Evaluation of *SciGirls Season Two* Outreach Program

Twin Cities Public Television (*tpt*)

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By

Knight Williams Inc.

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Introduction

The *SciGirls Season Two* television project is an outgrowth of a previous *SciGirls* outreach effort supported by a grant from the National Science Foundation's (NSF) Program for Gender Equity. Titled *Dragonfly TV SciGirls* (*SciGirls),* the outreach project was designed to encourage girls' interest in science by building capacity among outreach professionals in the area of gender-equity teaching and learning. The project emphasized the use of videos featuring girls engaged in authentic inquiry, drawn from the *DragonflyTV* series. Between 2005 and 2008, Twin Cities Public Television (***tpt***), the PBS affiliate station in St. Paul/Minneapolis, awarded 24 organizations with outreach grants, multimedia resources, and training to help outreach staff implement *SciGirls* outreach initiatives in their local communities. To assess the impact of the grantee program, the independent evaluation firm Knight Williams Research Communications (Knight Williams) conducted a summative evaluation of the program's first three years. The evaluation is available at: http://informalscience.org/images/evaluation/report_280.PDF.

Subsequently ***tpt*** received funding from the NSF's Division of Research on Learning in Formal and Informal Settings (DRL) for the production of *SciGirls Season Two,* which involved the creation of 10 new episodes and enabled the project team to significantly expand its web, outreach, and education activities, in part though the selection of 40 *SciGirls Season Two* partners. Each of these partners received a full day of training for 10-30 participants in their region, focused on the integration of inquiry-based science instruction with a commitment to gender equity, as well as educational support and resources.[1]

The independent evaluation firm Multimedia Research conducted an evaluation of the television component of *SciGirls Season Two,* including an experimental study of the impact of the TV series on girls' abilities to take part in science and engineering projects.[2] During the same period, the independent evaluation team from Knight Williams Inc. conducted an evaluation of the implementation of the outreach activities among the member institutions of the National Girls Collaborative Project (NGCP) network.

Knight Williams implemented the outreach evaluation of *SciGirls Season Two* to assess: (i) how the new *SciGirls* outreach materials were implemented within the NGCP network, (ii) what factors increased or decreased this implementation across the sample of network partners, (iii) and whether and how the *SciGirls Season Two* training and outreach materials enhanced the skills of the adults who work with girls within the NGCP member organizations, and in particular whether they improved their understanding of the strategies for working with girls. The following questions relating to the *SciGirls* training, programs, and resources were explored:

SciGirls training

- To what extent did the training improve the participants' abilities to implement *SciGirls* activities in their local communities?
- Did participants feel the training was well-organized and run?
- What features of the training did they find most and least valuable?
- To what extent did the training increase awareness within participants' departments of issues in gender-equity teaching and learning? In particular, did the training raise staff awareness of how girls learn, experience, and enjoy science?
- To what extent did the training improve participants' skills in integrating video and web resources into their programming?
- Did participants have suggestions for improving the training experience?

[1] The full list of *SciGirls* partner organizations is available at: http://scigirlsconnect.org/page/partners?xg_source=activity
[2] The full report, *Summative Evaluation of "SciGirls" Season Two: Television Series & Website*, is available on informalscience.org

SciGirls program

- What types of *SciGirls* programs did the educators hold and what were the lengths of their programs?
- When and in what types of settings did the educators hold their programs?
- How did youth participate in their programs?
- How many youth attended their programs, what were the community types in which the youth lived, and what were the grade levels, gender, and racial/ethnic backgrounds of the youth?
- To what extent were other individuals present during the program?

SciGirls multimedia resources (video, print, and web resources)

- Which of the video, print, and web resources did participants engage and why?
- How satisfied were participants with the resources? How do they compare with other informal science resources they've used to address girls in science issues?
- What did participants find to be the main challenges and highlights of implementing the resources they chose to use?
- From the participants' perspective, what did the girls gain from their experience with the resources? What methods if any, did they or other project staff use to assess these gains?
- Did participants use the resources in ways that took advantage of the inquiry-based and authentic investigation approaches reflected in *SciGirls*?
- In implementing the resources, did participants apply the key research findings built into the *SciGirls* materials?

Outline of the report

The report below is presented in three parts.

Part 1: Part 1 presents findings in two sections: Section 1 presents the findings from training evaluation forms completed by 359 educators who completed a *SciGirls* training between October 1, 2013 and March 31, 2014. Section 2 presents the findings from program report forms completed by a subset of 49 educators who implemented *SciGirls* programs between October 1, 2013 and May 31, 2014 and subsequently completed evaluation forms to report and reflect on their programs.

Part 2: Part 2 presents the findings from a more in-depth evaluation, focused on the pre-training feedback from 9 *SciGirls Season Two* partner organizations, including their reasons for applying for a *SciGirls* grant and their expectations for the training and their outreach programs. This evaluation was conducted in the fall of 2013, prior to educators participating in the training or conducting their programs. The report on these findings was previously provided to ***tpt*** and is included in entirety in this report.

Part 3: Part 3 builds on Part 2 and presents the findings from the same 9 partner organizations' use of the *SciGirls Season Two* resources, lessons learned from attending the training and using the materials, and the impact of both on their programs moving forward.

Part 1: Educator feedback and reports on their *SciGirls* training and program implementation

Section 1: Educator feedback on training

Introduction

SciGirls Season Two partners received a full day of training for 10-30 participants in their region, focused on the integration of inquiry-based science instruction with a commitment to gender equity, as well as educational support and resources. In all, 40 partners participated in 22 trainings (with some trainings being organized as partner collaborations) during the *SciGirls Season Two* outreach timeframe, and around 560 educators were trained. Educators who participated in a training between October 1, 2013 and March 31, 2014 were asked to complete an online evaluation form to capture their experience at the training and their expectations for implementing *SciGirls* programs within the next 12 months.

Method

The online training evaluation form was developed collaboratively by Twin Cities Public Television (***tpt***) and Knight Williams Inc. Educators were informed that the form was hosted by the independent evaluation team from Knight Williams and that their responses would be combined with those from other participants and reported in the aggregate. They were further informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future training programs.

Over the course of the 6-month October – March timeframe, a total of 359 educators completed the training form. These educators represented a wide range of organizations, including K-12 schools, science centers, girl-serving organizations such as the Girl Scouts and Girls Inc., STEM research organizations, universities, public television stations, and other non-profit organizations. In interpreting the educators' responses, it is important to note that the information summarized in the report only applies to educators who submitted training evaluation forms in this timeframe, and does not necessarily reflect the total sum of educator feedback during this 6-month period.

Basic descriptive statistics were performed on the quantitative data generated from the evaluation questions. Content analyses were performed on the qualitative data generated in the open-ended questions.[3] The analysis was both deductive, drawing on the objectives of the training program, and inductive, looking for overall themes, keywords, and key phrases. All analyses were conducted by two independent coders. Any differences that emerged in coding were resolved with the assistance of a third coder.

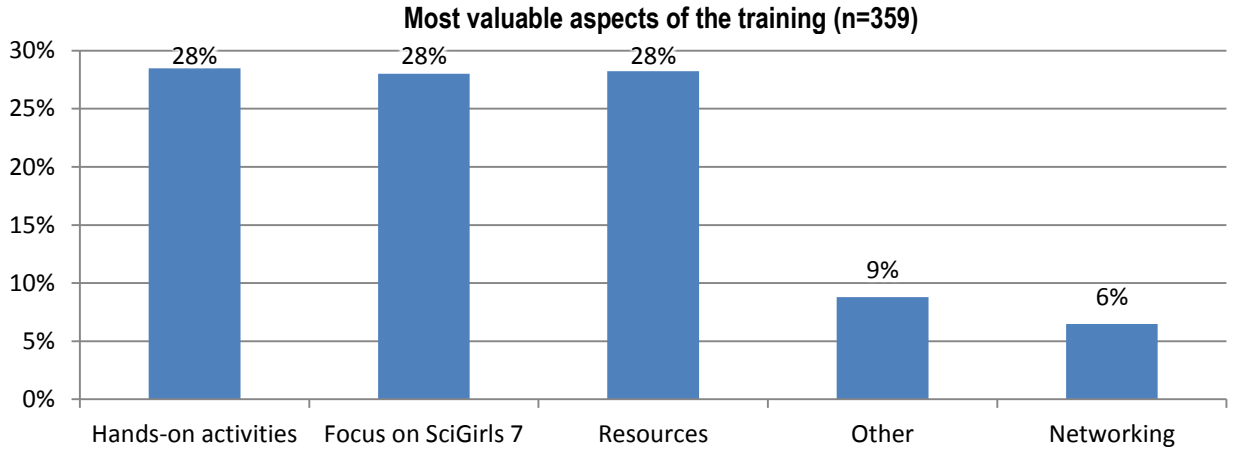
Findings

The Section 1 findings are presented as follows: what educators perceived to be the most and least valuable aspects of the training and how valuable they found the individual training sessions, their overall satisfaction with the training, what they perceived to be the impact of the training on their skills in implementing *SciGirls* activities, whether the training omitted important topics, their readiness for implementing programs, how they expected to apply what they learned, whether they were interested in becoming a *SciGirls* trainer, how many girls they expected to reach with the *SciGirls* resources, and the number of girls they typically serve annually.

[3] The educators frequently provided multiple answers to the open-ended questions, often resulting in response categories that added up to more than 100% for these questions.

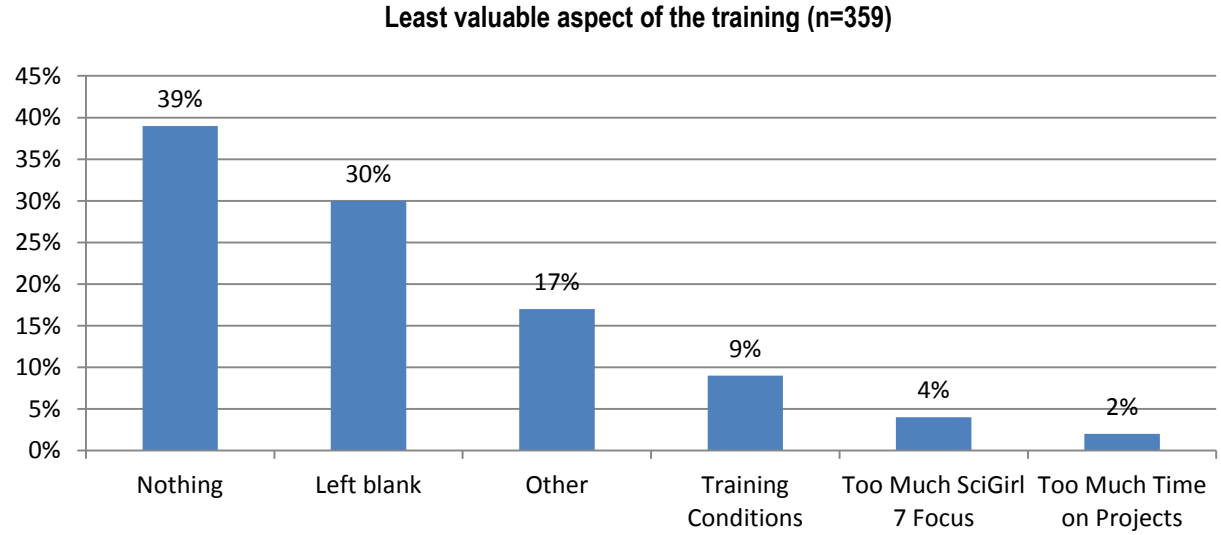
1.1 Most valuable aspects of the training

When asked to identify the *most* valuable aspects of the training, the educators most frequently pointed to four aspects. As shown in the graph below, more than one-quarter (28%) each pointed to the focus on the hands-on activities implemented during the session, the focus on *SciGirls* Seven, or the *SciGirls* resources, particularly the activities and videos.[4] Small groups of educators pointed to the opportunity to network (6%) or other aspects of the training (9%).



1.2 Least valuable aspects of the training

When asked to describe what they found *least* valuable about the training, no one aspect stood out for the majority of educators, as approximately three-quarters of the group either indicated there was no least valuable aspect (39%) or left the question blank (30%). As shown in the graph below, about a tenth of educators (9%) pointed to some aspect of the training conditions, typically the facilities used, the length of the training, the time of day, the room temperature, or the training setting. Smaller groups commented that their training featured too much focus on the *SciGirls* Seven (4%) or too much time on projects (2%). About one-sixth (17%) pointed to other aspects.



[4] Please see Appendix 1 for more information about *SciGirls* Seven, from the online book *SciGirls* Seven: How to Engage Girls in STEM.

1.3 Value of the individual workshop sessions

Overall, the educators found all of the training sessions to be valuable. As shown in the table below, while there were some differences of opinion as evidenced by the range of ratings in each case, in general, the Gender Equity/*SciGirls* Seven and *SciGirls* activity sessions were both rated as *extremely valuable* (median rating 5.0) on a scale of 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*). The Introductions/overview to *SciGirls* mission and program elements session and the Wrap-up reflections session were each rated as *very valuable* (median rating 4.0).

Educator ratings of value of training sessions (median ratings, n=359)						
Training sessions	**Not at all valuable 1.0**	**Slightly valuable 2.0**	**Moderately valuable 3.0**	**Very valuable 4.0**	**Extremely valuable 5.0**	**Not applicable *(if the training didn't address it)***
Introductions and overview to *SciGirls* mission and program elements				4.0 Range 1.0-5.0		
Gender Equity/*SciGirls* Seven session					5.0 Range 1.0-5.0	
SciGirls activity session					5.0 Range 1.0-5.0	
Wrap-up/reflections				4.0 Range 1.0-5.0		

1.4 Overall satisfaction with training

When the educators were asked for their level of agreement with four statements about their satisfaction with the training on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*), overall they indicated they were satisfied. As shown in the table below, while there were some differences of opinion as evidenced by the range of ratings in each case, the educators *strongly agreed* (median rating 7.0) that the training was well run and organized, that they found the training to be a good use of their time, and that they had fun at the training. The educators generally *agreed* (median rating 6.0) that they learned a lot about how girls learn, experience, and enjoy science, and were *neutral* (median rating 4.0) about whether they would have liked more information about the agenda before they arrived.

Educator ratings of training conditions (median ratings, n=359)							
	Strongly disagree 1.0	**Disagree 2.0**	**Somewhat disagree 3.0**	**Neutral 4.0**	**Somewhat agree 5.0**	**Agree 6.0**	**Strongly agree 7.0**
The training was well run and organized.							7.0 Range 1.0-7.0
I would have liked more information about the training agenda before I arrived.				4.0 Range 1.0-7.0			
I found the training to be a good use of my time.							7.0 Range 1.0-7.0
I had fun at the training.							7.0 Range 1.0-7.0
I learned a lot about how girls learn, experience, and enjoy science.						6.0 Range 1.0-7.0	

1.5 Training impact on skills in implementing *SciGirls* activities

Educators were asked to reflect on their skill level in implementing the *SciGirls* activities covered at the training before vs. after the training, using a scale from 1.0 (*no skill*) to 5.0 (*advanced skill*). As shown in the median ratings in the table below, while there were some differences of opinion, the educators generally reflected that they had *little skill* prior to the workshop (median rating 2.0) but *moderate skill* after (median rating 4.0).

1 = No skill **3 = Medium level skill** **5 = Advanced skill**

Before training					My skill level in….	After training				
1	2	3	4	5	implementing the *SciGirls* activities covered at the training	1	2	3	4	5
2.0 RANGE 1.0-5.0						4.0 RANGE 1.0-5.0				

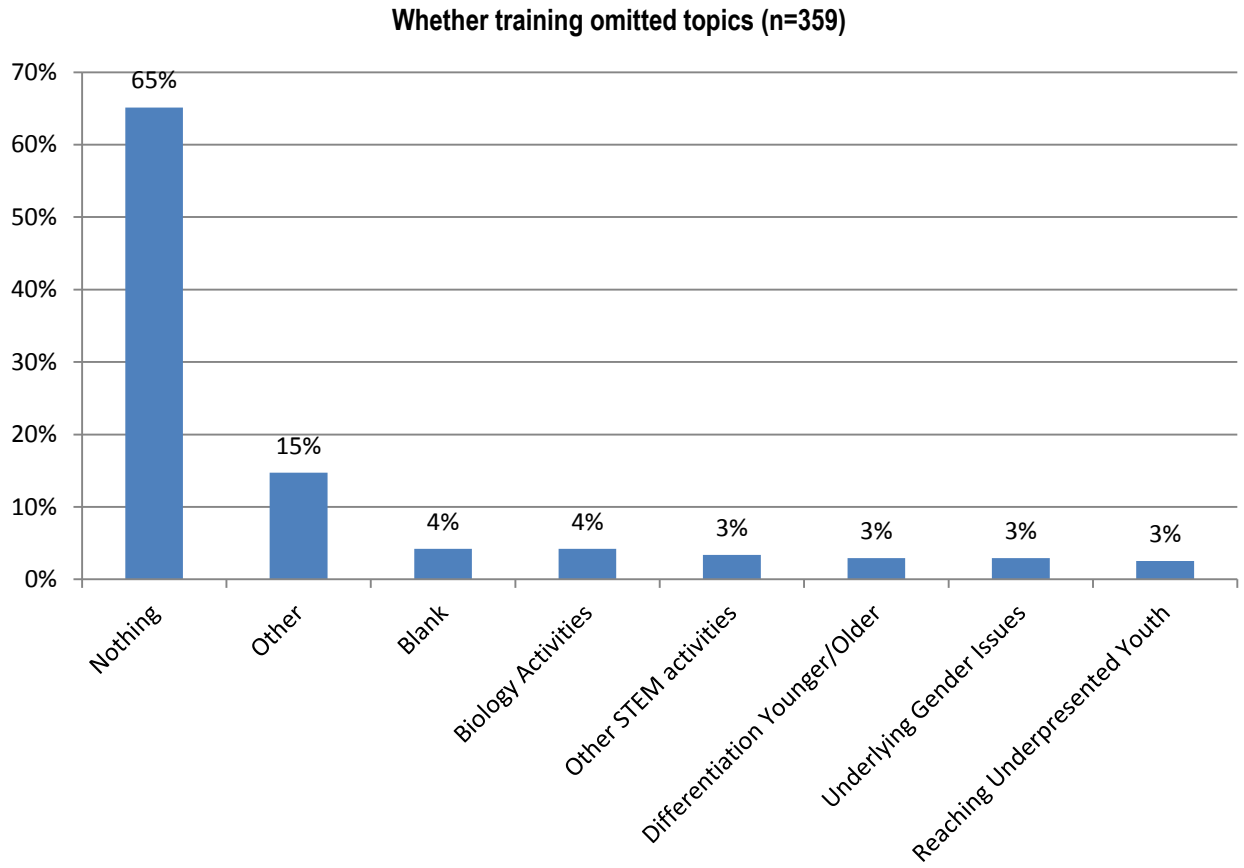
Educators were also asked to reflect on their skill incorporating the three strategies or processes listed in the table below when implementing the *SciGirls* activities covered at the training. As shown in the median ratings below, while there were again differences of opinion, the educators generally reflected that they had *little skill* incorporating the *SciGirls* Seven Strategies prior to the training (median rating 2.0) but *moderate skill* after the training (median rating 4.0). They further indicated that previously they had *some skill* incorporating the Engineering Design Process and the Science Inquiry Process (median rating 3.0 each) but after the training had *moderate skills* incorporating the Engineering Design Process (median rating 4.0) and *advanced skills* incorporating the Science Inquiry Process (median rating 5.0).

1 = No skill **3 = Medium level skill** **5 = Advanced skill**

Before training					My skill level in…	After training				
1	2	3	4	5	incorporating the *SciGirls* Seven strategies	1	2	3	4	5
2.0 RANGE 1.0-5.0						4.0 RANGE 1.0-5.0				
1	2	3	4	5	incorporating the Engineering Design Process	1	2	3	4	5
3.0 RANGE 1.0-5.0						4.0 RANGE 1.0-5.0				
1	2	3	4	5	incorporating the Science Inquiry Process	1	2	3	4	5
3.0 RANGE 1.0-5.0						5.0 RANGE 2.0-5.0				

1.6 Whether training omitted topics

Educators were asked if they felt the training omitted a topic they wish had been covered, or did not cover a topic in as much depth as they would have liked. As shown in the chart below, the majority of educators indicated that nothing was omitted or covered in insufficient depth (65%). Small groups of educators indicated there were some topics or activities they would have liked to see covered or addressed more fully, including: biology activities (4%), other STEM activities (3%), differentiation (gearing activities to older and younger youth) (3%), underlying gender issues accounting for *SciGirls* Seven (3%), and guidelines for reaching or working with underrepresented youth (3%). About one-sixth of educators pointed to other, miscellaneous subjects (15%), and a few left the question blank (4%).



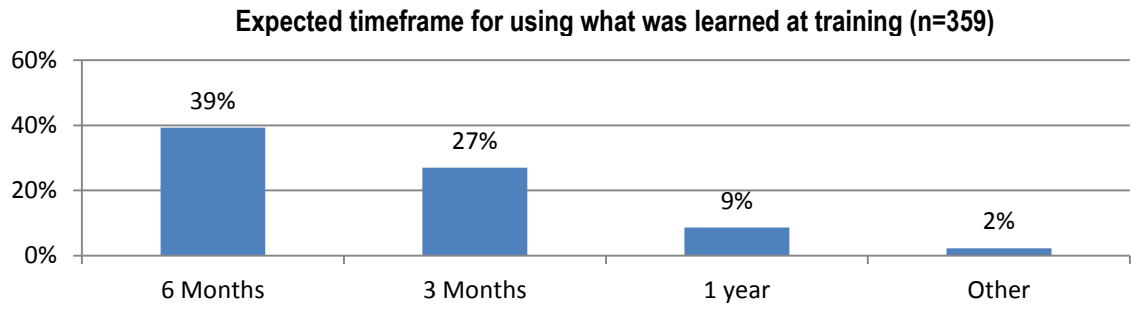
1.7 Readiness for training utilization

The educators were asked to rate how strongly they agreed or disagreed with four statements about their readiness for applying information learned at the training on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*). As shown in the table below, while there were some differences of opinion, overall, the educators *agreed* (median rating 6.0) that they: could clearly describe the *SciGirls* Seven strategies to a colleague, felt well prepared to implement the *SciGirls* activities in girls-only settings, felt well prepared to implement the SciGirls activities in mixed-gender settings, and planned to incorporate the *SciGirls* Seven strategies throughout other areas of their work. The educators were generally *neutral* (median rating 4.0) about preferring more opportunities to relate the training material to their own situations.

Educator ratings of readiness of training utilization (median ratings, n=359)							
Readiness for training utilization	**Strongly disagree 1.0**	**Disagree 2.0**	**Somewhat disagree 3.0**	**Neutral 4.0**	**Somewhat agree 5.0**	**Agree6.0**	**Strongly agree 7.0**
I can clearly describe the *SciGirls* Seven strategies to a colleague.						6.0 Range 1.0-7.0	
I feel well prepared to implement the *SciGirls* activities in girls-only settings						6.0 Range 1.0-7.0	
I feel well prepared to implement the *SciGirls* activities in mixed-gender settings						6.0 Range 1.0-7.0	
I would have preferred more opportunities to relate the training material to my own situation.				4.0 Range 1.0-7.0			
I plan to incorporate the *SciGirls* Seven strategies throughout other areas of my work.						6.0 Range 1.0-7.0	

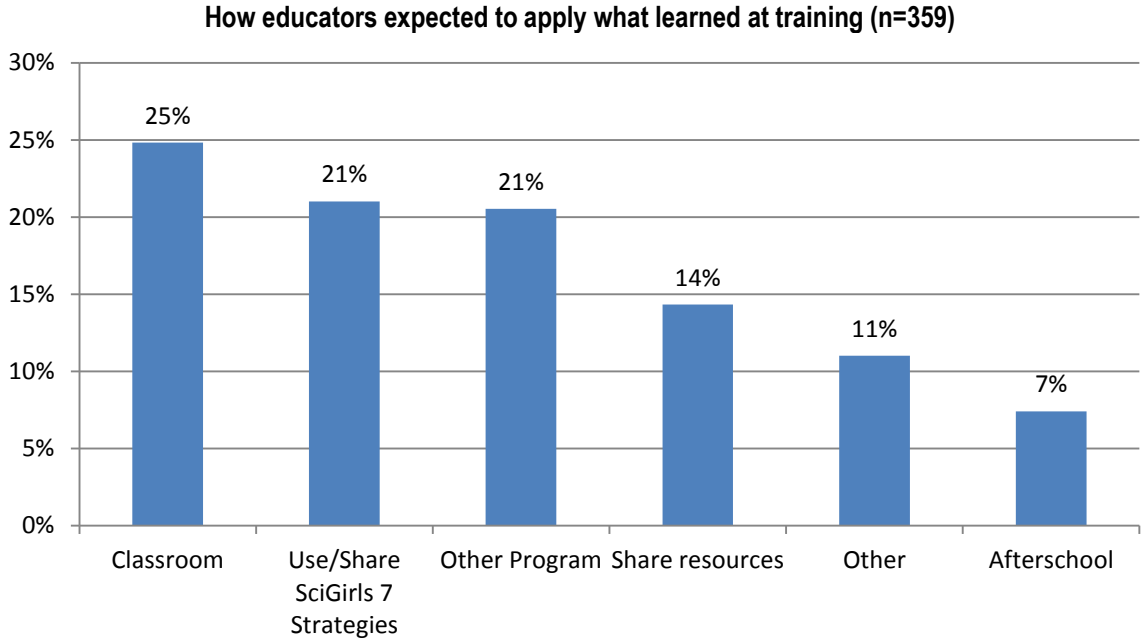
1.8 Expected timeframe for using what was learned at training

Educators were asked: *If we were to follow-up with you as to how you used or applied what you learned from the training, what timeframe would make the most sense for your plans?* Response options included: Ask me in 3 months, I plan to use or apply aspects immediately; Ask me in 6 months, I plan to use or apply aspects sometime during the next few months; and Ask me in 1 year, my professional circumstances will not allow me to use or apply aspects until then. As the chart below shows, two-fifths (39%) of the educators expected to use or apply what they learned in 6 months, while over one-quarter (27%) pointed to 3 months, one-tenth (9%) to 1 year, and a handful (2%) to another timeframe.



1.9 How educators expected to apply what was learned at the training

Educators were asked to explain how they expected to use or apply what they learned at the training when they returned home. As shown in the chart below, the educators most frequently pointed to implementing activities in their classrooms or other types of programs and/or they indicated they expected to use or share the *SciGirls* Seven strategies.



Specifically:

- One-quarter (25%) expected to implement activities in a classroom setting.
- One-fifth each (21%) expected to implement activities in other program settings or expected to use and/or share the *SciGirls* Seven strategies.
- One-sixth (14%) expected to share *SciGirls* resources.
- Less than one-tenth (7%) expected to implement activities in afterschool settings.
- Just over one-tenth (11%) pointed to other ways they play to apply what they learned at the training.

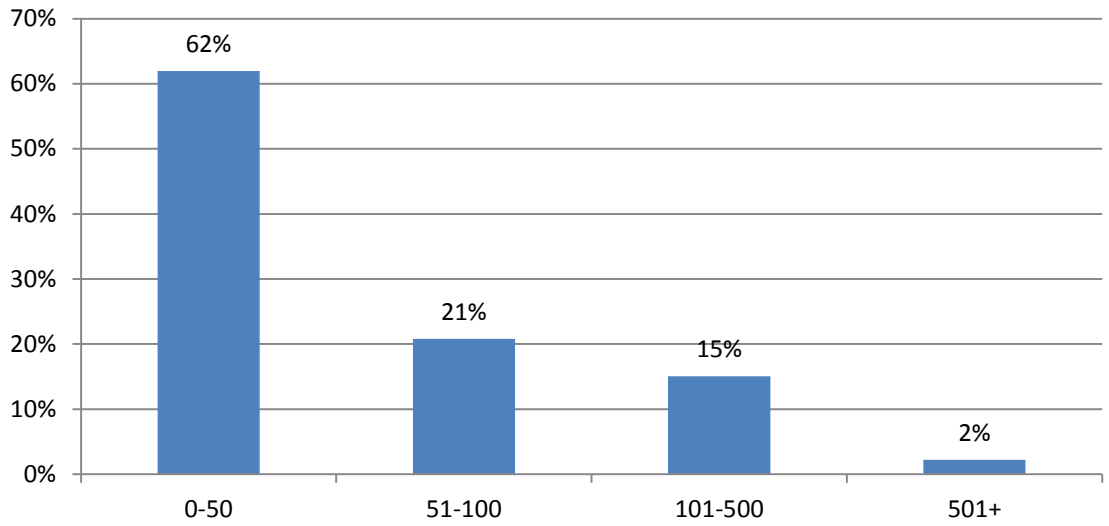
1.10 Interest in becoming a *SciGirls* trainer

Based on their experience at this training, educators were asked to indicate how interested they were in becoming a *SciGirls* trainer on a scale from 1.0 (*not at all interested*) to 5.0 (*extremely interested*). Generally speaking, the educators were *moderately interested* (median rating 3.0), although their individual ratings ranged from a low of 1.0 to a high of 5.0.

1.11 Number of girls expected to use *SciGirls* resources

The educators were asked to estimate approximately how many girls they expected to use the *SciGirls* resources with over the next 12 months. As the educators' responses ranged widely, from 2 up to 1,600 girls, and were sometimes provided as a range rather than a specific number, their estimates were grouped into the brackets shown in the chart below. The majority of educators (62%) indicated that they expected between 0-50 girls to use the resources within the 12-month timeframe. Just over one-fifth (21%) expected use by 51-100 girls, one-sixth (15%) expected use by 101-500 girls, and a handful (2%) expected use by more than 500 girls.

Number of girls the educators expected would use *SciGirls* resources during next 12 months (n=359)



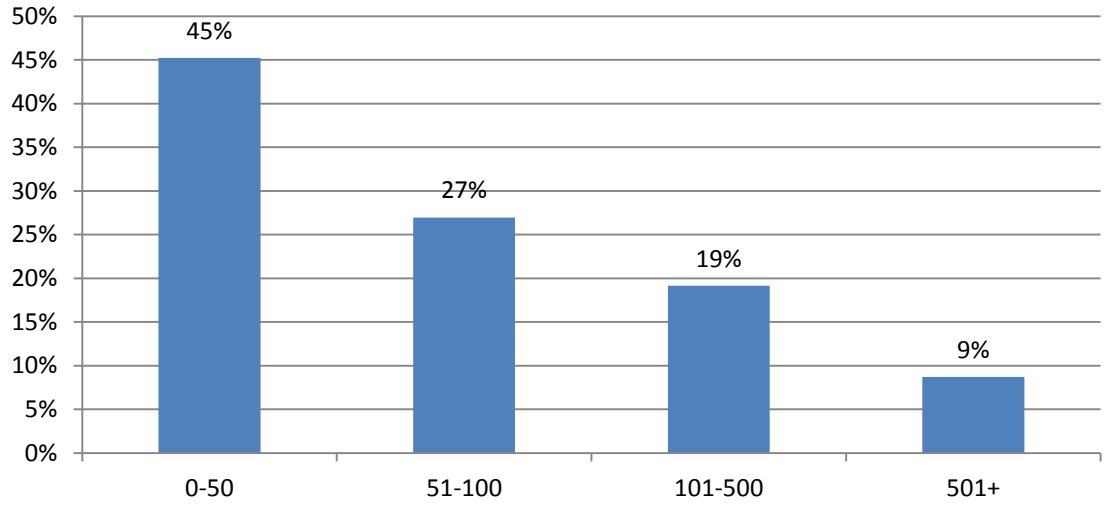
As the chart above shows, the majority of educators estimated that between 0 to 50 girls would use the resources during the next 12 months. The table below shows a mode of 20 for this '0-50' category, wherein 19% of the overall 62% of educators (12% of the total group) estimated that it was likely for 20 girls to use *SciGirls* resources within the next 12 months.

Category	Mode	Mode Frequency	Percentage of Category	Percentage of Total
0-50	20	26	19%	12%
51-100	60	13	28%	6%
101-500	101	11	32%	5%
500+	1000	2	40%	1%

1.12 Number of girls the educators served on annual basis

Finally, the educators were asked to estimate approximately how many girls they serve through their work on an annual basis. As their responses ranged widely, from 0 up to 30,000 girls, and were sometimes presented as a range rather than a specific number, their estimates were grouped into the brackets shown in the chart below. Just under half (45%) of the educators indicated that they worked with 0-50 girls per year, while more than one-quarter (27%) reported serving 51-100 girls, one-fifth (19%) reported serving 101-500 girls, and less than a tenth (9%) served over 500 girls.

Number of girls the educators served on annual basis (n=359)



The table below shows additional detail on these estimates per category. The most common number of girls estimated to be served by the educators was between 0 and 50 girls annually (mode 50). In this '0-50' category, 16% of the overall 45% of educators (7% of the total group) estimated that they serve 50 girls annually. As the table shows, there is considerable variation in the '0-50' category, especially as this category's mode frequency is the same as in the '51-100' category, although the percentages they represent in their respective categories are quite different.

Category	Mode	Mode Frequency	Percentage of Category	Percentage of Total
0-50	50	17	16%	7%
51-100	100	17	27%	7%
101-500	300	12	27%	5%
501+	1000	7	35%	3%

Section 2: Educator reflections on their programs

Introduction

After completing their *SciGirls* training, *Season Two* partners began to implement *SciGirls* programs. Section 2 presents the findings from the program report forms completed by educators who implemented *SciGirls* programs between the fall of 2013 and the spring of 2014 and subsequently completed evaluation forms to report on and reflect on their programs.

Method

Educators who ran a *SciGirls* program were asked to complete an online program report and reflection form to capture how they were using the *SciGirls* resources. The form was developed collaboratively by Twin Cities Public Television (***tpt***) and Knight Williams Inc. In each case the educators were informed that the online form was hosted by the independent evaluation team from Knight Williams and that their responses would be combined with those from other participants and reported in the aggregate. They were further informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future programs.

This summary accounts for the program reports submitted by educators between October 1, 2013 and May 31, 2014. During this timeframe, a total of 49 educators completed the form. In interpreting the educators' responses, it is important to note that these numbers only apply to programs that submitted forms during this 8 month period, and do not necessarily reflect the total sum of *SciGirls* activity as a whole during this period.

Basic descriptive statistics were performed on the quantitative data generated from the evaluation questions. Content analyses were performed on the qualitative data generated in the open-ended questions.[5] The analysis was both deductive, drawing on the program objectives, and inductive, looking for overall themes, keywords, and key phrases. All analyses were conducted by two independent coders. Any differences that emerged in coding were resolved with the assistance of a third coder.

