well as a survey question where respondents indicate whether they attended live or accessed the recording (though the survey was only for 10 days and not completed by all educators).

³ Every site had two educators attend the training, as intended, except for one site. That site was not able to find a replacement educator after they realized that they needed to implement the program at one site rather than two, as they were planning for two educators from two different sites to attend.

- As a result of the webinars and in-person training, educators had made strong gains in:
 - Their interest in teaching girls coding.
 - Perception of the value of coding to make a difference in the world.
 - Their knowledge of how to use effective strategies to engage girls in coding (an area that was not highly rated at the start of the project).
 - Comfort with computer science or coding.
 - How to build computational thinking skills in girls.
- Educators foresee challenges in fitting this work in amongst other roles or responsibilities, getting girls to stay in the program over the nine-months, and dealing with technical issues. SciGirls Code project team is aware of these challenges and implementing strategies to help prevent or ameliorate them.
- The project team is paying close attention to the efficiency and effectiveness of all different aspects of the project model to help guide future scale efforts, including breaking the curriculum up into smaller chunks if time, making the training available online, finding affordable options for the curriculum, and not becoming overburdened with providing technical support.
- Recommendations made in the report include providing webinar materials before the event, providing educators with information and resources on educational and career opportunities in computer science and coding, and offering more assistance to sites to help them maintain girls' involvement through the nine-month program.
- Project successes this year include:
 - Starting the webinar series a few months in advance of the in-person training to allow the educators an opportunity to become familiar with basics about the project.
 - The in-person training was highly praised and thought to be very effective as preparation for educators.

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1 Introduction

The goals of *SciGirls Code: Connected Learning for Middle School Girls in Out-of-School Time* are to 1) spark and strengthen girls' interest, skills, and confidence as technology creators before high school, when attitudes and academic choices can influence postsecondary computer science (CS) studies and careers; 2) support girls' efforts by training educators and role models in best practices for engaging girls in gender equitable STEM education; and 3) contribute to the field by researching the connected learning model for out-of-school learning of CS. *SciGirls Code* is creating new model for using digital media to empower girls, role models, and STEM educators, ultimately enriching and supporting girls' pursuit of CS in academic settings.

In August 2015, Twin Cities Public Television in partnership with the National Girls Collaborative Project (NGCP) and the University of Minnesota Learning Technologies Media Lab started implementation of a 2-year National Science Foundation (NSF) grant under the STEM + Computer Partnerships Program to use principles of connected learning with 16 committed STEM outreach partners to provide 160 girls and their 32 leaders with computational thinking and coding skills.

The products of the project include a nine-month curriculum with three strands (mobile app design and development, robotics, and e-textiles); role model training for female technology professionals; professional development for STEM educators; and a research component to inform program success, impact and refinement. A logic model for the program can be found as Appendix A. Education Development Center (EDC) is conducting the formative and summative evaluation of the project. This report summarizes the findings from Year 2 of the project (August 2016- July 2017)⁴.

2 Evaluation Overview

The project's evaluation focuses on the implementation of the proposed activities and the progress toward meeting the desired outcomes for the educators, role models, and the youth they reach. A detailed description of the evaluation methodology can be found in Appendix B.

The following evaluation questions were established regarding *SciGirls Code* implementation and impact and guide all data collection and analysis:

EDUCATORS

1. What are characteristics of the educators involved?
2. What are educators' experiences with the project training and resources (levels of participation and satisfaction)?
3. To what extent do educators have what they need from *SciGirls Code* to successfully implement the program? Are educators comfortable using the technology to implement the program?

⁴ No data collection occurred during Year 1, so this is the first annual evaluation report.

4. How do educators implement *SciGirls* Code curriculum and activities in their programs (fidelity and adaptations)? To what degree do educators use effective strategies for engaging girls in CS (e.g. *SciGirls* Seven)?
5. How do educator attitudes, interest, confidence, and knowledge related to computing change as a result of their participation?
6. To what extent are educators aware of the educational and career opportunities in CS and convey them to the youth in their programs?
7. To what extent do educators understand the nature of CS and computational thinking and facilitate the development of this knowledge with the girls?
8. What other impacts do educators experience as a result of their participation and training?

ROLE MODELS

9. Who are the role models involved?
10. How do role models perceive the effectiveness of the role model training and support?
11. What content, activities, and strategies do role models use with the youth participants? How do role models connect with participants (virtually, in-person, lead activities, etc.)?
12. To what extent do role models have increased knowledge of how to reach out to girls and increased confidence in their ability to effectively be a role model?
13. To what extent do role models utilize effective strategies from the training in conducting outreach?
14. What other impacts do role models experience as a result of their participation and training?

YOUTH PARTICIPANTS

15. Who are the girls reached by the trained educators?
16. How do girls participate in *SciGirls* Code?
17. How are girls affected by role models? How is the impact of role models related to how they connect with or interact with role models?

SCALE-UP

18. What was learned during implementation of this model that could inform future scale-up?
19. What were barriers and benefits of participating for educators and their programs?
20. How could the project more effectively and/or efficiently meet its outcomes?
21. What components of the project were most crucial to its success?
22. To what degree did local adaptations at partner sites affect the success of the project?

During Year 2, the evaluation plan was refined, instruments were designed, and data collection, mainly with educators, began. The following evaluation activities were accomplished this past year:

- The evaluation team met with the project team and project researcher approximately monthly to go over project updates, do evaluation planning and discuss recent findings.
- Obtained IRB approval to conduct data collection activities.

- Further clarified the evaluation questions from the proposal, adding the following sub-questions:
 - *EDUCATORS 3B*) Are educators comfortable with technology to implement the program?
 - *EDUCATORS 4B*) To what degree do educators use effective strategies for engaging girls in CS (e.g. *SciGirls Seven*)?
 - *ROLE MODELS 3B*) How do role models connect with participants (virtually, in-person, lead activities, etc.)
 - *YOUTH PARTICIPANTS 3B*) How are girls affected by role models?
- Coordinated with the project researcher on data collection and data sharing, where appropriate, which include a shared consent form, joint efforts to communicate clearly with educators on their role and expectations for participation in the evaluation and research, and selection of cases for site visits (with different sites for research and evaluation). The evaluation and research teams will share evaluation instruments to reduce burden on respondents, such as combining questions into one youth post-survey and creating a shared educator interview protocol to provide data for the evaluation and the research.
- Designed the following evaluation instruments: *Educator “pre-survey”, Educator post-training survey; Educator post-webinar survey; Role model post-training survey; Role model reflection survey; and Project Leadership interview protocol.*
- Administered a “pre-survey” to partner site contacts (which included educators and project leads. Since many partner sites had not yet set their designated roles in the project, we use “educators” generally to include all contacts at a partner site, though some may end-up with an administrative role) in February 2017 (as part of the February post-webinar survey) and to new educators joining the project through March. Results were summarized for the project team, including a table showing educators’ experience and existing knowledge of computer science by site to help guide the development of training and support resources. Thirty-six out of 45 educators responded.
- Administered the educator post-webinar survey six times, immediately following monthly webinars offered from February to July 2017. (*Note: Starting in August 2017, we will be asking the educators about the webinars in the post-curriculum survey rather than continuing to administer immediate post-webinar surveys*). The surveys stayed open for a week to gather responses from educators who accessed the recording of the survey during that time. Responses were received by an average of 23 educators per survey.
- Two evaluation team members attended the in-person training in April 2017 to meet educators, observe the training, learn and observe the curriculum activities, and to review evaluation expectations with educators. A post-training survey was administered at the end of the training, with 30 out of 31 attendees responding. Results were summarized for the project team.

- To help understand successes and challenges of project implementation and gather more context for interpreting other evaluation data, evaluators conducted an interview with two representatives of the project team in July 2017.

Table 1 shows the data collection instruments and administration dates during Year 2.

Year 2 Evaluation Instruments, Timeline and Respondents

| Instrument | Administration Date | Invitees ⁵ | Respondents | Response Rate ⁶ |
|---|---------------------|-----------------------|-------------|----------------------------|
| Educator Pre-survey (<i>Appendix C</i>) | Feb 2017 | 45 | 36 | 80% |
| Webinar Post Survey: Educator Online Orientation (<i>Appendix D</i>) | Feb 2017 | 45 | 31 | 69% |
| Webinar post-survey: Connected Learning and the <i>SciGirls</i> Seven (<i>Appendix E</i>) | Mar 2017 | 43 | 29 | 67% |
| Webinar post-survey: Computational Thinking, Research, and Evaluation (<i>Appendix F</i>) | Apr 2017 | 44 | 26 | 59% |
| Webinar post-survey: Using Role Models and Recruitment and Retention of Girls (<i>Appendix H</i>) | May 2017 | 44 | 20 | 44% |
| Webinar post-survey: LRNG & Supplemental Curriculum Materials (<i>Appendix I</i>) | Jun 2017 | 44 | 13 | 30% |
| Webinar Post-survey: Materials and Digital Meet-ups ⁷ (<i>Appendix J</i>) | Jul 2017 | 44 | 10 | 23% |

⁵ Note that partner sites agreed to have two trained educators to implement the *SciGirls* Code program at their site. Many sites have more than two people on the “participant” list for *SciGirls* Code for a few different reasons: 1) Administrators and other program staff were interested in learning about the program and thinking how it would be implemented at their site or in receiving the professional development and they were invited to participate in all webinars and stay apprised of the program via the GoogleGroup even though they were not planning to be a direct facilitator of the program; 2) Sites were still deciding their roles, such as which two people would be serving as the trained educators; 3) At least one site did not understand that the two educators needed to be from the same location and working together to implement one *SciGirls* Code program; 4) Changes in roles occurred for other reasons such as hiring of new staff or shifting of roles and resources at a partner organization. *SciGirls* Code regularly updated their list of participants from partner sites (administrators and educators), which is why the number of invitees to the monthly webinar post-survey has not been consistent.

⁶ Response rate based on number of invited educators to the webinars, not the number of live participants.

⁷ July webinar data was still being analyzed and will be included in the next Annual Report.

| Instrument (continued) | Administration Date | Invitees ⁸ | Respondents | Response Rate ⁹ |
|--|---------------------|-----------------------|-------------|----------------------------|
| Educator in-person training survey (Appendix G) | Apr 2017 | 31 | 30 | 97% |
| Project lead interviews (Appendix K) | Jul 2017 | 2 | 2 | 100% |

Additionally, the following statistics and metrics were gathered in July 2017:

- Webinar and training participation
- Website statistics
- LRNG metrics and examples
- Role model registration update

⁸ Note that partner sites agreed to have two trained educators to implement the SciGirls Code program at their site. Many sites have more than two people on the “participant” list for SciGirls Code for a few different reasons: 1) Administrators and other program staff were interested in learning about the program and thinking how it would be implemented at their site or in receiving the professional development and they were invited to participate in all webinars and stay apprised of the program via the GoogleGroup even though they were not planning to be a direct facilitator of the program; 2) Sites were still deciding their roles, such as which two people would be serving as the trained educators; 3) At least one site did not understand that the two educators needed to be from the same location and working together to implement one SciGirls Code program; 4) Changes in roles occurred for other reasons such as hiring of new staff or shifting of roles and resources at a partner organization. SciGirls Code regularly updated their list of participants from partner sites (administrators and educators), which is why the number of invitees to the monthly webinar post-survey has not been consistent.

⁹ Response rate based on number of invited educators to the webinars, not the number of live participants.

3 Findings

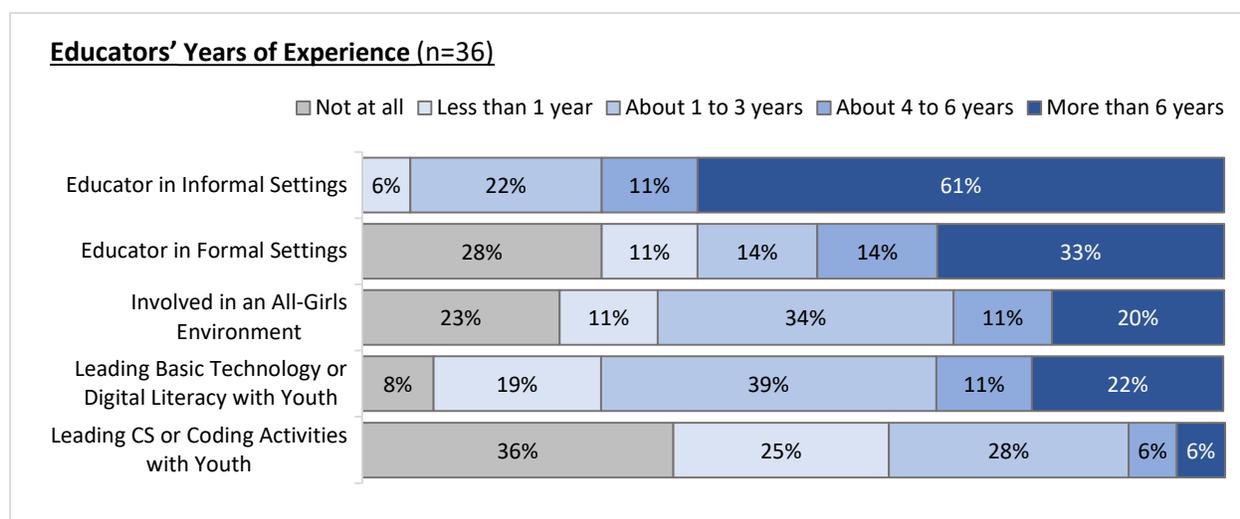
Data collected this past year are presented here in response to each evaluation question. Note that since much of the data collection focused on the educators involved at partner sites who have been participating in trainings, many of the evaluation questions related to role models and youth participants are not yet addressed.