Findings

A summary of the educators' responses are presented in three sections, as outlined below:

- Section 2a provides an overview of the educators' reports on: the types of programs they held, the month/year of their programs, the setting and length of their programs, how youth participated in their programs, the highlights and challenges of their programs, and their efforts to evaluate their programs.
- Section 2b provides an overview of the *SciGirls* program participants according to the educators, including: the number of youth who attended their programs, the community types in which the youth lived, the grade levels, gender, and racial/ethnic backgrounds of the youth, and the extent to which other individuals were present during the program.
- Section 2c provides an overview of educators' use of and experience with the *SciGirls* activities, videos, and website, including their perceptions of the value of these resources and the gains they observed in the youth as a result of their use.

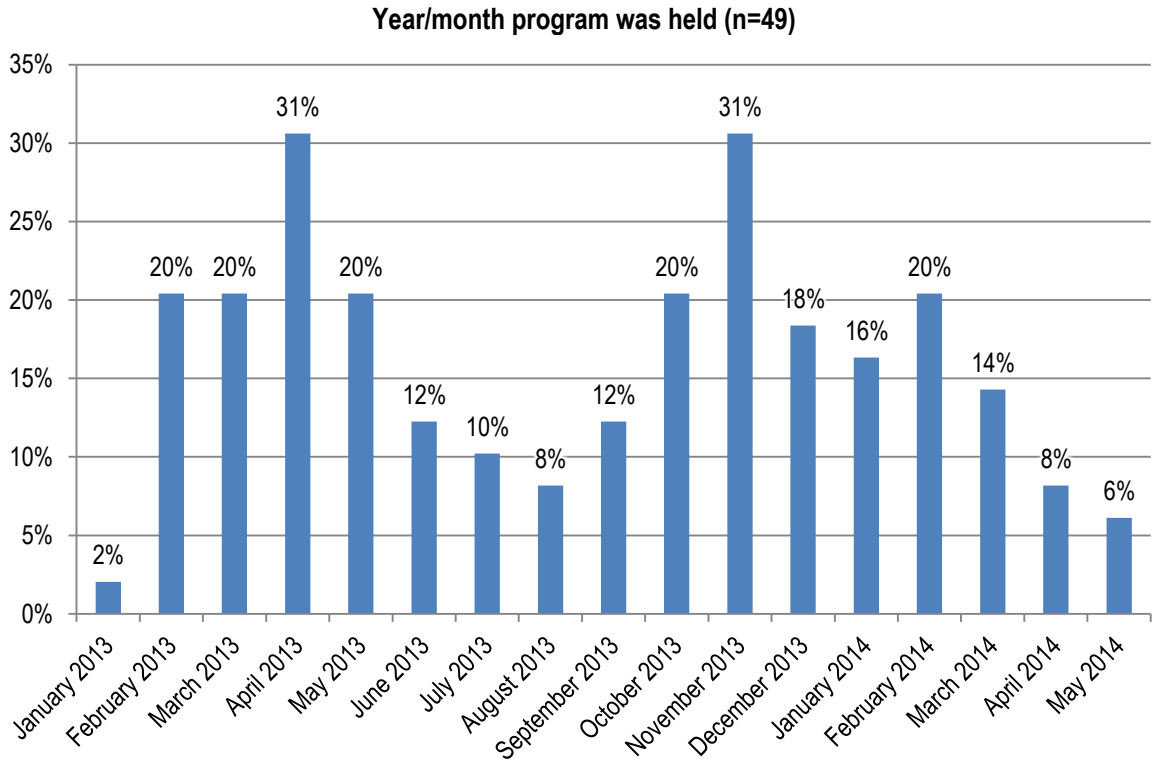
[5] The educators frequently provided multiple answers to the open-ended questions, often resulting in response categories that added up to more than 100% for these questions.

Section 2a: Overview of *SciGirls* programs

The educators who completed program report forms represented a wide range of organizations, including K-12 schools, science centers, girl-serving organizations such as the Girl Scouts or Girls Inc., STEM research organizations, universities, public television stations, and other non-profit organizations. This section provides an overview of these educators' reports on: the types of *SciGirls* programs they held, the month/year when they held their programs, the setting and length of their programs, how youth participated in their programs, the highlights and challenges of their programs, and their efforts to evaluate their programs.

2a.1 Month/year program was held

As shown in the chart below, the majority of educators held their programs in 2013, with April and November being particularly active program months. As indicated below, a number of *SciGirls* programs took place before the program report submission period (October 1, 2013 to May 31, 2014).

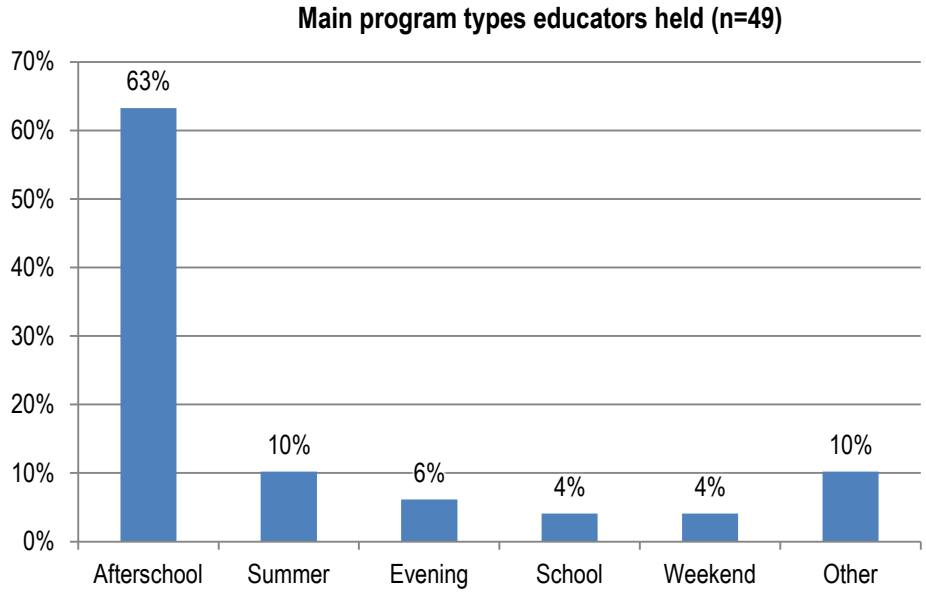


Specifically:

- Nearly three-quarters (72%) of programs were held in 2013, while about a quarter (24%) of programs were held in 2014.
- The most active months were April and November of 2013, with almost a third (31%) of programs reporting activity in each of these months.
- The least active months, with less than one-tenth of program offerings per month, were August 2013 (8%), April 2014 (8%), May 2014 (6%), and January 2013 (2%).

2a.2 Program types

As shown in the chart below, the majority of the educators held afterschool programs. Summer, evening, school, and weekend programs were implemented far less frequently.

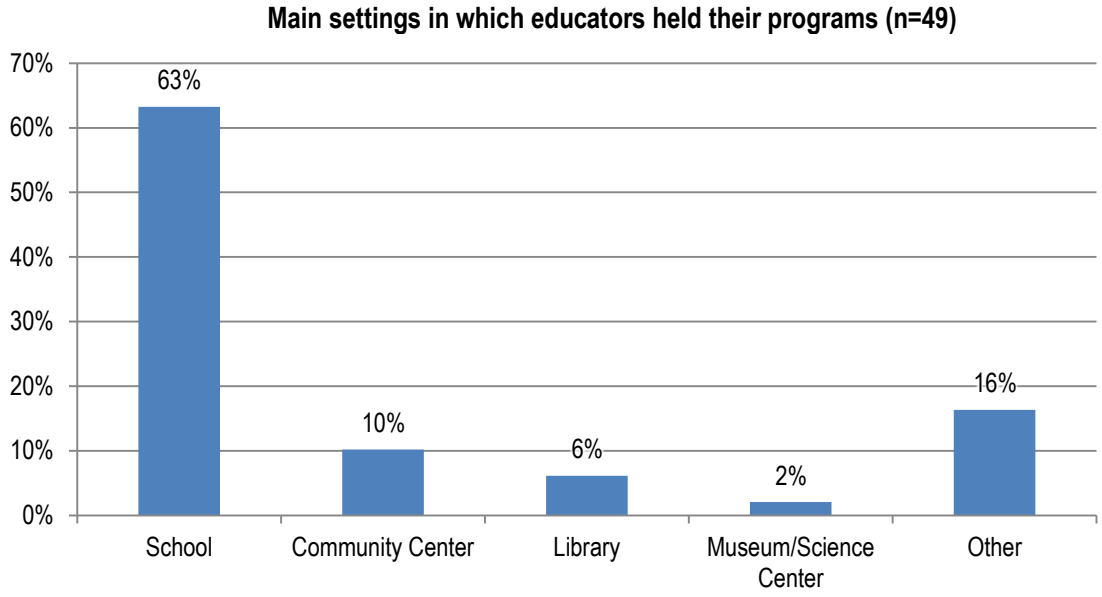


Specifically:

- Nearly two-thirds (63%) of programs were held after school.
- One-tenth (10%) were held during the summer.
- Less than one-tenth each were held in the evening (6%), during school (4%), or on a weekend (4%).
- One-tenth (10%) of programs were held at a time other than those listed.

2a.3 Program settings

Two-thirds of the educators held programs at a school, as shown in the chart below. Community centers, libraries, and museum/science centers hosted programs far less frequently.

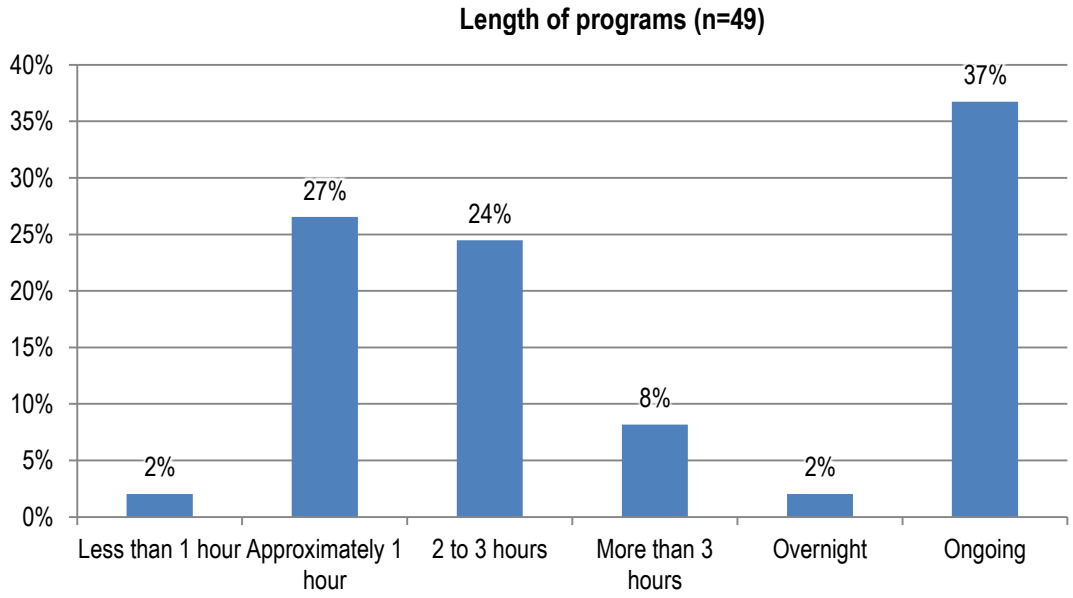


Specifically:

- Nearly two-thirds (63%) of programs were held at a school.
- One-tenth (10%) of programs were held at a community center.
- Less than one-tenth each were held at a public library (6%) or a museum or science center (2%).
- About one-sixth of programs (16%) were held at other locations, such as: National Guard Armory, Girls Inc. facility, 4-H office, or another non-profit organization.

2a.4 Program length

The majority of the educators held ongoing programs or held one-time programs that lasted between 1 to 3 hours, as shown in the chart below. Relatively few programs were more than 3 hours in length or overnight.

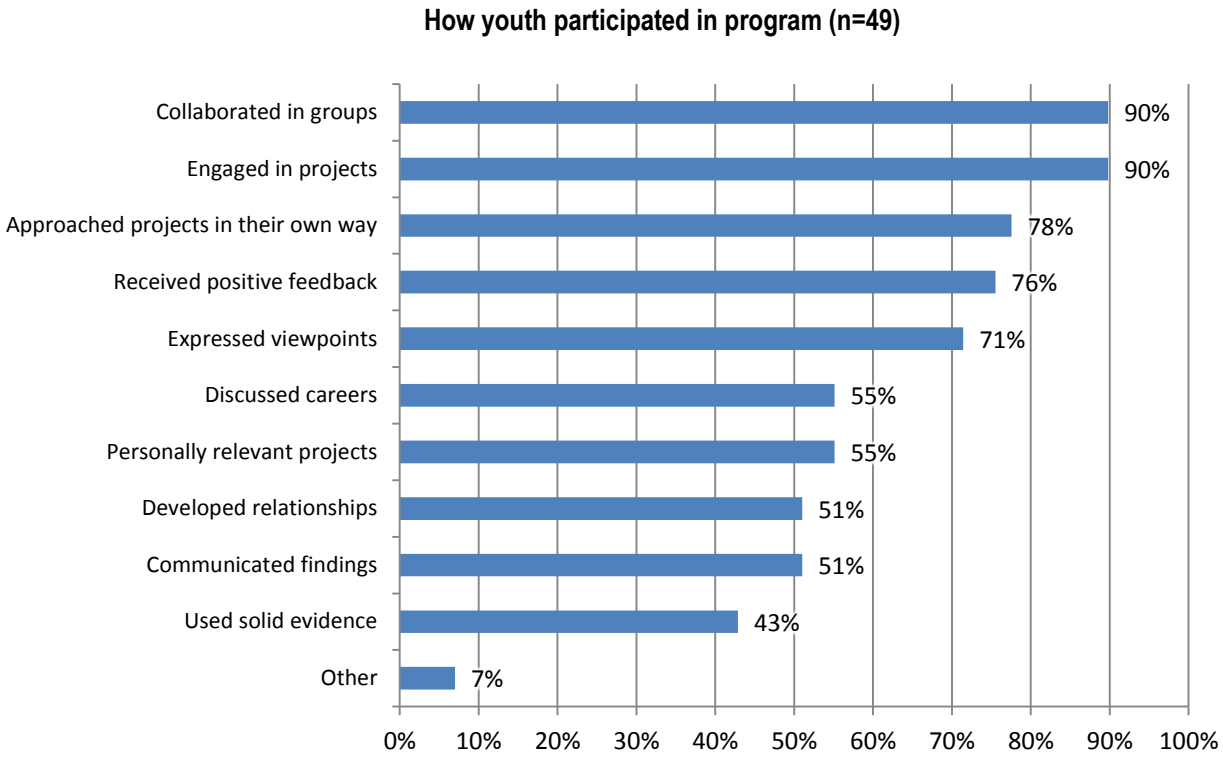


Specifically:

- A handful (2%) of programs were less than an hour long.
- More than a quarter (27%) of programs were about 1 hour in duration.
- Another quarter (24%) of programs were 2 to 3 hours long.
- Just under one-tenth (8%) of programs lasted more than 3 hours.
- A few (2%) of programs lasted overnight.
- More than one-third (37%) of programs were/are ongoing. Educators described their ongoing programs in various ways, as shown in the following examples:
  - *We have a summer program for 6 weeks.*
  - *We usually meet from 3:15-4:45 or 5 after school. Our 8th graders try to meet once a month. We have only had one meeting with our 6th graders.*
  - *Program is 3 or 4 days a week from 4:15 to 5:15. It involves both girls and boys.*
  - *We met for 6 sessions for 1.5 hours initially. We will restart again March 2014 for more afterschool 1.5 hour sessions 2x a month.*
  - *Sessions were once a week for 26 weeks from September-April. Each session was an hour and a half.*
  - *Our program meets two days a week after school at a local junior high. We meet from 2:45 to 5:30, Mondays and Wednesdays from September - May.*

2a.5 How youth participated in program

Educators were asked to check off which of the ways listed in the chart below that youth participated in their programs. These 10 activity strategies are reflected in the *SciGirls* Seven. As shown in the chart, nearly three-quarters or more of the educators indicated that their youth collaborated in groups, engaged in projects, approached projects in their own way, received positive feedback, and expressed viewpoints. Other strategies were reported somewhat less frequently.



Specifically:

- Nine-tenths of the educators indicated that their youth engaged in hands-on, open-ended projects and investigations (90%) and/or collaborated in groups (90%).

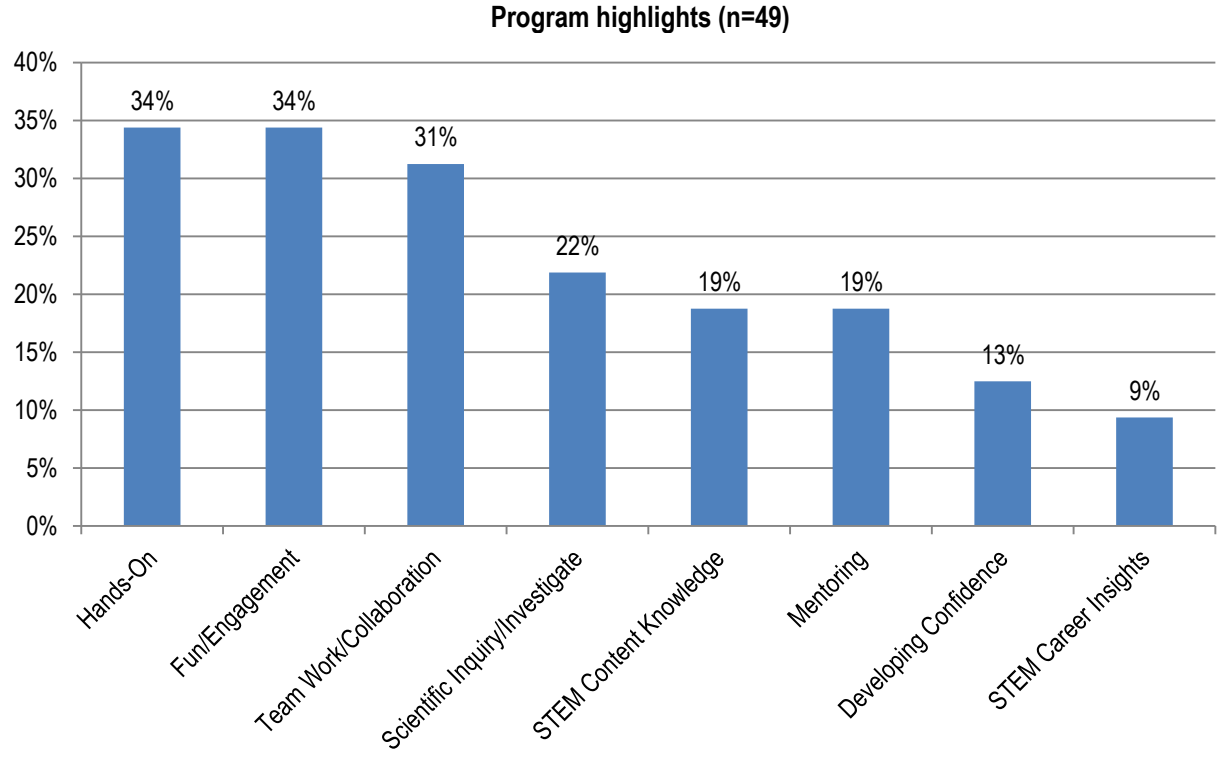
- Approximately three-quarters of the educators reported that their youth approached projects in their own way (78%), received specific, positive feedback on their effort, strategies, and/or behaviors (76%), and/or expressed their individual viewpoints within a group setting (71%).

- Half or just over half of the educators reported that their youth worked on a project designed to be personally relevant and meaningful to them (55%), discussed STEM careers (55%), communicated findings to the group using a variety of techniques (51%), and/or developed relationships with role models or mentors (51%).

- Just over two-fifths (43%) of the educators indicated youth used solid evidence to support claims when communicating findings, while less than one-tenth (7%) said their youth participated in other ways, including: *Discussed STEM opportunities in/out of school for girls their age.*

2a.6 Program highlights

Educators were asked to describe the highlights of their *SciGirls* programs. As shown in the chart below, they most often pointed to the hands-on elements, the fun and engaging aspects, and/or the opportunities for teamwork/collaboration. Other aspects were pointed to somewhat less frequently, including elements that involved scientific inquiry, learning of STEM content, mentoring, developing confidence, and STEM career insights.

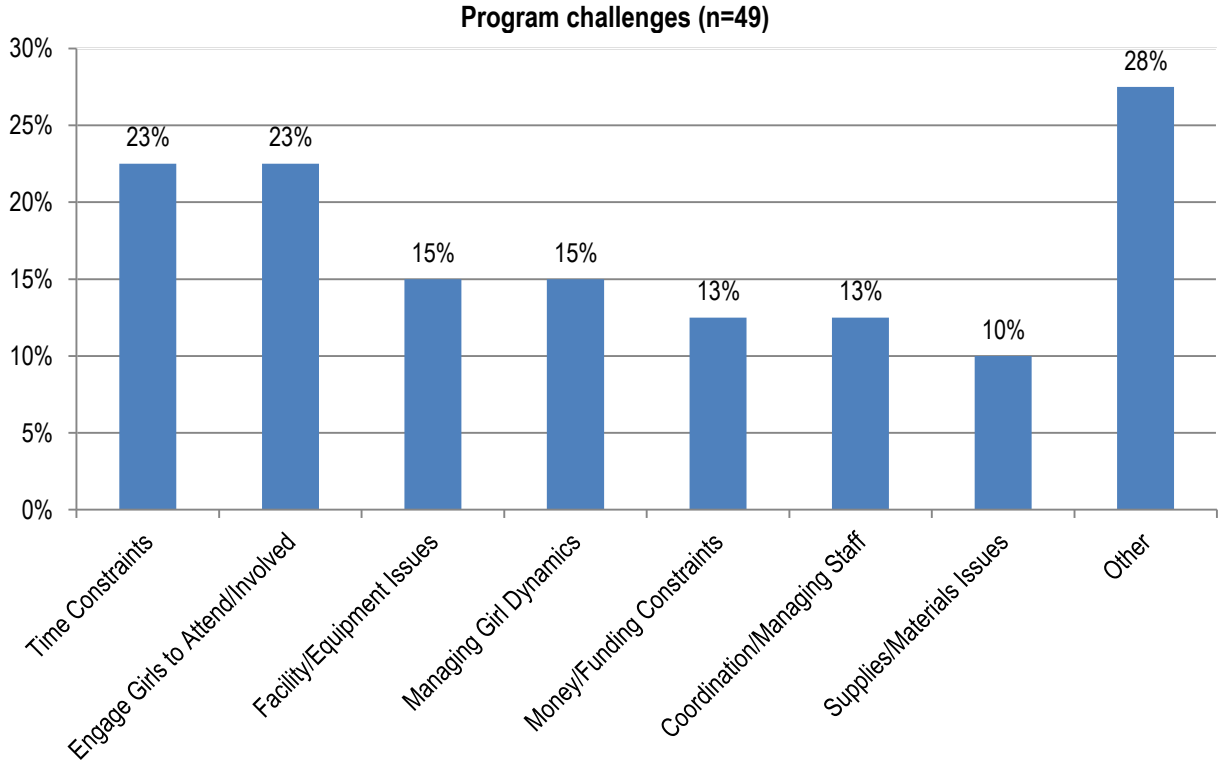


Specifically:

- About one-third each pointed to the hands-on aspects (34%) and/or the fun and engaging nature of the program (34%).
- Just under one-third (31%) of educators regarded the teamwork/collaboration aspects to be the program highlight.
- Scientific inquiry and investigation was regarded as a highlight by one-fifth (22%) of educators.
- STEM content knowledge and/or mentoring were both seen to be highlights by just under one-fifth (19%) of educators.
- More than one-tenth (13%) of educators saw the youth's development of confidence as a program highlight.
- Youth's STEM career insights were regarded to be a highlight by less than one-tenth (9%) of educators.

2a.7 Program challenges

Just under one-quarter of the educators reported challenges with time constraints and/or getting girls to attend or stay involved in their program, making these two issues the most common among the educator group. As shown in the chart below, an even greater number of respondents reported miscellaneous challenges, suggesting a high degree of variety in problems encountered by individual educators.



Specifically:

- Time constraints and/or engaging girls to attend and stay involved with the programs were both reported by nearly a quarter (23%) of the educators.
- Facility/equipment issues and/or managing girl dynamics were each reported by one-sixth (15%) of educators.
- Money issues and/or coordinating/managing staff were both stated to be challenges by more than a tenth (13%) of the educators.
- Issues with supplies/materials used in the programs were reported by a tenth (10%) of the educators.
- Other challenges were reported by 28% of educators, including:
  - *Writing the grant, reinforcing the task would be difficult and not to be frustrated with an imperfect project.*
  - *Once a month means sometimes students forget.*
  - *Wide age group.*
  - *Science fair projects.*
  - *Some of the participants were satisfied with only one or two trials which were not the best attempts.*

2a.8 Efforts to evaluate program

Nearly two-fifth (39%) of the educators indicated that they had had an opportunity to evaluate how their programs impacted their youth. Most often these educators pointed to positive findings with respect to STEM engagement, confidence, and attitudes. While some educators did not describe how they evaluated these outcomes, several mentioned using group discussions or youth and/or parent written surveys. Several also indicated a willingness to share their evaluation findings with ***tpt*** once available. Examples of how these educators described their evaluation process and findings are below:

- *Sharing experiences, having them write down what they liked and did not liked I did not have written evaluation*
- *Most of the girls said they wanted a job in the STEM field and were really excited to meet women working in the Sciences and to hear how many other women are now working in these jobs.*
- *Open-ended questions Group Feedback (dialogue and conversation) Parent Evaluations Girl Evaluations Staff Evaluation*
- *Parents and participants filled out a survey.*
- *Girls took written communication home. Have not tallied them yet*
- *The children get excited about science because they are able to do hands-on projects.*
- *We are in the process of evaluating this and should have findings available in the fall.*
- *As part of the specific afterschool program this was taught as a part of, each student was rated on their pervious knowledge or experience in the various subject areas. During each class, students were giving skills-based feedback to help develop a greater sense of confidence and understanding. At the end of the program, all participants were reevaluated on their understanding of the subjects taught to better understand their mastery.*
- *We gave the girls a pre/post survey on attitudes towards STEM concepts.*
- *After the completion of the exercises, the students and I discussed how much they learned, what they learned, and if they were not interested in participating in the exercises early on, the students were asked how they felt about participating in the future. The students responded they didn't know the exercises would be fun, and would like to become more active in the exercises.*
- *We administered a pre/post survey with the girls assessing their attitudes towards science and math. We found their confidence and attitudes improved after participating in the program.*
- *We used a survey that the girls filled out both at the beginning of the year and at the end to see if their expectations were met for the program.*
- *The girls filled out surveys before and after SciGirls. We also asked them at the beginning and end of the school year what they wanted to be when they grow up.*

Section 2b: Participant background information

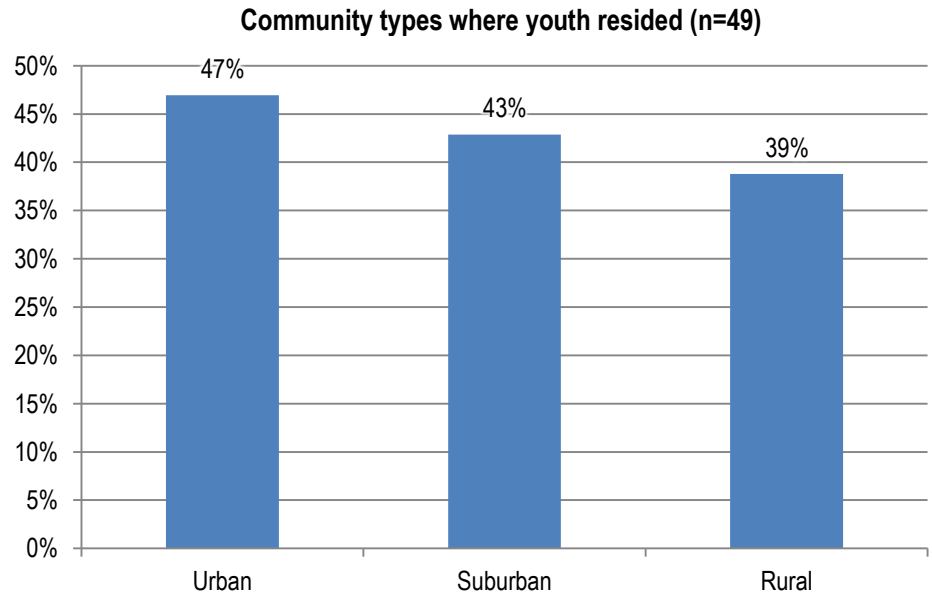
This section provides an overview of the *SciGirls* program participants, as reported by the educators, including: the number of youth who attended the programs; the community types in which the youth live; the grade levels, gender, and racial/ethnic backgrounds of the youth; and the extent to which other individuals were present during the program.

2b.1 Number of youth who attended the programs

Educators estimated the number of youth participants who attended their programs. Their estimates ranged from a low of 6 to a high of 254. On average there were 34 youth per program, with a total of 1618 youth attending across the programs.

2b.2 Community types where youth resided

The educators most often indicated that they served youth from urban communities, as shown in the chart below, although suburban and rural communities were also frequently listed.



Specifically:[6]

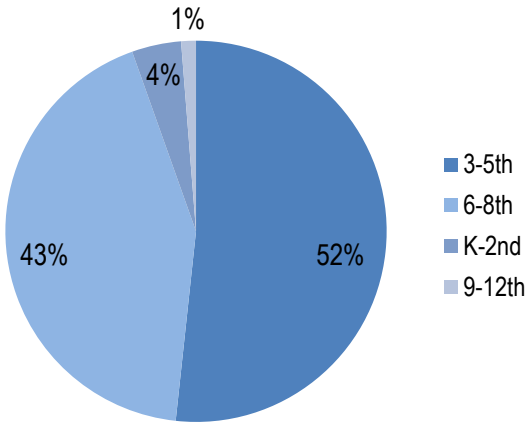
- Nearly half (47%) of educators served youth from urban communities.
- More than two-fifths (43%) of educators served youth from suburban communities.
- Just under two-fifths (39%) of educators served youth from rural communities.

[6] Note: These percentages do not represent the actual percentages of youth that came from each type of community. They represent the percentages of survey respondents who reported having program participants from that type of community.

2b.3 Grade level

Educators estimated that the majority of the youth who participated in their program were in upper elementary school or middle school, as shown in the chart below.

Grade level of youth participants (n=49)



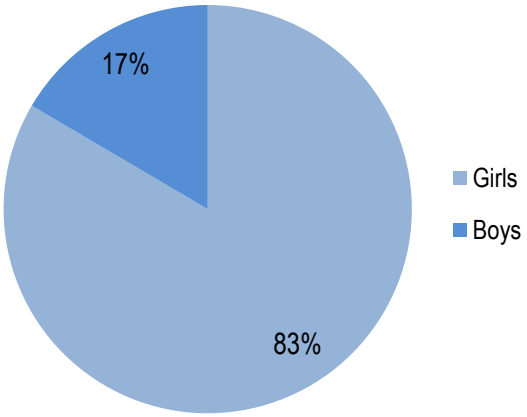
Specifically:

- 3rd through 5th graders made up more than half of the youth who participated (52%).
- Just over two-fifths (43%) of youth participants were in grades 6 through 8.
- Very few participants were in kindergarten through 2nd grade (4%).
- Even fewer participants (1%) were in 9th through 12th grade.

2b.4 Gender

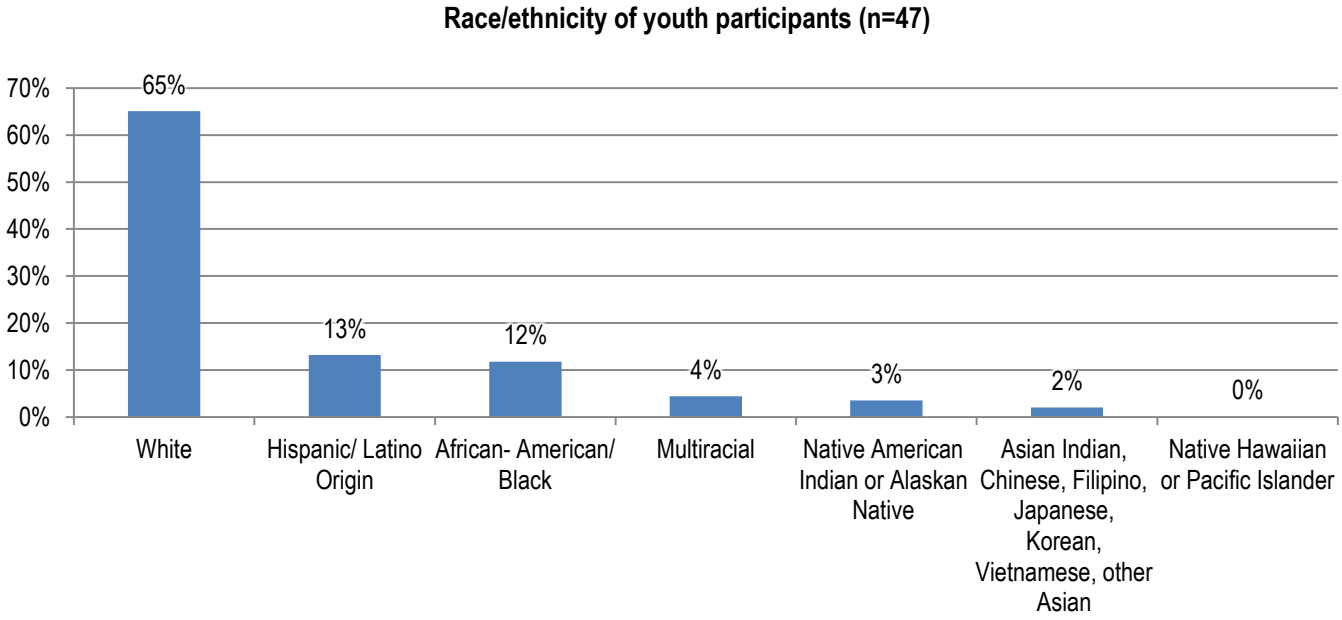
Educators indicated that the majority of the youth who participated in their programs were female, as shown in the chart below. More than four-fifths (83%) were female, compared to less than one-fifth (17%) male.

Gender of youth participants (n=49)



2b.5 Racial/ethnic background

Educators reported that the majority of the youth who participated in their program were White, as shown in the chart below.



Specifically:

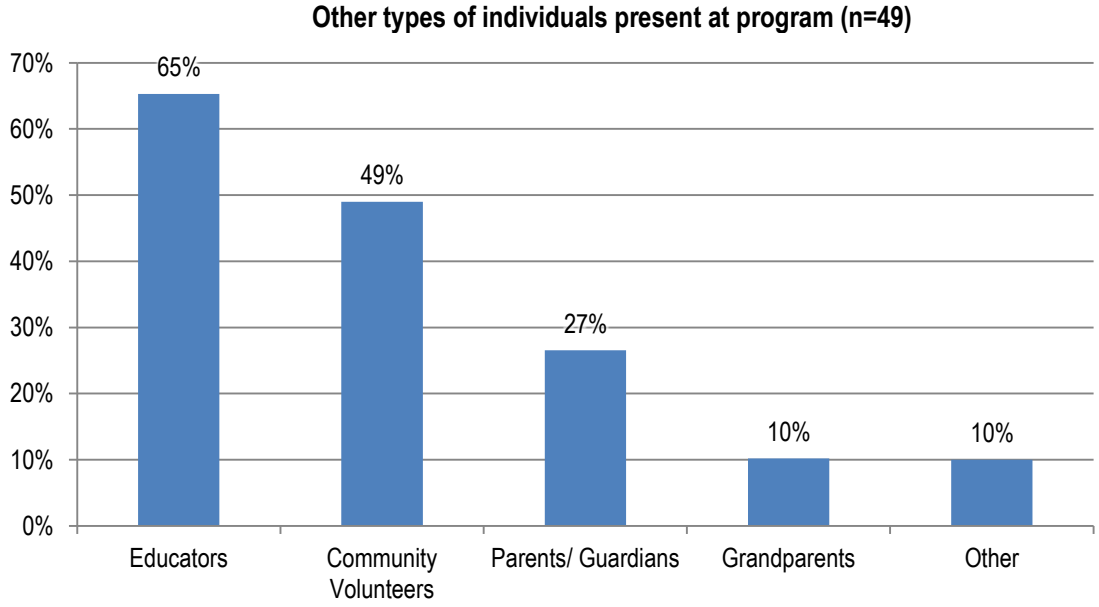
- Nearly two-thirds (65%) of youth served were White.
- More than one-tenth (13%) of youth served were of Hispanic or Latino origin.
- More than one-tenth (12%) of youth were African-American or Black.
- A handful each were Multiracial (4%), Native American or Alaskan Native (3%), or Asian or Indian (2%).
- None of the educators reported serving Native Hawaiian or Pacific Islander youth.

Participants were also invited to comment on or explain the numbers that they reported. Several participants indicated that they did not formally keep track of race/ethnicity information or that they did not have a formal sign-in process, explaining either that their numbers were estimates or that they could not provide an estimate. A few educators qualified their estimates to help explain the way they were calculated. Participants' comments and explanations included:

- *These are estimates. There was not a formal sign in process. This was an evening activity of the Mathcounts program.*
- *This report is for the Girls group only. We also run a mixed gender program which overlaps this GirlsInSTEM program and includes some of the same people.*
- *Our district is primarily economically disadvantaged white students.*
- *These numbers are calculated from all of the girls that participated at least once. Not all of these girls consistently come. We have about 15 regulars that come to each meeting.*
- *Made estimate of 50% of Girls, Inc. girls being American Indian. Have breakdowns of numbers by month from five sites.*

2b.6 Other types of individuals present at program

As shown in the chart below, the educators indicated that beyond themselves and their youth participants, educators and community volunteers were also frequently present at their programs, followed by parents/guardians, and grandparents.



Specifically:

- Educators were present at about two-thirds (65%) of the programs.
- Community volunteers were present at nearly half of programs (49%).
- Parents and guardians were present at more than one-quarter (27%) of the programs.
- Grandparents and other individuals were each present at 10% of the programs.
- Examples of other individuals present at the programs included: County Science Coordinator, scientist, interns, STEM role models, and guest speakers from the community.

Section 2c: Use of *SciGirls* resources

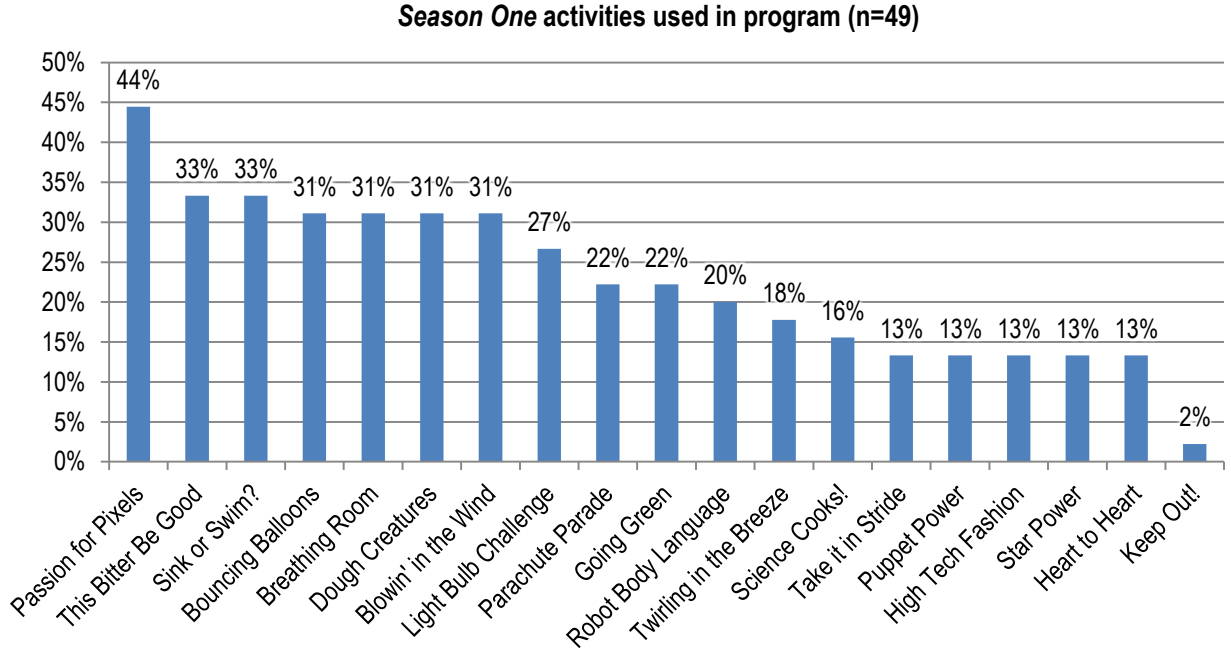
This section provides an overview of educators' use of and experience with the *SciGirls* activities, videos, and website, including their perceptions of the value of these resources and the gains they observed in the youth as a result of their use.

2c.1 Use and perceived value of *SciGirls* activities

Use of Season One and Two activities

As the two charts below show, the educators used some *Season One* and *Season Two SciGirls* activities more than others in their programs.

Season One
From *Season One, Passion for Pixels* was most frequently used followed by *This Bitter be Good, Sink or Swim?, Bouncing Balloons, Breathing Room, Dough Creatures,* and *Blowin' in the Wind.*

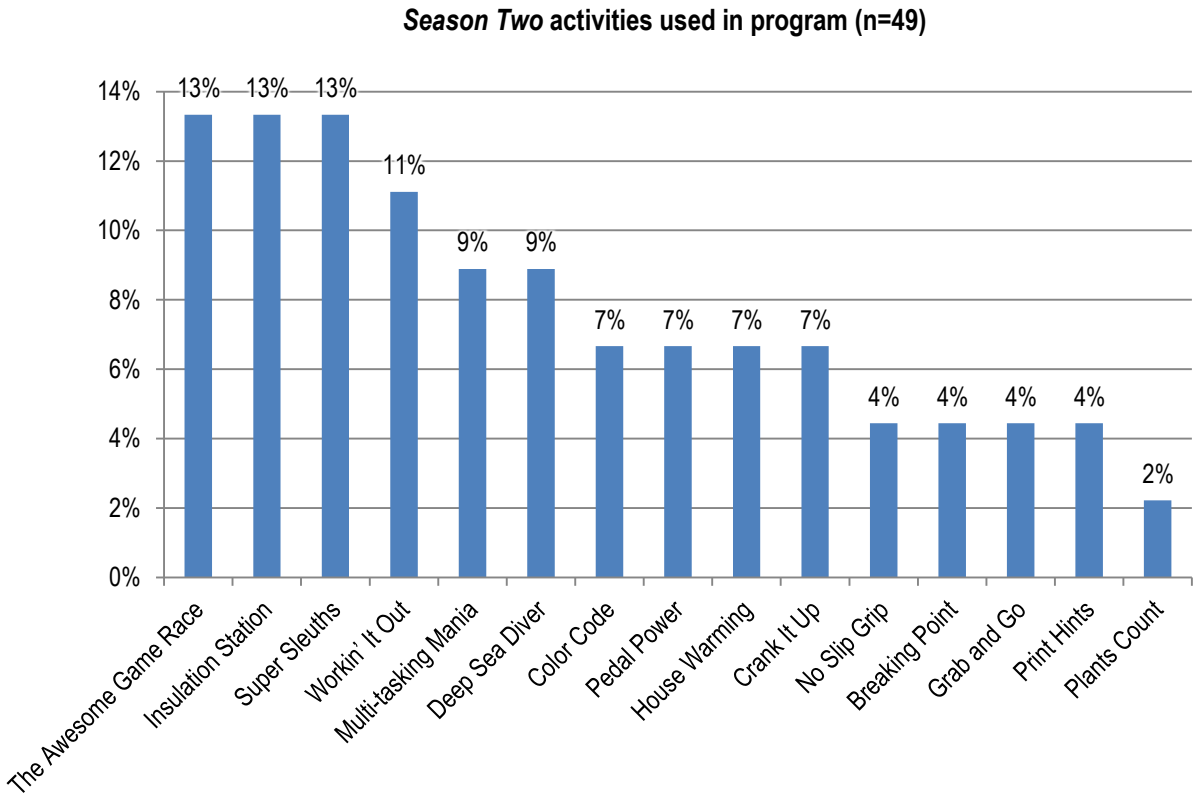


Specifically:

- Nearly one-half (44%) of programs reported using *Passion for Pixels*, making it the most used activity from *Season One*.
- *This Bitter Be Good, Sink or Swim?, Bouncing Balloons, Breathing Room, Dough Creatures,* and *Blowin' in the Wind* were all used by a third of program (31% to 33%).
- *Light Bulb Challenge, Parachute Parade,* and *Going Green* were all used by about one-fourth of programs (22% to 27%).
- *Robot Body Language, Twirling in the Breeze,* and *Science Cooks!,* were used by about one-fifth of programs (20%, 18%, and 16% respectively).
- *Take it in Stride, Puppet Power, High Tech Fashion, Star Power,* and *Heart to Heart* were each used by just over one-tenth (13%) of programs.
- *Keep Out!* was only used by 2% of programs, making it the least used activity.

Season Two

According to the educators, the *Season Two* activities were generally used less widely than those from *Season One*. The three most used activities were *The Awesome Game Race, Insulation Station,* and *Super Sleuths.*



Specifically:

- *The Awesome Game Race, Insulation Station,* and *Super Sleuths* were each used by just over one-tenth (13%) of programs.
- *Workin' It Out, Multi-tasking Mania,* and *Deep Sea Diver* were used by about one tenth (9% to 11%) of programs.
- *Color Code, Pedal Power, House Warming,* and *Crank It Up* were each used by less than one-tenth (7%) of programs.
- *No Slip Grip, Breaking Point, Grab and Go,* and *Print Hints* were each used by less than one-twentieth (4%) of programs.
- *Plants Count* was used by 2% of programs, making it the least used activity.
- None of the educators reported using the *Season Two* activities in Spanish.

2c.2 Perceived value of *SciGirls* activities

Reflecting on the overall value of the *SciGirls* activities used in their programs, the educators indicated that the activities were generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*) the median rating for the educator group of 49 was 4.0, though there were some differences of opinion within the group, as the ratings ranged from a low of 2.0 to a high of 5.0.

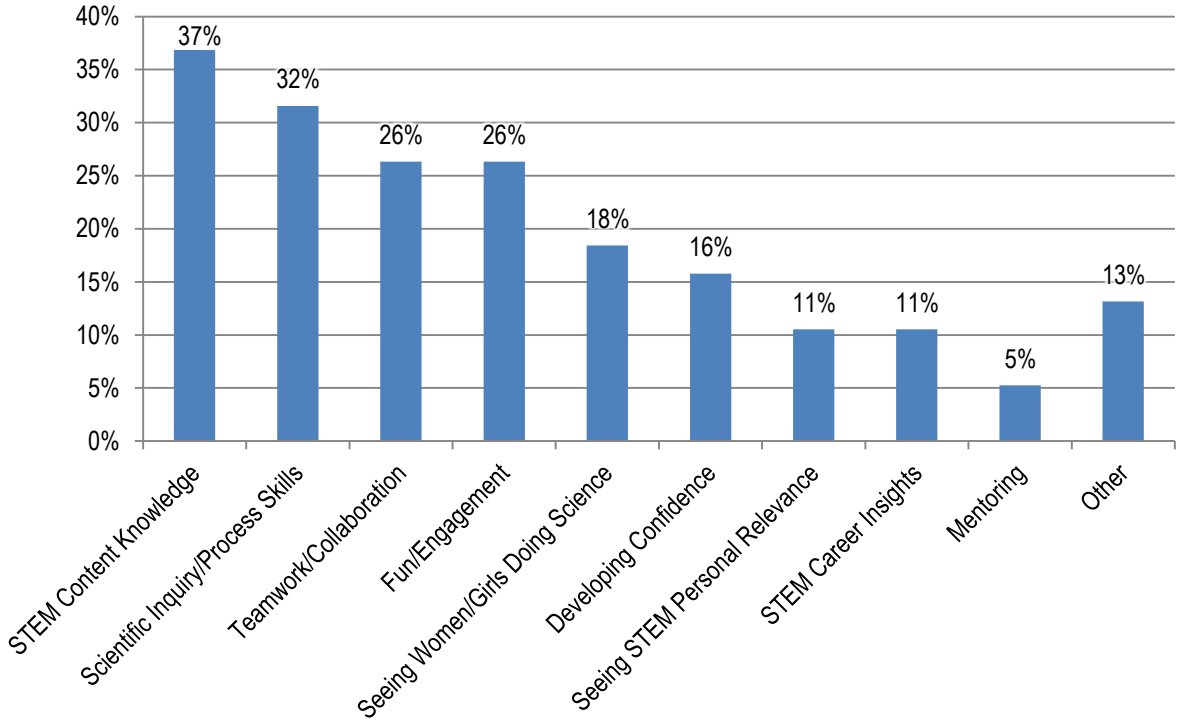
When invited to elaborate on their ratings, the educators praised various aspects of the *SciGirls* activities, such as their ease of use, adaptability, interactivity, applicability to boys and girls, synergistic value with the *SciGirls* videos, and overall motivational and learning value. For example:

- *I think the most amazing thing was to see how the girls were motivated to combine fashion with circuits.*
- *Great activity, easy to use as a stand alone and introduce meaningful concepts.*
- *Boys and girls both love these videos and learn valuable lessons from these activities.*
- *It was good to start with information that they knew and let them discuss and think before leading them with questions.*
- *Very interactive; enjoyed critical thinking.*
- *Just from the comments of the students, the balloon bounce presented several engineering concepts that the students had to consider and work through.*
- *The boys and girls in our program loved the materials. The boys didn't even seem to notice that the science mentors presented in the videos were all women.*
- *I like that the activities are spelled out and the videos are relevant.*
- *The Sink or Swim activity was very popular with teachers ranging from upper elementary to middle school. Interest was high, the activity was engaging, participants liked the group work and active thinking about how to address the problem of determining characteristics of materials and how to use those observations practically in identifying the mystery materials.*
- *I was doing the presentation at a community recreation center and for some of the participants this was their 1st time engaging with STEM activities. They were really excited and want me to come back and do more.*
- *I had a lot of students who are really active in sports and this activity really connected them to what some engineers do.*
- *Girls were engaged in the activities and made connections to the video.*
- *We embellish on the activities quite a bit, but all of our activities are based on SciGirls Curriculum.*

2c.3 Participant gains from use of *SciGirls* activities

The educators were asked to reflect on what participants gained from their involvement with the *SciGirls* activities. As seen in the chart below, the educators most often observed their participants gain STEM content knowledge, scientific inquiry/process skills, teamwork/collaboration skills, and/or the opportunity to enjoy a fun/engaging experience.

Participant gains from use of *SciGirls* activities (n=49)



Specifically:

- Nearly two-fifths (37%) of the educators observed their youth gain STEM content knowledge.
- About one-third (32%) indicated the youth gained scientific inquiry and process skills.
- One-quarter (26%) each observed gains in teamwork and collaboration and/or saw the youth having fun and being engaged by the materials.
- One-fifth (18%) believed the youths' experiences were enriched by seeing women and girls doing science.
- One-sixth (16%) observed their youth develop greater confidence.
- More than one-tenth (13%) observed something other than the categories listed on the chart above. For example:
  - *The older girls have attitude issues and have already decided they don't like science and have no use for it…The younger girls are jumping right in and learning every time we meet.*
- One-tenth (11%) each observed seeing the youth discover STEM as being more personally relevant and/or developing career insight in STEM fields.
- A handful (5%) believed that their youth gained the most from mentoring.

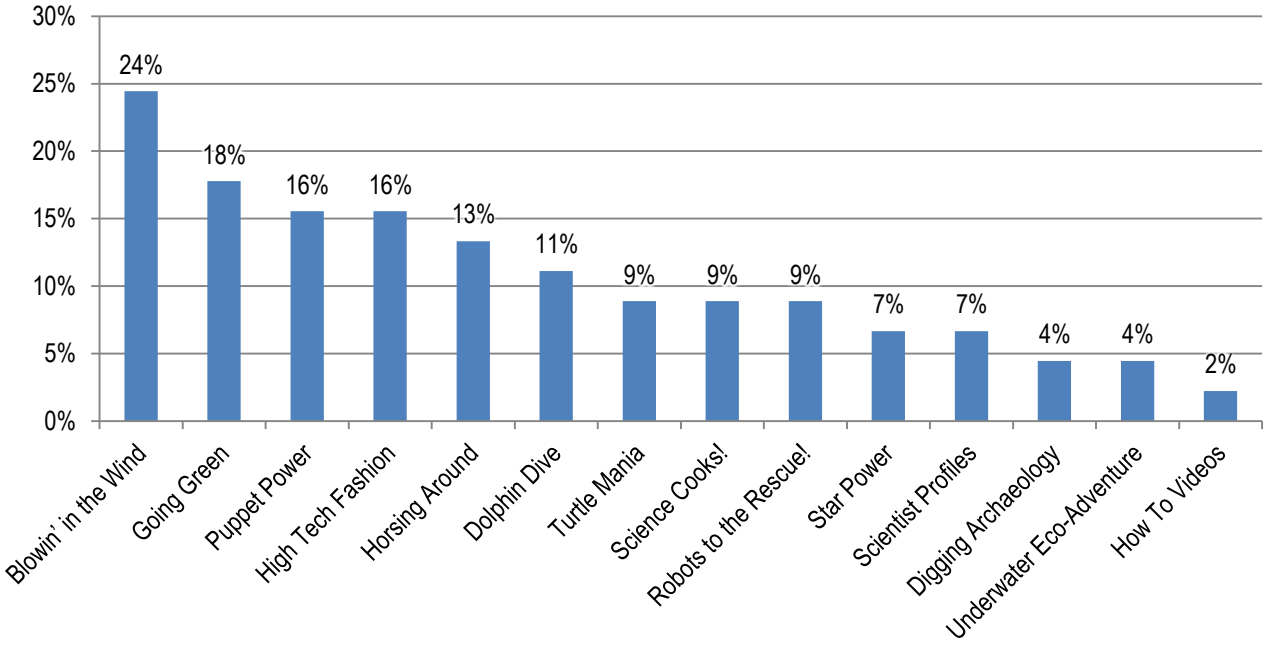
2c.4 Use and perceived value of *SciGirls* videos

Use of Season One and Two videos

As the two charts below show, the educators used some *Season One* and *Season Two SciGirls* videos more than others in their programs.

<u>*Season One*</u>
Of the *Season One* videos, *Blowin' in the Wind* was used most often, followed by *Going Green, Puppet Power,* and *High Tech Fashion.*

Season One videos used in program (n=49)

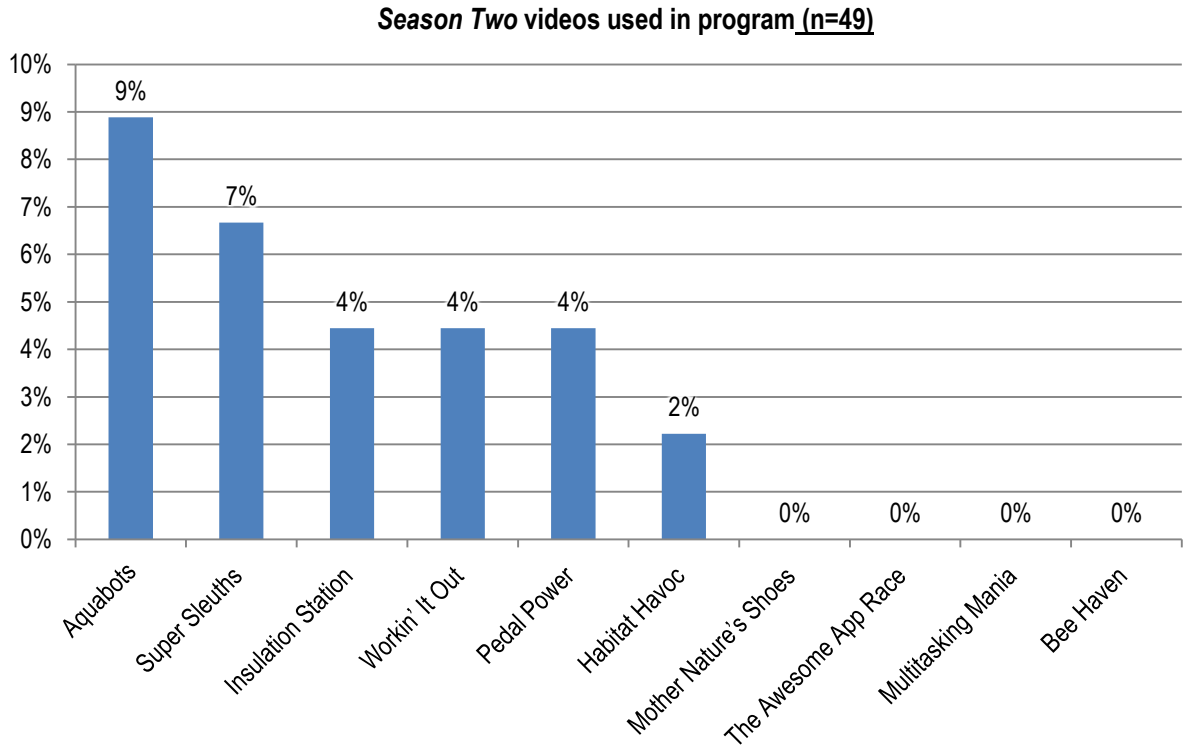


Specifically:

- *Blowin' in the Wind* was used by nearly one-quarter (24%)of programs, making it the most used *Season One* video.
- *Going Green* was used by less than one-fifth (18%) of programs.
- *Puppet Power* and *High Tech Fashion* were each used by about one-sixth (16%) of programs.
- *Horsing Around* and *Dolphin Dive* were each used by more than one-tenth (13%) of programs.
- *Turtle Mania, Science Cooks!, Robots to the Rescue!, Star Power,* and *Scientist Profiles* were each used by less than one-tenth (7% to 9%) of programs.
- *Digging Archaeology, Underwater Eco-Adventure,* and *How To Videos* were the used least *Season One* videos, with each being used by just a handful (2% to 4%) of programs.

Season Two

As a whole, the *Season Two* videos were less widely used than the *Season One* videos. The two most-used videos were *Aquabots* and *Super Sleuths.*



Specifically:

- *Aquabots* was the most frequently used *Season Two* video, used by nearly one-tenth (9%) of programs.
- *Super Sleuths* was used by less than one-tenth (7%) of programs.
- *Insulation Station, Workin' It Out, Pedal Power*, and *Habitat Havoc* were each used by just a handful (2% to 4%) of programs.
- *Mother Nature's Shoes, The Awesome App Race, Multitasking Mania,* and *Bee Haven* were not used by any programs.
- Less than one-twentieth (4%) of programs used the *Season Two* videos in Spanish.

Perceived value of SciGirls videos

Reflecting on the overall value of the *SciGirls* videos used in their programs, educators indicated that the videos were generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*) the median rating for the educator group of 49 was 4.0, though there were some differences of opinion within the group, as ratings ranged from a low of 1.0 to a high of 5.0.

When invited to elaborate on their ratings, the majority of educators praised some aspect of the videos, typically explaining that they were excellent lesson starters, fed well into discussions, featured wonderful scientist role models, and/or were valuable because they showed regular girls discovering science. For example:

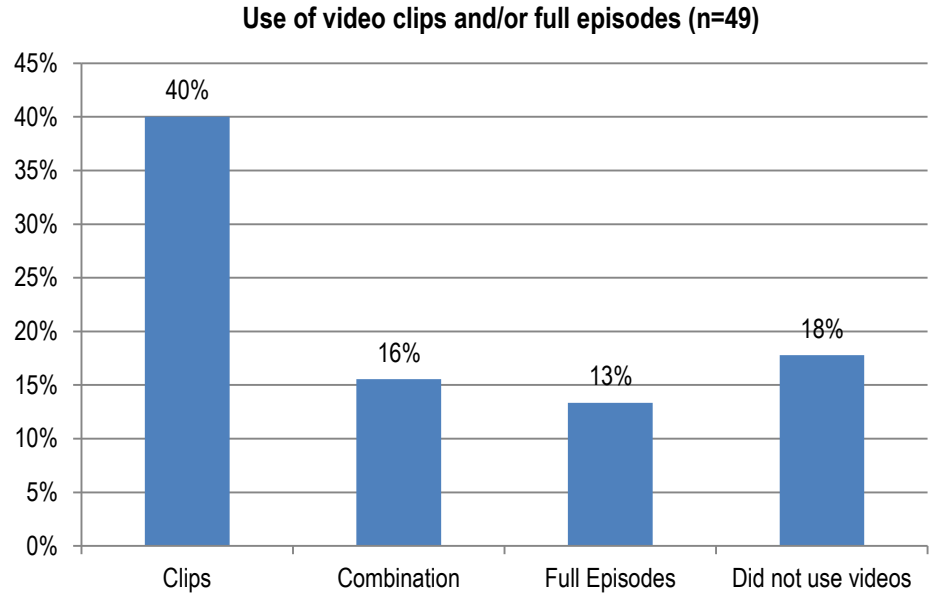
- *The girls loved having a discussion afterwards and thought it was neat that the mentor was on Project Runway. We did a passport piece and they moved into stations. We used the engineering design process and I think they felt like the girls on the video.*
- *They appreciated that the kids in the video were more their own age. Some of the introductory material made them think it would be for the "little kids."*
- *Videos are an excellent tool to start a lesson.*
- *The facilitator for our program during the fall did not utilize any videos. I'm so disappointed by this, and I look forward to writing the report for the spring program we are running currently! We're using lots of videos!*
- *I love how the videos use regular girls to discover science topics. The girls are into these.*
- *I think the Mentor Moments were very valuable because [they] gave teachers a great resource to show real scientists at work.*
- *Even the older girls were a little more interested in the videos than in the hands-on activities. They thought the bicycle was cool, but admit they are lazy and don't want to do any work. We are trying to win them over slowly.*
- *Videos got the girls excited about science and got to see the activities.*

Some educators, however, did not find the videos particularly valuable for use in their programs. These educators most often indicated that they did not find a way to use them due to space, access, or time constraints, or they explained that their participants (particularly older girls) were not interested in the videos. For example:

- *We didn't show any videos due to facility space and access.*
- *Our facilitators barely used the videos. I think junior high age girls can be awfully critical, but we're going to make sure they are better used in our next program year.*
- *None were used but staff continues to encourage our volunteers to use the material provided in addition to what they present.*
- *The girls in our group that watched the videos claimed they were boring and hard to watch. We are going to try videos again next year and hope to get a better response from the girls.*
- *Our older girls were not interested in the videos.*
- *I did not use any SciGirls videos because the facility we use does not have proper equipment for showing videos.*
- *Difficult to keep kids focused, they are ready "to do."*
- *They did not enjoy the videos but liked most of the games.*

Use of video clips or full episodes

Educators indicated that they more often used the videos as clips, as opposed to full episodes or a combination of clips and full episodes, as shown in the chart below.

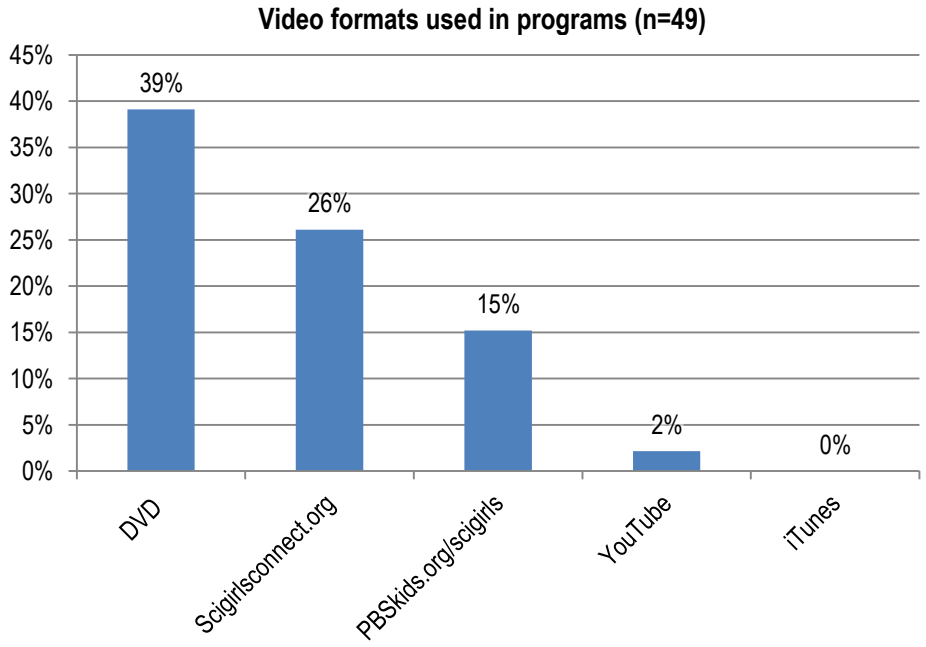


Specifically:

- Two-fifths (40%) of programs used clips exclusively.
- One-sixth (16%) of programs used a combination of clips and full episodes.
- More than one-tenth (13%) of programs used full episodes exclusively.
- Nearly one-fifth (18%) did not use videos, providing the following reasons:
  - *Volunteers were new and felt more comfortable with their material. Moving forward staff plans to have the video running as a part of the opening of the meeting.*
  - *We didn't show any videos due to facility space and access.*
  - *I stated this above. The facilitator chose not to, and I was unaware. We have been utilizing them like crazy since January 1 with new facilitators! Woot Woot!*
  - *Our program was set up in a lunch room. We had no access to the equipment needed.*
  - *I do not have the ability in the setting I am in to show videos. I hope to work on obtaining a laptop for next time.*
  - *I did not use any SciGirls videos because the facility we use does not have proper equipment for showing videos.*

Video formats used

Educators indicated that the youth in their programs most often watched the videos on DVD or through the *SciGirls* CONNECT website, as opposed to watching them through PBSkids.org, YouTube, or iTunes, as shown in the chart below.



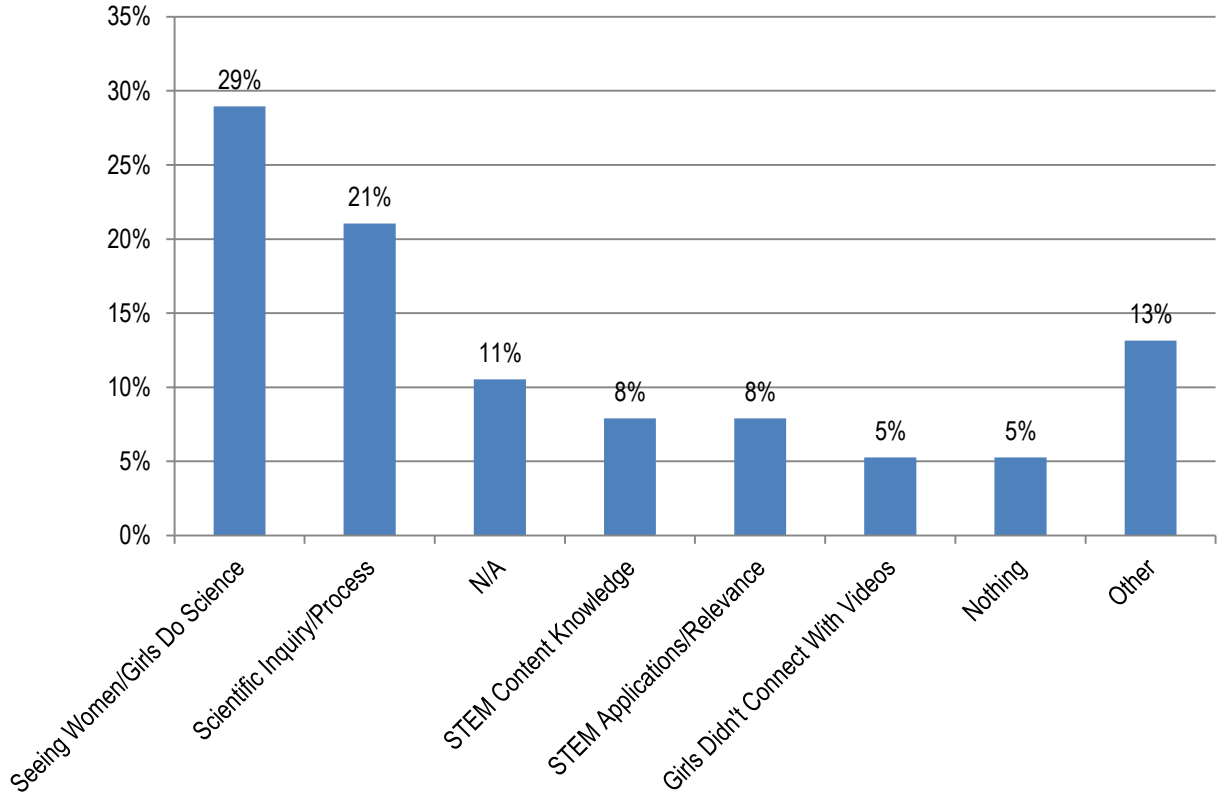
Specifically:

- Almost three-tenths (29%) of the programs used videos shown in DVD format.
- About one quarter (26%) used videos shown through Scigirlsconnect.org.
- Approximately one-sixth (15%) used videos shown through PBSkids.org/scigirls.
- A handful (2%) used videos shown through YouTube.
- No videos were shown using iTunes.