EDUCATORS

1. What are characteristics of the educators involved?

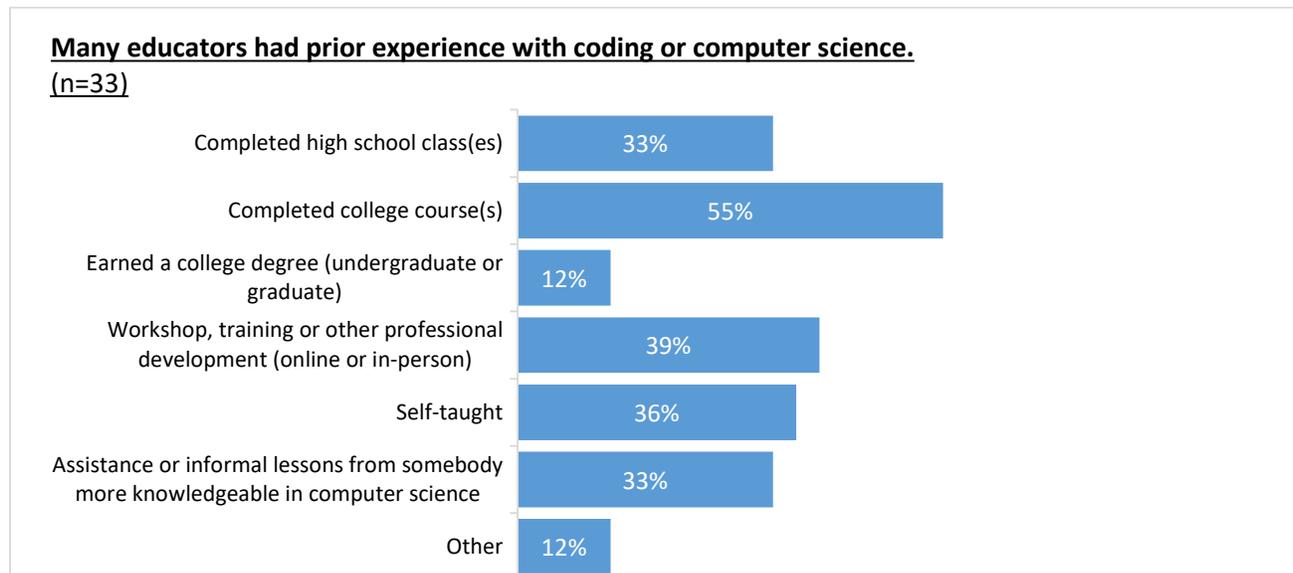
SciGirls Code includes 16 partner sites across the U.S., including informal and formal organizations, each of which will reach 10 girls with the nine-month curriculum. Partners were identified at the project proposal stage and were all previously involved in other *SciGirls* programming. All educators responding to the pre-survey had at least some experience working in informal education settings and 61% had more than six years of experience. Additionally, 72% of respondents had at least some experience in formal education settings. About three-quarters had been involved in an all-girls environment.

While more than 90% of respondents had led basic technology or digital literacy activities with youth (with a third of all educators having about four years of experience or more), they had comparatively less experience leading computer science or coding activities with youth. Thirty-six percent of educators had never led computer science or coding activities and a 25% of respondents had led computer science or coding for less than a year. A portion of respondents was more experienced leading computer science or coding: 28% had about one to three years of experience and 12% had about four years of experience or more.



In terms of their own educational experiences in computer science or coding, a third of educators had completed high school classes and a little more than half had completed college courses. A handful of

educators had received a college degree in computer science or coding. Forty-percent of respondents had attended a workshop or professional development in the subject area. A third of respondents had help or lessons from somebody more knowledgeable and a similar percentage indicated they were self-taught.



Examples of educators' varying experiences in computer science included:

- *Short workshops at conferences: Scratch, e-textiles. Self-taught in Dot & Dash robots, Sphero, Lego robotics. I have no formal training, but have learned a bit about kid-friendly coding (e.g., Scratch, Blockly, Wonder, etc.) through outreach work involving different robotics platforms*
- *BSEE Degree and 20 years as a software engineer*
- *Beginning hourofcode.org classes, experiment with dash and dot, bee bot*
- *Learned HTML and built websites in high school. Completed college coursework: Introduction to Computer Science, Data Structures, Robotics, and Principles of GIS.*
- *I have done Mindstorms and Botball competitions, which required some coding for students.*

Fourteen of the 16 partner sites had offered coding or computer science-related programming within the last three years. Of those, eight of the sites had girls-only coding or computer science-related programming. The coding or computer science-related programming offered by sites within the past three years included participating in activities for Hour of Code, offering a curriculum for girls, Lego Robotics, computer science in after school or summer programs, geocaching, a coding class, and coding with SCRATCH or Alice.

EDUCATORS

2. What are educators' experiences with the project training and resources (levels of participation and satisfaction)?

Participation in online and in-person trainings

SciGirls Code began offering monthly webinars in February 2017 and will continue to do so until completion of the project. Educators can participate in webinars “live” at the time they are offered or log-on to the *SciGirls Code* website to access the recorded version. They can also download the slides and view the chat box from the webpage. Based on available data,¹⁰ educators' attendance at webinars was higher at the beginning of the project, though it is likely that many educators who access the recorded webinars are not reflected in these data. It is also notable that webinars are sometimes attended by partner site staff who will not be closely involved in the program implementation and who are therefore not expected to attend *SciGirls Code* webinars (for example, a director may be interested in learning more about connected learning, but will not be a *SciGirls Code* educator so may choose not to attend any other webinars). In addition to webinars, an in-person training was held over three days in April 2017 at the Twin Cities PBS office in Saint Paul, Minnesota and attended by 31 educators representing all 16 sites.

“CS is challenging but fun as designed by SciGirls with an integrated approach to include hands-on activities, role model inclusion and group work.”

A *SciGirls Code* Educator, after attending the in-person training

¹⁰ Webinar participation was calculated by sign-in of email at “live” webinars and then survey responses where educators selected if they accessed the recording or participated live. Note that the surveys only stayed open for responses for 10 days after a “live” webinar. This method underestimates participation in three ways:

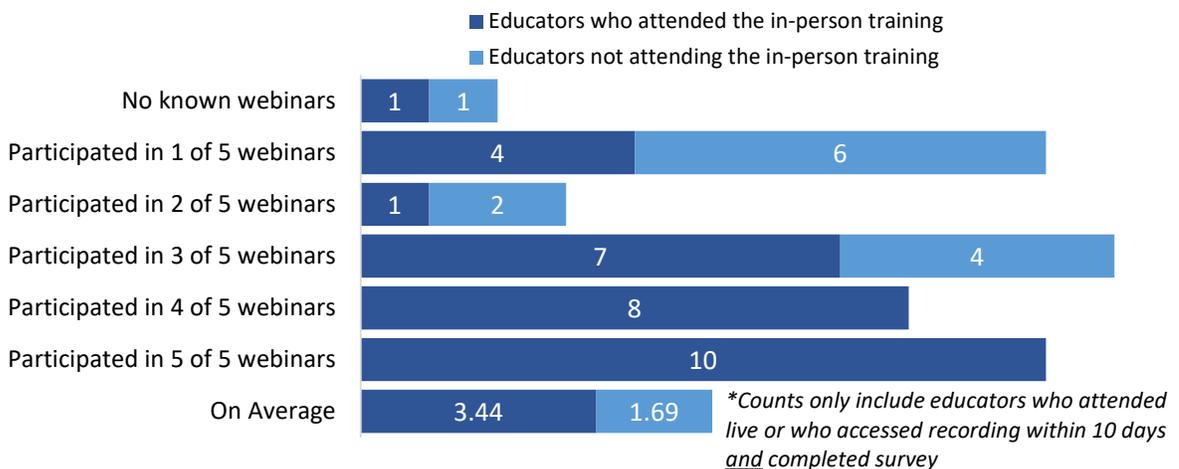
- A group of attendees from a site could login with one email sign-in;
- An educator who accessed the recording within 10 days did not complete a survey;
- An educator accessed the recording more than 10 days after it was offered “live” (when the survey was closed).

Educators' known participation in webinars has decreased since the beginning of the project.



Educators who attended the in-person training were more likely to have attended or accessed more of the monthly webinars (based on the data available). On average, educators who attended the in-person training participated in 3.44 of the 5 webinars and educators who did not attend the training participated in 1.69 webinars, on average.

Educators who attended the in-person training are more likely to have accessed more of the webinars (based on known participation*)



Available webinar participation data show that nine out of the 16 sites sent at least one representative to all of the webinars and another 6 sites had a representative at all but one of the webinars.

Participation in webinars was strong across partner sites.

| Organization | | Total participants | Number of known participants attending live or accessing the recording from a partner site | | | | | Total Webinars w Representation |
|---|-----------------------------------|--------------------|--|----------------------|----------------------|----------------------|----------------------|---------------------------------|
| | | | Attended ¹¹ Feb Webinar | Attended Mar Webinar | Attended Apr Webinar | Attended May Webinar | Attended Jun Webinar | |
|  | Cedar Park Elementary | 3 | 2 | 3 | 3 | 2 | - | 4 |
|  | CommunityCode | 2 | 2 | 2 | 1 | 1 | 1 | 5 |
|  | CU Science Discovery Center | 3 | 3 | 3 | 2 | 1 | - | 4 |
|  | Discovery Center | 4 | 2 | 1 | 2 | 1 | - | 4 |
|  | Girl Scouts of Central Texas | 2 | 2 | 2 | 2 | 2 | 1 | 5 |
|  | Girls Inc of Orange County | 2 | 1 | 1 | 1 | 1 | 1 | 5 |
|  | Laura Jeffrey Academy | 4 | 3 | 2 | 2 | 2 | 2 | 5 |
|  | New Mexico PBS | 2 | 2 | 2 | 2 | 1 | - | 4 |
|  | Project Scientist | 3 | 3 | 2 | 2 | 1 | 1 | 5 |
|  | Salem-Keizer Education Foundation | 2 | 2 | 2 | 2 | 1 | 2 | 5 |
|  | Science Center of Iowa | 4 | 2 | - | 1 | 1 | - | 3 |
|  | Sci-Port Louisiana | 3 | 4 | 3 | 2 | 2 | 2 | 5 |
|  | spectrUM Discovery Area | 2 | 3 | 3 | 2 | - | 3 | 4 |
|  | Town of Ramapo Challenger Center | 2 | 1 | 2 | 2 | 1 | 2 | 5 |
|  | WSKG | 2 | 1 | 1 | 2 | 1 | 1 | 5 |
|  | YMCA of Metropolitan Washington | 4 | 2 | 2 | 2 | - | 1 | 4 |

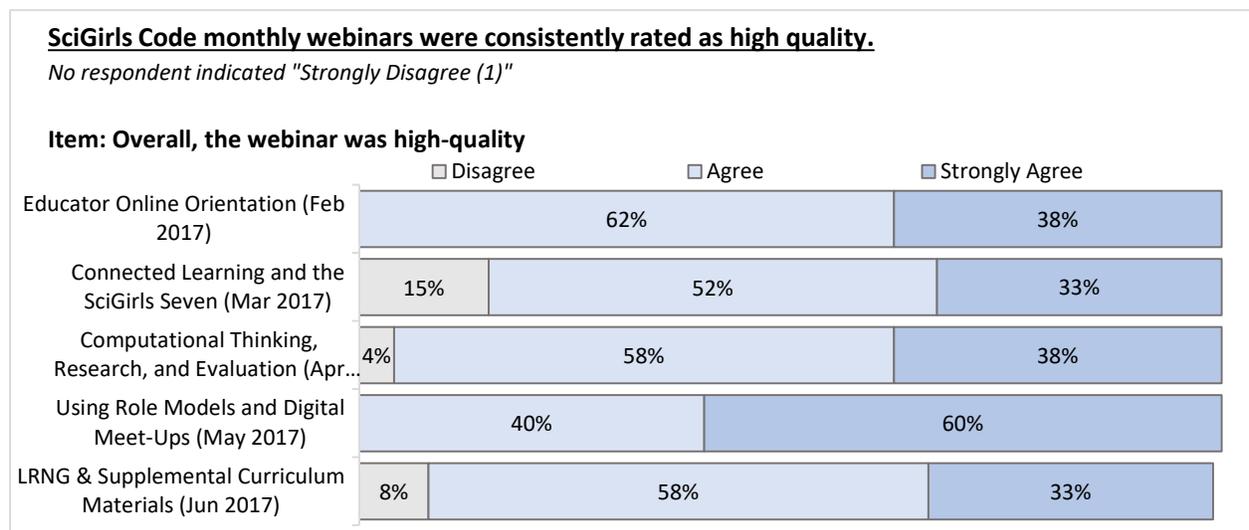
¹¹ “Live” or via the recording, based on data available which underestimates participation

Educators are also asked to complete “homework” before some of the webinars. The completion rate in the LRNG platform¹² shows that 31/44 educators completed full the *SciGirls* Seven “XP”; 29 completed the XP on connected learning and 25 completed the one on computational thinking. Post-survey responses also show that a handful of educators started the XPs without completing them.

Project Team members have been impressed with the involvement and responsiveness of all partner sites so far, commenting on their strong participation in webinars, their sustained engagement at the in-person training, completion of the homework, and responsiveness to e-mails and requests for information.

Satisfaction with training and resources

The *SciGirls* Code monthly webinars were consistently rated as high quality, with 90% agreeing or strongly agreeing they were high quality for four out of the five webinars. The highest rated webinar was the May session on using role models and digital meet-ups. The lowest rated webinar was in March on connected learning and the *SciGirls* Seven.



A handful of educators have made suggestions to improve the webinars, some of which have been incorporated into the subsequent webinars after the project team received their feedback. There were a few sessions when educators felt the content could have been covered more efficiently, but otherwise the majority of post-survey respondents always rated content as “about right” rather than too simple or too advanced. Educators have also requested that information or materials about what is going to be covered in webinars be provided before it is offered to help them feel prepared and give context to the topic.

¹² The LRNG platform was used to present content to educators and will also be used by the girls.

There were also a few challenges related to the recorded webinar and suggestions were made for the chat box to scroll with the recording. One person also commented that the networking and team-based aspect of webinars is lost when watching the recorded version.

There was a high level of praise about the quality and value of the in-person training. It was a very positive and supporting learning environment, *“Absolutely fabulous training with some of the most engaging, thoughtful trainers ever. [I] really appreciated the variety in training styles.”*

Additionally, the value and effectiveness of the training is evident in educators’ gains in knowledge and confidence.

See Question 3 on the high level of comfort educators have with the technology and how to lead the curriculum activities covered during the in-person training and Question 5 on increases in comfort and knowledge in computer science.

“This training was an amazing experience in terms of personal growth. I am so excited to share this opportunity with others. Overall, I’m very thankful for all the amazing work this team put into this curriculum and this training.”

-SciGirls Educator after the in-person training

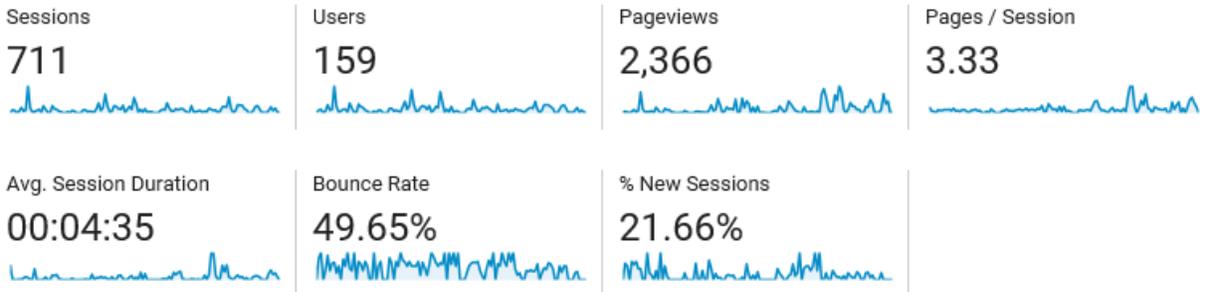
Over half of the respondents agreed that the length of the three-day training was “just right” (others were evenly divided between the training being “a bit too short” and “a bit too long”). Eighty-seven percent of respondents agreed that the training content was “just right,” while four educators felt it was “a bit advanced.”

Educators’ top take-aways from the training included increases in knowledge related to the content in the curricular units (16 respondents), the resources and tools curriculum they received to help them implement the program (11 respondents), a feeling of confidence in doing and facilitating the activities (9 respondents), strategies how to engage girls in coding (8 respondents), and a feeling of community in meeting others involved in the project (8 respondents).

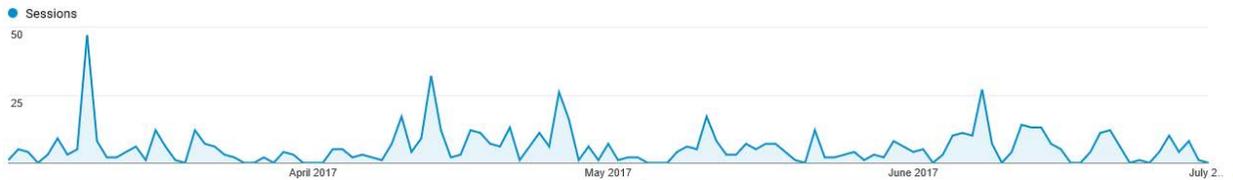
The success of the project training was considered as one of the biggest successes of this year by two members of the project team, who felt that it was a success both from the trainers’ perspective and the perspective of the participating educators.

Use of the *SciGirls* Code Website

Since the launch of the *SciGirls* Code website in March 2017 through July 1, there have been 711 total sessions¹³ from 159 users. The sessions featured an average of about 3 pages per session, giving the site more than two thousand page views.



The number of sessions usually peaked the day before or the day of a webinar.



The webinar page had the most page views on the site, followed by the page with the mobile app strand, which was accessed mostly during the past month.

Page views on the *SciGirls* Code Website

| Page | Page Views | Unique Page Views | Average Time on Page | Entrances |
|--|------------|-------------------|----------------------|-----------|
| /tpt.org/SciGirlscode/webinars | 326 | 255 | 272.74 | 149 |
| /tpt.org/SciGirlscode/mobile | 202 | 56 | 55.75 | 13 |
| /tpt.org/SciGirlscode | 186 | 157 | 157.21 | 142 |
| /tpt.org/SciGirlscode/curriculum | 176 | 105 | 88.40 | 26 |
| /tpt.org/SciGirlscode/home | 156 | 122 | 81.67 | 74 |
| /tpt.org/SciGirlscode/in-person-training | 111 | 99 | 155.02 | 49 |
| /tpt.org/SciGirlscode/robotics | 67 | 38 | 34.20 | 6 |

¹³ Web stats include internal use by *SciGirls* Code project team.

The majority of sessions and users were from states where partner organizations were located. Other than near Saint Paul¹⁴, the most sessions were conducted in Tennessee and in New York near the Ramapo Challenger Center. Texas had the highest number of visitors using the site, followed by Louisiana and New Mexico, which could reflect large project teams working on their implementation of *SciGirls Code*.

Web Use by Partner Sites' Location

| | State | Sessions | New Users |
|-----------------------------------|-------------------------------|--|-----------|
| Cedar Park Elementary | MN (Apple Valley) | 20 | 3 |
| CommunityCode | SC | 25 | 1 |
| CU Science Discovery Center | CO | 18 | 6 |
| Discovery Center | TN | 37 | 6 |
| Girl Scouts of Central Texas | TX | 26 | 15 |
| Girls Inc. of Orange County | CA | 18 | 5 |
| Laura Jeffrey Academy | MN (Saint Paul) | Data cannot be separated from TPT internal use | |
| New Mexico PBS | NM | 18 | 8 |
| Project Scientist | NC | 20 | 2 |
| Salem-Keizer Education Foundation | OR | 18 | 3 |
| Science Center of Iowa | IA | 25 | 4 |
| Sci-Port Louisiana | LA | 18 | 8 |
| spectrUM Discovery Area | MT | 25 | 4 |
| Town of Ramapo Challenger Center | NY (Ramapo) ¹⁵ | 34 | 5 |
| WSKG | NY (Binghamton) ¹⁶ | 17 | 3 |
| YMCA of Metropolitan Washington | Washington, DC ¹⁷ | 8 | 2 |

Users also visited the *SciGirls Code* websites from other states, including Utah, Virginia, Georgia, Illinois, Arizona, Mississippi, Florida, and Washington.

¹⁴ In Saint Paul, usage of a partner site data cannot be separated from internal use by Twin Cities PBS and the *SciGirls Code* project team.

¹⁵ Includes web use from Spring Valley, White Plains, Sufern and Scarsdale, NY and Hawthorn, NJ.

¹⁶ Includes web use from Johnson City

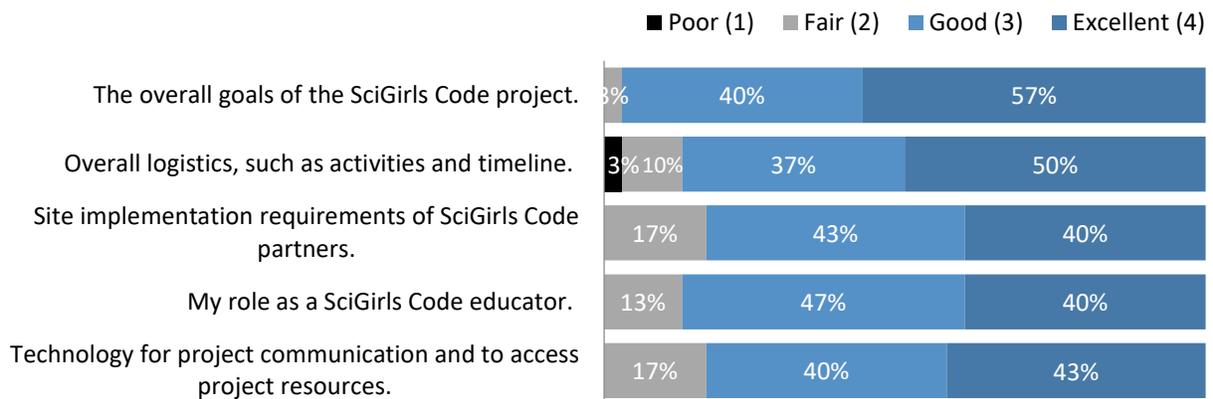
¹⁷ Includes web use from Maryland.

EDUCATORS

3. To what extent do educators have what they need from *SciGirls* Code to successfully implement the program? Are educators comfortable using the technology to implement the program?

Almost all educators completing the February 2017 Orientation post-survey indicated they had a “Good” (40%) or “Excellent” (57%) understanding of the overall goals of the *SciGirls* Code project. At least 80% of the educators indicated a “Good” or “Excellent” understanding of overall logistics, site implementation requirements, their role as a *SciGirls* Code educator, the technology for project communication and how to access project resources.

Educators' had a high understanding of SciGirls Code goals and implementation after the February 2017 orientation. (n=30)



“No confusion or questions [on Mobile Apps]. The introduction to the software and materials were effective to getting me started. I feel prepared and confident to expand my learning over the next few months.”

-A *SciGirls* Code Educator, after attending the In-person training

Educators completing the survey after the April 2017 in-person training had a very good sense of the overall goals and scope and the learning objectives of the Mobile Apps strand (which was covered in the most depth as it will be implemented starting in the fall). Seventeen percent of respondents rated their comfort in using the technology as “Satisfactory,” and the other 83% of respondents rated it as “Good” or

“Excellent.”

For the Robotics strand, 80% rated their comfort with the technology in the strand as “Good” or “Excellent” and 87% felt prepared to facilitate the activities. While many wrote that they felt prepared and confident, a few respondents wrote wanting more time practice with the materials and technology

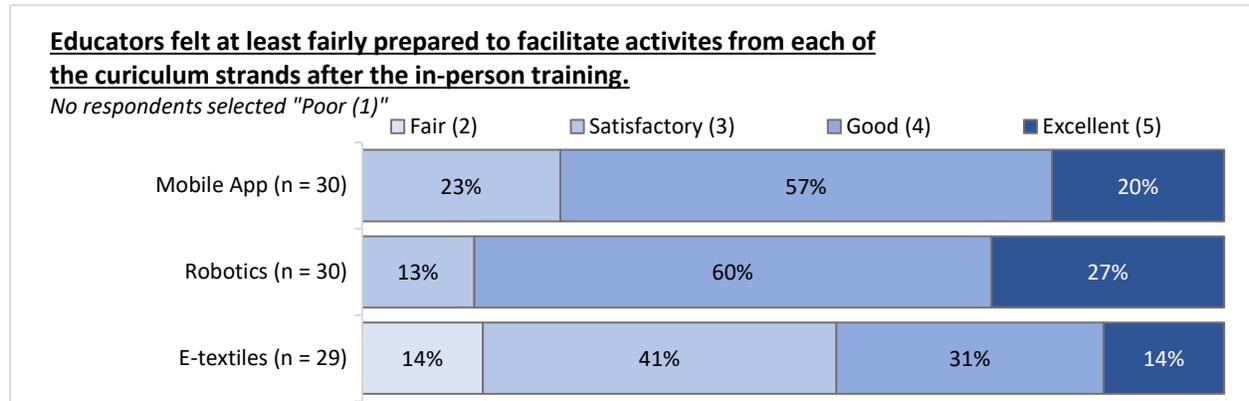
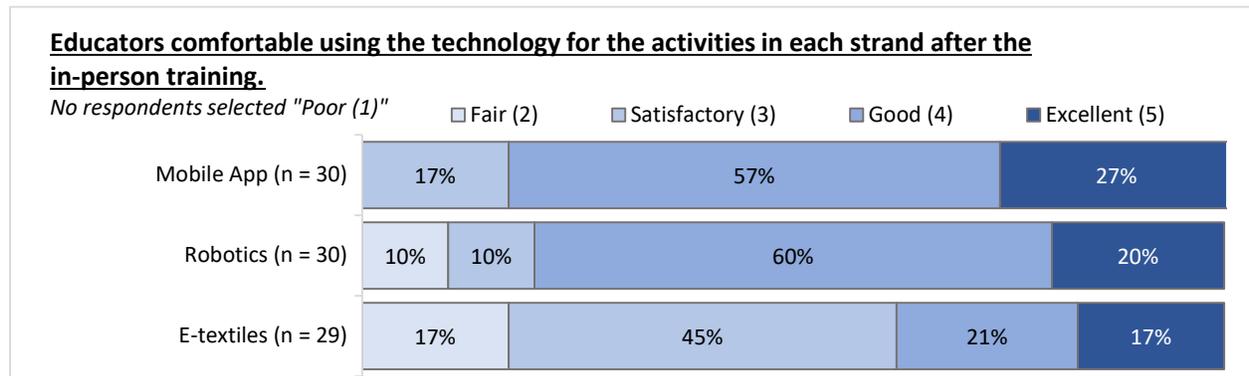
to feel more comfortable, *“I’m still not comfortable at all with the Hummingbird code programming. The physical aspects I understand but I would struggle leading girls through the coding process or being a helpful resource to them troubleshooting.”*

Comfort and preparedness was slightly lower for the e-textiles strand, which was not covered as fully during the in-person training¹⁸: 77% of the respondents had a strong sense of the overall scope of the unit and 80% understood the learning objectives (with ratings of “Good” or “Excellent”).