Participant gains from use of SciGirls videos

The educators were asked to reflect on what they believed participants gained from watching the *SciGirls* videos used in their programs. As the chart below shows, the educators most often pointed to benefits their participants gleaned from seeing women and girls doing science, followed by gains they observed in their participants' use of scientific inquiry/process.

Educator reflections on participant gains from use of *SciGirls* videos (n=49)



Specifically:

- Nearly three-tenths (29%) of the educators believed that their participants benefitted from seeing women and girls do science.
- More than one-fifth (21%) observed the improvement of scientific inquiry and processes among participants.
- About one-tenth (11%) reported the question was not applicable in their case.
- Less than a tenth (8%) each observed gains in STEM content knowledge and STEM applications and relevance.
- One-twentieth (5%) each believed that their participants did not connect to the videos or believed that their youth did not gain anything from viewing.
- More than one-tenth (13%) reported gains in areas other than those noted above.

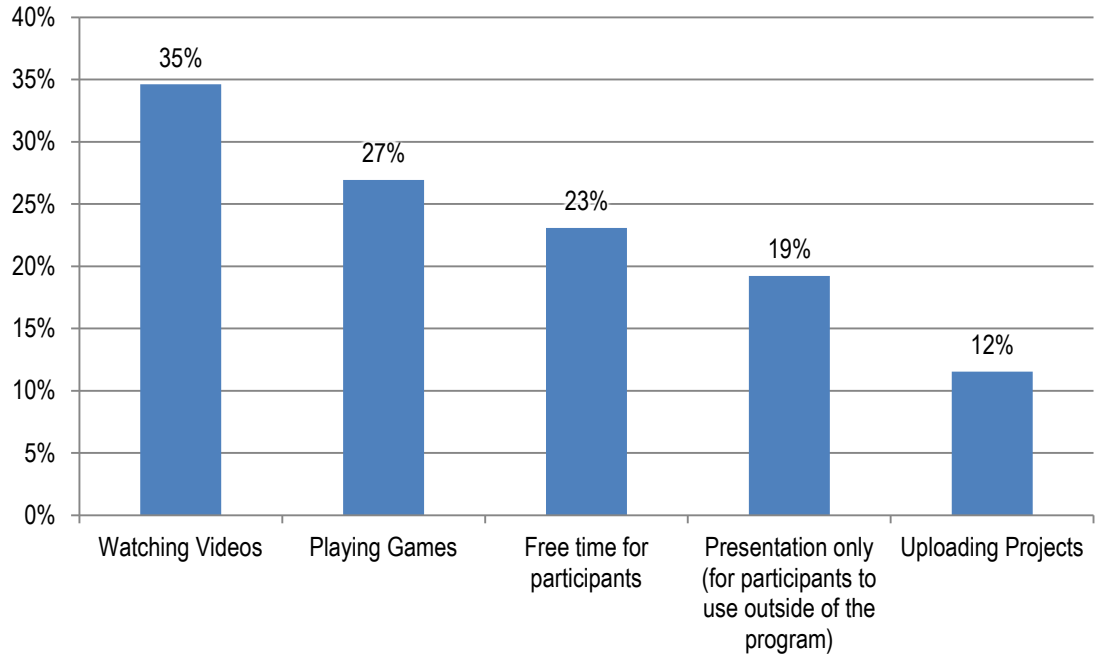
2c.5 Use and perceived value of web resources

Use, perceived value, and perceived gains from use of SciGirls PBS Kids website

Use of the *SciGirls* PBS Kids website

Just under one-half (44%) of the educators who answered this question (n=45) reported using the *SciGirls* PBS Kids website at http://pbskids.org/scigirls with participants in their program. As shown in the chart below, among the 20 educators who *did* use the website, the most common uses were watching videos and playing games, followed by free time for participants, presenting findings, or uploading projects.

Use of *SciGirls* PBS Kids website (n=20)



Specifically:

- Of those who used the website, more than a third (35%) used it for watching videos.
- More than a quarter (27%) used the website for playing games.
- Just under a quarter (23%) used the website for free time for participants.
- One-fifth (19%) used the website for presentations.
- More than one-tenth (12%) used the website to upload projects.
- No participants reported using the website for anything other than the categories listed.

Perceived value of *SciGirls* PBS Kids website

Reflecting on the overall value of the *SciGirls* PBS Kids website used in their program, the 20 educators who used the website indicated that it was generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*) the median rating for the group as a whole was 4.0, with the ratings ranging from a low of 3.0 to a high of 5.0, indicating there was some difference of opinion within the group.

When invited to elaborate on their ratings, a few educators praised some aspect of the website, noting that it was easy to navigate and handy for both in-class and out-of-class use. For example:

- *The site is easy to navigate.*
- *One of the teachers forgot the DVD and we were able to find the video on the site- thank you!*
- *This would be a nice if we had more time. Good activity to follow up with at home.*

A few educators commented on technical difficulties they had with the online videos, as in:

- *I, personally, really enjoy the videos. I think our girls would enjoy the videos if we had presented them at a different time and with equipment that worked well. At the time we had them watching the videos, the equipment did not have a new filter and the colors were distorted.*

Participant gains from use of *SciGirls* PBS website

The 20 educators who used the website indicated that their participants gained from the site in different ways. The largest group (40%) said participants benefitted from the opportunity to explore the website at home/during leisure time. About one-fifth (21%) pointed to the opportunity to play games/activities, and less than one-sixth (14%) each pointed to the opportunity to share and track investigations online and/or engage in social networking with girls and female scientists.

Use and perceived value of SciGirls CONNECT website

Use of *SciGirls* Connect website

Nearly two-thirds (60%) of the educators who answered this question (n=45) indicated that they used the *SciGirls* CONNECT website to develop their programs. These educators were further asked to rate the value of the site to their programs on a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*). The median rating for the group as a whole was 4.0, with the ratings ranging from a low of 3.0 to a high of 5.0.

When invited to elaborate, many educators praised some aspect of the website. They most often explained that it helped with program structure, served as a full-service resource, had high repeat visit value, and/or provided valuable information and resources. For example:

- *The information on the website gave my program structure.*
- *I have spent a great deal of time at SciGirls CONNECT, and I introduced all facilitators to it from the get go. It's a great resource!*
- *Everything you need is there. The videos, the activity and challenge lessons, links to handouts.*
- *Lots of helpful information.*
- *At first it was difficult to navigate around the site…As I use the site it is becoming easier to obtain what I want..*
- *I can double check for best practices and find the webinars inspiring.*
- *The website is fantastic. The resources are GREAT.*
- *I used most of the website to decide if I wanted to do the activity with the younger students or not. It helped me guide my focus on what younger students should be able to do.*
- *I refer to the activities and SciGirls strategies on the website while creating programs.*
- *Too many things to list. We use this site every day!*
- *There is so much information available on this website that helps with every aspect of the club. The discussion boards helped a lot because there was feedback from other after school club leaders going through the same processes I was.*

Use of resources at *SciGirls Parents* website

About one-sixth (16%) of the educators who answered this question (n=45) indicated that they used the *SciGirls* Parents website to develop their *SciGirls* programs. Those who did described their uses as follows:

- *Logo to recruit and to communicate to volunteers and children.*
- *I've printed quiz cards from the website to leave out to play with in the library.*
- *Green lesson folio.*
- *SciGirls Seven to adapt programs.*
- *As the lead educator, I checked out the various activities and background information in planning which ones would fit best for my class.*
- *Handouts for parents and students.*

Summary

Section 1: Educator feedback on training

SciGirls Season Two partners received a full day of training for 10-30 participants in their region, focused on the integration of inquiry-based science instruction with a commitment to gender equity, as well as educational support and resources. In all, 40 partners participated in 22 trainings (with some trainings being organized as partner collaborations) during the *SciGirls Season Two* outreach timeframe, and around 560 educators were trained. Educators who participated in a training between October 1, 2013 and March 31, 2014 were asked to complete an online training evaluation form to capture their experience at the training and their expectations for implementing *SciGirls* programs within the next 12 months.

Over the course of the 6-month October – March timeframe, a total of 359 educators completed the training form. These educators represented a wide range of organizations, including K-12 schools, science centers, girl-serving organizations such as the Girl Scouts and Girls Inc., STEM research organizations, universities, public television stations, and other non-profit organizations. In interpreting the educators' responses, it is important to note that the information summarized in the report only applies to educators who submitted training evaluation forms in this timeframe, and does not necessarily reflect the total sum of educator feedback during this 6-month period.

Most valuable aspects of the training: When asked to identify the *most* valuable aspects of the training, the educators most frequently pointed to four aspects. About one-quarter each commented on the focus on hands-on activities, the focus on *SciGirls* Seven, or the *SciGirls* resources, particularly the activities and videos. Smaller groups of educators pointed to the opportunity to network or another aspect of the training.

Least valuable aspects of the training: When asked to describe what they found *least* valuable about the training, no one aspect stood out for the majority of the educators, with most of the group either indicating that there were no least valuable aspects or leaving the question blank. Some pointed to miscellaneous aspects, while a few educators pointed to some aspect of the training conditions, such as the facilities used, the length of the training, the time of day, the room temperature, or the training setting. Smaller groups commented that their training featured too much of a focus on the *SciGirls* Seven or too much time spent on projects.

Value of the individual workshop sessions: Overall, the educators found all of the training sessions to be valuable. While there were some differences of opinion, as evidenced by the range of ratings in each case, in general, the Gender Equity/*SciGirls* Seven and *SciGirls* activity sessions were both rated as *extremely valuable* (median rating 5.0) on a scale of 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*). The Introductions/overview to *SciGirls* mission and program elements session and the Wrap-up reflections session were each rated as *very valuable* (median rating 4.0).

Overall satisfaction with training: When the educators were asked for their level of agreement with four statements about their satisfaction with the training on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*), overall they indicated they were satisfied. While there were some differences of opinion, as evidenced by the range of ratings in each case, the educators *strongly agreed* (median rating 7.0) that the training was well run and organized, that they found the training to be a good use of their time, and that they had fun at the training. The educators generally *agreed* that they learned a lot about how girls learn, experience, and enjoy science (median rating 6.0) and were *neutral* about whether they would have liked more information about the agenda before they arrived (median rating 4.0).

Training impact on skills in implementing *SciGirls* activities: Educators were asked to reflect on their skill level in implementing the *SciGirls* activities covered at the training before vs. after the training, using the scale from 1.0 (*no skill*) to 5.0 (*advanced skill*). While there were some differences of opinion, as evidenced by the range of ratings in each case, the educators generally reflected that they had *little skill* prior to the workshop (median rating 2.0) but *moderate skill* after (median rating 4.0).

Using the same scale, educators were also asked to reflect on their skill incorporating three strategies or processes when implementing the *SciGirls* activities covered at the training. While there were again differences of opinion, the educators generally reflected that they had *little skill* incorporating the *SciGirls* Seven strategies prior to the training (median rating 2.0) but *moderate skill* after the training (median rating 4.0). They further indicated that previously they had *some skill* incorporating the Engineering Design Process and incorporating the Science Inquiry Process (median rating 3.0 each) but after the training had *moderate skills* incorporating the Engineering Design Process (median rating 4.0) and *advanced skills* incorporating the Science Inquiry Process (median rating 5.0).

Whether training omitted topics: The majority of educators indicated that no topics or activities were omitted from the training or covered in insufficient depth, while some pointed to miscellaneous subjects. Small groups of educators indicated there were some topics or activities they would have liked to see covered or addressed more fully, including: biology activities, other STEM activities, differentiation (gearing activities to older and younger youth), underlying gender issues accounting for *SciGirls* Seven, and guidelines for reaching or working with underrepresented youth. A few left the question blank.

Readiness for training utilization: The educators were asked to rate how strongly they agreed or disagreed with four statements about their readiness for applying information learned at the training on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*). While there were some differences of opinion, overall, the educators *agreed* (median rating 6.0) that they: could clearly describe the *SciGirls* Seven strategies to a colleague, felt well prepared to implement the *SciGirls* activities in girls-only settings, felt well prepared to implement the SciGirls activities in mixed-gender settings, and planned to incorporate the *SciGirls* Seven strategies throughout other areas of their work. The educators were generally *neutral* (median rating 4.0) about preferring more opportunities to relate the training material to their own situations.

Expected timeframe for using what was learned at training: Educators were asked: *If we were to follow-up with you as to how you used or applied what you learned from the training, what timeframe would make the most sense for your plans?* Response options included: Ask me in 3 months, I plan to use or apply aspects immediately; Ask me in 6 months, I plan to use or apply aspects sometime during the next few months; and Ask me in 1 year, my professional circumstances will not allow me to use or apply aspects until then. The largest group of educators expected to use or apply what they learned in 6 months, while a somewhat smaller group pointed to 3 months. A few said they would need 1 year, and a handful pointed to another timeframe.

How educators expected to apply what was learned at the training: Educators were asked to explain how they expected to use or apply what they learned at the training when they returned home. The educators most frequently pointed to implementing activities in their classrooms or other types of programs and/or indicated that they expect to use or share the *SciGirls* Seven strategies. Some expected to share the *SciGirls* resources, and a few expected to implement activities in afterschool settings.

Interest in becoming a SciGirls trainer: Based on their experience at this training, educators were asked to indicate how interested they were in becoming a *SciGirls* trainer on a scale from 1.0 (*not at all interested*) to 5.0 (*extremely interested*). Generally speaking, the educators were *moderately interested* (median rating 3.0), although their individual ratings ranged from a low of 1.0 to a high of 5.0.

Number of girls expected to use *SciGirls* resources: The educators were asked to estimate approximately how many girls they expected to use the *SciGirls* resources with over the next 12 months. As the educators' responses ranged widely, from 2 up to 1600 girls, and were sometimes presented as a range rather than a specific number, their estimates were grouped into brackets. The majority of educators indicated that they expected between 0-50 girls to use the resources within the 12-month timeframe. Some expected use by 51-100 girls, while a slightly smaller group expected use by 101-500 girls. A handful expected use by more than 500 girls.

Number of girls the educators served on annual basis: Finally, the educators were also asked to estimate approximately how many girls they served through their work on an annual basis. As their responses ranged widely, from 0 up to 30,000 girls, and were sometimes presented as a range rather than a specific number, their estimates were grouped into brackets. Just under half of the educators indicated that they worked with 0-50 girls each year. Some reported serving 51-100 girls, while a slightly smaller group reported serving 101-500 girls. A few said that they serve over 500 each year.

Section 2: Educator reflections on their programs

After completing their *SciGirls* training, *Season Two* partners began to implement *SciGirls* programs. Educators who ran a *SciGirls* program were asked to complete an online program report and reflection form to capture how they were using the *SciGirls* resources. This summary accounts for the program reports submitted by educators between October 1, 2013 and May 31, 2014. During this timeframe, a total of 49 educators completed the form. In interpreting the educators' responses, it is important to note that these numbers only apply to programs that submitted forms during this 8 month period, and do not necessarily reflect the total sum of *SciGirls* activity as a whole during this period.

Section 2a: Overview of *SciGirls* programs

Organizations that hosted *SciGirls* programs: The educators who completed program report forms represented a wide range of organizations, including K-12 schools, science centers, girl-serving organizations such as Girl Scouts or Girls Inc., STEM research organizations, universities, public television stations, and other non-profit organizations.

Month/year program was held: The majority of programs were held in 2013, with the rest taking place in 2014. A number of *SciGirls* programs took place before the program report submission period (October 1, 2013 to May 31, 2014). The most active programming months were April and November of 2013, and the least active programming months were August 2013, April 2014, May 2014, and January 2013.

Program types: The majority of the educators held afterschool programs, while summer, evening, school, and weekend programs were implemented far less frequently. Some programs were held at a time other than those listed.

Program settings: The majority of educators held programs at a school, while community centers, libraries, and museum/science centers hosted programs far less frequently. Some programs were held at other locations, such as: National Guard Armory, Girls Inc. facility, 4-H office, or another non-profit organization.

Program length: The majority of the educators held ongoing programs or one-time programs that lasted between 1 to 3 hours. Relatively few programs were more than 3 hours in length or overnight.

How youth participated in program: Educators were asked to check off the ways in which youth participated in their programs, choosing from among 10 activity strategies reflected in the *SciGirls* Seven. Most of the educators indicated that their youth engaged in hands-on, open-ended projects and investigations and/or collaborated in groups. Other large groups of educators reported that their youth approached projects in their own way, received specific, positive feedback on their effort, strategies, and/or behaviors, and/or expressed their individual viewpoints within a group setting. Around half of the educators reported that their youth worked on a project designed to be personally relevant and meaningful to them, discussed STEM careers, communicated findings to the group using a variety of techniques, and/or developed relationships with role models or mentors. A slight smaller group indicated that their youth used solid evidence to support claims when communicating findings, while a handful said their youth participated in other ways, including: *Discussed STEM opportunities in/out of school for girls their age.*

Program highlights: Educators were asked to describe the highlights of their *SciGirls* programs. Most often educators pointed to the hands-on elements, the fun and engaging aspects, and/or the opportunities for teamwork/collaboration. Other aspects were pointed to somewhat less frequently, including elements that involved scientific inquiry, learning of STEM content, mentoring, developing confidence, and STEM career insights.

Program challenges: Some of the educators reported challenges with time constraints and/or getting girls to attend or stay involved in their program, making these two issues the most common among the educator group. However, an even greater number of respondents reported miscellaneous challenges, suggesting a high degree of variety in problems encountered by individual educators.

Efforts to evaluate program: Less than half of the educators indicated that they had had an opportunity to evaluate how their programs impacted their youth. Most often these educators pointed to positive findings with respect to STEM engagement, confidence, and attitudes. While some educators did not describe how they evaluated these outcomes, several mentioned using group discussions or youth and/or parent written surveys. Several also indicated a willingness to share their evaluation findings with ***tpt*** once available.

Section 2b: Participant background information

Number of youth who attended the programs: Educators estimated the number of youth participants who attended their programs. Their estimates ranged from a low of 6 to a high of 254. On average there were 34 youth per program, with a total of 1618 youth attending across the programs.

Community types where youth resided: Educators most often indicated that they served youth from urban communities, although suburban and rural communities were also frequently listed.

Gender: Educators indicated that the majority of the youth who participated in their programs were female.

Grade level: Educators estimated that the majority of the youth who participated in their program were in upper elementary school or middle school. Very few participants were in kindergarten through 2nd grade, and even fewer participants were in 9th through 12th grade.

Racial/ethnic background: Educators reported that the majority of youth served were White. Smaller groups of youth served were of Hispanic or Latino origin, African-American or Black, Multiracial, Native American or Alaskan Native, or Asian or Indian. Participants were also invited to comment on or explain the numbers that they reported. Several participants indicated that they did not formally keep track of race/ethnicity information or that they did not have a formal sign in process, explaining either that their numbers were estimates or that

they could not provide an estimate. A few educators qualified their estimates to help explain the way they were calculated.

Other types of individuals present at program: The educators indicated that beyond themselves and their youth participants, educators and community volunteers were also frequently present at their programs, followed by parents/guardians and grandparents. Other, miscellaneous individuals were present at a handful of programs. Examples of other individuals present at the programs included: County Science Coordinator, scientist, interns, STEM role models, and guest speakers from the community.

Section 2c: Use of *SciGirls* resources

Use and perceived value of *SciGirls* activities

Use of *Season One* activities*:* Educators used some *Season One* activities more than others in their programs. Nearly half of programs reported using *Passion for Pixels*, making it the most used activity from *Season One*. *This Bitter Be Good, Sink or Swim?, Bouncing Balloons, Breathing Room, Dough Creatures,* and *Blowin' in the Wind* were all used by slightly smaller groups, while even fewer educators used *Light Bulb Challenge, Parachute Parade, Going Green*, *Robot Body Language, Twirling in the Breeze, Science Cooks!, Take it in Stride, Puppet Power, High Tech Fashion, Star Power,* and *Heart to Heart*. *Keep Out!* was only used by a handful of programs, making it the least used activity.

Use of *Season Two* activities*:* According to the educators, the *Season Two* activities were generally used less widely than those from *Season One*. The three most used activities were *The Awesome Game Race, Insulation Station,* and *Super Sleuths.* A few groups each used *Workin' It Out, Multi-tasking Mania, Deep Sea Diver*, *Color Code, Pedal Power, House Warming,* and *Crank It Up*. Additionally, *No Slip Grip, Breaking Point, Grab and Go,* and *Print Hints* were each used by a handful of educators; while *Plants Count* was the least used activity. None of the educators reported using the *Season Two* activities in Spanish.

Perceived value of *SciGirls* activities: Reflecting on the overall value of the *SciGirls* activities used in their programs, educators indicated that the activities were generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5 (*extremely valuable*) the median rating for the educator group of 49 was 4.0, although there were some differences of opinion within the group. When invited to elaborate on their ratings, the educators praised various aspects of the *SciGirls* activities, such as their ease of use, adaptability, interactivity, applicability to boys and girls, synergistic value with the *SciGirls* videos, and overall motivational and learning value.

Participant gains from use of *SciGirls* activities: The educators were asked to reflect on what participants gained from their involvement with the *SciGirls* activities. The educators most often observed their participants gain STEM content knowledge, scientific inquiry/process skills, teamwork/collaboration skills, and/or a fun/engaging experience. Others believed the youths' experiences were enriched by seeing women and girls doing science; saw their youth develop greater confidence; observed seeing youth discover STEM as being more personally relevant, and/or saw the youth developing career insight in STEM fields. A handful believed that their youth gained the most from mentoring, with others pointed to miscellaneous gains.

Use and perceived value of *SciGirls* videos

Use of *Season One* videos: Educators used some *Season One SciGirls* videos in their programs more than others. *Blowin' in the Wind* was used most often, followed by *Going Green, Puppet Power and High Tech Fashion.* Other program used *Horsing Around, Dolphin Dive, Turtle Mania, Science Cooks!, Robots to the*

Rescue!, Star Power, and *Scientist Profiles*. *Digging Archaeology, Underwater Eco-Adventure,* and *How To Videos* were each used by just a handful of programs.

Use of *Season Two* videos: As a whole, the *Season Two* videos were less widely used than the *Season One* videos. The most used videos were *Aquabots* and *Super Sleuths. Insulation Station, Workin' It Out, Pedal Power,* and *Habitat Havoc* were each used by just a handful of programs. *Mother Nature's Shoes, The Awesome App Race, Multitasking Mania,* and *Bee Haven* were not used by any programs. A few of the programs used the *Season Two* videos in Spanish.

Perceived value of *SciGirls* videos*:* Reflecting on the overall value of the *SciGirls* videos used in their programs, educators indicated that the videos were generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*) the median rating for the educator group of 49 was 4.0, though there were some differences of opinion within the group, as ratings ranged from a low of 1.0 to a high of 5.0. When invited to elaborate on their ratings, the majority of educators praised some aspect of the videos, typically explaining that they were excellent lesson starters, fed well into discussions, featured wonderful scientist role models, and/or were valuable because they showed regular girls discovering science. Some educators, however, did not find the videos particularly valuable for use in their programs. These educators most often indicated that they did not find a way to use them due to space, access, or time constraints, or they explained that their participants (particularly older girls) were not interested in the videos.

Use of video clips or full episodes: Educators indicated that they more often used clips as opposed to full episodes or a combination of clips and full episodes.

Video formats used: Educators indicated that the youth in their programs most often watched the videos on DVD or through the *SciGirls* CONNECT website, as opposed to watching them through PBSkids.org, YouTube, or iTunes.

Participant gains from use of *SciGirls* videos: The largest group of educators believed that their participants benefitted from seeing women and girls do science, while a slightly smaller group observed the improvement of scientific inquiry and processes among participants. A few participants each reported the question was not applicable in their case or reported miscellaneous gains. A handful each observed gains in STEM content knowledge and STEM applications and relevance, believed that their participants did not connect to the videos, believed that their youth did not gain anything from viewing.

Use and perceived value of web resources

Use of the *SciGirls PBS* site: Just under half of the educators who answered this question (n=45) reported using the *SciGirls* PBS Kids website at http://pbskids.org/scigirls with participants in their program. Among the 20 educators who *did* use the website, the most common uses were watching videos and playing games, followed by free time for participants, presenting findings, or uploading projects.

Perceived value of and gains from *SciGirls* PBS website: Reflecting on the overall value of the *SciGirls* PBS Kids website used in their program, the 20 educators who used the website indicated that it was generally *very valuable*. Using a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*) the median rating for the group as a whole was 4.0, with the ratings ranging from a low of 3.0 to a high of 5.0, indicating there was some difference of opinion within the group. When invited to elaborate on their ratings, a few educators praised some aspect of the website, noting that it was easy to navigate and handy for both in-class and out-of-class use. A few educators commented on technical difficulties they had with the online videos.

The 20 educators who used the website indicated that their participants gained from the site in different ways. The largest group said participants benefitted from the opportunity to explore the website at home/during leisure time. Others pointed to the opportunity to play games/activities, share and track investigations online, and/or engage in social networking with girls and female scientists.

Use and perceived value of *SciGirls* CONNECT website: More than half of the educators who answered this question (n=45) indicated that they used the *SciGirls* CONNECT website to develop their programs. These educators were further asked to rate the value of the site to their programs on a scale from 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*). The median rating for the group as a whole was 4.0, with the ratings ranging from a low of 3.0 to a high of 5.0. When invited to elaborate, many educators praised some aspect of the website. They most often explained that it helped with program structure, served as a full-service resource, had high repeat visit value, and/or provided valuable information and resources.

Use of resources at *SciGirls Parents* website: About one-sixth of the educators who answered this question (n=45) indicated that they used the *SciGirls* Parents website to develop their *SciGirls* programs.

Part 2: In-depth partner background evaluation

Introduction

Part 2 presents the findings from a pre-training background evaluation from the lead staff (hereafter called the program leaders) of 9 member institutions of the NGCP. Eleven (11) organizations were invited to participate in this background evaluation from a larger group of 40 *SciGirls Season Two* grantees. These 11 organizations were selected by ***tpt*** and Knight Williams with the goal of representing a diverse range of groups (including afterschool program, universities, science centers, and girls' clubs, among other organization types).

Of the 11 invited organizations, 9 completed the background survey, for a response rate of 82%. All of the surveyed program leaders were women, and they came from 8 different states around the U.S. – 2 from California and one each from Colorado, Minnesota, Nevada, New York, North Carolina, Ohio, and Virginia, as shown in the map to the right.

9 surveyed partner locations (Note: Point H represents two groups)

Method

Partner background feedback from the 9 program leaders was gathered by paper survey with a follow-up email and phone conversation where needed. The program leaders later completed a post-training follow-up phone interview with the independent evaluation team, considered in Part 3 of this report. For their participation in these two aspects of the evaluation, each organization received a $100 honorarium. Participants were informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future programs.

Content analyses were performed on the qualitative data generated in the open-ended questions. All analyses were conducted by two independent coders. The analysis was both deductive, drawing on the program's objectives, and inductive, by looking for overall themes, keywords, and key phrases. Any differences that emerged in coding were resolved with the assistance of a third coder.

Findings

Part 2 is divided into 3 sections. The first provides background information about the 9 organizations, their reasons for applying for a *SciGirls* grant, and how they learned about the grant opportunity. The second details program leaders' expectations for the *SciGirls* training. The third section considers program leaders' expectations for their *SciGirls* outreach programs prior to development and implementation.

2.1 Background information

Section 2.1 assesses the background information provided the 9 surveyed program leaders. It is presented in 7 parts, as follows:

2.1.1 How program leaders first learned about the *SciGirls* grantee opportunity
2.1.2 Why the organizations applied for a *SciGirls* grant
2.1.3 Youth programs implemented within the past 5 years
2.1.4 How *SciGirls* will build on or differ from previous programs
2.1.5 What *SciGirls* will bring that wasn't previously available
2.1.6 Gender equitable teaching strategies currently used by grantee organizations
2.1.7 Staff knowledge of gender equity and STEM issues, *SciGirls* Seven, *SciGirls* videos, and *SciGirls* activities

2.1.1 How program leaders first learned about the *SciGirls* grantee opportunity

When asked how they (or the initial *SciGirls* contact person in their program) first learned about the *SciGirls* grant opportunity, all but one of the program leaders pointed to one or more sources. The largest group indicated that someone in their organization heard about the project from an external person or source. For example:

- *The SciGirls opportunity was brought to our attention by Christie Pearce from Girls Inc. Orange County.*
- *Our Chief Education Officer had previously worked with Rita Karl through the Challenger Learning Center organization, and she emailed us with information about this opportunity.*
- *Our director, Tony Murphy, was familiar with SciGirls from his work at St. Catherine's University in St. Paul.*[7]
- *National Girls Collaborative Project newsletter.*

Others indicated that they heard about the opportunity from a source internal to their organizations, such as a board member or an email from their state or national headquarters. For example:

- *We learned about the grant opportunity through our board member, Christi Whitworth, who is a SciGirls educator.*
- *Each month the NYS 4-H office sends out the First Friday Focus News and in it there was information regarding the SciGirls grant opportunity.*
- *I received an email from Girls Inc. National Headquarters with information on applying to this opportunity.*

A few said they learned about the opportunity at an event (as in *I attended the STEM exhibits at the Minnesota State Fair in August. There I met the people from SciGirls who told me about the program and encouraged me to apply* and *I saw a flyer about SciGirls at the Colorado Collaborative* NGCP) and one said she learned about the opportunity through a web search (as in *I was looking for resources to share about getting girls involved in STEM and found SciGirls via a Google search*).

[7] St. Catherine University faculty appeared in two *SciGirls Season Two* episodes..

2.1.2 Why the organizations applied for a *SciGirls* grant

The program leaders were asked to rate a series of statements in terms of the importance to their organizations' decisions to apply for a *SciGirls* grant, using a scale from 1.0 (*not at all important*) to 5.0 (*extremely important*). The table below shows the median ratings and ranges.

Median program leader ratings of the importance to their organizations' decisions to apply for a *SciGirls* grant					
	Not at all important 1.0	**Slightly important 2.0**	**Moderately important 3.0**	**Very important 4.0**	**Extremely important 5.0**
We wanted to start a STEM program focused on girls. (n=6)			3.0 Range 3.0-5.0		
We wanted to expand or build on an existing program focused on girls. (n=8)					5.0 Range 2.0-5.0
We wanted to incorporate the *SciGirls* materials into another more general educational program we are already implementing/planning to implement. (n=8)				4.5 Range 3.0-5.0	
We wanted to integrate gender equitable teaching strategies into our programming. (n=8)					5.0 Range 3.0-5.0
We were interested in the opportunity to apply to become certified *SciGirls* trainers so we can provide professional development to other educators. (n=9)			4.0 Range 1.0-5.0		
We felt the *SciGirls* grant would enable us to form new community partnerships. (n=9)			4.0 Range 3.0-5.0		
We felt the *SciGirls* grant would enable us to continue working with our existing community partners. (n=8)			3.5 Range 3.0-5.0		

Though there were some differences of opinion in each case, as evidenced by each range of ratings in the table above, the program leaders generally indicated that they *wanted to expand or build on an existing program focusing on girls* (median rating 5.0) and *wanted to integrate gender equitable teaching strategies into our programming* (median rating 5.0). Overall, they also *wanted to incorporate the SciGirls materials into another more general educational program [they] are already implementing/planning to implement* (median rating 4.5). To a lesser extent they generally *felt the SciGirls grant would enable [them] to form new community partnerships* (median rating 4.0) and *were interested in the opportunity to apply to become certified SciGirls trainers so [they] can provide professional development to other educators* (median rating 4.0). They also generally indicated that it was *moderately important* that *the SciGirls grant would enable [them] to continue working with [their] existing community partners* (median rating 3.0) and that they *start a STEM program focused on girls* (median rating 3.0). When invited to elaborate on their responses, one program leader noted that their organization already has a STEM program focused on girls (as in *we already have this*) and another commented on their enthusiasm for the program (as in *we are very interested in finding different ways of reaching and doing a better job teaching our middle school-aged female participants in the STEM project area, especially since they are the majority of those that we work with through 4-H programming. The SciGirls grant program fits perfectly with our needs and will complement our 4-H STEM camp and 4-H afterschool program/curriculum*). The 7 remaining program leaders declined to provide additional information.

2.1.3 Youth programs implemented within the past 5 years

The program leaders were asked to indicate if their organizations have implemented programs for girls ages 8-13, Hispanic youth ages 8-13, and/or youth ages 8-13 focused on STEM within the past 5 years. Where applicable, there were also asked to estimate the number of youth served annually and provide a brief description of their program(s).

All but one of the program leaders indicated that their organization have implemented at least one of the three kinds of programs noted above. The remaining respondent noted that her organization is new and that they *looked for this partnership to be able to start [their] program outreach.*

<u>Program(s) geared to girls ages 8-13</u>

Just over half of the program leaders noted that their organizations have implemented programs for girls ages 8-13 within the past 5 years. When asked to estimate the number of girls reached annually, responses ranged from a low of 40 to a high of 9750. The total number girls reported was 20,135. Of the program leaders who answered the question (n=5), the mean number of girls reached was 4,027.

The program leaders provided varying levels of detail when describing their programs, as in:

- *GEMS (Girls Excelling in Math and Science) Club.*
- *After school programming during the school year and summer camps.*
- *Project Scientist Academy is a 5-week summer camp on Queens University Campus in Charlotte, NC, for girls with an aptitude, talent and passion for STEM.*
- *1. Camp-In: approximately 9000 to 9500 girls are served annually in our overnight program that involves a themed workshop, large format movie, museum exploration, dance party and sleeping in the museum. 2. Discover Programs: 250 to 300 girls are served annually in our Girls Discover Engineering and Girls Discover (other subject). In these programs, girls are mentored by college women studying STEM careers. Girls attend workshops lead by professional female engineers/STEM career holders and perform group STEM challenges.*
- *After school program; summer camp; Lego club; GirlsInSTEAM (the girls want to add the A for Art), NANODAYS, field trips to STEM industry and science related institutions, workshops.*[8]

[8] This program leader also directed the evaluation team to an unsolicited comment she had written earlier in the survey: *SELF International has been delivering a STEM program at Sabathani Community Center's Youth Horizon Program for about two years. We started by offering a NanoDays program in cooperation with The Science Museum of Minnesota and N.I.S.E. Net. This was followed by a 9 week Nano Summer camp. All of this was offered as a pilot project to determine if our partnership would work. It was a great success so we entered into plans on how to proceed and integrate what we had to offer into the existing Horizon Youth after school program. We carried out a second NanoDays program followed by another summer science camp. Immediately following the camp we began the after school STEM program. which we are still offering. We are also making plans for our third year of NanoDays events in just a few months. The numbers vary in the programs, but we see approximately 120 kids (kindergarten through middle school) enrolled throughout the year. About half of them are girls. If we count the attendees at special events the numbers are higher. We target underserved children of color and those who are economically challenged in urban neighborhoods.at the current time. Our goal is to eventually branch out to serve as a mobile science lab reaching out to rural areas who do not have resources available to them, but for now our focus is in the inner city. Prior to our work at Sabathani we have presented events or workshops at various other venues. Our goal is to reach children at an early age when they are still open and very curious and to expose them to scientific ideas and scientific method and vocabulary in order to prepare them for high school science courses. Many of the students are turned off to science by the time they reach high school from fear that it is too hard, it has no relevance to them, or it's simply not cool. Once they experience the "hands-on," FUN projects we offer and find out science is about themselves, they usually change their attitude to science. In this urban, sports based inner city culture I have to admit they have approached STEM studies with reticence and apprehension. This is turning to enthusiasm as we spend time with them, however. We want to reach more students now that we are making inroads into the community. We include parents in events to help them understand better what we are doing, but we are facing issues like lack of SAFE transportation to get young children to the center when parents are unable to provide transportation. We hope that this program will help to reduce the huge achievement gap in this community for children of color.*

Program(s) geared to Hispanic youth ages 8-13

A handful of the program leaders noted that their organizations have implemented programs for Hispanic youth ages 8-13 within the past 5 years. When asked to estimate the number of Hispanic youth reached annually, responses ranged from a low of 9 to a high of 1446. The total number Hispanic youth reported was 1,479. Of the program leaders who answered the question (n=3), the mean number of Hispanic youth reached was 493. Not including the program leader who indicated that her organization would reach 1446 Hispanic youth, the mean of remaining respondents (n=2) was significantly lower, at 17.