“I just need to spend more time planning out and working with e-textiles to become more comfortable. I’m worried that the girls or I will fry circuitry that can’t be replaced.”

- A SciGirls Code Educator, after attending the In-person training

For the e-textiles strand, educators were worried about damaging the circuits, unpracticed at sewing, and desired more time to practice and play around with the materials.



Many of the monthly webinars have featured information on different areas of implementation and technology that will be used in implementation of the project. Topics have included components such as their role in evaluation and research activities, recruiting and retaining girls, and using role models, including of connected learning, digital meet-ups (using Flipgrid).

¹⁸ Educators will not be starting implementation of the e-textiles strand for six months.

Post-surveys showed a high level of educator understanding in these areas:

- Respondents for the March post-webinar survey had significantly higher ratings of their knowledge of connected learning. Respondents' "Before" ratings on their **knowledge of connected learning** were fairly low, with only 15% indicating they were moderately or very knowledgeable. After the webinar, 75% indicated they were moderately or very knowledgeable.
- After the May webinar, all post-survey respondents agreed that they learned **effective strategies to recruit girls** to participate in the program **and to keep girls in the program**. All but 5% of respondents have what they need to recruit girls to participate in the program.
- All respondents agreed that they understood **how role models would be used** in the project (55% agree and 45% strongly agreed after the May webinar).
- All respondents in June either agreed or strongly agreed that they understand how the **LRNG platform** will be used by the youth participants.

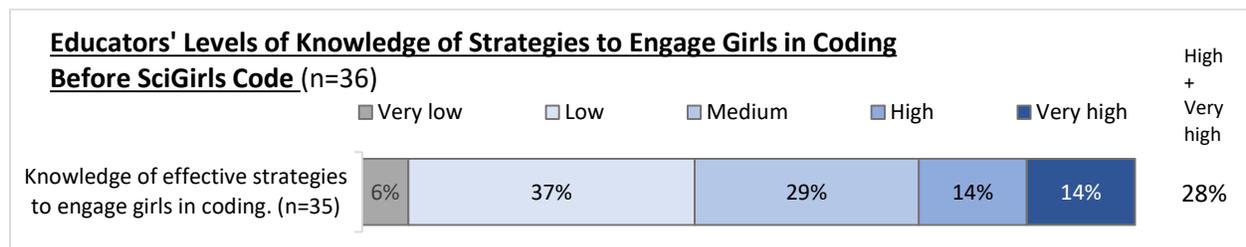
Educators are currently receiving the materials and technology purchased as part of this grant.

EDUCATORS

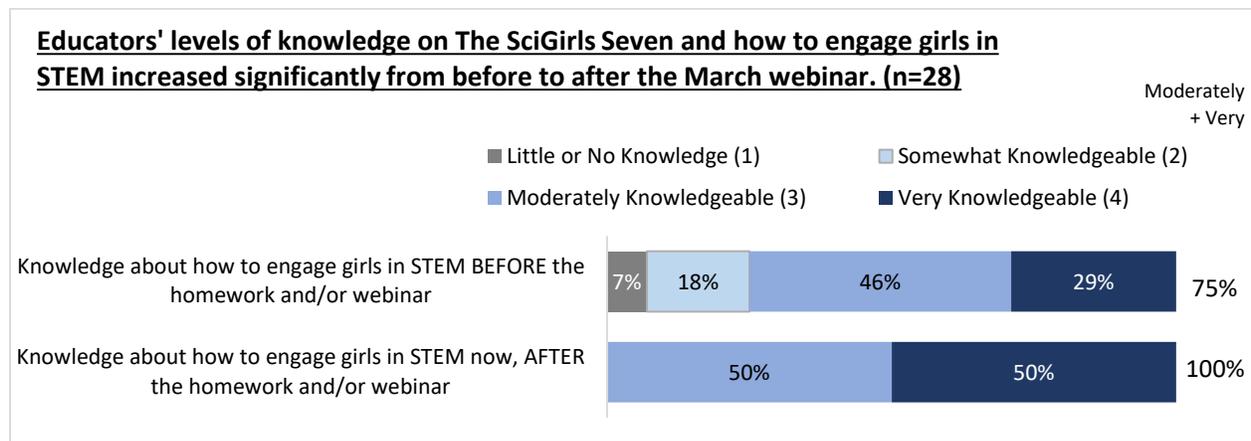
4. How do educators implement *SciGirls* Code curriculum and activities in their programs (fidelity and adaptations)? To what degree do educators use effective strategies for engaging girls in computer science (e.g. *SciGirls* Seven)?

Since educators are not yet implementing their *SciGirls* Code programming, there is not yet data on fidelity and adaptations to the curriculum and activities. However, data do show that educators have gained knowledge on effective strategies to engage girls in computer science.

Before their participation in *SciGirls* Code, most educators did not rate their knowledge of strategies to engage girls in coding very highly. Twenty-eight percent of educators indicated it was "High" or "Very high." Most indicated their knowledge of effective strategies in this area as "Low" (37%) or "Medium" (29%).



Of those responding to the post-survey after the March webinar (which focused in part on the *SciGirls Seven* and how to engage girls in STEM), the percentage of educators indicating they were “Moderately” or “Very” knowledgeable increased from 75% before the session to 100% after the session.



All respondents to the March webinar post-survey agreed or strongly agreed that the *SciGirls Seven* resource was high quality. Ninety-three percent of post-survey respondents indicated that the content was useful to help prepare them to be a *SciGirls Code* educator and all agreed that the information would be useful in their other work. When asked what they planned to apply to their work, a few responses referenced effective strategies to engage girls in STEM or Computer Science, including providing a safe learning environment, facilitating learning versus teaching, and strategies around relevance, collaboration opportunities, and praising effort:

- *The strategies to use when teaching STEM to girls. I appreciated the comment to think about making sure the girls feel safe to think critically and share their thinking.*
- *To remember the valuable and effective impact that sincere positive feedback has on student performance and building rapport.*
- *ALL of the ideas about how to engage girls in STEM, but a specific one is to allow them time to collaborate and talk about their ideas.*

EDUCATORS

5. How do educator attitudes, interest, confidence and knowledge related to computing change as a result of their participation in *SciGirls Code*?

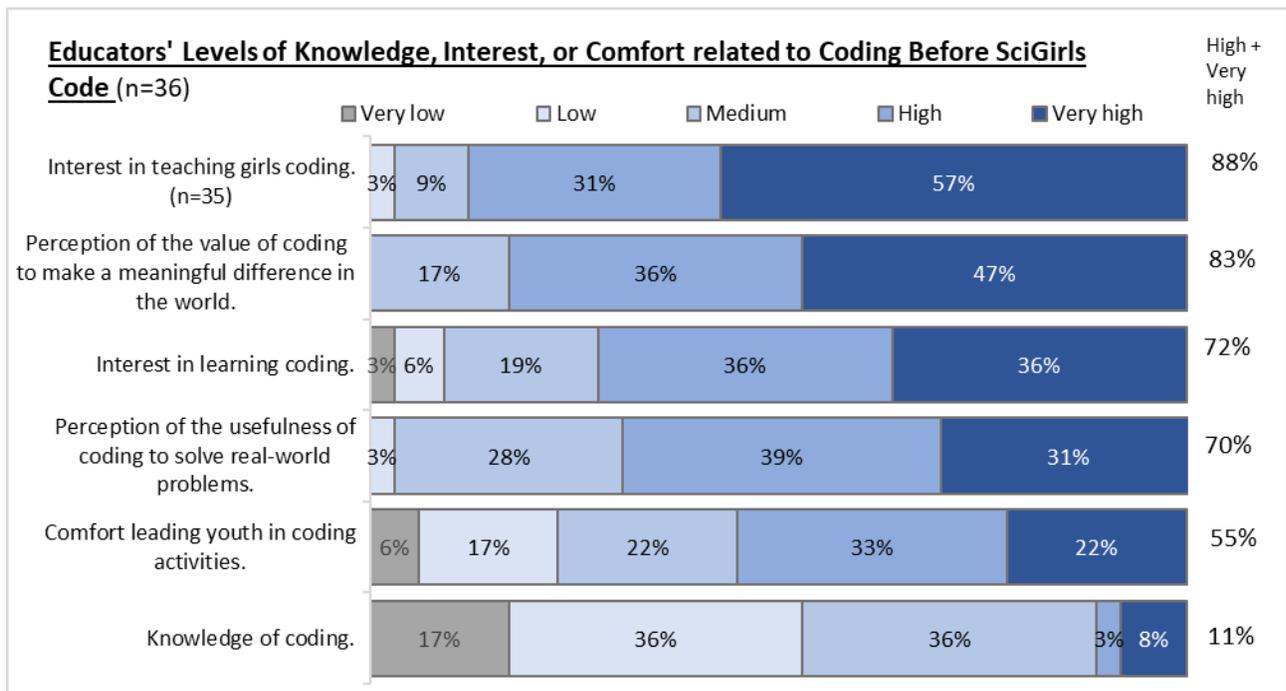
Educators generally had high interest and positive views of coding before the start of the project. In the pre-survey, respondents indicated their interest in teaching girls coding was “High” or “Very high.” Additionally, most educators indicated that they held a high value of coding in making a meaningful

difference in the world and in solving real-world problems (with 83% and 70% indicating “High” or “Very high,” respectively).

Ratings of their knowledge of coding was much lower, with only 11% of respondents indicating it was “High” or “Very high.” However, even with lower levels of knowledge, educators felt fairly comfortable leading youth in coding before starting with *SciGirls Code* (with 55% indicating “High” or “Very high”).

“While I knew a little about coding, I was surprised by how quickly I picked up in coding concepts when collaborating with my group members.”

-An educator after the in-person training



In an open-ended question about what they hoped to get out of participating in *SciGirls Code*, many responses mentioned increasing their own knowledge of coding or computer science (19 educators, or 45% of respondents) and confidence in coding (8 educators, 19%). They also hoped to make gains in facilitating girls’ and knowledge of coding. The most common response, by 60%, was that they wanted to engage girls in coding or computer science, and twelve people (29%) mentioned they wanted to learn strategies and resources to teach coding.

Examples of responses included:

- *Personally, I hope to gain confidence and competency in teaching coding. Professionally, I am hopefully to inspire and provide a space for my girls to thrive and gain the access to coding*

- *I am excited to develop my own coding/CS knowledge and expertise and to connect with more resources that can benefit girls in our community.*
- *I would like to be confident in my ability to properly engage girls in coding, in an intentional and meaningful way.*

“I was extremely unsure of myself and my knowledge beforehand and now I feel more confident because I not only understood what was happening, but could execute it as well. STEM has never been my strong suit, but now I feel great about it!”
-An educator after in-person training

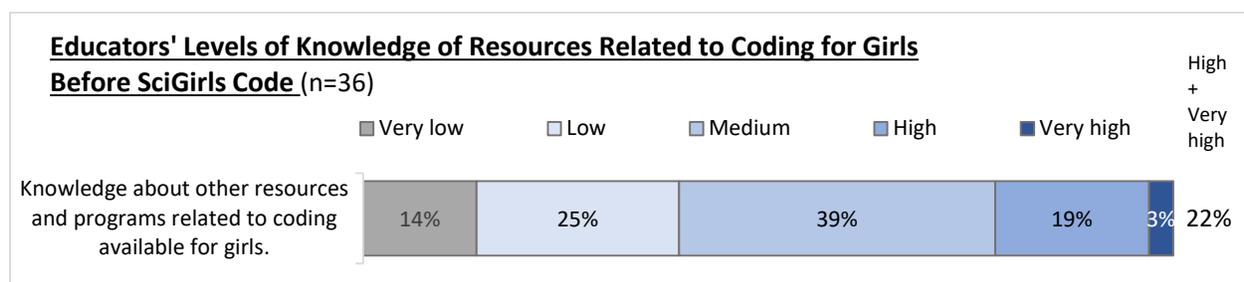
After the in-person training, educators noted their increased comfort with computer science or coding, an area where they had not felt confident in the past, *“I was very uncomfortable with coding prior to this training and now I feel like I have the tools I need to be comfortable educating myself and others on coding.”* The project team also commented on the increase in educators’ confidence as a result of their

experiences in the in-person training, doing the hands-on activities and struggling through and being successful.

EDUCATORS

6. To what extent are educators aware of the educational and career opportunities in CS and convey them to the youth in their programs?

Compared to other self-ratings of educators’ knowledge before *SciGirls Code*, ratings of awareness of resources and programs related to coding available for girls were lower, with 22% indicating their current level was “High” or “Very high” and most educators (39%) rating it as “Medium.”



When asked what s/he wanted to get out of their involvement in *SciGirls Code*, a few educators wrote about inspiring girls to pursue coding:

- *“I hope to inspire young women to consider career choices they may not have felt a comfort level in exploring before. Personally and professionally, I want to encourage and nurture girls to be scientifically literate. I also want to increase my understanding of coding and its*

importance in the lives of 21st century learners. I feel like technology is advancing at such a rapid pace and I want to "catch the wave," so to speak.

- *"I hope to contribute to solving the problem related to the decline of female participation in STEM education and eventual careers."*

The many educational and career opportunities have not yet been well-covered in the educators' training so far. However, the information is embedded in the curriculum, including videos showing women working in computer science or coding and an activity where girls make a slide show of females working in CS. Since the girls are middle-school age, the focus will be less on career information and more to get them in the pipeline for the preparatory courses in high school.

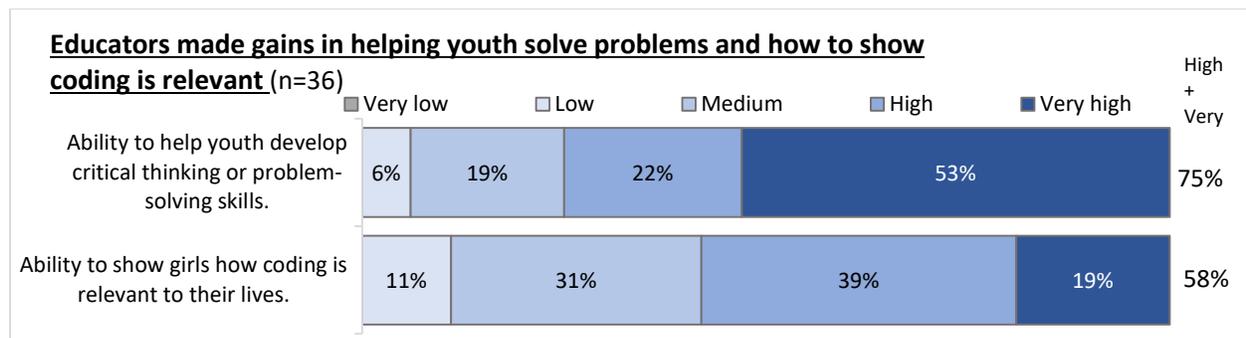
EDUCATORS

7. To what extent do educators understand the nature of computer science and computational thinking and facilitate the development of this knowledge with the girls?

"I found the structure of concepts within computational thinking very important, as they tend to follow the patterns I have seen and learned to intuit in the programming I've done. I also appreciate the parallels of practices to the scientific method, but also their extensions to the perspectives that inquiry creates. I want to know more about how implementation of this framework looks and how to assess participants."

-An educator, in "homework" in the LRNG platform

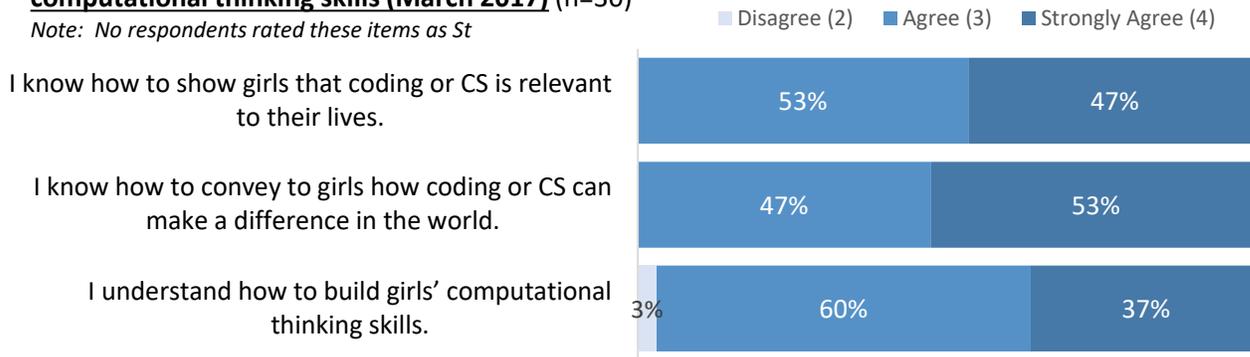
Before the program began, educators had fairly high levels of agreement that they could build girls' computational thinking skills, with three-quarters of respondents indicating their ability as "High" or "Very high." Their ratings of their ability to show girls how coding or computer science is relevant to their lives were slightly lower, with 58% of respondents indicating their ability as "High" or "Very high."



After the March webinar, one educator wrote that s/he would use one of the *SciGirls* Seven strategies and emphasize the relevance of the content to the girls: *“Will try to implement more emphasis on relevancy and meaningfulness with regard to the students and the subject matter being addressed.”*

Educators agreed or strongly agreed that they know how to show girls that or CS is relevant and can make a difference. All but one agreed they knew how to build computational thinking skills (March 2017) (n=30)

Note: No respondents rated these items as St



A few educators suggested more examples of how computational thinking looks in an educational setting, *“I would like to see some examples of the different practices used with students and how students responded to those practices. I think that I understand the concepts of computational thinking but I would not feel 100% on putting those concepts into practice quite yet without seeing some examples or learning about some solid strategies to use with the students.”*

An educator wrote about his/her understanding of computational thinking, *“Computational thinking doesn't have to involve computing, but is more powerful when it does. When working with individuals who are intimidated by coding/computer science, it's helpful to create opportunities for them to dip their toe in the pool. So, creating and leading activities applying CT without CS can build confidence and lay ground for when computing is eventually rolled in-- I'm excited to develop, work with, and lead CT-based curricula.”*

Project team members stated that they hoped educators will allow the program to be really girl-led and to allow the girls to be creative, to struggle, and to be as self-directed as possible.

EDUCATORS

8. What other impacts do educators experience as a result of their participation and training?

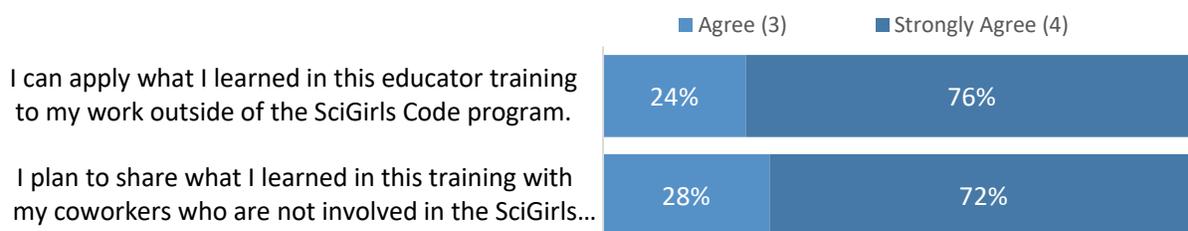
Educators are being exposed to many different types of technology and introduced to a variety of effective practices through their participation of *SciGirls* Code. Most of the examples of what educators have learned from webinars fit under the large categories of knowledge of comfort with coding and the

technology involved in delivering the curriculum, understanding of connected learning and computational thinking and effective strategies for engaging girls in STEM, all of which have been covered in previous evaluation questions.

Other gains of educators are that their knowledge and experience will apply to other work outside of *SciGirls* Code. After the in-person training, all educators who completed the post-survey indicated they would apply what they learned and would share the information they learned in the training with their co-workers.

All educators agreed or strongly agreed that they will utilize what they learned in the training by either applying and/or sharing the information. (n=29)

Note: No respondents indicated Strongly Disagree (1) or Disagree (2).



A few educators mentioned that they have developed a growth mindset and/or that they had strategies of how to help develop a growth mindset in their participants. One educator wrote, *“I developed more of a growth mindset than I had before attending the training.”* Another educator, after a webinar on *“supplemental curriculum”* noted that sh/e would use the, *“F.A.I.L. acronym... First attempt in learning!! LOVE IT!”* in her program.

The project incorporates recent technology to support connected learning, such as the LRNG platform. Becoming familiar with LRNG and in general, how to set-up and manage virtual learning opportunities, is a potential benefit to educators. Other examples include using Flipgrid (short videos for educators to share with each other and for *“Digital Meet-ups”* between program sites so that girls can be see what other *SciGirls* Code girls in another site are working on).

Educators found high value from the May webinar where they learned about the role model component and learned about FabFems. Getting connected to local role models working in computer science or coding and learning how to effectively use role models in girl programming is another potential area of impact for educators.

Project Team members believe this group of educators is a stronger cohort compared to previous projects they have implemented with a group or programs. This is due at least in part by *SciGirls* Code efforts to bring educators together so that they can serve as a resource for each other and share best practices and challenges and not overwhelm TPT in providing all types of support to 16 sites, which

would not necessarily be a sustainable model. The monthly webinars, use of Flipgrid and LRNG and the GoogleGroup listserv all help to connect educators together and encourage sharing and collaboration. As one educator wrote, it is exciting to be part of the community, *“It is so refreshing and inspiring to be surrounded by strong, female role models, ready to transfer excitement about STEM to girls all over the country.”*

ROLE MODELS

9. Who are the role models involved?

ROLE MODELS

10. How do role models perceive the effectiveness of the role model training and support?

ROLE MODELS

11. What content, activities, and strategies do role models use with the youth participants? How do role models connect with participants (virtually, in-person, lead activities, etc.)?

ROLE MODELS

12. To what extent do role models have increased knowledge of how to reach out to girls and increased confidence in their ability to effectively be a role model?

ROLE MODELS

13. To what extent do role models utilize effective strategies from the training in conducting outreach?

ROLE MODELS

14. What other impacts do role models experience as a result of their participation and training?

No evaluation data has been collected related to role models, but it is planned to start in the coming month, in August 2017.

Role models will be asked to participate (attending live or watching via recording) in two training sessions of the role model training. The first session covers general effective practices for role models and there will be a follow-up session specific to each of the three *SciGirls* Code program curriculum strands. The first set of trainings are scheduled for August 2017 and a post-training survey will be administered after the second session.

Educators are recruiting role models and the FabFems project (affiliated with National Girls Collaborative Project, a project partner) is also helping to identify role models working in computer science for the partner sites. So far, six partner sites have sent the names of 11 role models who will be invited to the trainings. Every role model needs to participate (attending live or watching via recording) in the two training sessions before they visit a program. A follow-up “reflection” survey will be administered at the end of each curriculum strand.

YOUTH PARTICIPANTS

15. Who are the girls reached by the trained educators?

YOUTH PARTICIPANTS

16. How do girls participate in *SciGirls* Code?

YOUTH PARTICIPANTS

17. How are girls affected by role models? How is the impact of role models related to how girls connect or interact with role models?

Relevant data to answer these questions have not yet been collected.

SCALE-UP

18. What was learned during implementation of this model that could inform future scale-up?

The project team is considering the following items related to future scale-up efforts:

- Making everything from the in-person training available online.
- How to break the 9-month curriculum into smaller chunks to make it easier for partner sites and other organizations to merge the content and activities into existing programs.
- Adding new strands, which would be able to reach new sites as well provide something new for existing partners (such as cybersecurity or game design).

- Activities and content that have low equipment needs and/or low recurring cost. The E-textiles strand may be challenging to scale-up as the materials are consumable, not common, and may be difficult to obtain. However, the project team believes that if it is proven to be effective, then it will be possible to find alternative funding sources to allow others to implement the strand.
- To help prevent tech support being too burdensome for Twin Cities PBS, they are looking into using equipment from Best Buy Education as they would provide technical support out in the field.

SCALE-UP

19. What were benefits and barriers of participating for educators and their organizations?

As organizations that have already been involved with past efforts of *SciGirls*, there was already a high commitment to the mission of the program and to engaging more girls in STEM through informal quality education opportunities. Additionally, many of the partners had expressed interest in getting involved in Computer Science or coding and therefore the opportunity of *SciGirls* Code was especially appealing (according to impressions of Project Team members). On the flipside, not necessarily everybody at an organization is onboard with doing computer science or with other aspects of this program and educators may need to make the case to their supervisor and/or board members to get support.

Project Team members believe this group of educators is a stronger cohort compared to previous projects they have implemented with a group or programs. This is due at least in part by *SciGirls* Code efforts to bring educators together so that they can serve as a resource for each other and share best practices and challenges and not overwhelm TPT who would otherwise be providing all types of support to 16 sites. The monthly webinars, use of Flipgrid and LRNG and the Google Groups listserv all help to connect educators together and encourage sharing and collaboration.

Partner sites get to keep all of the equipment they received as part of their involvement (as long as they have plans to use it), which is a large financial benefit of educators' participation in *SciGirls* Code.

Educators were asked to identify potential barriers that could affect successful implementation of *SciGirls* Code. They were most worried about maintaining high attendance and retention of youth participants (11 respondents), fitting this work into their own schedules (4 respondents), their knowledge and comfort related to the curriculum (3), technology concerns (2) and transportation concerns for the participants involved (2).

- o *Attendance. We are a performing arts school and will have occasional after school conflicts with performances. Will schedule/reschedule accordingly.*

- *Nine months of weekly 3-hour programming gave us pause. We are an institution that does not serve girls in this sort of sustained and regular way, so we have had to consider very carefully the access points we have to a steady population of girls who can participate. We are still finalizing this, but are convinced that we can make this work.*
- *The time commitment-- both educators at our institution have other active projects that they lead and/or participate in, so finding time to complete the homework, organize, and lead the activities may be difficult on occasion.*

Project team members reiterated some of the same barriers, such as for educators to fit this work in with their other job responsibilities and also to juggle all of the different responsibilities of their role: participating in evaluation and research activities, recruiting girls, using LRNG and Flipgrid as well as all of the technology for the curriculum.

An additional challenge is that some sites are just adding new educators to their implementation team who have not had the opportunity to spend a few months getting acquainted with the program or attend the in-person training (though they can access the webinar recordings).

SCALE-UP

20. How could the project more effectively and/or efficiently meet its outcomes?

This question cannot be fully answered well until after the outcomes are determined.

SCALE-UP

21. What components of the project were most crucial to its success?

There are a few components the project team considers to be crucial to its success so far, including:

- ✓ Starting the webinar series a few months in advance of the in-person training allowed the educators an opportunity to become familiar with the project team and other partner sites, the overall goals of the project, and some more logistical and background information (such as on Connected Learning and the evaluation and research components). This saved the in-person time for educators to do more hands-on activities that is so important for learning and becoming comfortable with new technology.
- ✓ Connecting the educators to each other (through ongoing webinars, at the in-person training, and through Google Groups, LRNG and Flipgrid) so that they can learn from one another rather than having them reliant only on the *SciGirls* Code project team for support.