The program leaders provided varying levels of detail when describing their programs, as in:

- *We had 9 Latina girls on scholarship for our program summer 2013.*
- *After school programming during the school year and summer camps.*
- *Ours is an exclusively STEM, or STEAM, program. We explore cutting edge science to show them how it is relevant to their lives. They initially think that science is in textbooks and test tubes, but find out soon that it is all around them. This is one of the reasons why we have focused so heavily on NANO science and technology. It's fresh and new and growing. It will play a big part in their lives. We also emphasize engineering. They were quite unaware of what an engineer does or is. They only knew of a maintenance engineer at their schools. We've done a lot of building and I offer a lot of projects to build from simple every day materials so they can realize you don't need a lot of money to build things. They can more easily replicate or expand on these projects at home. We have built robo arms and core samplers from cardboard for example. We have STEM Lego projects and are hoping to create a League for competition by next year when we receive funding for it. We have a strong connection to the University of Minnesota and have invited scientists to our facilities to expose the kids to real people in STEM. We have also toured the NanoFabrication Center at the U of M. That was probably the first time most all of them had even been on a college or university campus. One of our friends from the U of M brought liquid nitrogen from the chemistry department to our facility and we made Nano ice cream. We are looking for more mentors to expose the kids to more individuals in the STEM fields, especially persons of color who can become role models. Last summer we toured PAR Systems where they were building the robotics which will do the clean up the nuclear disasters at Chernobyl and Fukushima. In the spring we will begin teaching computer coding.*

Program(s) geared to youth ages 8-13 with a focus on STEM

Nearly all of the program leaders noted that their organizations have implemented programs for youth ages 8-13 with a focus on STEM within the past 5 years. When asked to estimate the number of youth reached annually, responses ranged from a low of 40 to a high of 63,000, with a total of 75,709. One program leader's comment (*Thousands – we recently changed our webpage and do not have an exact number. However, we have at least 10,000 active teachers around the world*) was not specific enough to be included in this total. Of the program leaders who provided specific answers (n=7), the mean number of youth reached was 10,816. Not including the program leader who indicated that her organization would reach 63,000 youth, the mean of remaining respondents (n=6) was significantly lower, at 2,118.

The program leaders provided varying levels of detail when describing their programs, as in:

- *Project Scientist Academy is a 5-week summer camp on Queens University Campus in Charlotte, NC, for girls with an aptitude, talent and passion for STEM. We will also pilot Project Scientist Scholars for girl's ages 13 – 18 who are STEM Superstars in their community and will serve as leaders at the summer Academy.*
- *STEM after school programming once a week at our Youth and Family Center. Eureka summer camp offers 50% STEM programming of the total day for four weeks. AppJam for 13 middle school students creating mobile apps.*

- *Students from all backgrounds are integrated in our program. Horizon Youth has traditionally been a tutorial program. We will still have tutorials so those students who need help and time for homework are able to complete that, but the program is becoming a totally focused STEM program.*[9]
- *GEMS Club…see website at www.gemsclub.org.*[10]
- *County 4-H Programs in the STEM area include: 9 animal science program areas, forestry/natural resources, meteorology, astronomy, plant science, GPS/GIS, rocketry, fabric science, cooking, and agri-science. These topics are taught through two after-school programs, county-wide workshops/clinics, day-long programs, and special-interest programs at community events. In-depth, progressive skill building/knowledge is used with 4-H curriculum and volunteer expertise.*
- *The GLOBE Program trains teachers around the world (we partner with 110+ countries) to work with students collecting data, completing projects, and learning more about their local environment.*
- *In the last five years, we have been fundraising and working toward bringing a full Challenger Learning Center to the Northern Nevada area. While we have been doing this, we have provided outreach programs to local schools and academic group. These programs include full planetarium science programs on our portable inflatable planetarium dome, and hands-on science workshops with robotics, rocketry, GPS, space suits, and other aerospace themes.*
- *Camp ins (overnights), Summer Camps, Schools out camps (week long to single day camps), Discover Programs, COSI in the Classrooms (in school workshops), COSI on Wheels-traveling outreach, in building workshops for youth, homeschool workshops, birthday parties.*

2.1.4 How *SciGirls* will build on or differ from previous programs

When asked how their *SciGirls* outreach programs would build on or differ from youth programs implemented within the last five years, program organizers pointed to four main benefits of the *SciGirls* opportunity: additional resources, program expansion, a focus on young women, and/or a new or renewed focus on STEM.

The largest group of program leaders noted that their new *SciGirls* outreach programs would make use of additional resources and programming opportunities, as in:

- *SciGirls will…provide us with vetted curriculum and programming for the girls we serve.*
- *I want to have more resources to reach our goals.*
- *It will give us tools we need to do outreach events and helps us in our volunteering experiences.*
- *We currently have a lot of girls in various schools participating in GLOBE, but it will be wonderful to have additional resources.*
- *Building on the program with top line SciGirls resources!*

Some pointed to the opportunity to expand their current outreach efforts by serving more girls, planning additional events, and increasing the complexity of their programming. For example:

- *I see our SciGirls program expanding on what we have already begun but exploring some of these subjects in greater detail. I want to see more girls recruited into the program.*
- *I plan to offer a STEM Club that meets once a month on Saturdays that uses SciGirls resources.*
- *Our SciGirls program will differ from current programs by utilizing our newly-learned teaching techniques and increasing the complexity of our programming…*

[9] This program leader also directed the evaluation team to an unsolicited comment s/he had written earlier in the survey. See footnote 4 for the full text of this comment.

[10] The GEMS website says: The GEMS (Girls Excelling in Math and Science) club was started in 1994 by Laura Reasoner Jones, a teacher and parent of two school-age daughters. *Upon hearing her daughter say she didn't want to go to a magnet school because "Math is hard." Ms. Jones enlisted the help and support of her local elementary school and started an after school club for fifth and sixth grade girls. Since that time, over 40 similar clubs have begun around the country, and GEMS clubs have expanded to both younger and older girls.*

While others highlighted the opportunity to focus on outreach to girls, as in:

- *This SciGirls program will help us reach out specifically to female students instead of mixed groups of males and females – we can target our encouragement to girls*
- *We are also recruiting female instructors to incorporate a female science career aspect to the program.*
- *With SciGirls, we can add resources about involving girls in STEM.*
- *I want to see more girls recruited into the program. I want it to be girl led, to empower them to learn more, to be creative, resourceful and solution oriented. I want them to have responsibility and to learn leadership. I want them to know that they can do anything they choose to do. But, I also know we need to give them options so they have something to choose from. Their ideas of what girls can do is quite limited initially, and often they seem to think science is not for girls. We are making progress on this but need to take it further.*

And a few described the importance of their outreach program's new or renewed focus on STEM, as in:

- *Our SciGirls program will differ from current programs by utilizing our newly-learned teaching techniques and increasing the complexity of our programming through offerings in digital technology, fiber science, botany, chemistry, entomology, and astronomy with our "A,B,C's of Science" Science Camp. We are also recruiting female instructors to incorporate a female science career aspect to the program.*
- *With SciGirls, we can add resources about involving girls in STEM.*

2.1.5 What *SciGirls* will bring that wasn't previously available

When asked what *SciGirls* would bring to the youth served by their organizations that wasn't previously available, the program leaders pointed to specific resources and trainings, networking opportunities, a renewed or increased focus on young women, and funding.

The largest group of program leaders indicated that the *SciGirls* opportunity would provide new resources and allow them to take advantage of training opportunities. For example:

- *The SciGirls partnership will bring us fully vetted curriculum, tools for girls in STEM, and training. In 2013 one of our teachers created the curriculum. We believe we need improvement of curriculum and teacher training.*
- *More media-rich exposure and new hands-on activities.*
- *More resources, training, collaboration and networking with others in the community.*
- *The training we receive will be especially useful, we've assisted in outreach programs before, but feel we need guidance in building our own events and activities.*
- *Before this opportunity was presented to us, we were unaware of the valuable programming available through this organization. The science videos and online interactive content will be useful in our interactions with youth, and the trainings offered through SciGirls will be helpful to our staff and to educators in our area who wish to reach out more effectively to girls.*

A few commented on the value of the networking opportunities the program would afford, as in:

- *SciGirls will allow us to develop professional collaborative ties that we have not had previously in our community, specifically with high-tech industries located here. We will use the SciGirls program structure to approach industry professionals to become program advisors and instructors for our different STEM offerings thereby increasing the complexity and depth of the programs we are able to offer our youth participants, going beyond what current 4-H educators are able to teach. Our goal is to make the 4-H learning experience more impactful and meaningful over the long term.*
- *More resources, training, collaboration and networking with others in the community.*
- *More activities and another connection to our in house PBS station.*

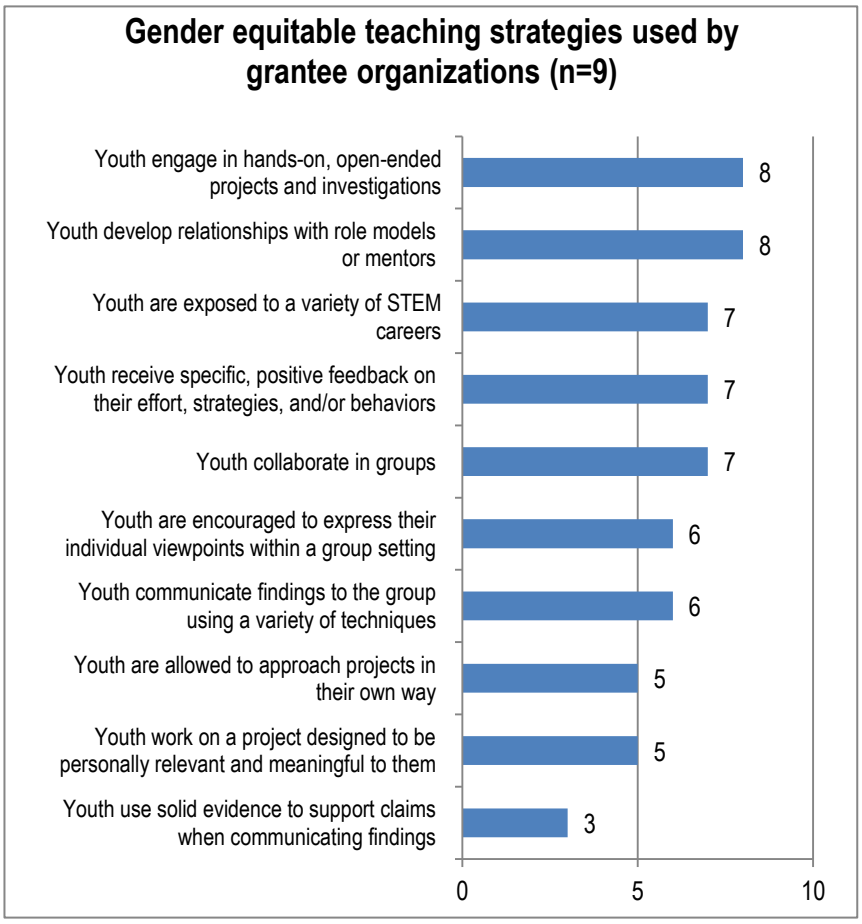
A handful specifically pointed to the program's impact on girls, as in:

- *The focus on girls in STEM.*
- *I hope more opportunities for the girls to meet other girls and female leaders in the STEM fields. I hope to find more sources of funding because of our connection with SciGirls. I also want the girls to learn more about working in teams, how to communicate with each other better in collaborative projects.*

Finally, one program leader mentioned the possibility of additional funding opportunities (as in *I hope to find more sources of funding because of our connection with SciGirls*).

2.1.6 Gender equitable teaching strategies currently used by grantee organizations

All but one of the program leaders indicated that their organizations currently use one or more gender equitable teaching strategies. As shown in the chart to the right, almost all of the program leaders noted that they use *hands-on, open-ended projects and investigations* and *relationships with role models or mentors*. Some reported that their youth: *are exposed to a variety of STEM careers; receive specific, positive feedback on their effort, strategies, and behaviors*; and/or *collaborate in groups*.



Others indicated that their youth: *are encouraged to express their individual viewpoints within a group setting; communicate findings to the group using a variety of techniques; are allowed to approach projects in their own way;* and/or *work on a project designed to be personally relevant and meaningful to them*. Finally, a handful noted that their youth *use solid evidence to support claims when communicating findings.*

When invited to elaborate on their responses, only 3 program leaders provided additional information. Two (2) described opportunities for improvement, as in:

- *Although we do many of these strategies, I believe we could improve on most. We are very good at exposing the girls to a variety of STEM careers. Every day the girls have a presentation or hands-on experiment with a women STEM professional, 25 women participated in 2013.*
- *We are still working to develop scientific methodology, substantiation of facts, and good research habits. This seems to be a challenge. I think they are used to being handed what they are supposed to learn instead of being self-motivated to find out information. We are only beginning the mentor program and are still searching for women of color in STEM fields.*

And one commented on her organization's recent work, as in: *We recently had a Student Climate Research Campaign in which we encouraged students to explore and study their local environments and also compare these to other environments around the world. As part of this, we had a virtual science conference, video competitions, and art competitions.*

2.1.7 Staff knowledge of gender equity and STEM issues, *SciGirls* Seven, *SciGirls* videos, and *SciGirls* activities

The program leaders were asked to consider their staff members who will be involved in the *SciGirls* project and rate their knowledge of gender equity and STEM issues, *SciGirls* Seven: How to Engage Girls in STEM[11], *SciGirls* videos, and *SciGirls* activities, using a scale from 1.0 (*not at all knowledgeable*) to 5.0 (*extremely knowledgeable*)The table below shows the median ratings and ranges. Program leaders were also given the option to choose *don't know*, though no one selected this answer for any of the questions.

Median program leader ratings of staff members' knowledge (n=9)					
	Not at all knowledgeable 1.0	**Slightly knowledgeable 2.0**	**Moderately knowledgeable 3.0**	**Very knowledgeable 4.0**	**Extremely knowledgeable 5.0**
Gender equity and STEM issues			3.0 Range 2.0-4.0		
SciGirls Seven: How to Engage Girls in STEM		2.0 Range 1.0-3.0			
SciGirls videos	1.0 Range 1.0-3.0				
SciGirls activities		2.0 Range 1.0-3.0			

In general, the program leaders indicated that their staff members were *moderately knowledgeable* (median rating 3.0) of gender equity and STEM issues, *slightly knowledgeable* of *SciGirls* Seven (median rating 2.0) and *SciGirls* activities (median rating 2.0), and *not at all knowledgeable* of *SciGirls* videos (median rating 1.0), though there were some differences of opinion in each case, as evidenced by each range of ratings in the table above.

Of those who provided additional feedback, the largest group expressed their enthusiasm, as in:

- *None of our staff have had any exposure to SciGirls yet but they are eager to learn.*
- *SciGirls is a new program to those of us working at Chenango County 4-H but we are becoming more knowledgeable about the program as we review the resources on the website.*
- *We are familiar, but want to learn more!*
- *Our staff hopes to find out more about SciGirls content through further exploration online and through training provided by SciGirls.*

Additionally, a few program leaders elaborated on staff knowledge and future plans, as in:

- *Right now those of us teaching the STEM workshops and classes are the only ones who are aware of the SciGirls program and strategies to some extent. OUR goal at Horizon Youth is to become a full STEM program. We need to integrate other staff into the program so we are all on the same page in our approach. We have already approached the art department to invite them to a STEM program. We still need to integrate the tutorials, and admin and others better.*

[11] Please see Appendix 1 for more information about *SciGirls* Seven, from the online book *SciGirls* Seven: How to Engage Girls in STEM.

2.2 Grantee expectations for the *SciGirls* training

Section 2.2 assesses grantee expectations for the *SciGirls* training, as provided by the 9 surveyed program leaders. It is presented in 6 parts, as follows:

2.2.1 Individuals expected to attend the *SciGirls* training
2.2.2 Expectations program leaders have for themselves
2.2.3 Expectations program leaders have for their staff
2.2.4 Expectations program leaders have for their collaborating partners
2.2.5 Program leaders' interest in becoming a *SciGirls* trainer
2.2.6 Program leaders' interest in five aspects of the *SciGirls* training

2.2.1 Individuals expected to attend the *SciGirls* training

When asked who was expected to attend the *SciGirls* training, all of the program leaders expressed confidence that *they* and *other staff from their organization* would attend. Nearly all of the program leaders indicated that *volunteers* would also be attending, with one respondent qualifying her answer with *maybe, not sure if there will be room yet*. Most of the program leaders also noted that *staff from [their] partner organizations* would be attending as well, with one respondent qualifying her answer with *possibly*.

Most of the program leaders also said that *school educators* would be attending the training, with one respondent qualifying her answer with *possibly*. Others indicated that *afterschool educators* would attend the training, a few said *parents* and *community members* would be in attendance, and one said that *hopefully board members* would be attending the *SciGirls* training on behalf of the grantee's outreach programs.

2.2.2 Expectations program leaders have for themselves

When asked to look ahead to the upcoming *SciGirls* training and describe the expectations they have for themselves, the program leaders generally pointed to two main goals: to gain new knowledge about the *SciGirls* resources and strategies, and to be leaders within their organizations.

The largest group of program leaders indicated that they expect to learn something at the training, as in:

- *I would like to learn more about SciGirls and how to incorporate it.*
- *Learn new activities and gain a clear understanding of SciGirls resources to implement throughout the year.*
- *More specific ideas for recruitment and direction of the program to keep the girls engaged.*
- *I hope I can learn as much as possible…*
- *Gain a further understanding on how to fully engage youth in STEM activities which promote inquiry and allow the youth to gain knowledge. Learning how to approach industry professionals to incorporate their expertise into 4-H programming throughout the county.*

Meanwhile, a group of the same size noted that they expect to be organizational leaders over the course of their projects, planning events, overseeing staff, sharing ideas, and ensuring that their groups make the most of the opportunity. For example:

- *Organizing the local event (communication with school district teachers, etc.); logistics for event set-up, registration, communications with SciGirls staff.*
- *I hope I can…feel confident about taking leadership in organizing activities for my group and the community.*
- *Seeing my staff gain knowledge and empowerment to address STEM gender issues in our program offerings.*

- *Additionally, I would like to share these resources with teachers I work with. On a personal note, it will be great to use with the Girl Scout troops I lead.*
- *To make sure we make the most of the training by filling 100% with our teachers, staff, interns, volunteers.*

2.2.3 Expectations program leaders have for their staff

When asked to look ahead to the upcoming *SciGirls* training and describe the expectations they have for their staff, the program leaders, as a group, identified three main goals: for staff to gain knowledge about *SciGirls* and STEM education; for staff to come out of the training with increased commitment, understanding, and confidence; and for staff to develop general professional skills.

The largest group of program leaders indicated that they expected their staff to learn about *SciGirls* and STEM education, as in:

- *The staff will also have the available resources and knowledge to share SciGirls resources and strategies.*
- *Providing supplementary/follow-up content and training after SciGirls content has been delivered.*
- *Gain a better understanding of STEM and why it's important for our girls to be exposed frequently to it.*
- *Gain a further understanding on how to fully engage youth in STEM activities which promote inquiry and allow the youth to gain knowledge.*

A handful said they expected the training to help their staff increase their commitment, understanding, and confidence, as in:

- *I hope they commit to the program and use the tools acquired to benefit the outreach programs we organize.*
- *An understanding of the goals and a willingness to collaborate so we can be successful as a whole*
- *Become more confident in helping to offer STEM programming.*

Finally, a few noted a hope that the training would help staff develop professional skills, as in:

- *Learning how to approach industry professionals to incorporate their expertise into 4-H programming throughout the county*
- *To assist in the logistics of the training day and pre/post communication to participants.*
- *Providing supplementary/follow-up content and training after SciGirls content has been delivered.*

2.2.4 Expectations program leaders have for their collaborating partners

When asked to look ahead to the upcoming *SciGirls* training and describe any expectations they have for their collaborating partners, the program leaders pointed to two primary goals: for partners to support the grantee organizations and gain knowledge from their inclusion in the program.

The largest group of program leaders said they expect their collaborating partners to provide support for their organizations and outreach efforts, as in:

- *Support for our group to successfully plan and organize outreach events.*
- *A sensitivity to our goals so that when we collaborate they understand our focus, methods, and strategies.*
- *Develop a strong partnership with Santa Ana College Society of Women Engineers to help offer STEM programming to our girls.*
- *Building long-term collaborative partnerships that meet common educational goals for all youth participants.*
- *Recruiting attendees for event.*
- *Collaborating partners will have the option to share SciGirls resources and strategies.*

A few program leaders indicated that they expect their collaborating partners to gain insight and knowledge from the opportunity, as in:

- *To use the knowledge they receive and credit the leadership of SciGirls and Project Scientist for their inclusion in the program.*
- *I would hope they would carry whatever they learn with us to their own organizations and help girls wherever they are.*
- *Allow educators, volunteers and community members to come together and learn more about engaging youth in STEM activities that are meaningful to the youth participating.*

2.2.5 Program leaders' interest in becoming a *SciGirls* trainer

When asked to indicate their level of interest in becoming a *SciGirls* trainer, on a scale from 1.0 (*not at all interested*) to 5.0 (*extremely interested*), program leaders' responses ranged from 1.0 to 5.0, with the median rating being 3.0 (*moderately interested*).

When given the opportunity to elaborate, most declined to provide additional information. A few program leaders, however, commented on their interest (or lack thereof) in becoming *SciGirls* trainers, as in:

- *I feel I would need to know more first.*
- *I have many classes and activities going on and might not be able to add more commitments at the time, but maybe in the future.*

2.2.6 Program leaders' interest in five aspects of the *SciGirls* training

The program leaders were asked to rate their interest in five aspects of the upcoming *SciGirls* training on a scale from 1.0 (*not at all interested*) to 5.0 (*extremely interested*): *SciGirls* Seven: How to Engage Girls in STEM; *SciGirls* STEM hands-on activities; science inquiry and engineering design processes; the PBS Kids *SciGirls* website, and the *SciGirls* CONNECT website. The table below shows median ratings and ranges.

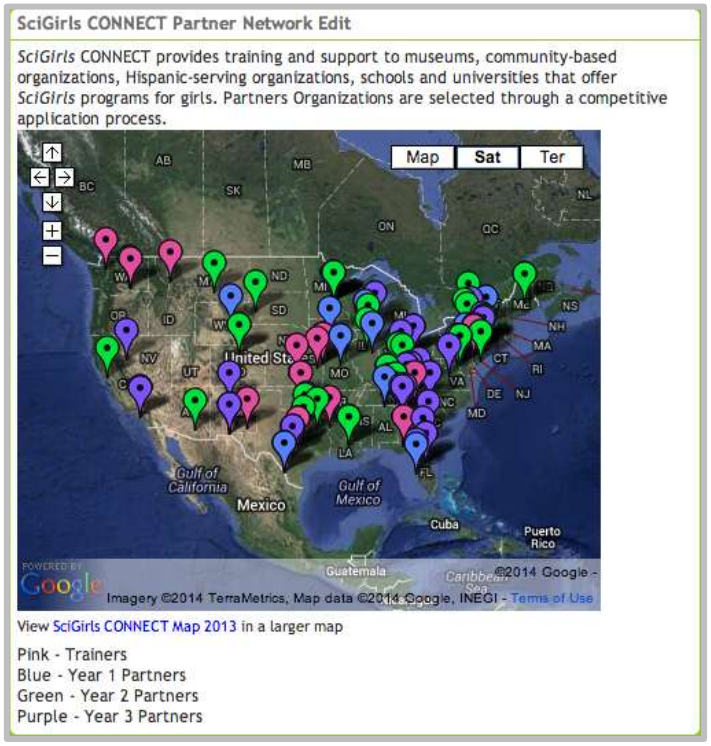
Median program leader interest in aspects of the *SciGirls* training (n=9)					
	Not at all interested 1.0	**Slightly interested 2.0**	**Moderately interested 3.0**	**Very interested 4.0**	**Extremely interested 5.0**
SciGirls Seven: How to Engage Girls in STEM				4.0 Range 3.0-5.0	
SciGirls STEM hands-on activities					5.0 Range 4.0-5.0
Science inquiry and engineering design processes				4.0 Range 3.0-5.0	
PBS Kids *SciGirls* website			3.0 Range 3.0-5.0		
SciGirls CONNECT website			3.0 Range 3.0-5.0		

Though there were some differences of opinion in each case, as evidenced by each range of ratings in the table above, the program leaders generally expressed the most enthusiasm for portions of the training focused on the hands-on activities (median rating 5.0), *SciGirls* Seven: How to Engage Girls in STEM (median rating

4.0), and the science inquiry and engineering design processes (median rating 4.0). They also indicated that they were *moderately interested* in learning about the PBS Kids *SciGirls* website (median rating 3.0) and the *SciGirls* CONNECT website (median rating 3.0). See the image to the right, for a map of the *SciGirls* CONNECT Partner Network, featured on the *SciGirls* CONNECT website.

When given the opportunity to elaborate on these ratings, 2 program leaders provided additional feedback. Both reiterated their organizations' interest in the program and one made a suggestion regarding effective use of the resources, as in:

- *We want to explore fully all the resources available through SciGirls.*
- *We are very interested in learning about and utilizing the SciGirls materials and teaching methods that are very similar to the methods and materials that we use through 4-H. Having time to review an entire website is hard to remember to do on a regular basis but receiving monthly email updates through a list serve about all of the great things going on is very helpful!*



Screenshot from the *SciGirls* CONNECT website

2.3 Outreach goals and expected use of *SciGirls* resources and strategies

Section 2.3 assesses the 9 program leaders' outreach goals and their expected uses of the *SciGirls* resources and strategies. It is presented in 14 parts, as follows:

2.3.1 *SciGirls* outreach programs: Goals
2.3.2 *SciGirls* outreach programs: Agendas
2.3.3 *SciGirls* outreach programs: Partnerships
2.3.4 *SciGirls* outreach programs: Desired outcomes
2.3.5 *SciGirls* outreach programs: Girls served
2.3.6 Expected use of *SciGirls* resources
2.3.7 Expected use of *SciGirls* Spanish language resources
2.3.8 Expected use of role models
2.3.9 Intentions to incorporate gender equity STEM teaching strategies
2.3.10 Potential challenges facing the implementation of *SciGirls* outreach programs
2.3.11 Additional resources or support that could help address outreach challenges
2.3.12 How the organizations are funding their *SciGirls* outreach programs
2.3.13 Intentions to incorporate *SciGirls* programming into future offerings
2.3.14 Intentions to use gender equity STEM teaching strategies in other programs

2.3.1 *SciGirls* outreach programs: Goals

When asked to describe the goals of their *SciGirls* outreach programs, the program leaders pointed to two main objectives: educating and empowering young women interested in STEM, and strengthening their organizations' programs.

Most of the program leaders indicated that they hope *SciGirls* grant will help them teach young women about STEM, as in:

- *I want to see more girls coming into our program because they hear of the success we having. I want our older girls who have gone through the program to come back and serve as assistants and leaders for the younger girls coming into the program. I want to see our girls move on in STEM studies in high school and college. I want to see more girls eager to pursue a STEM career. But, whatever they choose to do, I want them to be self confident and empowered to fully pursue their dreams.*
- *The mission of Project Scientist is to engage and empower girls with a passion, talent and aptitude for science, technology, engineering, and math (STEM). OUR PROMISE: At Project Scientist we're fostering today's scientists who will lead the world in solving tomorrow's greatest problems! Our promise is to educate, coach, and advocate for girls with an aptitude, talent, and passion for STEM. Through hands-on exploration, education and career counseling, mentoring, and internships our girls discover the endless opportunities available to them in STEM.*
- *My goal is to engage 50 middle school girls in STEM Club over the school year.*
- *Stimulate an interest in and the study of STEM careers for female youth in the county.*
- *Provide STEM activities for girls in order to encourage them to explore and enjoy these activities and consider them as future career options.*
- *Our goals: Be more intentional about including and encouraging girls in STEM by including SciGirls activities in our existing programming.*

Others indicated that they hoped to use the opportunity to build on or strengthen their programs. For example:

- *To have a group prepared to organize and execute any event or activity that involves outreach, to fulfill our club mission of promoting STEM.*
- *Learn new teaching methods to increase our effectiveness as educators. Build long-term collaborative partnerships with community/business professionals. Build long-term membership and program participation with youth in Chenango County. Increase the complexity and depth of 4-H programs and projects.*
- *Our goals are to share SciGirls resources, strategies, and activities with our network of teachers, scientists, and partners. Additionally, we would like to use SciGirls strategies for implementing competitions and future campaigns.*
- *To strengthen our relationship with partner organizations providing content to girls in our area.*
- *Connect all GEMS Club initiatives throughout metro DC and nationally with SciGirls resources.*

2.3.2 *SciGirls* outreach programs: Agendas

When asked to outline their *SciGirls* outreach agendas, the program leaders generally noted that their organizations would be developing new programs, updating existing programs, expanding partnerships with individuals and organizations, and/or sharing the *SciGirls* resources.

The largest group explained that their *SciGirls* outreach program would allow their organizations to start a new program or programs, as in:

- *SUMMER ACADEMY 2014 will serve girls age 4-12, bringing together a community of like-minded girls that enjoy exploring through the sciences and celebrating their accomplishments. We will hold a 5 week camp at Queens University of Charlotte, hoping to serve over 100 girls per week.*
- *I plan on offering monthly STEM Club meetings on Saturdays from 9:00-12:00 where girls will participate in SciGirls activities.*
- *We would like to incorporate the strategies and resources into future campaigns (if possible).*
- *Provide hands-on activity workshops to groups of girls and help them experience success both individually and as group members. Expose girls to successful professional women mentors in STEM careers.*
- *Hold the SciGirls training and our "A,B,C's of Science" science camp with our newly learned skills and new program topics. [We will also] plan and schedule programs for youth, with an emphasis on recruiting female participants from every school district within the county, [and] create an evaluation plan and use it to evaluate each project/program individually with participants and instructors as well as a 6mon. and 12mon. overall evaluation of the Chenango County 4-H STEM program.*

Others indicated that their *SciGirls* outreach program would expand or supplement an existing program, as in:

- *We will continue to explore STEM studies in fun, interesting ways to engage girls and attempt to sustain their involvement in high school and beyond. We will explore more resources and utilize them to enhance our program*
- *We will infuse SciGirls activities into our existing workshops [and will] incorporate SciGirls activities in our Family Night community events.*
- *Blend the SciGirls learning model with that of 4-H to develop a program outline of emerging STEM fields of study to present to STEM professionals as we recruit volunteers, with supporting logic models and program implementation worksheets.*

A handful commented on their plan to connect with other people and organizations, as in:

- *Become active volunteers with organizations like Girls Inc. and Boys and Girls Club, helping with their various STEM programs as well as holding events in our school and planning activities with other engineering organizations to promote STEM education.*
- *Contact local professionals/businesses and present our program goals and project ideas and recruit volunteers.*

And a few described plans to share the resources with others, as in:

- *We plan to work with our partners and trainers to provide them with SciGirls resources.*
- *We will make SciGirls programming known and encouraged to our Homeschool families during our regular programming [and will] incorporate SciGirls activities and the SciGirls Seven model to our existing Teacher Professional Development sessions and encourage the use of SciGirls as a resource to the educators we work with.*

2.3.3 *SciGirls* outreach programs: Partnerships

When asked to describe their intended partners, the program leaders didn't overwhelmingly point to one kind of partnership.

A few noted that they would be working with educators and schools, both as educational and event partners. For example:

- *We are contacting all middle school STEM teachers, library youth educators, 4-H educators from across our region and educational district to attend the SciGirls training. We will use this group as the starting base for our network of collaborative partners. We will link resources amongst this group and develop a regional database of resource people and resources that can be used to strengthen STEM programming for all partners.*
- *Universities – low cost to host our Summer Academy; School District and schools – work with STEM office to identify our teachers and students.*

A couple indicated that they would be working with local organizations to reach more young women and share the *SciGirls* resources as widely as possible, as in:

- *We endeavor to further cultivate our relationship with our local Girl Scouts organization, and work with them to find groups of girls who wish to participate in our hands-on workshops and STEM activities.*
- *Godman Guild and St. Stephens - We will continue to encourage the use of SciGirls activities and resources with the staff of these two institutions which have after school programming and we will continue to infuse the SciGirls activities into our professional development sessions with them.*

A handful of program leaders said that they would be sharing resources and strategies with unidentified partners, as in:

- *We will make them aware of our strategies and goals and find ways to collaborate with them. We will encourage them to use these strategies in their own work also. We will find ways for our girls to connect with others and expand their relationships in the community.*
- *We will be able to provide our partners with resources in our trainings as well as our trainer and partner communities on our web page.*

Finally, one each indicated that their organizations would be partnering with funders (as in *Funders – to provide scholarships to low income girls*) and mentors (as in *I hope that The Society of Women Engineers from Santa Ana College members will take the lead every other month for STEM Club so our girls will get to interact with women college role models and establish bonds with them*).

2.3.4 *SciGirls* outreach programs: Desired outcomes

Next, the program leaders were asked to describe the outcomes they hope to see as a result of their *SciGirls* outreach. Responses ranged both in scale and in timeline, from small to large goals and from short-term to long-term objectives. One program leader declined to answer the question.