- ✓ Heather Benedict is on the project team (hired as a consultant with Twin Cities PBS) and was the lead developer of the 9-month curriculum that is a deliverable with this project. Her background in technology, technology integration and training and experience in site management was considered highly valuable to the quality of the curriculum and the educator training.
- ✓ The intensively hands-on experience of the in-person training in giving the educators a feel for what their participants will be doing during the program.
- ✓ *SciGirls Code* has more staff assigned to this project compared to other TPT projects (each working a smaller percentage of time), which has been a success in terms of dividing the workload, sharing duties at the training, and will be useful as the project looks to scale-up.

SCALE-UP

22. To what degree did local adaptations at partner sites affect the success of the project?

The beauty of *SciGirls Code*, according to a project team member, is *SciGirls* does not “force people [to do certain things an exact way]. We’re flexible in our implementation.” They expect that sites will make adaptations in their implementation and they look forward to being able to use the related data as a way to help them test what worked well and what was not effective. Also, although this is a pilot of new curriculum, there are many aspects of the project and activities and strategies used in the curriculum that have already been established as being effective.

No other evaluation data has yet been collected to further answer this question.

4. Areas of Consideration

The following recommendations emerged from the data, directly from respondents, and from analysis by the evaluation team.

- Continue to improve webinars so that watching via the recording is a better experience and consider how to further align it with the “live” experience, such as incorporating opportunities for a viewer to comment or submit questions.
- Provide materials ahead of webinars, such as informational overview, handouts, and/or the presentation slides.
- Provide more examples to help educators better understand computational thinking. A few educators commented they understood the concept, but not necessarily the different ways it would look in their programs.

- Since new educators are joining the implementation teams at a few partner sites, consider how to provide them with the content and activities from the in-person training. The value of the in-person training was the hands-on “tinkering” time and going through the different activities that educators will be facilitating with the girls, so using LRNG to assign this tinker-time to new educators could be helpful.
- Plan innovative ways to increase educator experience and comfort with the technology and activities in the e-textiles unit. The training was less focused on the final curriculum strand, e-textiles, that will not be implemented until the spring. Ratings of educator comfort with this strand was lower, compared to the other strands, and many educators mentioned that they would need more time with the materials to get comfortable.
- Educators could be better prepared with resources and information to share with girls on educational and career opportunities in computer science and coding (as only 22% of educators indicated they had high or very high knowledge of such resources. Although participants are middle-school aged and therefore a few steps away from higher education and career choices, they could be prepared with more information on how or why to pursue computer science or coding classes in high school.
- An area of concern for many educators is maintaining high attendance and retaining girls during the nine-month program, which is longer than the typical programs many of the partners offer. Starting a “tip sheet” with suggested strategies to help educators keep girls engaged in the program would likely be helpful. Ideas could be added by the project team and/or other educators.

5. Areas for Further Exploration

Several areas have emerged from the project implementation and data so far that would be interesting to explore during this project grant or in subsequent work.

- Q How the number of educators (and number of “trained” educators) at partner sites affects program delivery and outcomes. As of February 2017, half of the 16 sites planned to have two trained educators facilitating each session of the program and 31% were planning on one trained educator per session (19% of sites were undecided at that time).
- Q How the inclusion of the fifth graders affect the program; whether the content is too advanced or moves too quickly and whether this younger group experiences a different level or types of outcomes. While the program and curriculum were intended for middle-school age girls, based on responses from February 2017, half of the sites were planning to serve fifth graders.
- Q This is the longest program that *SciGirls* has trained partner sites to implement (with a nine-month curriculum). They are curious whether the model “holds up” for that length of time, if girls are retained in the program for the duration, and whether the partner sites can incorporate a program of this length in the future.

- Q *SciGirls* Code has provided enough equipment for three or four girls to share a tablet or other technology. Some partner sites may be purchasing more equipment to reduce the ratio to 2:1 and it could be worth exploring whether that affects aspects such as the timing or learning outcomes.
- Q Whether getting connected to local role models working in computer science or coding and learning how to effectively use role models in girl programming is another potential area of impact for educators.
- Q How effective the LRNG platform is for providing content, from both the facilitator perspective and the girls' perspective. It is a new site and features are still being developed (sometimes lagging behind the needs of the project).

5. Summary

SciGirls has had a successful year of project planning, curriculum design and educator training. Partner organizations and educators are fully engaged and largely very satisfied with the support offered by *SciGirls* Code to prepare them to implement the programming with girls in their site. The in-person training was especially lauded by both the project team and the educators. Both groups are looking forward to the beginning of implementation to see how it is experienced by the girls.

Appendices

Appendix A: Logic Model

| SciGirls Code Logic Model | | | | |
|--|---|--|--|---|
| Resources (Inputs) | Strategies/ Activities | Outputs (Deliverables) | Outcomes (Aims) | Medium & Long-term Impacts |
| <p><i>Expertise of PIs and project team partners including:</i></p> <ul style="list-style-type: none"> • TPT’ <i>SciGirls</i>, a 10 year media-based gender equity and STEM educational outreach program • National Girls Collaborative Project - <i>network of practitioners and supporters of girls in STEM, online training environments</i> • University of Minnesota’s Learning Technologies Media Lab- <i>K-12 digital media, and connected learning expertise</i> <p><i>SciGirls videos modeling technology integration and design into STEM</i></p> <p><i>SciGirls Seven model for researched-based gender equitable teaching strategies</i></p> <p><i>SciGirls Role Model Strategies + directory of FabFems role models</i></p> <p><i>SciGirls partner educators and girls</i></p> | <p>Design and implement an out of school time <i>SciGirls Code</i> program including connected learning pedagogy, STEM and computer science (CS) in three tracks: e-textiles/wearable technology; robotics; and mobile geospatial technologies</p> <p>Develop and implement ongoing professional development training for informal STEM educators</p> <p>Develop and moderate an online platform(s) for girls and educators</p> <p>Plan and implement regular digital meet ups for participating girls, including sharing of girls’ work, “tip videos” and meeting role models from the CS, technology industry and academia.</p> <p>Plan and provide online training for role models using <i>SciGirls Role Model Strategies</i> and <i>FabFems</i> resources</p> <p>Research the impact of the <i>SciGirls Code</i> model on girls’ development of CS concepts, practices and perspectives as well as interest in the field</p> | <p><i>SciGirls Code</i> program reaching 160 middle school girls held at 16 sites</p> <p><i>SciGirls Code</i> professional development program for 32 educators (training curriculum and follow-up webinars) two online platforms for sharing experiences (girls and educators)</p> <p>Six virtual meet ups for girls to share projects</p> <p><i>SciGirls Code</i> role model online training module 30+ role models (trained)</p> <p>A model for scale-up via the <i>SciGirls</i> partner network, including participating educators as potential trainers</p> <p>Research and evaluation findings to inform larger CS education community and to inform the potential for scale up nationally</p> | <p>Participating educators:</p> <ul style="list-style-type: none"> • have increased interest and confidence in facilitating CS/STEM activities in and out of school • have increased understanding of CS and computational thinking • have increased awareness of the educational and career opportunities in CS • use strategies for effectively engaging girls in CS • provide girls with CS resources and career information <p>Participating girls:</p> <ul style="list-style-type: none"> • have increased understanding of computational thinking—concepts, practices and perspectives. • have increased confidence in their ability to do CS • have positive attitudes about CS • have increased knowledge of CS career options and educational pathways for CS careers • understand how CS is relevant in their lives • see their use of technology as potential “makers” rather than “consumers” <p>Participating role models:</p> <ul style="list-style-type: none"> • have increased knowledge of ways to connect with girls, especially to girls from underrepresented populations • have confidence and ability to effectively conduct outreach | <p><i>Increased number of STEM organizations offering CS opportunities</i></p> <p><i>Increased number of educators and role models working with girls in CS</i></p> <p><i>More girls participate in CS formal and informal education opportunities</i></p> <p><i>More girls demonstrate CS-literacy</i></p> <p><i>Increased number of girls interested in pursuing CS careers or educational pathways</i></p> <p><i>More females in CS careers</i></p> <p><i>Increased number of educators, girls, and parents serving as advocates for girls in STEM+C</i></p> |

Appendix B: Evaluation Methods and Activities

SciGirls Code: Connected Learning for Middle School Girls in Out of School Time Evaluation Plan

Evaluation Overview

The project's evaluation by Education Development Center (EDC) focuses on the implementation of the proposed activities and the progress toward meeting the desired outcomes for the educators, role models, and the youth they reach. The evaluation tracks implementation of the project; for example, describing who is engaged in the project and how, attendance at trainings and events, the educators' fidelity of the implementation, and role models' activities. Outcomes of the project are assessed during implementation and as part of the summative evaluation, looking at project impacts on trained educators, role models, and girls. Evaluators have received approval to conduct evaluation activities from the EDC Institutional Review Board (IRB).

The evaluation utilizes mixed methods aimed to answer the evaluation questions. The evaluation is utilization-focused and conducted in close collaboration with project leadership. Formative evaluation results are shared regularly to help guide the ongoing implementation of the project. Near the end of the grant, the summative evaluation will look at the overall impact of the project in terms of its expected outcomes. Since the research will be focused on the impact on the participating youth, the main target of the evaluation are the educators trained to use the *SciGirls Code* resources in their programs.

Quantitative data are analyzed using a variety of statistical methods including descriptive statistics, and paired t-tests of pre-post results, where appropriate. Qualitative data are coded for themes using content analysis and analytical induction techniques. Data triangulation is used to increase the accuracy and credibility of findings. In addition to providing timely formative feedback via data summaries and check-ins with the project team, the evaluation team prepares annual formal evaluation reports.

Year 2 Evaluation Activities

- The evaluation team met with the project team and project researcher approximately monthly to go over project updates, do evaluation planning and discuss of recent findings.
- Obtained IRB approval to conduct data collection activities.
- Further clarified the evaluation questions from the proposal, adding the following questions:
 - *EDUCATORS 3B*) Do educators have the technology and are they comfortable with technology to successfully implement the program?
 - *EDUCATORS 4B*) To what degree do educators use effective strategies for engaging girls in CS (e.g. *SciGirls Seven*)?
 - *ROLE MODELS 3B*) How do role models connect with participants (virtually, in-person, lead activities, etc.
 - *YOUTH PARTICIPANTS 3B*) How are girls affected by role models?
- Coordinated with the project researcher on data collection and data sharing, where appropriate, which include a shared consent form, joint efforts to communicate clearly with educators on their role and expectations for participation in the evaluation and research, and selection of cases for site visits (with different sites for research and evaluation). The evaluation and

research teams will share evaluation instruments to reduce burden on respondents, such as combining questions into one youth post-survey and creating a shared educator interview protocol to provide data for the evaluation and the research.

- Designed the following evaluation instruments: *Educator “pre-survey”, Educator post-training survey; Educator post-webinar survey; Role model post-training survey; Role model reflection survey; and Project Leadership interview protocol.*
- Administered an educator “pre-survey” in February (as part of the February post-webinar survey) and to new educators joining the project through March. Results were summarized for the project team, including a table showing educators’ experience and existing knowledge of computer science by site to help guide the development of training and support resources. Thirty-six out of 45 educators responded.
- Administered the educator post-webinar survey six times, immediately following monthly webinars offered from February to July 2017. (*Note: Starting in August, we will be asking the educators about the webinars in the post-curriculum survey rather than continuing to administer immediate post-webinar surveys*). The surveys stayed open for a week to gather responses from educators who accessed the recording of the survey during that time. Responses were received by an average of 23 educators per survey.
- Two evaluation team members attended the in-person training in April 2017 to meet educators, observe the training, learn and observe the curriculum activities, and to review evaluation expectations with educators. A post-training survey was administered at the end of the training, with 30 out of 31 attendees responding. Results were summarized for the project team.
- To help understand successes and challenges of project implementation and gather more context for interpreting other evaluation data, evaluators conducted an interview with two representatives of the project team in July 2017.

Overall Timeline of Evaluation Activities

| | | Year 2: 2016-2017 | | | | Year 3: 2017-2018 | | | | Wrap-up |
|--|--------------------------|----------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------|
| ACTIVITY | Timing | Quarter 1: Aug-Sept-Oct | Quarter 2: Nov-Dec-Jan | Quarter 3: Feb-Mar-Apr | Quarter 4: May-Jun-Jul | Quarter 1: Aug-Sept-Oct | Quarter 2: Nov-Dec-Jan | Quarter 3: Feb-Mar-Apr | Quarter 4: May-Jun-Jul | Aug-Sept 2018 |
| Evaluation planning; Review project curriculum; Background research on outcomes and measures | Aug-Dec 2016 | | | | | | | | | |
| IRB application | Aug-Dec 2016 | | | | | | | | | |
| Instrument design (Batch 1): Educator post-training survey; Educator post web training survey; Educator post-curriculum survey; Role model post-training survey; role model reflection survey; Project Leadership interview protocol | Aug-Dec 2016 | | | | | | | | | |
| Instrument design (Batch 2): Educator interview protocol; Observation rubric; Youth survey; Youth focus group protocol; educator reflection survey | | | | | | | | | | |
| Educators Pre-Survey | Feb 2017 | | | | | | | | | |
| Educators Post-Webinar Survey | Feb 2017; June 2018; | | | | | | | | | |
| Educators Post-Training Survey | Apr 2017 | | | | | | | | | |
| Project Leadership Interviews | August 2017 and Aug 2018 | | | | | | | | | |
| Role Model Post-Training Survey | Aug 2017 | | | | | | | | | |
| Program observation with fidelity rubric | Apr/May 2018 | | | | | | | | | |
| Youth Survey | Apr/May 2018 | | | | | | | | | |

| | | Year 2: 2016-2017 | | | | Year 3: 2017-2018 | | | | Wrap-up |
|--------------------------------------|------------------------------------|----------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------|
| ACTIVITY | Timing | Quarter 1: Aug-Sept-Oct | Quarter 2: Nov-Dec-Jan | Quarter 3: Feb-Mar-Apr | Quarter 4: May-Jun-Jul | Quarter 1: Aug-Sept-Oct | Quarter 2: Nov-Dec-Jan | Quarter 3: Feb-Mar-Apr | Quarter 4: May-Jun-Jul | Aug-Sept 2018 |
| Youth Focus Groups | Apr/May 2018 | | | | | | | | | |
| Educator post curriculum-unit survey | Nov 2017; Feb 2018; May 2018 | | | | | | | | | |
| Educator Interviews | Nov 2017- Jan 2018 | | | | | | | | | |
| Role Model Reflection Survey | June 2018 | | | | | | | | | |
| Educator Reflection Survey | June 2018 | | | | | | | | | |
| Project stats and document review | Aug 2017 and 2018 | | | | | | | | | |
| Annual or Summative Report | August 2017 and 2018 | | | | | | | | | |

| | | | |
|-------------|-----------------|------------------------|------------------|
| KEY: | Planning | Data collection | Reporting |
|-------------|-----------------|------------------------|------------------|

Appendix C: Education Pre-survey



About this Survey

This survey is being administered by Education Development Center, the evaluators of the *SciGirls* Code project. The evaluation team is interested in learning more about your thoughts and experiences related to coding and the project activities. Survey results will help inform the project's ongoing activities.

The survey should take about 15 minutes to complete. You may skip any question that you do not wish to answer. In the first section of the survey, responses will be shared with the *SciGirls* Code team to aid in their planning. In all other sections on the survey, the evaluation team will keep your individual responses confidential. Findings will be reported in aggregate form with identifying information removed. We hope to receive responses to this survey from everybody who plans to serve as an educator for *SciGirls* Code, so please expect to receive reminders until you submit a survey.

If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org. Thank you for your responses! Your feedback is important and highly valued.

Information for the *SciGirls* Code Team

PLEASE NOTE: Your responses in this section are identifiable and individual responses will be shared with the *SciGirls* Code team to aid in their planning of follow-up activities.

Your name:

Your organization:

What is your role in this project? Select all that apply.

- Administrator/Director/Project Lead (not planning to work directly with girls on *SciGirls* Code activities)
- Lead educator (planning to work directly with girls on *SciGirls* Code activities)
- Support educator (planning to work directly with girls on *SciGirls* Code activities)
- Other, please specify: _____

How many educators (who attend the April *SciGirls* Code in-person training) will facilitate the program at your site?

- 1 educator per session
- 2 educators per session
- Other, please specify: _____

How many additional adults (volunteers or educators; not including role models) will help to facilitate the program at your site?

- None
- 1
- 2
- 3 or more
- Not sure

What grades will the girls participating in the *SciGirls* Code program be in at your site? Select all that apply.

- 5th grade
- 6th grade
- 7th grade
- 8th grade
- 9th grade
- Other, please specify: _____

When do you plan to offer the *SciGirls* program at your site? Choose the best response.

- Saturdays for 3+ hours
- 1 weekday after school for 3+ hours
- 2 weekdays after school for 1.5+ hours each day
- Other, please specify: _____

Getting to Know You

Please note: In the remainder of this survey, your individual responses will remain confidential within the evaluation team from Education Development Center. An aggregate summary of all responses will be provided to the *SciGirls* Code project team, with no information to identify respondents.

Please indicate how long you have been involved in the following:

| | Not at all | Less than 1 year | About 1 to 3 years | About 4 to 6 years | More than 6 years |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Years you have been an educator in “informal” settings such as afterschool or summer programs | <input type="radio"/> |
| Years you have been an educator in “formal” settings such as a school classroom | <input type="radio"/> |
| Years you have been involved in an all-girls environment | <input type="radio"/> |
| Years you have taught or led basic technology or digital literacy activities with youth | <input type="radio"/> |
| Years you have taught or led computer science or coding education activities with youth | <input type="radio"/> |

Please indicate any prior experiences you have had related to coding or computer science, if any. Note that there are no expectations of your involvement in computer science prior to this project. Please check all that apply.

- Completed high school class(es)
- Completed college course(s)
- Earned a college degree (undergraduate or graduate): _____
- Workshop, training or other professional development (online or in-person). Please describe topic and duration:

- Self-taught Please describe: _____
- Assistance or informal lessons from somebody more knowledgeable in computer science
- Other, please specify: _____

Please provide any additional detail about your prior experiences with coding or computer science:

Has your organization (at your site) offered any coding or computer science-related programming in the last 3 years?

- I don't know
- No
- Yes, please briefly describe: _____

Display This Question:

If Has your organization (at your site) offered any coding or computer science-related programming i... Yes, please briefly describe: Is Selected

Were any of the coding or computer science programs during the last three years for girls only?

- Yes
- No

Please indicate your current level of knowledge, interest or comfort related to the following statements related to coding and education.

| | Very low | Low | Medium | High | Very high |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| My current level of interest in learning coding. | <input type="radio"/> |
| My current level of knowledge of coding. | <input type="radio"/> |
| My interest in teaching girls in coding. | <input type="radio"/> |
| My knowledge of effective strategies to engage girls in coding. | <input type="radio"/> |
| My comfort leading youth in coding activities. | <input type="radio"/> |
| My ability to help youth develop critical thinking or problem-solving skills. | <input type="radio"/> |
| My knowledge about other resources and programs related to coding available for girls. | <input type="radio"/> |
| My perception of the usefulness of coding to solve real-world problems. | <input type="radio"/> |
| My perception of the value of coding to make a meaningful difference in the world. | <input type="radio"/> |
| My ability to show girls how coding is relevant to their lives. | <input type="radio"/> |

What do you hope to gain from participating in *SciGirls Code*? What do you hope comes out of this experience for you, personally and/or professionally?

Which best describes you? Please check all that apply.

- American Indian/Alaska Native
- Asian
- African American/Black
- Hispanic/Latina/Mexican/Mexican American

- White/Caucasian
- Native Hawaiian/Other Pacific Islander
- Other, please specify: _____

Appendix D: Webinar Post-survey: Educator Online Orientation

SciGirls Code Educator Post-Webinar Survey

About this Survey

This survey is being administered by Education Development Center, evaluators for the *SciGirls* Code project. . We will use the survey results to help us determine the usefulness of this webinar training and inform the project’s ongoing activities.

The survey should take about 10 minutes to complete. You may skip any question that you do not wish to answer.

The evaluation team will keep individual responses confidential and report any findings in aggregate form only.

Any quotes or open-ended responses with identifying information will be de-identified before sharing.

If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org.

Thank you for your responses! Your feedback is important and highly valued.

Before this Webinar

Add in questions from the Educator “Pre-Survey,” with additional instruction/prompts to answer the items as they felt before attending the training.

Your Experiences with the Webinar

1. Did you attend the webinar in-person or access the recorded version, or both?

- Live
- Recorded version
- Both live and recorded version
- None (branch)

2. What was the most valuable aspect of this webinar for you?

3. What was the least valuable aspect of the webinar for you?

4. Please respond to the following statements about the webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) |
|---|-----------------------|--------------|-----------|--------------------|
| Overall, the webinar was of high quality. | | | | |
| Content was clearly presented. | | | | |
| Materials (such as slides and “handouts”) were useful. | | | | |
| The webinar was useful to help prepare me as a <i>SciGirls</i> Code educator. | | | | |
| Attending the webinar was a good use of my time. | | | | |

5. Please indicate your level of understanding in each of the following areas:

| Level of Understanding | Poor (1) | Fair (2) | Good (3) | Excellent (4) |
|---|----------|----------|----------|---------------|
| The overall goals of the <i>SciGirls</i> Code project. | | | | |
| Overall logistics, such as activities and timeline. | | | | |
| Site implementation requirements of <i>SciGirls</i> Code partners. | | | | |
| My role as a <i>SciGirls</i> Code educator. | | | | |
| Technology for project communication and to access project resources. | | | | |

6. Please add any details or explanation to any of your ratings above (optional):

7. At this early point in the project, what do you see as the largest barrier to the successful implementation of *SciGirls* Code at your site? If possible, please include any suggestions or ideas to help overcome any barriers you identified.

8. What is one “next step” you plan to take as a result of what you learned during this webinar?

9. Please add any additional comments or suggestions about this webinar or future webinars from *SciGirls* Code:

Appendix E: Webinar Post-survey: Connected Learning and the *SciGirls* Seven (March 2017)



Did you start or complete the homework (the "XP") on the LRNG site on The *SciGirls* Seven (downloading the guide and creating a post)?

- Yes, I completed The *SciGirls* Seven homework (reading the guide and posting)
- I started this homework, but did not complete it
- No, I did not start this homework
- Not sure

Did you start or complete the homework (the "XP") on the LRNG site on Connected Learning (viewing three videos and creating a post)?

- Yes, I completed the Connected Learning homework (watching 3 videos and posting)
- I started this homework, but did not complete it
- No, I did not start this homework
- Not sure

Did you attend the March 9 webinar "live" and/or have you accessed the recorded version?NOTE: If you plan to access the recorded version, but have not yet done so, please exit the survey now and return to the survey (via the same link in your email) after viewing the recorded version.

- Attended "live" on March 9
- Accessed the recorded version
- Both "live" and recorded version
- I did not attend or access this monthly webinar and do not plan to do so. (If you plan to access the recording, please do so and return to your survey afterwards to complete this section).

What was the most valuable aspect of the homework and/or webinar for you?

What was the least valuable aspect of the homework and/or webinar for you?

Please respond to the following statements about the webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) | N/A |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The resources on Connected Learning were high quality. | <input type="radio"/> |
| Doing the homework (or "XP") on Connected Learning was a good use of my time. | <input type="radio"/> |
| The resources on The <i>SciGirls</i> Seven were high quality. | <input type="radio"/> |
| Doing the homework (or "XP") on The <i>SciGirls</i> Seven was a good use of my time. | <input type="radio"/> |
| Overall, the webinar was of high quality. | <input type="radio"/> |
| Joining or viewing the webinar was a good use of my time. | <input type="radio"/> |
| Content on the webinar was clearly presented. | <input type="radio"/> |
| Overall, the content was useful to help prepare me to be a <i>SciGirls</i> Code educator. | <input type="radio"/> |
| I will be able to use what I learned on these topics in my work, outside of my role as a <i>SciGirls</i> Code educator. | <input type="radio"/> |

Please add any details or explanation regarding any of your responses above (optional):

Please indicate your level of knowledge about Connected Learning BEFORE and AFTER the homework and/or webinar.

| | Little or No Knowledge (1) | Somewhat Knowledgeable (2) | Moderately Knowledgeable (3) | Very Knowledgeable (4) |
|---|----------------------------|----------------------------|------------------------------|------------------------|
| My level of knowledge about Connected Learning BEFORE the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| My level of knowledge about Connected Learning now, AFTER the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please indicate your level of knowledge about The *SciGirls* Seven and how to engage girls in STEM BEFORE and AFTER the homework and/or webinar.

| | Little or No Knowledge (1) | Somewhat Knowledgeable (2) | Moderately Knowledgeable (3) | Very Knowledgeable (4) |
|--|----------------------------|----------------------------|------------------------------|------------------------|
| My level of knowledge about how to engage girls in STEM BEFORE the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| My level of knowledge about how to engage girls in STEM now, AFTER the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

What would you like more information on, or what questions do you still have, related to these topics?

What is one, specific, example of something you learned from the homework or webinar that you will apply to your work?

Please add any additional comments or suggestions:

Appendix F: Webinar Post-survey: Computational Thinking, Research, and Evaluation (April 2017)

About this Survey

This survey is being administered by Education Development Center, the evaluators of the *SciGirls* Code project. We are interested in your experience in the April 13, 2017 webinar on Computational Thinking and the project's research. Survey results will help inform future webinars and support from *SciGirls* Code.

The survey should take about 10 minutes to complete. You may skip any question that you do not wish to answer. The evaluation team keeps your individual responses confidential; findings are reported in aggregate form with identifying information removed. If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org.



Have you started or completed the homework (the "XP") on the LRNG site on Computational Thinking (accessing the PDF from the Harvard Scratch page and posting on LRNG)?

- Yes, I completed the homework (read the PDF and posted)
- I started this homework, but did not complete it
- No, I did not start this homework
- Not sure

Did you attend the April 13 webinar "live" and/or have you accessed the recorded version?

NOTE: If you plan to access the recorded version, but have not yet done so, please exit the survey now and return to the survey (via the same link in your email) after viewing the recorded version.

- Attended "live" on April 13
- Accessed the recorded version
- Both "live" and recorded version
- I did not attend or access this monthly webinar and do not plan to do so. (If you plan to access the recording, please do so and then return to your survey).

What was the most valuable aspect of the homework and/or webinar for you?

What was the least valuable aspect of the homework and/or webinar for you?

Please respond to the following statements about the webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) | N/A |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The resource on Computational Thinking was high quality. | <input type="radio"/> |
| Doing the homework (or "XP") on Computational Thinking was a good use of my time. | <input type="radio"/> |
| Overall, the webinar was of high quality. | <input type="radio"/> |
| Joining or viewing the webinar was a good use of my time. | <input type="radio"/> |
| Content on the webinar was clearly presented. | <input type="radio"/> |
| Overall, this content was useful to help prepare me to be a <i>SciGirls</i> Code educator. | <input type="radio"/> |
| I will be able to use what I learned on these topics in my work, outside of my role as a <i>SciGirls</i> Code educator. | <input type="radio"/> |

Please add any details or explanation regarding any of your responses above (optional):

Please indicate your level of knowledge about Computational Thinking BEFORE and AFTER the homework and/or webinar .

| | Little or No Knowledge (1) | Somewhat Knowledgeable (2) | Moderately Knowledgeable (3) | Very Knowledgeable (4) |
|--|----------------------------|----------------------------|------------------------------|------------------------|
| My level of knowledge BEFORE the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| My level of knowledge AFTER the homework and/or webinar | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

What would you like more information on, or what questions do you still have, related to the webinar topic?