Nearly all of the program leaders expressed a desire for their programs to inspire young women to develop a new or expanded interest in STEM, as in:

- *Number of interested females identified and enrolled in the programs; Project Scientist participants perception and attitudes toward their future in STEM; Project Scientist participants entry into STEM majors and careers and achieved science awards and scholarships.*
- *Successful girls in STEM, excited about their potential, their opportunities and their successes.. Leaders empowered to be more themselves and willing to help other girls.*
- *An increase in girls' interest in STEM subjects and careers.*
- *Increased youth participation in emerging STEM technologies/careers [and] long-term STEM interest from female participants and STEM volunteers.*
- *We hope to see even more participation from girls in GLOBE. Additionally, we hope these girls pursue careers in STEM fields.*
- *Student success and encouragement through hands-on activities; Increased awareness by female students of the many options available to them in STEM careers and opportunities.*
- *We hope to see teachers/parents/afterschool providers that we work with develop lessons and projects with their female students that incorporate the SciGirls Seven and we will see an increase in the participation of girls from these groups in STEM endeavors inside and outside of their school experience.*

Others indicated that they hope their programs will help establish community connections or expanded partnerships, as in:

- *More involvement from our current members and hopefully recruit more members that are interested in outreach and volunteering*
- *Increased collaboration within Chenango County and our region [and] volunteer development from professionals and past program participants to sustain the program long term.*
- *We keep up with students who have been part of GLOBE via our GLOBE alumni network. I also hope that this will lead to more partnerships and grant opportunities outside of current GLOBE relationships.*
- *Stronger partner relationships.*

A handful commented on their organizations' goals of increased programming and expanded projects, as in:

- *Increased youth program offerings.*
- *Build nationwide model and increase the number of women in STEM majors and careers; Project Scientist alumni will be positioned as leaders in the field that solve some of our world's most pressing issues; Project Scientist research will raise the caliber of STEM communities work with girls/women.*

Finally, a few program leaders noted that they hope their programs would increase educator knowledge and awareness, as in:

- *Research and evaluation on females in STEM; Cultivation of best practices for mentoring, curriculum and teacher development in these fields.*
- *We hope to see teachers/parents/afterschool providers that we work with develop lessons and projects with their female students that incorporate the SciGirls Seven…*

2.3.5 *SciGirls* outreach programs: Girls served

The program leaders were asked to approximate the number of girls they expect to reach with their programs. Responses ranged from a low of 20 to a high of 10,000+. The total number girls reported was 21,555. Of the program leaders who answered the question (n=8), the mean number of girls reached was 2,694 per program leader.

As detailed in the examples below, program leaders' responses and descriptions varied greatly:

- *Initially I hope about 20 in the core group, but more as we continue.*
- *35 with the "A,B,C's of Science" camp; ~1,900 with 4-H STEM programming throughout the year*
- *50*
- *50+*
- *100 per week for 5 weeks (some will attend several weeks, all 5 weeks or just 1 week)*
- *1000+*
- *8,000 nationally*
- *10,000+*
- *Unknown*

When asked to characterize the girls they plan to serve and provide any relevant demographic or background information, the largest group of program leaders noted that they would primarily be working with underserved populations, as in:

- *These girls are from inner city neighborhoods. Many are living at poverty levels. Some depend on the food they get at the program to supplement their diet. We have Somali girls, girls from other African backgrounds, as well as African American girls. Hispanic girls are coming in greater numbers. A few Asian girls have attended occasionally. We should have opportunity to reach more from all groups.*
- *We would like to reach out to every student we can, we do live in a city where the majority are Hispanic/Latino, and that would be the main demographic of our program/events.*
- *Most of our girls are Hispanic and live in Santa Ana or Costa Mesa, CA. 69% of the girls we serve come from non-English speaking homes and over half have a family income level of under $25,000 a year.*
- *Chenango County is a poor, rural community that relies heavily on agriculture. Quite a few of the youth that we work with through 4-H have never left the county before heading out on a 4-H program. We are very interested in working with these youth to help them learn about different fields of study and the possibilities that await them in the outside world. Making science relevant to them and showing them much the different fields cross over or overlap has really made a difference with those we work with, especially girls who are finding out that there are many different technical career fields that support their interests or passions that they never knew existed!*
- *Most of the girls targeted through our community nights and our work with afterschool providers are African American; from economically disadvantaged families. We are also beginning work with a school that serves primarily Somali students and another that serves Hispanic students.*

A handful indicated that their programs would reach diverse groups of youth, including those who are underserved, as in:

- *Engaging and empowering girls with a passion, talent and aptitude for science, technology, engineering, and math (STEM): Paying clientele at $375 per week; Scholarship girls – mainly Latina girls. In 2013 of the 45 girls we served, 9 were Latinas on scholarship.*
- *In the United States, we serve really all populations – schools range from rural to urban, 100% free and reduced lunch to private Ivy League prep schools, Tribal schools, schools with large minority populations, and everything in between.*
- *We anticipate reaching a diverse group of girls in our area. Our school district is now more than a quarter Hispanic, and our partner organization reaches out to girls of differing socioeconomic status.*

2.3.6 Expected use of *SciGirls* resources

The program leaders were asked to indicate which *SciGirls* resources they planned to use in their outreach programs. All but one pointed to one or more resources, with most program leaders pointing to five or more resources.

All but one of the program leaders indicated an intent to use the *SciGirls* Engineering activities, Science activities, and Tech activities. Almost all of the program leaders noted that they also plan to use the *SciGirls* videos or clips and the *SciGirls* PBS Kids website (see the image to the right), while others pointed to the *SciGirls* Parents website and the *SciGirls* CONNECT website. One grantee declined to answer the question.

Screenshot of the *SciGirls* PBS Kids website

2.3.7 Expected use of *SciGirls* Spanish language resources

When asked if they plan to use any *SciGirls* Spanish language resources, the largest group of program leaders indicated that this was their intent. For example:

- *Yes. Especially for our parents. Each day our parents receive a newsletter explaining the day's events. Would be great to engage them more through various resources.*
- *Yes, to explain to Spanish speaking parents what the programs are and what STEM is.*
- *Yes, since I'm not familiar with the resources yet, I'm not sure how I will best utilize them.*
- *Yes! We have many schools with large Spanish speaking populations. This will be a fantastic resource for us.*

A few indicated that they *might* use the *SciGirls* Spanish language resources, as in:

- *The girls who come to the program speak fluent English, but if we can find materials and ways to share with Spanish speaking parents we may be able to make greater progress with the girls.*
- *We may be working with Latina SciGirls content to reach out to girls in predominantly Hispanic school settings, so the Spanish language resources should be helpful to reference and encourage follow-up.*
- *At this time, the school we are working with that is primarily Hispanic students prefer that we only work with the students in English, so there is not much encouragement to use these with the students, but we are seeking ways to make these known to the parents so that they may play a greater role in their child's learning.*

One said that her organization *would not* be making use of the Spanish language resources (As in *No – we lack a heavily diversified population in Chenango County*) and another declined to answer the question.

2.3.8 Expected use of role models

When asked if and how they plan to use role models in their outreach programs, almost all of the program leaders indicated that they would be working with either in-person and virtual role models, with about half of the group noting that role models are already an important part of their existing outreach programs. For example:

- *Yes, we will be inviting role models to talk with us in our workshops and through Skype, and e-mails, as well as web sites (videos) such as NASA.*
- *Absolutely, it is important for girls to have role models, to have someone they can look up to and maybe even relate to in some way.*
- *Yes, the college students from Santa Ana College Women of Engineers will make wonderful role models. We might also invite female guest speakers from the STEM fields if time allows.*
- *To encourage greater volunteerism from the community, we will blend the SciGirls learning model with that of 4-H to develop a program outline of emerging STEM fields of study to present to STEM professionals as we recruit volunteers, with supporting logic models and program implementation worksheets. Once these plans are in place, we will contact local professionals/businesses and present our program goals and project ideas and recruit volunteers. These volunteers will be the starting base for our network of collaborative partners. We will link resources amongst this group and develop a regional database of resource people and resources that can be used to strengthen STEM programming for all partners. These volunteers will be asked to offer technical advice to our youth program and to lead projects and programs.*
- *Yes, we have a GLOBE International Scientist Network. Additionally, I'm interested in sharing FabFems with the teachers.*
- *Yes we engage several women STEM professionals a day*
- *We have several successful female role models on our board who are involved with STEM careers. We have already involved them in outreach with partner organizations and our own content delivery programs, and intend to continue this in the future.*
- *We do have several females on staff that do the programs and then are seen as a role model. We also encourage the afterschool providers we work with to be a role model for the girls they work with.*

One grantee simply wrote *Funding barriers*, indicating that her organization is unlikely to use role models in its outreach program.

2.3.9 Intentions to incorporate gender equity STEM teaching strategies

When asked to describe how they intend to incorporate gender equity STEM methods into their *SciGirls* outreach programs, the program leaders pointed to a variety of strategies. The largest group provided a general description of how their outreach plans would achieve this goal, as in:

- *We plan to more consciously utilize the gender equity strategies while teaching youth and incorporate the strategies into volunteer/club leader trainings that we hold with our membership.*
- *I would like to provide a section in my trainings that includes strategies, tips, and resources. Additionally, I would like to incorporate methods from SciGirls into non-gender specific activities, campaigns, and projects.*
- *From what we have learned from looking at SciGirls content online, the teaching strategies we will learn from SciGirls training will help us find stronger ways to encourage girls to experience success in STEM activities - things to say and do which could break through student anxieties.*
- *Through projects chosen to expand their skills they will realize they have capabilities they never thought they had. With this increased self confidence they will be given more challenging goals to pursue.*

Some indicated that they would be working with role models, as in:

- *We will continue to have a Woman STEM Superstar present/work with the girls each day.*
- *We are currently seeking mentors, women in the community, who can work with the girls to make it real and help them realize the steps they need to make to achieve their goals.*
- *We will also recruit more female project/program leaders in our STEM programming.*

Others commented on their hopes for their training. For example:

- *We would like to use the training to plan this, like said before, we are a new organization and have never done independent events.*
- *We only offer girls programming so I feel we already are doing this. However, I'm interested in learning more techniques from the training that I can use.*

A handful pointed to lessons focusing on the historical impact of women in science:

- *When teaching on various STEM topics we will include references to women pioneers in those fields/subjects.*
- *We are studying some of the history of women in science and talking about the absence and the reasons for the absence of great numbers of women in these fields. We discuss the implications of this, the obstacles girls have to overcome in many circumstances, so they see the reality of what women before them have done.*

And a few described teaching strategies that would allow girls to approach projects in their own way:

- *Our art program will continue to allow girls to find their voice and stand up for their STEM interests and ambitions.*
- *Students are able to express themselves creatively in their experiment presentations to their classmates.*

Finally, one each commented on a variety of other strategies, including educating parents or utilizing one of the other SciGirls Seven methods (encouraging collaboration, planning projects the girls find personally relevant, organizing hands-on and open-ended investigation, and encouraging critical thinking). For example:

Educating the parents

We will also be educating the parents. Currently, some of the parents don't seem to take the project for the girls too seriously With greater understanding and commitment from the parents we should be able to make greater progress with the girls.

Encouraging collaboration

We provide collaboration opportunities in our programs (i.e. developing experiments as a team).

Planning projects that are personally relevant

Activities are relevant – (we often have an inquiry component where the students develop an experiment based on things they are curious about)

Organizing hands-on, open-ended investigations

All of our programs are very hands-on in nature.

Encouraging critical thinking

We are studying some of the history of women in science and talking about the absence and the reasons for the absence of great numbers of women in these fields. We discuss the implications of this, the obstacles girls have to overcome in many circumstances, so they see the reality of what women before them have done. Then we talk about the changes in our society and how we can make more changes. We discuss their own situations and what they perceive as obstacles for themselves. Then we seek solutions and give support.

2.3.10 Potential challenges facing the implementation of *SciGirls* outreach programs

The program leaders identified a number of challenges or obstacles that they thought they might encounter while implementing their *SciGirls* outreach programs. Almost all of the grantees pointed to *financial constraints*, while others cited *competing institutional priorities* and/or *time constraints*. A handful noted the challenge of gaining *access to facilities/equipment*. One each selected *resistance to gender themes* and *linking/connecting with partner organizations*.

When given the opportunity to elaborate, grantees generally addressed these and other concerns, as in:

- *We are an upstart! Never enough time or resources for all we want to accomplish.*
- *I do not have a specific revenue source for STEM Club. I will need to obtain grant funding to purchase supplies. Although we have access to a site in Costa Mesa for STEM Club to meet, finding a location in Santa Ana where we can meet on a Saturday may be difficult.*
- *While we have many programs that use this focus, many are one and done opportunities. We have limited time with the students we work with – This is why we are focused more on working with the afterschool providers; who will have the "facetime" with the girls to be able to make the positive change we hope to see in their choices toward STEM studies and ultimately a STEM career.*
- *We also currently do not have the funds to dedicate to a larger deeper program. We are looking into a Girls only program that will be on Sunday afternoons. This will provide the ideal connection to girls to employ these strategies, but the budget has not been approved for this program as of yet.*
- *We have attempted to begin a robotics program and offer more advance STEM activities. However, monetary constraints limit what we can and cannot do for programing at a local level. We do not have easy access to labs and equipment, especially in the afterschool programming that we do. We offer more portable learning opportunities for 4-H youth and program participants.*
- *Our budget has been severely cut. I'm not sure how we will fund trainings.*
- *A matter of logistics and communication with individual troops who might be interested in participant in our hands-on workshops -- most people involved at the troop level are volunteers, so working out details will take a little time.*
- *The organization with which we are partnering now has never separated girls. They do not seek funding for separate programs for girls, so we are enlightening them as much as possible to try and get more funding. Our budget is very limited. I am hoping that the training will reinforce this. We have small periods of time to see the girls. They come after school tired from the long school days. They have to do homework and they want to be active, not sit around and do sedentary activities. So, whatever we do has to truly engage them to overcome the fatigue and competition of other activities. Also, parents pick them up at odd times as they are getting off from work. Some girls are pulled out of our projects before they can finish or complete anything. With more funding we can invest in more materials to keep them engaged and offer more opportunities which are interesting and exciting for them. We are hoping to get tablets so we can do some research as a group, learn coding and other technical skills, and spend time with math and other STEM computer games, making it fun while learning.*

2.3.11 Additional resources or support that could help address outreach challenges

When asked to comment on additional resources or support that might assist them in addressing the challenges or obstacles described in the previous section, the program leaders pointed to three main items: funding, expanded partnerships, and additional strategies and examples. One program leader expressed a desire for additional information about the training itself.

The largest group of program leaders indicated that additional funding would be especially appreciated, as in:

- *Funding to implement the program or ideas for resources/funders.*
- *More grant funding for supplies would be great!*
- *Resources on low cost or no cost trainings, grant opportunities.*
- *We currently look for smaller grants to fund our program while keeping in line with 4-H's national mission mandates.*

Others commented on the value of expanded partnerships, either with *SciGirls*, local schools, or other organizations. For example:

- *Explore possibility of larger partnership with SciGirls and attracting funding together.*

- *School faculty and advisors can hopefully work with us to make the events/programs possible when they can help.*
- *We also rely heavily on our work with establishing good relationships with community grantors and educational partners.*
- *Further developing personal relationships with regional leadership and troop leaders.*

A handful of program leaders pointed to the usefulness of additional strategies and examples, as in:

- *Best practices, examples, strategies, case studies, ideas on the organizations that have made the best use of this partnership.*
- *I am hoping SciGirls may have some ideas and suggestions. I am looking forward to the training to learn more about what SciGirls will have to help us.*

Finally, one program leader indicated that it would be helpful to have additional information about the upcoming *SciGirls* training, saying: *I have not heard back from SciGirls as to the date of our training at this time and I will need to reserve the space. If we do not have sufficient lead time we may not be able to get the space we need for the training and may have to find another date. Also, we will need lead time to invite the people we wish to be involved. Right now I can offer nothing specific to them.*

2.3.12 How the organizations are funding their *SciGirls* outreach programs

When asked how their organizations would be funding their outreach program(s), the largest group of *SciGirls* grantees indicated that they plan to *fold [them] into another related program/budget*. A few each said that they *have no additional funding* or pointed to *specific grants* (as in *In 2013 we had $20,000 in funding to sponsor 9 girls in the program* and *JC Penny funds our after school programs, Stewart's Shops Holiday Match Program, Otis Thompson Foundation for Summer STEM-Literacy Program*). One organization each pointed to funding from *community partner contributions*, *community donations*, and/or a program fee (as in *we charge parents $375 per week*). Though all of the organizations received a $200 stipend from *SciGirls*, only one specified that funding would be provided by ***tpt***.

2.3.13 Intentions to incorporate *SciGirls* programming into future offerings

When asked to look ahead and describe if and how they see *SciGirls* programming fitting into their organizations' future offerings, beyond the grant, all but one of the program leaders said they thought or hoped this would be the case. The remaining contact responded *not sure*.

In terms of specific plans, the program leaders pointed to the value of using *SciGirls* resources in future programs, sharing skills with other groups and individuals, and expanding their partnerships with *SciGirls*, schools, and local individuals and organizations.

The largest group of program leaders expressed a desire to use the *SciGirls* resources in their organizations' future offerings, as in:

- *We are piloting our Project Scientist Scholars program this summer for girls ages 13 – 18. We may look incorporate specific SciGirls work in this program.*
- *I see this project as the spring board to incorporating the program into the ongoing Horizon Youth program.*
- *I hope that the SciGirls resources and lessons will become part of our normal STEM offerings during the school year and summer programming for years to come.*
- *We plan to continue utilizing SciGirls programming -- content from videos and online activity ideas -- in developing program ideas for our organization's outreach programs. We continue to endeavor to reach out to encourage girls in STEM areas.*

- *We would like to include SciGirls activities in several of our programs that will continue for many years*.

While others indicated that they intend to share the resources and training information with groups and individuals, as in:

- *SELF International will also be taking what we have learned here on to other groups we will serve in the future.*
- *The training itself will be useful to train community educators on how to positively influence girls and other youth to not give up, encourage them to think for themselves, explore all of their interests, and follow their dreams. We will incorporate this training into our afterschool programs at The Place and Oxford Afterschool as well of our normal 4-H Youth Development Program.*
- *If we train our partners (they organize training for the GLOBE teachers), we will be able to incorporate SciGirls into our future sessions. Partners are able to pick and choose which areas they offer, so some will not choose to share SciGirls information, however I believe many will.*
- *In addition, we are making the resource known to school across Ohio, Indiana, Michigan, Kentucky, and West Virginia by including the SciGirls and SciGirls CONNECT websites in our resource section for teachers and parents that book our programs, where there is a connection to science content of our COSI on Wheels program.*

Finally, a handful of program leaders expressed a desire to expand their organizations' partnerships with *SciGirls*, schools, and local individuals and organizations in an effort to increase the likelihood of project success and sustainability. For example:

- *Perhaps our girls could be the focus of a TV segment? Our long term goal is to have Project Scientist on University Campuses across the country. We would love to look at a larger partnership with SciGirls. Project Scientist is a unique model in that we have camper fees, grants, donations, and corporate support. As long as we can continue to run efficiently while remaining effective for the girls we should be sustainable.*
- *We would look into funding through our school and other organizations, showing them the work we do with the SciGirls programs and the results we obtain so they can help with funds to continue the work.*
- *To ensure program sustainability, we will increase collaboration within Chenango County and our region while generating long-term STEM interest from female participants and STEM volunteers by creating a program that they value because of its engaging nature and nurturing environment. Sustainability also depends upon volunteer development from professionals and past program participants to sustain long term.*

2.3.14 Intentions to use gender equity STEM teaching strategies in other programs

Next, the program leaders were asked to look ahead and describe if and how they anticipate using the gender equity strategies in their other programs. Almost all of program leaders said they thought they would use the strategies in the future and provided general information about their plans. Additionally, a few program leaders indicated that they would have a better idea of how they would be able to use these teaching strategies after the *SciGirls* training. For example:

- *Our entire program is on girls/STEM, so yes. See Project Scientist Scholars above [We are piloting our Project Scientist Scholars program this summer for girls ages 13 – 18. We may look incorporate specific SciGirls work in this program.]*
- *We are a part of the Girls Rise and are already implementing some strategies. With SciGirls we expect to continue and strengthen that trend.*
- *Everything we do will fully incorporate gender equality even if they are in integrated groups.*
- *We look forward to learning more about the SciGirls seven strategies to target girls and encourage them. These strategies should be helpful to increase our awareness and approaches to female students.*
- *I only offer STEM programming but would be happy to incorporate any strategies once I learn them.*
- *We are curious to see what the gender equity strategies are in the program and hope to encourage more girls to be successful in science and STEM related fields. We will break the tradition thinking that girls often feel*

about science, like that it is not cool to be intelligent and succeed in STEM related fields and to prevent them from falling behind in school and not going after their initial career/life dreams.

- *I hope that we will be able to incorporate the activities and strategies learned from SciGirls into trainings, activities, and also for future grant proposals.*

The remaining two program leaders declined to answer the question.

Summary

Part 2 presents the findings from a pre-training background evaluation from the lead staff (hereafter called the program leaders) of 9 member institutions of the NGCP. Eleven (11) organizations were invited to participate in this background evaluation from a larger group of 40 *SciGirls Season Two* grantees. These 11 organizations were selected by ***tpt*** and Knight Williams with the goal of representing a diverse range of groups (including afterschool program, universities, science centers, and girls' clubs, among other organization types).

Of the 11 invited organizations, 9 completed the background survey, for a response rate of 82%. All of the surveyed program leaders were women, and they came from 8 different states around the U.S. – 2 from California and one each from Colorado, Minnesota, Nevada, New York, North Carolina, Ohio, and Virginia.

Partner background feedback from the 9 program leaders was gathered by paper survey with a follow-up email and phone conversation where needed. The program leaders later completed a post-training follow-up phone interview with the independent evaluation team, considered in Part 3 of this report. For their participation in these two aspects of the evaluation, each organization received a $100 honorarium. Participants were informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future programs.

Content analyses were performed on the qualitative data generated in the open-ended questions. All analyses were conducted by two independent coders. Each coder independently coded randomly ordered open-ended responses, blind to group assignment. The analysis was both deductive, drawing on the program's objectives, and inductive, by looking for overall themes, keywords, and key phrases. Any differences that emerged in coding were resolved with the assistance of a third coder.

Part 2 is divided into 3 sections. The first provides background information about the 9 organizations, their reasons for applying for a *SciGirls* grant, and how they learned about the grant opportunity. The second details program leaders' expectations for the *SciGirls* training. The third section considers program leaders' expectations for their *SciGirls* outreach programs prior to development and implementation.

2.1 Background information

How program leaders first learned about the *SciGirls* grantee opportunity: Program leaders generally indicated that they learned about the *SciGirls* grant either from contacts outside of their organization or from internal sources, such as board members and state or national headquarters. A few learned about the opportunity through events, and one learned about the grant through a web search.

Why the organizations applied for a *SciGirls* grant: When considering their organizations' decisions to apply for a *SciGirls* grant, the program leaders generally indicated that they *wanted to expand or build on an existing program focusing on girls* and/or that they *wanted to integrate gender equitable teaching strategies into [their] programming*. Overall, they also wanted to *incorporate the SciGirls materials into another more general educational program [they] are already implementing/planning to implement*. To a lesser extent, they

generally *felt the SciGirls grant would enable [them] to form new community partnerships* and *were interested in the opportunity to apply to become certified SciGirls trainers so [they] can provide professional development to other educators*. Finally, they also generally indicated that it was moderately important to their decision-making process that *the SciGirls grant would enable [them] to continue working with [their] existing community partners* and that they would *be able to start a STEM program focused on girls*.

Youth programs implemented within the past 5 years: All but one of the program leaders indicated that their organizations had implemented a program for girls ages 8-13, Hispanic youth ages 8-13, and/or youth ages 8-13 focused on STEM within the past 5 years. The remaining respondent noted that her organization is new and that they *looked for this partnership to be able to start [their] program outreach.*

Program(s) geared to girls ages 8-13

Just over half of the program leaders noted that their organizations have implemented programs for girls ages 8-13 within the past 5 years. When asked to estimate the number of girls reached annually, responses ranged from a low of 40 to a high of 9750. The total number girls reported was 20,135. Of the program leaders who answered the question (n=5), the mean number of girls reached was 4,027.

Program(s) geared to Hispanic youth ages 8-13

A handful of the program leaders noted that their organizations have implemented programs for Hispanic youth ages 8-13 within the past 5 years. When asked to estimate the number of Hispanic youth reached annually, responses ranged from a low of 9 to a high of 1446. The total number Hispanic youth reported was 1,479. Of the program leaders who answered the question (n=3), the mean number of Hispanic youth reached was 493. Not including the program leader who indicated that her organization would reach 1446 Hispanic youth, the mean of remaining respondents (n=2) was significantly lower, at 17.

Program(s) geared to youth ages 8-13 with a focus on STEM

Nearly all of the program leaders noted that their organizations have implemented programs for youth ages 8-13 with a focus on STEM within the past 5 years. When asked to estimate the number of youth reached annually, responses ranged from a low of 40 to a high of 63,000, with a total of 75,709. One program leader's comment (*Thousands – we recently changed our webpage and do not have an exact number. However, we have at least 10,000 active teachers around the world*) was not specific enough to be included in this total. Of the program leaders who provided specific answers (n=7), the mean number of youth reached was 10,816. Not including the program leader who indicated that her organization would reach 63,000 youth, the mean of remaining respondents (n=6) was significantly lower, at 2,118.

How *SciGirls* will build on or differ from previous programs: When asked how their *SciGirls* outreach programs would build on or differ from youth programs implemented within the last five years, program organizers pointed to four main benefits of the *SciGirls* opportunity: additional resources and programming opportunities, program expansion opportunities, a new or expanded focus on young women, and/or a new or renewed focus on STEM.

What *SciGirls* will bring that wasn't previously available: When asked what *SciGirls* would bring to the youth served by their organizations that wasn't previously available, the program leaders pointed to specific resources and trainings, networking opportunities, a new or expanded focus on young women, and funding.

Gender equitable teaching strategies currently used by grantee organizations: All but one of the program leaders indicated that their organizations currently use one or more gender equitable teaching strategies. Almost all of the program leaders noted that they use *hands-on, open-ended projects and investigations* and *relationships with role models or mentors*. Some reported that their youth: *are exposed to a variety of STEM*

careers; receive specific, positive feedback on their effort, strategies, and behaviors; and/or *collaborate in groups*. Others indicated that their youth: *are encouraged to express their individual viewpoints within a group setting; communicate findings to the group using a variety of techniques; are allowed to approach projects in their own way;* and/or *work on a project designed to be personally relevant and meaningful to them*. Finally, a handful noted that their youth *use solid evidence to support claims when communicating findings*.

Staff knowledge of gender equity and STEM issues, *SciGirls* Seven, *SciGirls* videos, and *SciGirls* activities: In general, the program leaders indicated that their staff members were *moderately knowledgeable* of gender equity and STEM issues, *slightly knowledgeable* of *SciGirls* Seven and *SciGirls* activities, and *not at all knowledgeable* of *SciGirls* videos. Of those who provided additional feedback, the largest group expressed their enthusiasm for the project, while others elaborated on staff knowledge and future plans.

2.2 Grantee expectations for the *SciGirls* training

Individuals expected to attend the *SciGirls* training: All of the program leaders expressed confidence that *they* and *other staff from their organization* would attend the training. Most of the program leaders indicated that *volunteers*, *staff from [their] partner organizations*, and *school educators* would be attending as well. Others indicated that *afterschool educators* would attend the training, a few said *parents* and *community members*, and one said *hopefully board members*.

Expectations program leaders have for themselves: When asked to look ahead to the upcoming *SciGirls* training and describe the expectations they have for themselves, the program leaders generally pointed to two main goals: to gain new knowledge about the *SciGirls* resources and strategies, and to be organizational leaders by planning events, overseeing staff, sharing ideas, and ensuring that their groups make the most of the opportunity.

Expectations program leaders have for their staff: When asked to look ahead to the upcoming *SciGirls* training and describe the expectations they have for their staff, the program leaders, as a group, identified three main goals: for staff to gain knowledge about *SciGirls* and STEM education; for staff to come out of the training with increased commitment, understanding, and confidence; and for staff to develop general professional skills.

Expectations program leaders have for their collaborating partners: The largest group of program leaders said they expect their collaborating partners to provide support for their organizations and outreach efforts. Additionally, a few program leaders indicated that they expect their collaborating partners to gain insight and knowledge from the opportunity.

Program leaders' interest in becoming a *SciGirls* trainer: The program leaders generally indicated that they were *moderately interested* in becoming a *SciGirls* trainer. When given the opportunity to elaborate, most declined to provide additional information. A few program leaders, however, provided information about why they were unlikely to become *SciGirls* trainers, noting that they would either need more information or more time in order to do so.

Program leaders' interest in five aspects of the *SciGirls* training: Overall, the program leaders indicated that they were *extremely interested* in the portion of the training focused on the hands-on activities and *very interested* in the portions focused on *SciGirls* Seven: How to Engage Girls in STEM and science inquiry and engineering design processes. They also indicated that they were *moderately interested* in learning about the PBS Kids *SciGirls* website and the *SciGirls* CONNECT website.

When given the opportunity to elaborate on these ratings, 2 program leaders provided additional feedback. Both reiterated their organizations' interest in the program and one suggested that *SciGirls* send monthly email updates to all of the program leaders.

2.3 Outreach goals and expected use of *SciGirls* resources and strategies

***SciGirls* outreach program goals:** When asked to describe the goals of their *SciGirls* outreach programs, the program leaders pointed to two main objectives: educating and empowering young women interested in STEM, and using the opportunity to build or strengthen their outreach programs.

***SciGirls* outreach programs agendas:** The largest group of program leaders noted that their *SciGirls* outreach program would be the start of a new program for their organization, while others indicated that their *SciGirls* outreach program would expand or supplement an existing program. Additionally, a handful noted that *SciGirls* would help them connect with people and organizations in their communities, and a few described plans to share the resources with others.

***SciGirls* outreach program partnerships:** When asked to describe their intended partners, the program leaders didn't overwhelmingly point to one kind of partnership. A few noted that they would be working with educators and schools, both as educational and event partners. A couple indicated that they would be working with local organizations to reach more young women and share the *SciGirls* resources as widely as possible. A handful said they would be working with unidentified partners, and one each pointed to partnerships with funders and mentors.

***SciGirls* outreach programs desired outcomes:** When asked to describe the outcomes they hope to see as a result of their *SciGirls* outreach, program leaders' responses ranged in scale and in timeline, from small to large goals and from short-term to long-term objectives. Nearly all of the program leaders expressed a desire for their programs to inspire young women to develop a new or expanded interest in STEM. Others indicated that they hope their programs would help establish community connections or expanded partnerships, and a few commented on their organizations' goals of increased programming and expanded projects. Finally, a few noted that they hope their *SciGirls* programs would increase educator knowledge and awareness.

***SciGirls* outreach program girls served:** The program leaders were asked to approximate the number of girls they expect to reach with their programs. Responses ranged from a low of 20 to a high of 10,000+, and the total number girls reported was 21,555. Of the program leaders who answered the question (n=8), the mean number of girls reached was 2,694 per program leader. When asked to characterize the girls they plan to serve and provide any relevant demographic or background information, the largest group of program leaders noted that they will primarily be working with underserved populations. A handful indicated that their programs would reach diverse groups of youth, including those who are underserved.

Expected use of *SciGirls* resources: All but one of the program leaders indicated an intent to use the *SciGirls* Engineering activities, Science activities, and Tech activities. Many also noted that they also plan to use the *SciGirls* videos or clips and the *SciGirls* PBS Kids website, and others indicated an intent to use the *SciGirls* Parents website and the *SciGirls* CONNECT website.

Expected use of *SciGirls* Spanish language resources: When asked if they plan to use any *SciGirls* Spanish language resources, the largest group of program leaders indicated that this was their intent. A few explained that they *might* use the *SciGirls* Spanish language resources, if they could find a way to make the

materials relevant to their educational situations. One said that her organization *would not* be making use of the Spanish language resources and another declined to answer the question.

Expected use of role models: Almost all of program leaders indicated that they would be using either in-person and virtual role models in their *SciGirls* outreach programs. Additionally, many program leaders noted that role models are already an important part of their existing outreach programs. Finally, one grantee simply wrote *Funding barriers*, indicating that her organization is unlikely to use role models in their outreach program.

Intentions to incorporate gender equity STEM teaching strategies: The program leaders indicated that they intend to incorporate gender equity STEM methods into their *SciGirls* outreach programs. The largest group provided a general description of how their outreach plans will achieve this goal. Some indicated that they would be working with role models, others commented on their hopes for their training, a handful pointed to lessons focusing on the historical impact of women in science, and a few described teaching strategies that would allow girls to approach projects in their own way. Finally, one each commented on a variety of other strategies, including educating parents or utilizing one of the other *SciGirls* Seven methods (encouraging collaboration, planning projects the girls find personally relevant, organizing hands-on and open-ended investigation, and encouraging critical thinking).

Potential challenges facing the implementation of *SciGirls* outreach programs: The program leaders identified a number of challenges or obstacles that they thought they might encounter while implementing their *SciGirls* outreach programs. Almost all of the grantees pointed to *financial constraints*, while others cited *competing institutional priorities* and/or *time constraints*. A handful noted the challenge of gaining *access to facilities/equipment*. One each selected *resistance to gender themes* and *linking/connecting with partner organizations*.

Additional resources or support that could help address outreach challenges: When asked to comment on additional resources or support that might assist them in addressing the challenges or obstacles described in the previous section, the largest group of program leaders indicated that additional funding would be especially appreciated. Others commented on the value of expanded partnerships, either with *SciGirls*, local schools, or other organizations. A handful of program leaders pointed to the usefulness of additional strategies and examples. Finally, one program leader indicated that it would be helpful to have additional information about the upcoming *SciGirls* training, saying: *I have not heard back from SciGirls as to the date of our training at this time and I will need to reserve the space. If we do not have sufficient lead time we may not be able to get the space we need for the training and may have to find another date. Also, we will need lead time to invite the people we wish to be involved. Right now I can offer nothing specific to them.*

How the organizations are funding their *SciGirls* outreach programs: When asked how their organizations would be funding their outreach program(s), the largest group of *SciGirls* grantees indicated that they plan to *fold [them] into another related program/budget*. A few each said that they *have no additional funding* or pointed to *specific grants* (as in *In 2013 we had $20,000 in funding to sponsor 9 girls in the program* and *JC Penny funds our after school programs, Stewart's Shops Holiday Match Program, Otis Thompson Foundation for Summer STEM-Literacy Program*). One organization each pointed to funding from *community partner contributions*, *community donations*, and/or a program fee (as in *we charge parents $375 per week*). Though all of the organizations received a $200 stipend from *SciGirls*, only one specified that funding would be provided by ***tpt***.

Intentions to incorporate *SciGirls* programming into future offerings: All but one of the program leaders said they thought or hoped they would be able to incorporate *SciGirls* programming into their organizations' future offerings. The remaining contact responded *not sure*. In terms of specific plans, the program leaders

pointed to the value of using *SciGirls* resources in future programs, sharing skills with other groups and individuals, and expanding their partnerships with *SciGirls*, schools, and local individuals and organizations.

Intentions to use gender equity STEM teaching strategies in other programs: When asked if they anticipate using the gender equity strategies in their other programs, almost all of program leaders said yes and provided general information about how they thought these teaching strategies might be used. Additionally, a few program leaders indicated that they would have a better idea of how they might use these teaching strategies after the *SciGirls* training.

Final Thoughts

This report provides background information about the 9 surveyed NGCP organizations, their reasons for applying for a *SciGirls* grant, how they learned about the opportunity, and their expectations for both the *SciGirls* training and their *SciGirls* outreach programs.

Overall, the program leaders expressed great enthusiasm for the *SciGirls* training and shared clear and developed goals for their *SciGirls* outreach programs. In general, they indicated that their participation in the project provided four main opportunities: to use STEM education to reach out to young women, to expand or strengthen their organizations' other programs, to build collaborative partnerships with community members, and to increase educator knowledge and awareness.

Looking across the findings and at themes that emerged in numerous places, we briefly summarize a few issues that might help inform this and other projects:

- The program leaders heard about the *SciGirls* grant from a variety of sources and cited a range of factors impacting their decision to apply. In addition to indicating that ***tpt*** successfully used many avenues to reach potential grant applicants, this also suggests that *SciGirls* appeals to and fits in with a variety of organization agendas.

- Most of the 9 NGCP organizations considered in this report have implemented STEM programs for youth ages 8-13 within the past 5 years. Though smaller groups have implemented programs for girls and/or Hispanic youth ages 8-13 in the same period, feedback from program leaders indicates that these are also valued programs. For example:

    - Program leaders frequently indicated that *SciGirls* would help them create or expand their programs for young women. Thus, for many organizations, *SciGirls* is filling a recognized programming gap.

      Funding is one of the biggest obstacles to project implementation. As noted by one program leader who hopes to use her *SciGirls* grant to reach out to partner organizations, focusing on girls is not something that every organization is able to prioritize in their budgets: *The organization with which we are partnering now has never separated girls. They do not seek funding for separate programs for girls, so we are enlightening them as much as possible to try and get more funding. Our budget is very limited. I am hoping that the training will reinforce this.*

    - Though only a handful of the surveyed organizations indicated that they have implemented programs for Hispanic youth ages 8-13 within the past 5 years, almost all of the program leaders indicated that they either *would* or *hoped to* use some of the *SciGirls* Spanish language resources with children, parents, and/or schools. Thus, even though an organization may not have a specific program for Hispanic youth, they are still likely to value the Spanish language resources and use them whenever necessary and possible.

- For program leaders, it seems that one of the primary benefits of the *SciGirls* program is its potential applicability to future organization offerings. As noted by one program leader, who mentioned elsewhere in the survey that her organization hopes to use the *SciGirls* resources for many years to come, *While we have many programs that use this focus, many are one and done opportunities.*

- Program leaders generally seem to believe that strong, collaborative partnerships (often with a variety of partners) are the foundation of successful, sustainable programs. Additional research will show if this has been the case with the *SciGirls Season Two* outreach activities.

Part 3: In-depth follow-up partner evaluation

Introduction

Part 3 presents the in-depth findings of *SciGirls Season Two* outreach activities among the lead staff (hereafter called the program leaders) of 9 member institutions of the NGCP. Eleven (11) organizations were invited to participate in this evaluation from a larger group of 40 *SciGirls Season Two* grantees. These 11 organizations were selected by ***tpt*** and Knight Williams with the goal of representing a diverse range of groups (including afterschool program, universities, science centers, and girls' clubs, among other organization types).

Of the 11 invited organizations, 9 completed a pre-training background survey and a post-training follow-up phone interview, for a response rate of 82%. All of the interviewed program leaders were women, and they came from 8 states around the U.S. – 2 from California and one each from Colorado, Minnesota, Nevada, New York, North Carolina, Ohio, and Virginia, as shown in the map to the right.

9 interviewed partner locations (Note: Point H represents two groups)

Method

For this project, pre-training background feedback from the 9 program leaders was gathered by paper survey with a follow-up email and phone conversation where needed. Their responses are examined in Part 2 of this report. The program leaders later completed a post-training follow-up phone interview with the independent evaluation team. For their participation in these two aspects of the evaluation, each organization received a $100 honorarium.

In May and June 2014, a member of the evaluation team conducted in-depth telephone interviews, each lasting between 60 and 90 minutes, with the 9 program leaders. Interview questions were developed by Knight Williams and ***tpt*** with an eye toward learning how the materials had been implemented, what factors facilitated or hindered their implementation, and whether and how the trainees' skills had been enhanced. Participants were informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future programs.

Content analyses were performed on the qualitative data generated in the open-ended questions. All analyses were conducted by two independent coders. The analysis was both deductive, drawing on the program's objectives, and inductive, by looking for overall themes, keywords, and key phrases. Any differences that emerged in coding were resolved with the assistance of a third coder.

Findings

Part 3 is divided into 9 sections, one for each of the participating organizations. Each of the 9 sections begins with the program leader's thoughts about their training, including: if and how it met their prior expectations; the most and least valuable aspects of the training; the impact of the training's focus on gender equity teaching strategies; their organization's use of the *SciGirls* resources; and their personal interest in becoming a *SciGirls*

trainer. Next, each of the 9 sections presents information about the organizations' outreach programs, including: if and how *SciGirls* has helped them build on or differ from previous programs; the number of girls reached; their satisfaction with the *SciGirls* resources; their use of the *SciGirls* Seven and the Spanish language resources; highlights; obstacles; longer term impacts on the girls, their families, and the organization; and program leaders' suggestions for sustainability. Together, the 9 sections highlight the range of programs that have been planned and implemented since each organization's *SciGirls* training.[12]

Partner 1: GEMS (Girls Excelling in Math and Science)

GEMS (Girls Excelling in Math and Science) is the umbrella network of a group of grassroots clubs dedicated to encouraging girls' interest in STEM in elementary and middle school. As noted on their website:

> *The GEMS (Girls Excelling in Math and Science) club was started in 1994 by Laura Reasoner Jones, a teacher and parent of two school-age daughters. Upon hearing her daughter say she didn't want to go to a magnet school because "Math is hard." Ms. Jones enlisted the help and support of her local elementary school and started an afterschool club for fifth and sixth grade girls. Since that time, over 40 similar clubs have begun around the country, and GEMS clubs have expanded to both younger and older girls.*[13]

SciGirls training

GEMS' *SciGirls* training was held on February 12, 2014. In addition to their program leader, the training was attended by approximately 30 other people, including other staff, educators, afterschool educators, and volunteers, with some overlap in these groups. All attendees were part of the GEMS network of afterschool programmers for 3rd through 8th grade girls. Though the program leader felt that there wasn't anyone who could have benefitted from the training who was unable to attend, she also noted that the training was capped at 30 people and that they might have been able to find additional attendees.

- *Prior expectations:* Prior to the training, the (volunteer) GEMS program leader didn't express any expectations for herself, her staff, or her collaborating partners, as her main goal was to plan a training that others could benefit from.

- *Most and least valuable aspects*: The program leader indicated that the opportunities to offer a free training and NSF-funded materials to her network of club leaders and educators were the most valuable aspects of the training. While she found no aspect of the training to be "least valuable," adding that the trainer was "*absolutely fantastic,*" she qualified that it seemed as though parts of the training might have been too basic for their "*seasoned group of educators*." For the program leader in particular, the downside of the training was having to organize the logistics of the event – securing the location (at Google's Virginia office), discovering that the room was a bit too small for the 30 attendees, and working with the local Virginia school system to coordinate professional development credits and time off for teachers.

- *Impact on gender equity teaching strategies:* The program leader indicated that she was already somewhat familiar with gender equity teaching strategies prior to the training, and that the teachers who attended were sensitive to the issue as well. In terms of the training's impact on her thinking about how girls learn, experience, and enjoy science, however, she said it "*absolutely*" impacted her and commented on the value of the concrete information provided. She also elaborated on the value of the training for

[12] The 9 partner trainings took place between January 17th and April 30th, 2014.
[13] The GEMS Clubs: http://www.gemsclub.org/

others in attendance from her point of view as a knowledgeable observer (rather than an educator), saying: "*As an observer, it was clear that it was helpful. It's the kind of thing that's easy not to erase biases though, even for this group, which is very invested. What you need to do is measure the impact once they turn around and implement the program."*

- *Use of SciGirls resources:* Though the program leader thought that the *SciGirls* materials were "*excellent*," she was uncertain about the extent to which the educators who attended the training would be able to implement the activities in their communities. She also expressed concern that the educators involved with GEMS might not be able to implement the activities unless they received additional funding, reasoning that (at least in the GEMS network) financial compensation might make *SciGirls* easier to apply. With respect to the video and web resources, the program leader indicated that many of her educators already use these kinds of materials, and that she would have to survey them to see if the training impacted their skill and interest in doing so further.

- *Interest in becoming a SciGirls trainer*: The GEMS program leader initially said that she was "*not at all interested*" in becoming a *SciGirls* trainer. Her interest in doing so did not waiver after the training, mainly because she volunteers for GEMS and didn't see a way to "piggyback it" onto one of her paid positions.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June of 2014, the GEMS program leader said she thought some of the educators who attended the training had implemented *SciGirls* lessons, and that others were planning to implement the lessons in the coming year, but could not elaborate. This group of educators came from GEMS' listserv of approximately 75 people, all of whom are affiliated with the organization, and most of whom have hands-on experience with the group. The *SciGirls* training was made available to these contacts on a first come, first served basis.

GEMS logo available at http://www.gemsclub.org/

- *How SciGirls builds on or differs from previous programs:* The program leader explained that *SciGirls* brings GEMS new resources and opportunities for educators, adding that as an umbrella organization of a grassroots group, *SciGirls* is an ideal partnership. She also indicated that *SciGirls* would bring to the youth served by GEMS "*a knowledge of SciGirls, and creative, research-based activities*."

- *Number of girls reached*: Though GEMS indicated on their background survey that they hoped to reach 8,000 girls with the *SciGirls* resources, the program leader clarified that this initial estimate included girls who might learn about *SciGirls* through GEMS' promotional outreach. By giving exposure to *SciGirls* through their website and social media pages, the organization hopes to open the door for self-motivated individuals to get involved with *SciGirls*, particularly those who might not otherwise hear about the program. The total number of girls reached directly by the resources is difficult to estimate, as it depends on how the 30 training attendees use and share the materials.

- *Satisfaction with SciGirls resources*: As noted earlier, the program leader was unsure which video, print, and web resources the GEMS affiliates have used or plan to use. Though she declined to comment on how satisfied the organization has been with the *SciGirls* resources, she spoke highly of the program from a personal point of view and said she would "*give anything*" to see the materials used more widely. She also declined to discuss how the *SciGirls* materials compare to other science resources GEMS has used

to address girls' science learning, saying it was beyond her area of expertise. Finally, she said that, though she wasn't sure if the *SciGirls* resources had been used in other outreach programs, she hoped that was the case.

- *Use of SciGirls Seven*: As it didn't seem applicable to her involvement in the program and her knowledge of the curricula of the grassroots clubs under the GEMS umbrella, the program leader was not asked if she and other GEMS contacts had been able to apply the *SciGirls* Seven, the 7 principles of how girls learn science.[14] She did indicate elsewhere, however, that gender equity STEM teaching strategies are a part of all of the organization's outreach efforts.

- *Use of Spanish language resources*: Though the program leader was uncertain if the GEMS educators were using the *SciGirls* Spanish language resources, she indicated that she hoped that was the case, as there is a large Spanish-speaking population in their area. She also said that GEMS clubs work with a range of demographic groups but was unable to provide specifics about how the *SciGirls* resources had or will be used with these groups.

- *Obstacles to implementation*: The program leader initially indicated that she expected *financial constraints* and *competing institutional priorities* (particularly in the elementary schools, where she said STEM is sometimes less of a focus than other subjects) to be obstacles to the implementation of their *SciGirls* program. She elaborated on these obstacles in her follow-up interview, saying that she thought volunteer educator positions should be paid and that, in the schools, STEM education is gaining acceptance as a worthwhile use of time and resources.

- *Impact on girls*: Though GEMS isn't planning to assess what the girls gained or will gain from their *SciGirls* outreach experience, the organization's hope is that they will be engaged in math and science as they move into middle school and that *SciGirls* will have a long-term impact.

- *Impact on families*: While the umbrella organization (GEMS) provides take-home papers for educators to give the girls, who then share them with their families, the program leader could not say how often these resources are used by individual educators, or if *SciGirls* will impact the families.

- *Impact on organization*: In terms of the lasting impact of the *SciGirls* training and materials, the program leader said that the group would like to continue working with *SciGirls*, that they hope the partnership will have a long-term impact on the organization, and that they think *SciGirls* can help them in their ongoing effort to persuade educators and others of the value of informal afterschool education.

- *Program highlights:* According to the program leader, the success of GEMS' efforts depends – at least in part – on having staff who can engage with educators and others on the grassroots level.

- *Potential for sustainability*: When asked about increasing *SciGirls* (or a similar program's) chance for sustainability, the program leader pointed the value of funding a project like GEMS on the local level. On the subject of what ***tpt*** can do to support their efforts moving forward, she reiterated the importance of compensating volunteers for their time and energy. Additionally, she commented on the need to conduct evaluations that assess program implementation and execution, and the need to better estimate the time, energy, and expense of such evaluations.

- *Final comments*: Finally, when asked if she had any final comments, the program leader pointed to the importance of having a more open dialogue about "*what works and what doesn't in this community*."

[14] Please see Appendix 1 for more information about *SciGirls* Seven, from the online book *SciGirls* Seven: How to Engage Girls in STEM.

Partner 2: The GLOBE Program

Based out of Boulder, Colorado, The Global Learning and Observations to Benefit the Environment (GLOBE) program is a worldwide, school-based science and education program for girls and boys. As noted on their website:

> *GLOBE's vision is of a worldwide community of students, teachers, scientists and citizens working together to better understand, sustain and improve Earth's environment at local, regional and global scales. GLOBE's mission is to promote the teaching and learning of science; enhance environmental literacy and stewardship; and promote scientific discovery.*[15]

SciGirls training

GLOBE *SciGirls* training was held on April 30, 2014. Along with the program leader, the training was attended by GLOBE staff and staff from the University Corporation for Atmospheric Research (UCAR), which manages GLOBE. Within GLOBE, all staff members attended the training. The program leader thought that everyone who could have benefitted from the training was able to attend.

- *Prior Expectations:* Prior to the training, GLOBE's program leader noted: "*I would like to learn more about SciGirls and how to incorporate it. Additionally, I would like to share these resources with teachers I work with. On a personal note, it will be great to use with the Girl Scout troops I lead."* She felt that the training in April partially lived up to this expectation. However, it wasn't until after she attended ***tpt***'s Train the Trainer training in May 2014 that she felt "*ready to go*."

  A tweet from The GLOBE Program, shared mid-training (https://twitter.com/GLOBEProgram/status/461605022979989504)

  Prior to the April training, GLOBE's program leader noted that she hoped her staff would "*have the available resources and knowledge to share SciGirls resources and strategies."* Post-training, she indicated that this expectation had been met. At the time of her follow-up interview, her expectation that collaborating partners would "*have the option to share SciGirls resources and strategies*" had not yet been met, only because GLOBE was still in the process of identifying program partners.

- *Most and least valuable aspects:* When asked what she found most valuable about the training, GLOBE's program leader pointed to the opportunity to learn about the *SciGirls* Seven and how to incorporate the strategies into GLOBE's current activities and offerings. It was not her first exposure to *SciGirls* Seven, but it was her first in-depth exposure, and the experience gave her "*food for thought*." When asked what she found least valuable about the training, she mentioned that she was already fairly knowledgeable about girls and STEM careers. However, for the rest of GLOBE's team, she thought everything was "*really good*."

- *Impact on gender equity teaching strategies:* GLOBE's program leader indicated that information about gender equity teaching strategies had the largest effect on her staff, as evidenced by the level of

[15] The GLOBE Program's Vision Statement & Mission: http://www.globe.gov/about-globe/vision-statement-mission

awareness they now exhibit. Personally, she was already familiar with this subject, and with research about how girls learn, experience, and enjoy science.

- *Use of SciGirls resources:* Though she felt "*pretty prepared*" to implement *SciGirls* activities in her community after the first training, the Train the Trainer training made an even larger impact. As this second training was held over the course of 3 days, it was more in depth and provided additional opportunities to see the hands-on activities and discuss the research behind the *SciGirls* Seven. The Train the Trainer training also focused more on adult learning, which GLOBE's program leader found especially applicable to her work with educators. In terms of GLOBE's use of the video and web resources, the program leader noted that – though she thinks they are "*fantastic*" and "*valuable*" for others – she has a personal preference for hands-on activities.

- *Interest in becoming a SciGirls trainer*: GLOBE's program leader was initially *extremely interested* in becoming a *SciGirls* trainer, and chose to attend the Train the Trainer training because the project is "*so well-researched and put together. [SciGirls] has it all, it's very well done*."

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in late May of 2014, GLOBE staff were still planning how best to incorporate *SciGirls* into their outreach efforts. They hope to share the resources through a virtual workshop with the NASA education community, and also intend to introduce *SciGirls* to approximately 30 partners, ranging from professors to teachers to scientists, at an upcoming event.

- *How SciGirls builds on or differs from previous programs*: The program leader explained that *SciGirls* is a nice complement to their current offerings, and that working with *SciGirls* will strengthen the collection of activities their partners have at their disposal. She also said that they intend to use the *SciGirls* Seven to make their current activities more open-ended and collaborative, saying, "*We have good activities, created by educators, and they have been well research, but there are ways to make small improvements*."

- *Number of girls reached*: In all, GLOBE estimates that they will be able to reach more than 10,000 girls within the year, which was their initial estimate on their background survey.

- *Satisfaction with SciGirls resources*: In addition to using some to be determined activities, GLOBE also intends to share the videos and web resources with their partners. In general, they are very satisfied with the *SciGirls* resources, finding them "*well researched and well put together*" and noting that they compare favorably to other resources used by their staff because they nicely highlight the collaborative nature of STEM learning. Additionally, when asked if the *SciGirls* resources had been or will be used in other outreach programs, she pointed to the University Corporation for Atmospheric Research (UCAR), which manages GLOBE and was represented at the training, but did not elaborate on the specific materials UCAR had used or would use in their outreach efforts.

- *Use of SciGirls Seven*: Because GLOBE primarily works with educators, their assessment of girls' gains is informal and anecdotal. However, GLOBE's program leader said that one of their main goals is "*for girls to see how they fit into science, and that science can be fun*." The program leader also noted that she and her staff believe they will be able to apply the *SciGirls* Seven, the 7 principles of how girls learn science, to their other outreach offerings. Furthermore, when asked if and how they have incorporated gender teaching strategies into their other outreach efforts, GLOBE's program leader noted that this approach has been central to their work for a number of years.

- *Use of Spanish language resources*: As of May 2014, GLOBE had yet to use the Spanish language *SciGirls* resources but was intending to share them with to be determined partners and educators in the near future. The program leader also explained that GLOBE intends to use *SciGirls* to reach a broad demographic, from "*rural to urban, 100% free and reduced lunch to private Ivy League prep schools, Tribal schools, schools with large minority populations, and everything in between*."

- *Program highlights:* According to the program leader, GLOBE's past and future success can be credited to many factors: supportive coworkers, a large and well-established network, and the *SciGirls* agendas, slides, and presentation materials, among others.

- *Obstacles to implementation:* The largest challenge to GLOBE's programming is financial. In recent years, budgets have been cut and the staff has diminished, leaving remaining employees "*trying to do more with less*." Though GLOBE's program leader also identified *time constraints* as a potential challenge on their background survey, after attending the training and learning more about the prepared resources *SciGirls* provides (such as presentation slides and activity agendas), she doesn't think this will be as large an obstacle as initially estimated.

- *Impact on girls and families:* As GLOBE has yet to share the resources widely, it is too soon to say what the lasting impact might be on the girls and families that will participate.

- *Impact on organization:* GLOBE's program leader notes that the program has already had an effect on her staff (who are "*glad they're doing this*") and will hopefully have a long term impact on the organization as well, depending on how the materials are received and utilized by GLOBE's to be determined partners.

- *Potential for sustainability:* When asked about increasing *SciGirls* (or a similar program's) chance for sustainability, GLOBE's program leader expressed her support for the Train the Trainer model. On the subject of what ***tpt*** could do to support their efforts moving forward, she noted that she likes the webinars and open chat sessions but mentioned that she would appreciate additional ways of keeping in touch, such as email check-ins.

Partner 3: Challenger Learning Center of Northern Nevada

Based out of Reno, Nevada, the Challenger Learning Center of Northern Nevada aims to use space exploration to "*[create] positive learning experiences that raise students' expectations of success; foster a long-term interest in mathematics, science, and technology; and motivate them to pursue careers in these fields."* [16]

SciGirls training

The Challenger Learning Center of Northern Nevada's (CLCNN) *SciGirls* training was held on March 8, 2014. Along with CLCNN's program leader, the training was attended by other staff, partner staff (local Girl Scout leaders), school educators, and volunteers, with some overlap in these groups. Approximately 20 people attended the training. The program leader mentioned that there were some teachers who wanted to attend the training but had scheduling conflicts. When asked if she thought they would have benefited from an online component, she said she did *not* think this would have been of use, as the valuable hands-on elements would be impossible to duplicate. Additionally, she indicated that she did not think that staff participation (or lack thereof) affected what they have been able to do, saying, "*There was still a good-sized group, so we were able to accomplish a lot*."

- *Prior expectations:* Going into the training, CLCNN's program leader said she expected it would see her handling "*[organization of] the local event (communication with school district teachers, etc.); logistics for event set-up, registration, communications with SciGirls staff*" and that her staff would "[*provide] supplementary/follow-up content and training after SciGirls content has been delivered*." She felt that the training in lived up to both of these expectations, saying that she found it especially easy to communicate with *SciGirls* staff and that the training made her staff more aware of gender equity teaching strategies. In terms of logistics, she also mentioned that she wasn't able to get the minimum number of required RSVPs until only a day or so before the trainer's deadline, which added some stress to the situation. However, this potential downfall allowed CLCNN to work out some of the kinks of their communication with teachers *and* establish connections with their school district administration, which turned out to be beneficial for the organization. In terms of her expectations for their collaborating partners, the Girl Scouts, she initially hoped they would recruit attendees for the training and was pleased that they fulfilled this expectation.

- *Most and least valuable aspects:* CLCNN's program leader indicated that the materials received, information about how to access the online resources, and the opportunity to run through the hands-on activities were the most valuable aspects of the training. She also said that she found no aspect of the training to be "least valuable," noting that there were kindergarten through high school teachers at the training and that different things were likely important to different people.

- *Impact on gender equity teaching strategies*: Though the program leader indicated that she was already somewhat familiar with gender equity teaching strategies prior to the training, she said she has noticed subtle changes in her staff, like their use of pronouns. Personally, the experience renewed this knowledge, and she mentioned that she also pays closer attention as she's forming words and phrases, to better encourage the girls.

- *Use of SciGirls resources:* CLCNN's program leader thought the resources were valuable, focusing on what she and her staff had learned at the training: "*It gave us ideas for activities we can do when we go*

[16] Challenger Learning Center of Northern Nevada: http://www.nevadachallenger.org/NevadaChallenger/About_Us.html

out to schools or hold our workshops, and it also gave us ideas for things that teachers can do with their kids." With respect to the video and web resources, she noted that CLCNN will be utilizing some of the *SciGirls* video clips and web resources, though they haven't decided which ones will be incorporated into their programming. They expect that these resources will merge into their existing programs with relative ease, as they are already using both video and web materials in their outreach.

- *Interest in becoming a SciGirls trainer:* Though CLCNN's program leader was initially *moderately interested* in becoming a *SciGirls* trainer, she has no plans to do so in the near future, primarily because she is currently focused on her other work with CLCNN.

SciGirls outreach program implementation and longer term outcomes

CLCNN currently has a stationary mission control simulator and a portable and inflatable dome (shown in the images below) that they take to schools and other groups. At the time of their follow-up interview in June 2014, CLCNN was still planning how best to incorporate *SciGirls* into their outreach efforts. Working with their partner, the Girl Scouts, they plan to visit a Girl Scout sleep-away camp a few times over the summer. They will be working with approximately 25 girls, grades 5-10, each time they visit, and will likely exceed their initial estimate of 50+ girls served by the *SciGirls* resources. When they work with the girls, they intend to use a non-*SciGirls* "rocket launch" activity, some to be determined *SciGirls* video clips, and the *SciGirls* Seven teaching strategies.

The Challenger Learning Center of Northern Nevada's Digital Dome, for off-site outreach efforts (http://www.nevadachallenger.org/NevadaChallenger/Dome_Programs.html)

If the camp visits go well, CLCNN might also partner with local troops and attend their meetings. To date, they've only worked with the Girl Scouts on an occasional basis, so the CLCNN camp activities have the potential to further the relationship between these two organizations.

- *How SciGirls builds on or differs from previous programs:* The program leader explained that CLCNN hopes to use their position in the community to let youth and educators know about *SciGirls* and its resources, as the program isn't shown or well known in their area. She also spoke about the opportunity for CLCNN educators to be more mindful of best practices when working with girls.

- *Number of girls reached*: As noted above, CLCNN will be working with more than 50 girls in the summer of 2014 through their partnership with the Girl Scouts. They also hope to partner with local troops in the

coming year, and intend to share the resources with educators and STEM coordinators in their area, though the program leader could not estimate how many girls these two efforts would allow them to reach.

- *Satisfaction with SciGirls resources*: Rather than incorporating specific activities into their programming, CLCNN primarily intends to share video and web resources with youth and educators – specifically the space, engineering, and technology modules. They have also been using the CONNECT website to see how other educators have used and adapted the materials. CLCNN is generally satisfied with the *SciGirls* resources, finding them "*very thorough*" and pointing to the value of having the educational standards available online, which they think the teachers and administrators they work with will greatly appreciate. When asked how *SciGirls* compares to other resources they've used to address girls' science learning, the CLCNN program leader said "*This is the 'go-to' place for girls in science. There's so much there!"* and commented again on the exhaustive educational standards (as in, "*Teachers can show their principals a whole page of standards, not just one or two*"). Additionally, the program leader indicated that some of the teachers who attended the training might have used *SciGirls* activities in the classroom but couldn't provide details.

- *Use of SciGirls Seven*: The program leader felt that she and her staff have been able to apply the *SciGirls* Seven in their work. Their staff consists of one full-time employee, one part-time employee, and 5 volunteers. Though none of the volunteers have been trained as teachers, they appreciated the opportunity to learn about the *SciGirls* Seven. Additionally, CLCNN's program leader explained that, even though they generally work with mixed gender groups (with the upcoming Girl Scouts camp being their first girl-focused session), she and her staff will be thinking about gender equity teaching strategies in all of the work they do.

- *Use of Spanish language resources*: As of June 2014, CLCNN had yet to use the Spanish language *SciGirls* resources but was planning to share them with schools in the area, many of which are largely Hispanic and also have STEM coordinators who may appreciate the opportunity to learn more about *SciGirls*. As noted by the program leader, "*It's a great opportunity to share this resource that a lot of them might not even know about*." Additionally, CLCNN has used and intends to use *SciGirls* to reach a broad demographic, as in: "*We anticipate reaching a diverse group of girls in our area. Our school district is now more than a quarter Hispanic, and our partner organization reaches to girls of differing socioeconomic status*." Though they haven't used the materials yet, the CLCNN program leader thinks the resources will be enjoyable and accessible to all demographics.

- *Program highlights*: According to the program leader, the success of the project depends – at least in part – on the strength of their partnership with the Girl Scouts. To that end, it was "*helpful to have the Girl Scout leaders at the training, so they're excited about us and about SciGirls…it was nice to make that connection with them and experience the training with them*."

- *Obstacles to implementation:* Though CLCNN's program leader initially thought that *linking with partners* would be their biggest obstacle, she is pleased with the progress that has been made. She noted, however, that after the Girl Scouts shared information about CLCNN in their newsletter, the number of requests for troop visits was lower than desired. Still, both organizations think that this relative lack of interest was due to the (end of school year) timing of the newsletter and are hopeful that the next announcement will yield better results. If not, the CLCNN's program leader intends to reach out to troop leaders on an individual basis.

- *Impact on girls:* Though CLCNN isn't planning to assess what the girls gained or will gain from the *SciGirls* outreach experience, the organization's hope is that the girls will see that they are capable of succeeding and that STEM can be fun.

- *Impact on organization:* CLCNN's program leader noted that the program has already had an effect on her volunteers. Because these volunteers previously picked up on education strategies in a "*sideways way*," through informal or on-the-job training, they have greatly benefitted from this more direct instruction. She also felt that CLCNN's connection to *SciGirls* would be beneficial to the organization in terms of having a wealth of resources and activities that they can share – in person and virtually – with educators.

- *Potential for sustainability*: CLCNN's program leader said that she hoped ***tpt*** would continue making new episodes and online resources, increasing the number of activities groups like theirs can use to engage youth. Additionally, on the subject of what ***tpt*** could do to support their efforts moving forward, she noted that she appreciated all of their support thus far and was grateful for the opportunity to share the *SciGirls* programming with her community.

Partner 4: Girls Inc. of Orange County

Based out of Costa Mesa, California, Girls Inc. of Orange County is an affiliate of the Girls Incorporated national organization. As noted on their website:

> *Girls Inc. of Orange County positively changes the lives of 5,000 girls, ages 4 1/2 to 18, each year, by providing year-round holistic, compensatory, and intentional programming focusing on STEM (Science, Technology, Engineering & Math), financial literacy, sound body image, healthy relationships, and college and career readiness.*[17]

SciGirls training

Girls Inc.'s *SciGirls* training was held on January 17th, 2014. In addition to their program leader, the training was attended by 7 or 8 other Girls Inc. staff members and 6 or 7 students from their partner organization, the Society of Women Engineers (SWE) at Santa Ana College, for a total of approximately 14 attendees. Though the Girls Inc. program leader initially indicated that volunteers might attend the training, this turned out not to be the case. The program leader mentioned that there were some people who could have benefitted from the training but could not attend due to scheduling conflicts. When asked if she thought they would have benefited from an online component, she said that she did *not* think this was necessary and mentioned that she will instead sit down with them and review the training. Additionally, she indicated that she did not think that staff participation (or lack thereof) has affected what they have been able to do.

- *Prior expectations:* Going into the training, Girls Inc.'s program leader noted that she hoped to "*learn new activities and gain a clear understanding of SciGirls resources to implement throughout the year*" and that she expected her staff would "*gain a better understanding of STEM and why it's important for our girls to be exposed frequently to it. Become more confident in helping to offer STEM programming.*" After the training, she indicated that both of these expectations had been met. In terms of her expectations of her collaborating partners, she initially expressed a desire to "*develop a strong partnership with Santa Ana College Society of Women Engineers to help offer STEM programming to our girls.*" Post-training, she said that – though she felt the foundation of this partnership was there – the two organizations hadn't had as much time as she would have liked to organize programs together. However, at the time of their follow up interview, Girls Inc. was planning a 4-week summer camp on the Santa Ana College campus. Additionally, 5 students from the college (SWE members and students from other STEM disciplines) were hired to work in their Eureka! program, a summer camp that develops girls' skills and enthusiasm in STEM. The program leader was excited about the students' involvement because she thought it would be valuable for the girls to meet mentors who are from their neighborhood, attend the community college, and are in STEM.

- *Most and least valuable aspects:* Girls Inc.'s program leader indicated that the opportunity to be led through the hands-on activities (as if they were a group of students) and the opportunity to work in a collaborative team were the most valuable aspects of the training. She also felt that the facilitator did a good job mixing up the groups and encouraging her staff to interact with the students from Santa Ana College. When asked what she found least valuable about the training, she pointed to the website review. Though she thought it would be a valuable resource for some, she's not sure her staff will take advantage of the online offerings.

[17] Girls Inc. of Orange County: http://www.girlsinc-oc.org/

- *Impact on gender equity teaching strategies:* The program leader indicated that she and her staff were quite familiar with gender equity teaching strategies prior to the training. Similarly, though the training didn't change her thinking about how girls learn, experience, and enjoy science, it reinforced what she already knew.

- *Use of SciGirls resources:* Though she thought the training prepared her to implement the *SciGirls* activities, she said that she has a STEM background and would be curious to ask some of her staff members this same question. With respect to the video and web resources, the program leader noted that – though she thinks they are "*good resources*" – she and her staff are unlikely to use them as they don't often have access to computers or the Internet in the rooms where they work.

- *Interest in becoming a SciGirls trainer*: The Girls Inc. program leader was initially *extremely interested* in becoming a *SciGirls* trainer, and choose to attend the Train the Trainer training so she could be a resource for Girls Incorporated nationally and bring *SciGirls* to other chapters.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June of 2014, Girls Inc. had completed two programs that made use of a *SciGirls* activity and were also planning to incorporate *SciGirls* activities into their summer camp.

On March 15, 2014, Girls Inc. coordinated a 3-hour Saturday field trip to Broadcom with around 16-20 7th and 8th grade girls, during which they toured the facilities, met some of the company's engineers, and did the *SciGirls Season One* activity *Dough Creature* with Broadcom staff, as shown in the image to the right. While staff from Girls Inc. initially tried to allow the Broadcom engineers to facilitate the activity, they quickly found that they had to intervene to make it more open-ended and fun for the girls. In spite of this hiccup, the program leader still described the day as "*very successful*."

Building a Dough Creature at Broadcom (Image courtesy of Girls Inc. of Orange Country)

On March 27, 2014, Girls Inc. incorporated *Dough Creatures* into a local math and science night for approximately 100 (male and female) elementary school students. Additionally, with their 2014 summer camp, which was still being planned at the time of their follow-up interview, they intend to incorporate *Dough Creatures* and a few other (unknown, at the time of their interview) *SciGirls* activities. With this outreach they will work with a maximum of 160 7th and 8th grade girls.

When asked to elaborate on their use of *Dough Creatures* in multiple events, the program leader said that now that they have the kits, the activity is her go to. She also mentioned that they might use *Deep Sea Diver* in the camp's design week and something similar to the *Super Sleuths* activity (but without glitter, because she is "*anti-glitter*") in the camp's CSI week. Additionally, Girls Inc. also hopes to establish a Saturday Science STEM club that can make use of multiple *SciGirls* activities, if and when they receive funding for this endeavor.