Did you find the webinar content to be too simple, too advanced, or just about right?

- Far too simple
- A bit too simple
- About right
- A bit too advanced
- Far too advanced

What is one, specific, example of something you learned from the homework or webinar that you will apply to your work?

Please add any additional comments or suggestions:

Appendix G: Educator In-person Training Survey

About the Survey

Congrats on completing the *SciGirls* Code 3-day training! We enjoyed watching you work hard and having fun. This survey is being administered by Education Development Center, evaluators for the *SciGirls* Code project. We will use the survey results to help determine the usefulness of this training and to inform the project’s ongoing activities.

The survey should take about 15 minutes to complete. You may skip any question that you do not wish to answer. The evaluation team will keep individual responses confidential and report any findings in aggregate form only, with any identifying information removed from open-ended responses.

If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org. Thank you for your responses! Your feedback is important and highly valued.

1) What were your top two takeaways from the training?

- Takeaway 1
- Takeaway 2

2) Do you plan to be a facilitator in your site's *SciGirls* Code program, working with the girls directly?

- Yes
- Not sure
- No

3a) Please rate the following items about the Mobile App unit (including Tangrams; Unplugged; Thinkable) on a scale from Poor to Excellent.

| | Poor | Fair | Satisfactory | Good | Excellent |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| My understanding of the learning objectives for the Mobile App activities covered during this training. | <input type="radio"/> |
| My preparedness to facilitate the Mobile App activities that were covered during this training. | <input type="radio"/> |
| My comfort using the technology for the activities unit the Mobile App unit. | <input type="radio"/> |
| My sense of the overall goals and scope of the Mobile App unit. | <input type="radio"/> |

3b) Please rate the following items about the Robotics unit (including Spheros; Light Painting Demo; Hummingbird Art Bot with sensor) on a scale from Poor to Excellent.

| | Poor | Fair | Satisfactory | Good | Excellent |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| My understanding of the learning objectives for the Robotics activities covered during this training. | <input type="radio"/> |
| My preparedness to facilitate the Robotics activities that were covered during this training. | <input type="radio"/> |
| My comfort using the technology for the activities unit the Robotics unit. | <input type="radio"/> |
| My sense of the overall goals and scope of the Robotics unit. | <input type="radio"/> |

3c) Please rate the following items about the E-textiles unit (including LilyMini Project; LilyPad Arduino Protoboard) on a scale from Poor to Excellent.

| | Poor | Fair | Satisfactory | Good | Excellent |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| My understanding of the learning objectives for the E-Textiles activities covered during this training. | <input type="radio"/> |
| My preparedness to facilitate the E-textiles activities that were covered during this training. | <input type="radio"/> |
| My comfort using the technology for the activities unit the E-textiles unit. | <input type="radio"/> |
| My sense of the overall goals and scope of the E-textiles unit. | <input type="radio"/> |

4) Please note any areas of confusion or any remaining questions you have related to:

The mobile Apps activities covered during the training

The robotics activities covered during the training:

The E-textiles activities covered during the training:

Other:

5) Please rate the following items about the project overall on a scale from Poor to Excellent.

| | Poor | Fair | Satisfactory | Good | Excellent |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| My understanding of the overall timeline of the project. | <input type="radio"/> |
| My comfort with applying the <i>SciGirls</i> Seven strategies during my <i>SciGirls</i> Code program. | <input type="radio"/> |
| My preparedness to facilitate the use of design journals with students. | <input type="radio"/> |
| My comfort navigating in the LRNG platform. | <input type="radio"/> |
| My understanding of the goals and process of a makeathon. | <input type="radio"/> |
| My understanding of the purpose of digital meet-ups. | <input type="radio"/> |
| My understanding of how role models can be used as facilitators in my program. | <input type="radio"/> |
| My confidence in my ability to successfully implement <i>SciGirls</i> Code. | <input type="radio"/> |

6) I thought the length of the training was:

- Much too short
- A bit too short
- Just right
- A bit too long
- Much too long

7) Overall, the training content was:

- Much too simple
- A bit too simple
- Just right
- A bit too advanced
- Much too advanced

8) Please respond to the following statements regarding coding or computer science (CS) from Strongly Disagree to Strongly Agree now that you have experienced the in-person training.

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| I know how to show girls that coding or CS is relevant to their lives. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know how to convey to girls how coding or CS can make a difference in the world. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I understand how to build girls' computational thinking skills. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

9) Please respond to the following statements from Strongly Disagree to Strongly Agree

| | Strongly Disagree | Disagree | Agree | Strongly Agree |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| I can apply what I learned in this educator training to my work outside of the <i>SciGirls</i> Code program. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I plan to share what I learned in this training with my coworkers who are not involved in the <i>SciGirls</i> Code program. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

10) Please add any additional comments or suggestions about this training or ongoing support from *SciGirls* Code:

Appendix H: Webinar Post-survey: Using Role Models and Digital Meet-Ups (May 2017)

About this Survey

This survey is being administered by Education Development Center, the evaluators of the *SciGirls* Code project. We are interested in your experience in the May 11, 2017 webinar on using role models and recruiting and retaining participants. Survey results will help inform ongoing support from *SciGirls* Code.

The survey should take about 10 minutes to complete. You may skip any question that you do not wish to answer. The evaluation team keeps your individual responses confidential; findings are reported in aggregate form with identifying information removed. If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org. Thank you!



What was the most valuable aspect of the webinar for you?

What was the least valuable aspect of the webinar for you?

Please respond to the following statements about the webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) | N/A |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Overall, the webinar was of high quality. | <input type="radio"/> |
| Content on the webinar was clearly presented. | <input type="radio"/> |
| Joining or viewing the webinar was a good use of my time. | <input type="radio"/> |
| Overall, this content was useful to help prepare me to be a <i>SciGirls</i> Code educator. | <input type="radio"/> |
| I understand how role models will be used in this project. | <input type="radio"/> |
| I learned effective strategies to recruit girls to participate in <i>SciGirls</i> Code. | <input type="radio"/> |
| I am confident that our site will be able to recruit 10 girls to participate in <i>SciGirls</i> Code. | <input type="radio"/> |
| I have what I need from <i>SciGirls</i> Code to recruit girls to participate in the program. | <input type="radio"/> |
| I learned effective strategies to keep girls in the program (retention). | <input type="radio"/> |
| I will be able to use what I learned on these topics in my work, outside of my role as a <i>SciGirls</i> Code educator. | <input type="radio"/> |

Please add any details or explanation regarding any of your responses above (optional):

What is one, specific, example of something you learned from the homework or webinar that you will apply to your work?

Did you find the webinar content to be too simple, too advanced, or just about right?

- Far too simple
- A bit too simple
- About right
- A bit too advanced
- Far too advanced

What would you like more information on, or what questions do you still have, related to the webinar topic?

Please add any additional comments or suggestions:

Appendix I: Webinar post-survey: LRNG & Supplemental Curriculum Materials (June 2017)



About this Survey

This survey is being administered by Education Development Center, the evaluators of the *SciGirls* Code project. We are interested in your experience in the June 8, 2017 webinar on LRNG & additional curriculum resources. Survey results will help inform ongoing support from *SciGirls* Code.

The survey should take about 10 minutes to complete. You may skip any question that you do not wish to answer. The evaluation team keeps your individual responses confidential; findings are reported in aggregate form with identifying information removed.

If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org. Thank you!

Did you attend the June 8 webinar "live" and/or have you accessed the recorded version?

NOTE: If you plan to access the recorded version, but have not yet done so, please exit the survey now and return to the survey (via the same link in your email) after viewing the recorded version.

- Attended "live" on June 8
- Accessed the recorded version
- Both "live" and recorded version
- I did not attend or access this monthly webinar and do not plan to do so. (If you plan to access the recording, please do so and then return to your survey).

Please respond to the following statements about this webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) | N/A |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Overall, the webinar was of high quality. | <input type="radio"/> |
| The content was useful to help me be an effective <i>SciGirls</i> Code educator. | <input type="radio"/> |
| I understand how the LRNG platform will be used by the youth participants. | <input type="radio"/> |
| I feel confident in my ability to learn how to use the LRNG platform as a Group Leader/educator. | <input type="radio"/> |
| I am comfortable using the supplemental curriculum (e.g. Positive Peer Review, roles). | <input type="radio"/> |

What is one, specific, example of something you learned from the homework or webinar that you will apply to your work as a *SciGirls* Code educator?

Did you find the webinar content to be too simple, too advanced, or just about right?

- Far too simple
- A bit too simple
- About right
- A bit too advanced
- Far too advanced

What would you like more information on, or what questions do you still have, related to this webinar topic?

What other topic(s) would you suggest for upcoming *SciGirls* Code webinars?

Please add any additional comments or suggestions related to this webinar or other aspects of the project:

Appendix J: Webinar Post-survey: Equipment mailing and Digital Meet-ups (July 2017)



About this Survey

Evaluators from Education Development Center are asking you to complete one more post-webinar survey before your *SciGirls* Code program begins this fall. We are interested in your experience in the July 13, 2017 webinar on materials, digital meet-ups, and other implementation details. Survey results will help inform ongoing support from *SciGirls* Code.

The survey should take about 10 minutes to complete. You may skip any question that you do not wish to answer. The evaluation team keeps your individual responses confidential; findings are reported in aggregate form with identifying information removed.

If you have any questions, please contact Carrie Liston from Education Development Center, cliston@edc.org. Thank you!

Did you attend the July 13 webinar "live" and/or have you accessed the recorded version?

NOTE: If you plan to access the recorded version, but have not yet done so, please exit the survey now and return to the survey (via the same link in your email) after viewing the recorded version.

- Attended "live" on July 13
- Accessed the recorded version
- Both "live" and recorded version
- I did not attend or access this monthly webinar and do not plan to do so. (If you plan to access the recording, please do so and then return to your survey).

Please respond to the following statements about this webinar on a scale from Strongly Disagree (1) to Strongly Agree (4).

| | Strongly Disagree (1) | Disagree (2) | Agree (3) | Strongly Agree (4) | N/A |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Overall, the webinar was of high quality. | <input type="radio"/> |
| The content was useful to help me be an effective <i>SciGirls</i> Code educator. | <input type="radio"/> |
| I understand what materials will be shipped to me and when. | <input type="radio"/> |
| I understand the goals of Digital Meet-ups. | <input type="radio"/> |
| I understand how to arrange and implement the Digital Meet-ups. | <input type="radio"/> |

Did you find the webinar content to be too simple, too advanced, or just about right?

- Far too simple
- A bit too simple
- About right
- A bit too advanced
- Far too advanced

What would you like more information on, or what questions do you still have, related to this webinar topic?

What other topic(s) would you suggest for upcoming *SciGirls* Code webinars?

Please add any additional comments or suggestions related to this webinar or other aspects of the project:

Appendix K: Project Lead Interview Protocol

SciGirls Code

Project Lead Interview Protocol

July 2017

Introduction

Evaluators from Education Development Center are conducting interviews with SciGirls Code project team members to help us better understand how the project is being implemented and progress toward meeting its goals. These data help provide us with context about the project and the other evaluation findings as we look back at the last year in our upcoming annual report.

The interview should take approximately 30 to 45 minutes. Your responses are confidential and we do not use identifying information when reporting interview findings. With your permission, we would like to audio-record the interview to aid with note taking.

Partner Sites and Educators

1. How would you describe the group of partners and the educators involved in SciGirls Code who will be implementing the program at their sites? *(Do they have similar characteristics to what you expected? How are they alike or similar? Do you have any concerns about the group? Is it a good size?)*
2. What do you think motivated partners and educators to join this project? What do partners and their organizations gain from participating in his project?
3. What are barriers for educators in participating in the program?

So far, educators have been prepared to implement SciGirls Code via monthly webinars and in-person training as well as some “homework” assignments online and in LRNG.

4. Are you satisfied with the level of attendance and engagement by educators in the training components?
5. What do you think worked well about the training and preparation of the educators?
6. What related to the training and preparation would you do differently to make it more effective or efficient?
7. What are the few most crucial aspects or theories behind SciGirls Code that you hope educators to understand at this point in the project? Do you think educators have a good level of understanding of these?
8. Have you received any requests for support that SciGirls Code is not able to provide as part of this project?
9. What is coming next in terms of continuing to prepare and support educators as they get ready to launch their program?

Many of the outcomes we are looking at in the evaluation are for the educators involved.

10. Have you seen or do you have evidence of any changes in educators' attitudes, interest, confidence, and knowledge related to computing as a result of their participation?
11. Have you seen or do you have evidence educators becoming more aware of the nature of computational thinking and how to facilitate that knowledge with the participating girls?
12. Do you think educators are more aware of the educational and career opportunities in CS? How does the project encourage educators to share that with the participating girls?
13. What are other impacts, if any, that you have seen educators experience as a result of their participation in this project so far?

Implementation, Sustainability and Scale-up

14. What have you identified to be crucial components or aspects of the program that you would like each site to implement in the same, or very similar, way?
15. What have you identified to be components or aspects of the program that each site could or should adapt to fit their needs?
16. Can you tell me about if and how you have been thinking of sustainability at this point? Are there decisions you have been made to help with sustainability for the program at TPT? For the partner sites?
17. What have you learned so far that could inform future scale-up efforts? *Consider aspects such as partner selection, educator training content and format, equipment and materials, curriculum activities, the role model component, etc.*

Wrap-up

18. What do you view as the biggest success of the project this year?
19. What do you see as the biggest challenge for *SciGirls* Code in meeting desired outcomes during the duration of this grant? How has or can this challenge be addressed?
20. Is there anything else you would like to share?