- *How SciGirls builds on or differs from previous programs:* The program leader explained that the focus on STEM at Girls Inc. of Orange County is relatively new and that – because she won't have to spend much time planning and modifying the *SciGirls* events – she thinks the materials will help them be even more

organized in the coming year. She also commented on the value of printed lessons plans and noted that she prefers books to online resources, which can be somewhat daunting when she needs to find something quickly.

- *Number of girls reached*: Though Girls Inc. initially estimated that they would reach 50 girls, that estimate has gone up to between 100 and 160 for the camp alone, on top of the 70 or so girls they have reached with programs already completed.

- *Satisfaction with SciGirls resources*: In addition to using the activities and the printed activity guides, the program leader indicated that she might be able to incorporate the videos in their summer camp, depending on classroom access and equipment. Though she isn't sure which episodes or clips she will use, she mentioned that it is useful that the episodes have been broken up into shorter clips. In general, the program leader indicated that she was "*very satisfied*" with the *SciGirls* resources. In comparison to other science resources she has used to address girls' science learning, she found the materials easier, more compact, and "*right there, topic wise.*" With her busy schedule, she appreciates having a reliable resource at her fingertips. Additionally, unlike some of the other science resources she has used, she appreciates that *SciGirls* features young girls and female scientists. She also said that someone from the local Boys & Girls Club might have also used the materials but was unable to provide details.

- *Use of SciGirls Seven*: When using the resources, the program leader felt that she has been able to apply the *SciGirls* Seven. Though she is less certain about other staff members, since they have not yet had an opportunity to facilitate with these principles in mind, she noted that the *SciGirls* approach is similar to how they generally work at Girls Inc. She also indicated, elsewhere, that gender equity teaching strategies are a part of all of the organization's outreach efforts.

- *Use of Spanish language resources*: Girls Inc. intends to use *SciGirls* to work with a large number of Hispanic students, the majority of whom come from non-English speaking homes (90% in their summer camps and 69% in their other programs). As of June 2014, Girls Inc. had yet to use the Spanish language *SciGirls* materials but hoped to find a way to incorporate them in the near future, possibly by showing clips in Spanish during an upcoming family night, for example. Additionally, the program leader also said that the *SciGirls* resources "*can serve any girl*."

- *Program highlights:* According to the program leader, Girls Inc.'s past and future success can be credited to many factors, including a supportive staff and an established, trusting relationship with the girls. The girls who visited Broadcom, for example, attended their summer camp in 2013 and were interested enough in the field trip that they signed up voluntarily. As noted by the program leader, when the girls sign up to do something with Girls Inc., they know that "*this will be fun, and these people care about us*."

- *Obstacles to implementation:* The largest obstacle facing the Girls Inc. program leader is *limited time*. She works with groups of all ages and sometimes feels the pull of *competing institutional priorities*. Additionally, she noted that Girls Inc. faces *financial constraints* and *access to facilities/equipment* (specifically in terms of finding programming space and access to computers and other technology).

- *Impact on girls:* In terms of assessing what the girls have gained and will gain from the *SciGirls* outreach experience, Girls Inc. plans to do a STEM-focused pre- and post-assessment with the girls in their summer camp. Though they didn't do anything official to assess the gains made by the girls who took part in the 3-hour field trip to Broadcom (or the girls at the outreach event for elementary school students), Girls Inc. staff informally noticed that Dough Creatures has been a very popular activity. Additionally, the program

leader noted, "*Some of the girls didn't think they would be able to make it work. A lot of girls have a lot of self doubt, and this activity erased some of that doubt."* Elsewhere in the interview, she also expressed a hope that *SciGirls* programs would impact the girls, saying, *"I don't know if it will increase their interest in STEM but I think it will help them enjoy STEM. If they have an interest, it will foster it. If they are hesitant, it might help us break through.*"

- *Impact on families:* Though the impact on families has been minimal, the program leader hopes the partnership with *SciGirls* has and will help parents learn about Girls Inc.'s ongoing outreach efforts.

- *Impact on organization:* Girls Inc.'s program leader noted that *SciGirls* will be part of Girls Inc. of Orange County for at least as long as she is with the organization, as she is now a *SciGirls* trainer and intends to share the opportunity with other chapters. She also said that the experience has expanded staff members' confidence in what they are capable of teaching.

- *Potential for sustainability:* Girls Inc.'s program leader said that she thought it would behoove ***tpt*** to expand the Train the Trainer program, as the model works well. She also talked about the importance of providing print materials to groups like hers, in addition to online resources. On the subject of what ***tpt*** could do to support their efforts moving forward, she mentioned that she and the other trainers might be motivated to share the resources more widely if they were to receive a stipend after running a training. Finally, she expressed an interest in meeting up with other *SciGirls* trainers and partners yearly or every few years. She thought this would be a good way to learn about new activities, share ideas, and get re-energized, saying, "*The webinars are good but there's nothing more beneficial, in my mind, than actually being in the same room as somebody and sharing ideas and learning something or getting their hands on the materials*."

Partner 5: Society of Women Engineers (SWE) at Santa Ana College

The Society of Women Engineers (SWE) at Santa Ana College is a chapter of SWE that was established approximately one year ago at a community college in Santa Ana, California. Though the group is not an official school club, they define themselves as a support group for students interested in pursuing engineering or another STEM field. As noted on their Facebook page, "*One of our main goals is…to mentor students from 6th-12th grade and encourage them to explore STEM fields, or simply pursue higher education."* [18]

SciGirls training

SWE's *SciGirls* training was held on January 17th, 2014. In addition to their program leader, who was one of the founding members of the Santa Ana College chapter, the training was attended by 7 students (SWE members and other students from the college) and 6-8 attendees from their partner organization, Girls Inc., for a total of approximately 14 attendees. Through the SWE program leader initially indicated that volunteers might attend the training, this turned out not to be the case. However, the training did help the club locate two new members, one of whom will be SWE's Vice President in the 2014-2015 academic year.

The training was held on a Friday because that was the best day for the majority of SWE members. However, the program leader mentioned that there were some students who could have benefitted from the training but had scheduling conflicts such as classes and jobs. When asked if she thought these SWE members would have benefited from an online component, she said that this likely would have been of value. Without this resource to refer to, SWE members who attended the training held a meeting for fellow members in which they shared the materials and talked about the *SciGirls* activities. Additionally, when asked if member participation (or lack thereof) has affected what they've been able to do, the program leader said yes. She indicated that, as a small and relatively new club, the group needs more member involvement, particularly in the face of obstacles like having a small engineering population to draw from and the challenges that come from being a club group on a community college campus where a lot of students hold jobs, live far from campus, and/or take classes at "*weird times*."

- *Prior expectations:* Going into the training, SWE's program leader noted that she hoped to "*learn as much as possible and feel confident about taking leadership in organizing activities for my group and the community.*" She later indicated that the training lived up to this expectation and that she feels better prepared to work with and guide youth than she did before the training (when she was occasionally volunteering with other girl-focused groups in the area). She also said that she initially expected the other members of SWE to "*commit to the program and use the tools acquired to benefit the outreach program we organize.*" Though not related to the quality of the training, she noted that she has had difficulty getting commitments from other members to follow through on *SciGirls* outreach, and that she hopes this will improve in the future. She is planning to transfer in the coming year, and is currently the last of 6 founding SWE members at Santa Ana College. Before she leaves, she would like to share her institutional memory and "*get the ball rolling*" on *SciGirls* outreach to make sure SWE stays active and focused.

  In terms of goals for SWE's collaborating partners, she initially commented on her expectations for Santa Ana College, as in: "*Support for our group to successfully plan and organize outreach events.*" Meeting this goal has also been challenging, mainly because SWE is a small chapter and not an official school club, which has made it difficult for the group to plan events on campus. However, they are currently looking for ways to partner with other, established engineering clubs to coordinate outreach efforts that will help them bring *SciGirls* resources to the community.

[18] Santa Ana College's Society of Women Engineers' Facebook page: https://www.facebook.com/SWE.SantaAnaCollege

- *Most and least valuable aspects*: SWE's program leader indicated that the opportunity to have the resources explained in an in-depth way and the chance to see how different people approach the hands-on activities were the most valuable aspects of the training, as they helped her feel better prepared to work with girls. When asked what she found least valuable about the training, she made what she acknowledged to be a minor criticism of the outdoor icebreaker, saying that she didn't enjoy it because it was hot and many of the attendees already knew each another.

- *Impact on gender equity teaching strategies:* SWE's program leader explained that the training's focus on gender equity teaching strategies confirmed what she already had a gut instinct about, saying "*When you start hearing these things you think 'Oh, that's right, we DO learn this way, we DO think this way*." She went on to note that the training has helped her approach teaching girls and making content interesting to girls in a new way. She also indicated that the training impacted her thinking about how girls learn, experience, and enjoy science by confirming what she has experienced in her classes.

- *Use of SciGirls resources*: SWE's program leader said the training was a "*great experience*" that prepared her to implement the *SciGirls* activities in her community. She mentioned that she had volunteered with youth in the past, but now feels better prepared to guide the girls she will work with in the future. Other SWE members had less volunteering experience and went into the training with concerns about their inexperience. After the training, however, the program leader noted that members have been talking about how they now feel up to the task and have been "practicing" on family members and friends.

  With respect to SWE's use of the video and web resources, the program leader noted that she has reviewed a lot of materials on the website, including the videos, saying, "*I don't think we knew that something like this existed, with STEM-related activities*." She specifically mentioned that she liked the presentation resources and the guides for talking to parents about *SciGirls* and STEM.

- *Interest in becoming a SciGirls trainer*: SWE's program leader was initially *slightly interested* in becoming a *SciGirls* trainer, but has decided not to pursue the opportunity because she has too many classes and commitments to add anything to her schedule.

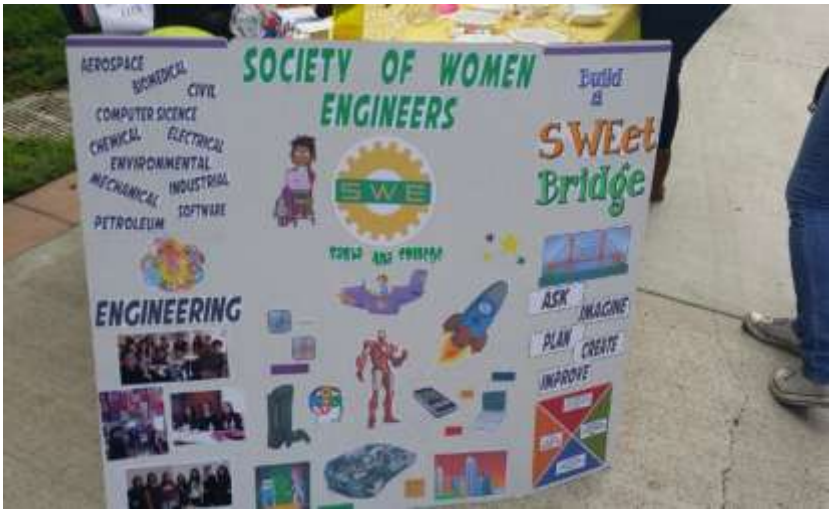
SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June of 2014, SWE had completed two programs that made use of a *SciGirls* activity or resource. The group also hopes to incorporate *SciGirls* into events in the upcoming academic year.

For their first event in March 2014, SWE participated in the 20th annual Santa Ana College KinderCaminata (Kinderwalk) by preparing a table and a poster using some of the *SciGirls* materials, as shown in the image on the following page. During the event, 1000 kindergarten (male and female) students, as well as parents and teachers, visited the campus and toured approximately 30 tables that provided interactive exposure to a range of careers.[19] Though they were not able to feature any of the *SciGirls* activities at their table, SWE members used what they had learned at the training to talk with girls and their parents about STEM.

[19] Though SWE's program leader guessed that there were approximately 500 students at the 2014 Kinderwalk, Santa Ana College's website's made the pre-event estimation that the event would draw 1,000 boys and girls. (http://www.sac.edu/newsroom/Pages/Santa-Ana-Students-Start-Thinking-about-Attending-College-in-Kindergarten.aspx#.U9VMeIBdXfg)

In late April 2014, the Santa Ana College SWE chapter collaborated with UC Irvine's SWE chapter and the Girl Scouts to include *SciGirls* programming in Badge Day, hosted at UC Irvine. During the event, they shared *Dough Creatures* and *Take it in Stride*, both from *SciGirls Season One*, with approximately 150 girls. Additionally, the Santa Ana College SWE chapter used *SciGirls* resources to create a poster for the event.



SWE poster at the 2014 Santa Ana College KinderCaminata (Kinderwalk) (https://www.facebook.com/SWE.SantaAnaCollege)

In the coming year, the SWE program leader also hopes to share *SciGirls* with her son's school. Her long-term goal is to start a STEM club at the school (for boys and girls) that will utilize the *SciGirls* resources, but this is something that she won't be able to formally discuss with school's educators until September 2014 at the earliest. Finally, as mentioned above, SWE is also hoping to collaborate with other engineering groups on campus to plan outreach efforts that will help that share *SciGirls* resources with their community.

- *How SciGirls builds on or differs from previous programs:* The program leader explained that the training and access to the activities has taught SWE members how to work with kids, saying, "*A lot of engineers and other professionals don't know how to present to kids – they do it like they're in a meeting*." When asked what the program would bring to the girls served that wasn't previously available, she elaborated on this topic, saying that SWE's members now know how to speak about engineering with girls and (hopefully) pique their interest.

- *Number of girls reached:* Though they were initially uncertain about the number of girls they would reach, SWE has already shared *SciGirls* activities with 150 Girl Scouts and will likely reach even more youth (boys and girls) with upcoming programming.

- *Satisfaction with SciGirls resources*: In addition to using the specific activities described above, the program leader indicated that she would like to use some (to be determined) video resources, that she has downloaded statistics about girls in science, and that she has shared information about *SciGirls* with other SWE members. She also tried to direct members to the *SciGirls* websites during the grantee application process, and has found that she's using the web resources "*mainly to inform my own group*." In general, the program leader indicated that she was "*very satisfied*" with the *SciGirls* resources, saying that she doesn't think she's seen "*anything else like this out there*." She also indicated that the resources might be used by Santa Ana College's Society of Hispanic Engineers and the school's Engineering Club. She said she shared the materials with both groups (and that the president of the Engineering Club attended the *SciGirls* training) but isn't sure what – if anything – the two clubs have done to incorporate *SciGirls* into their outreach efforts.

- *Use of SciGirls Seven*: When using the resources, the program leader felt that she and other SWE members have been able to apply the *SciGirls* Seven. She printed out the *SciGirls* Seven for all of her members, and mentioned, "*a lot of us relate to these principles…because we're women in STEM*."

Additionally, when asked if and how they have incorporated gender teaching strategies into their other outreach efforts, the SWE program leader noted that she and some of the other members have been using these strategies with their family members and friends.

- *Use of Spanish language resources*: SWE's program leader explained that they hope to use *SciGirls* to work with a large number of Hispanic students. When asked if they had been able to use the resources to reach their intended audience she said, "*not as much as I had planned – I had hoped to reach more Hispanic people because Santa Ana College and the community are mainly Hispanic. The Kinderwalk was mainly Hispanic, but I don't think there were any Hispanic people at the Girl Scouts' event [Badge Day at UC Irvine].*" In the future, she hopes to use the Spanish language materials for parents, saying, "*A lot of the parents [at her son's school] don't speak English, and I think it is very important to help parents learn about STEM and how to get their girls (and boys) interested*." She also mentioned that, even though she is bilingual, she occasionally finds it difficult to remember the Spanish translations of technical terms that she doesn't use on a daily basis, and that the *SciGirls* Spanish language resources will help her from having to translate everything herself.

- *Program highlights:* According to the program leader, the success of SWE's past and future outreach efforts depends on a number of factors, including: a dedicated member base, a good faculty advisor, and partnerships with organizations like Girls Inc.

- *Obstacles to implementation*: The largest challenges to SWE's *SciGirls* programming are *time constraints*, *access to facilities and equipment* within Santa Ana College, and *financial constraints*. However, funding has been less of a concern than initially anticipated, in part because the chapter intends to apply for a grant from SWE and in part because the *SciGirls* activities are less expensive than anticipated.

- *Impact on girls:* Though SWE does not have plans to coordinate any formal assessments and found it difficult to comment on the lasting impacts to girls, the program leader pointed to the value of SWE members working as both educators and role models and informally noted that they have had a very positive response from the girls they've worked with. Additionally, she explained that she thought it was important for girls to relate to young women in STEM (the SWE members) who are relatively close in age.

- *Impact on families:* Though the program leader found it difficult to comment on the lasting impacts to families, she and other SWE members have been pleased to find that parents are generally been interested in learning more about encouraging their daughters to stay interested in STEM.

- *Impact on organization:* In terms of the lasting impact of the training and materials, the program leader noted that it has already impacted both SWE and its members, saying, "*I think it taught us a lot, especially the members who didn't know how to run these types of events or activities. We are in the classroom right now, and we know how hard it is to prove yourself as a woman in STEM, and we want to change the system. Knowing that there's an organization like SciGirls out there, working to change this too – and that we can get involved with SciGirls – is huge*." Beyond the Santa Ana College chapter, the program leader also mentioned that many of their members will be transferring to schools with active SWE chapters in the coming semesters and will likely share *SciGirls* when they enroll somewhere else.

- *Potential for sustainability*: SWE's program leader suggested that *SciGirls* do more outreach and advertising, as most people in her area don't know what it is. Additionally, on the subject of what ***tpt*** could do to support their efforts moving forward, she requested that ***tpt*** let SWE know if and when new seasons and activities have been added, so they can add to their outreach repertoire.

Partner 6: SELF International, Inc.

Based out of Minneapolis, Minnesota, SELF International, Inc. is a non-profit educational organization that works to bring STEM opportunities to underserved youth ages 5-17. From their website:

> *Based on a mobile science concept, we bring science expertise to schools, community centers, and organization which have little or no scientific resources. Our goal is to reach students as young as possible to stimulate their natural curiosity and help them explore channels of scientific and technological study to prepare them to enter high school and college level academic paths which will lead them to jobs in science and technology.*[20]

SciGirls training

SELF International's *SciGirls* training was held on March 1, 2014. In addition to the program leader, the training was attended by 11 people including other staff, staff from partner organizations, community members, after-school educators, volunteers, two youth from the Sabathani Community Center, and a board member from Sabathani who "*stuck her head in for a few minutes*." Some of the attendees fit into multiple categories. Though the program leader initially indicated that parents would also be attending the training, that turned out not to be the case.

The program leader felt that even though there were some people who likely would have benefitted from the training, they still had a "*core group*." Though she was speculating, she thought that people might have had scheduling conflicts and/or that there could have been "*room for reaching out to more people*." When asked if those who were unable to attend might have benefited from an online component, she said "*yes, definitely*." Additionally, she indicated that she did not think that staff participation (or lack thereof) has affected what they have been able to do.

- *Prior expectations:* SELF International's program leader indicated that the training met the expectations she had for herself ("*More specific ideas for recruitment and direction of the program to keep the girls* engaged"), noting that it gave her sufficient information about *SciGirls* but that she wished there had been more pre-training communication from ***tpt*** about *SciGirls* and what would be expected of her before, during, and after the training. Prior to the training, she also expressed the expectation that her staff would come away with "*an understanding of the goals and a willingness to collaborate so we can be successful as a whole*." Though she felt the training helped everyone meet this goal, to varying degrees, she also mentioned that her team would have benefitted from more information about the *SciGirls* philosophy and how it can be incorporated into other subjects, as SELF International has staff members who focus on reading rather than STEM, for example. Finally, the program leader went into the training expecting that SELF International's collaborating partners would come away with "*a sensitivity to our goals so that when we collaborate they understand our focus, methods, and strategies I would hope they would carry whatever they learn with us to their own organizations and help girls wherever they are.*" After the training, she indicated that this goal had only been partially met, and that she would have liked to see more participation from her partner organization.

- *Most and least valuable aspects*: SELF International's program leader pointed to the opportunities to affirm the value of their work, gain new project ideas, and (for attendees from other organizations) get a better sense of the kind of work that SELF International does with kids as the most valuable aspects of the

[20] SELF International, Inc.: http://www.selfinternational.org/

training. When asked what she found least valuable about the training, the program leader said she thought it could have provided more statistics and examples/success stories that she could share with the community and use to highlight the value of their organization.

- *Impact on gender equity teaching strategies:* The program leader said that the training "*started people thinking*" about gender equity teaching strategies and that – in addition to reinforcing a lot of what she was already doing when working with girls – "*there were ah-ha moments there*," though she was unable to recall specific examples.

- *Use of SciGirls resources:* The program leader thought the training prepared her fairly well to implement the *SciGirls* activities, saying she now thinks it is "*pretty clear how to implement projects*." With regard to the video and web resources, she indicated that she and her staff were using these kinds of resources before the training and will continue to do so (with *SciGirls* and other materials) in the future.

- *Interest in becoming a SciGirls trainer*: The program leader was initially *moderately interested* in becoming a *SciGirls* trainer but has decided not to follow-up on the opportunity for the time being, for personal reasons. If her situation changes, she would likely be interested in the future.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June of 2014, SELF International had incorporated *SciGirls* into their afterschool program's spring curriculum, which was written before the March training.

SELF International hosted a weekly afterschool program in the spring of 2014 at the Sabathani Community Center for between 2 and 10 girls each week, with the total number of girls reached around 15. The program leader noted that the girls didn't attend consistently and that her work with the youth only began after they finished their homework, which meant that her time with the girls was often interrupted by parents picking their children up.

SELF International began working at Sabathani Community Center in the fall of 2013, initially with boys and girls. The spring 2014 program was the first that SELF International planned specifically for girls. At the time of their follow-up interview, the direction of future programs between the two partners had yet to be determined, though SELF International hopes to plan future summer and school-year programs for the youth.

The spring 2014 curriculum was focused on biology, germination, and seeds. After the *SciGirls* training, the program leader incorporated resources from the *SciGirls Season One* booklet *Go Green* into the existing curriculum. Thus far, SELF has been using the websites, videos, and clips, and hopes to incorporate activities into future lessons. In the spring, the girls talked about composing and soil, planted (and took apart) seeds, discussed the importance of recycling, and did a side project about paper in which they made (recycled) seed paper cards for Mother's Day. The curriculum ended with the girls planting flowers outside the community center, as shown in the image on the following page. According to the program leader, "*We had finished a unit experimenting with germination and plants and we culminated the project by taking charge of the planters at the community center where we have our meetings. No one was taking care of the planters, so we cleaned them out, added new compost, organic fertilizer, and dirt and planted flowers for the summer. It is the girls' responsibility to water them throughout the summer. None of them had done anything like this before.*"

- *How SciGirls builds on or differs from previous programs*: The program leader explained that *SciGirls* helps SELF International with the (community's) learning curve regarding the acceptance of programs like theirs, and said that being involved with *SciGirls* validates the work they are doing and makes it stronger. She also indicated that they hope to use and adapt *SciGirls* to the small amounts of time they spend with the youth.

- *Number of girls reached:* As noted above, SELF International's programming has reached around 15 girls to date, and there is the potential for expansion in the future.

- *Satisfaction with SciGirls resources*: The program leader spoke highly of the materials and said, in particular, that she liked that the activities were simple and inexpensive while also being effective. In comparison with the other resources SELF International has used to address girls' science learning, the program leader said she thought they were "*really good*" and that they're appropriate for every child. She also mentioned that some other organizations in the Minneapolis area are *SciGirls* partners but that their target audiences don't overlap.

- *Use of SciGirls Seven*: When using the resources, the program leader said that the group has been able to apply the *SciGirls* Seven. She also indicated, elsewhere, that gender equity STEM teaching strategies are a part of all of the organization's outreach efforts.

Spring planting at Sabathani Community Center (Image courtesy of SELF International, Inc.)

- *Use of Spanish language resources*: SELF International is hoping to use the Spanish language resources with the parents. Additionally, they were recently approached by a leader in the Latino community about setting up a program or programs in the suburbs, which will likely incorporate *SciGirls* Spanish language materials if and when the project moves forward. The program leader also indicated that the resources she has used thus far have helped her reach her target demographic, inner city students. However, she would like to make more progress in terms of educating the parents, some of whom may not initially see the value of a STEM-focused afterschool program.

- *Program highlights:* According to the program leader, two main factors have been important to the success of their project – the resources from *SciGirls* and the opportunity to have a joint training with their partners at the Sabathani Community Center.

- *Obstacles to implementation*: SELF International's program leader initially indicated that she expected *financial constraints*, *time constraints* (both on her own time and the limited time she spends with the youth), *competing institutional priorities*, and *resistance to gender themes* (from the community and potential partners) to be the largest obstacles in the implementation of their *SciGirls* program. After being involved in the program for a number of months, she still thought these would be the primary obstacles to accomplishing their goals.

- *Impact on girls*: Though SELF International isn't currently planning to assess what the girls have gained or will gain from their involvement with *SciGirls*, they have done pre and post questionnaires with youth in the past and might do so again in the future. Additionally, having previously worked with groups of boys and girls, the program leader noted that she has (informally) seen how separating the girls and letting them have time on their own can empower them. Over the course of the spring unit, the girls learned to work together, talked about teams and collaboration, and gained confidence in their abilities. When asked if the *SciGirls* training and materials have had a lasting impact on the girls, she said, "*So far, I can't help but think that the younger girls, anyway, their lives will be different."*

- *Impact on families*: The program leader indicated that she has seen small changes in the families that have participating, saying that they have learned more about the value of the afterschool program through the enthusiasm of their children and that they "*show a glimmer of interest, more than in the past, at least. Maybe they're getting comfortable with what we're doing too. And I think if they start seeing the results, hopefully that will help too.*"

- *Impact on organization*: SELF International's program leader noted that *SciGirls* has already had a large effect on their organization, saying, "*It has been a passion for me to work with girls and equalize the playing field for girls…not feeling like I'm out there by myself. You have an organization behind you that backs you and has resources. It's extremely valuable, and I'm so glad to be part of it.*" She also mentioned that *SciGirls* has impacted some of her volunteers, many of whom are college-aged and are getting excited about the opportunity to focus on girls, and indicated that she hopes *SciGirls* will have a lasting impact on their staff and the staff at their partner organization, the Sabathani Community Center.

- *Potential for sustainability*: When asked about increasing *SciGirls* (or a similar program's) chance for sustainability, the program leader noted that their organization would benefit from guidance on where partners might apply for additional funding for their projects, how they can build interest within their community, and how they can locate potential mentors. She also said that she thought some of the *SciGirls* videos could be more diverse, and could feature more African American students and mentors in particular. Additionally, on the subject of what ***tpt*** could do to support their efforts moving forward, she said that they have "*been really helpful all along*," and mentioned only that she would be interested in taking part in online trainings or refresher courses when new materials become available.

Partner 7: COSI (Center of Industry and Science)

COSI (Center of Industry and Science) is a science center located in Columbus, Ohio. As stated on their website:

> *COSI provides an exciting and informative atmosphere for those of all ages to discover more about our environment, our accomplishments, our heritage, and ourselves. We motivate a desire toward a better understanding of science, industry, health, and history through involvement in exhibits, demonstrations, and a variety of educational activities and experiences. COSI is for the enrichment of the individual and for a more rewarding life on our planet, Earth.*[21]

SciGirls training

COSI's *SciGirls* training was held twice over the course of two days, on January 20 and 21, 2014. Some attendees took part on Monday the 20th and others took part on Tuesday the 21st, depending on individual schedules and availability. Along with COSI's program leader, the training was attended by staff from Columbus-based *SciGirls* partners (After School Counts and Girlstart) and other COSI staff (12 COSI on Wheels educators, some floor staff, and some managers). According to COSI's program leader, *"We tried to get as many different workers as we could in there so they could all see it."* There were between 12-20 attendees each day. She also noted that there were some staff members who could have benefited from the training but weren't able to attend. However, she went on to point out that this has not limited what they have been able to do, saying, *"There were so many of us who did take it and were impressed by it that we talk about it all the time. We shared everything that we learned with them, so they still got it even though they weren't there."*

Most of those who did not attend were part-time employees with scheduling conflicts. The program leader indicated that an online review of the training would not be needed, as the employees in attendance are the ones developing COSI's *SciGirls* program(s). Additionally, the program leader did not think that staff participation (or lack thereof) impacted what COSI was able to do with the training and resources.

- *Prior expectations:* COSI's program leader thought the training lived up the expectations she had for herself, her staff, and her collaborating partners. As indicated on their background survey, she expected that she would *"[see her] staff gain knowledge and empowerment to address STEM gender issues in our program offerings."* Though more specific expectations for her staff and collaborating partners were not provided on the background survey, they were discussed over the phone after the training. In her follow-up interview, she noted that she had hoped her staff would understand the reason and value of the *SciGirls* training, that the training would help them understand the challenges girls face, and that they would see that they can make science fun for girls without excluding boys. In terms of COSI's collaborating partners, she went into the training hoping that they would be able to work together to make a difference. All of these expectations were met by the training.

- *Most and least valuable aspects*: The program leader explained that the opportunity for COSI's exhibit team to learn more about gender equity and *"see it more tangibly"* was the most valuable part of the training, as these staff members will have additional tools at their disposal when developing exhibits. When asked what she found least valuable about the training, she mentioned that she was already familiar

[21] COSI – Our Mission: http://www.cosi.org/about-cosi/mission

with some of the activities, from her participation in a previous training at a Girls RISE (Raising Interest in Science and Engineering) event. However, for the rest of the team, she thought everything was valuable.

- *Use of SciGirls resources:* Though COSI's program leader had previous exposure to the *SciGirls* materials and had shared as much as she could with her staff, the training in January allowed her to bring the training experience directly to the team, rather than sharing the ideas and materials second-hand. Thus, in term of impacting COSI's ability to implement *SciGirls* activities in their community, the January training was *"the icing on the cake."* With respect to the video and web resources, the program leader noted that these kinds of resources are difficult for COSI to incorporate into their educational programs, primarily because they see the kids for a short period of time in their COSI in the Classroom program and their traveling COSI on Wheels program. However, she does see the value of the video and web resources and would like to find a way to incorporate them into the pre- and post-COSI activities (which are coordinated by classroom teachers). COSI is currently looking into ways to lead teachers to the resources and set them up with their own *SciGirls* accounts. Additionally, the program leader noted that the *SciGirls* video and web resources will be used in COSI's teacher professional development programs.

- *Impact on gender equity teaching strategies:* The program leader indicated that she was already somewhat familiar with gender equity teaching strategies prior to the training, but noted it had a large effect on her staff, as evidenced by the way they now talk about gender equity and girls in science.

- *Interest in becoming a SciGirls trainer*: Though the program leader was initially *extremely interested* in becoming a *SciGirls* trainer, she now thinks it is unlikely due to time constraints and financial constraints, as COSI wouldn't be able to pay for her to travel to various training sites.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in late May of 2014, COSI had used one of the *SciGirls* activities and was planning to incorporate additional activities in the fall. After the January training, staff evaluated their current programming and looked for places to utilize *SciGirls* activities. Their first inclusion of a *SciGirls* activity was in their 21st Century Learning Lab program. Offered on a variety of subjects, each learning lab is a 3-hour, hands-on, immersive experience for groups of children or young adults. In association with their Sherlock Holmes exhibit (open February 8 – September 1, 2014), COSI offered a Forensics Lab for middle school or high school students and incorporated the *SciGirls Season Two Super Sleuths* "glitter" activity into the Learning Lab for middle school students.

21st Century Learning Lab: Forensic Science

Available Spring 2014

Grades: 3-12 Price: $25 per person

Develop your 21st Century skills by investigating and solving COSI mysteries through these incredible experiences:

- COSI general admission
- Admission to The International Exhibition of Sherlock Holmes, a limited-engagement exhibition at COSI. Meet Sherlock Holmes, scientifically trained, a master of deduction, an employer of imagination and encyclopedic knowledge. Experience an interactive exhibition like no other as you join Sherlock Holmes in solving a captivating mystery.
- CSI Crime Scene Investigation: become a crime scene investigator and use the help of chemistry and biology to solve the mystery in this 45-minute workshop led by the COSI Team.
- For Grades 5-8: Admission to COSI's Adventure exhibition – step inside Adventure and you are transported to another place and another time: a remote island shrouded in darkness, where remnants of an ancient culture guard a secret that only you can unlock.
- For Grades 9-12: In Depth: Autopsy Live, where an Ohio State University pathology resident will join your students as they observe a 90-minute recorded human autopsy from beginning to end. Your students must use information gathered during the program and post-visit activities to determine the cause of death.

Dates:
2014: More dates coming soon!

Information about COSI's 21st Century Learning Lab: Forensic Science (http://www.cosi.org/educators/field-trips/learning-labs)

As detailed in the image to the right, for $25 per person the Forensic Science Learning Lab includes general admission, admission to COSI's Sherlock Holmes exhibit, and special workshops with COSI staff. Between January and May 2014, COSI offered the Forensic Science lab approximately 15 times, and conservatively estimates having reached 150-200 middle school girls (and an equal number of boys).

In addition to incorporating the *Super Sleuths* activity into their already existing programming, COSI staff are currently looking for other ways to infuse *SciGirls* activities into museum offerings, like their homeschool program and/or a Sunday Science group for teen girls that they hope to establish in the near future, pending funding. Finally, at the time of their follow-up interview, the program leader also noted that they hope to incorporate *SciGirls* into their summer 2014 library programs. In all, they estimate that they will be able to reach 1,000 girls within a year, which is the same estimate made on their background survey.

In addition to these educational activities, COSI has also worked to incorporate *SciGirls* into their professional development programs for educators and afterschool educators. Prior to their January 2014 training, COSI began using *Super Sleuths*, *Plants Count* (adapted to their geographic area,) and *Deep Sea Diver* (all from *SciGirls Season Two*) with teachers. In general, staff, teachers, and students have enjoyed all of the activities, though the program leader noted that *Deep Sea Diver* was somewhat expensive and the glitter used in *Super Sleuths* was "*incredibly messy*."

- *How SciGirls builds on or differs from previous programs:* The program leader explained that, though the content and mission will be similar, *SciGirls* will help make COSI programs "*richer and more intentionally accepting of the things that are interesting to girls*." When asked what *SciGirls* will bring to the girls that wasn't previously available, the program leader said that the materials established a connection to public television and provided kids and young adults with a productive online activity.

- *Number of girls reached:* As noted above, COSI estimates that they will reach 1,000 girls within a year, the same estimate made on their background survey.

- *Satisfaction with SciGirls resources:* For COSI's educational programs, they often have to rethink and rework the activities for their needs, since "*the activities are made for a class of up to 30 kids to do once, not four sessions of 30 kids*." For this reason, COSI's staff appreciates the adaptability of the *SciGirls* lessons, as in "*you can pick and choose pieces, change the order, and it doesn't depend on TV-time.*" In comparison to other science resources they've used to address girls' science learning, they think the *SciGirls* materials are "*the most fun and engaging*," like the way the lessons merge hands-on learning with technological/interactive pieces, and find that the online accessibility (for girls and educators) helps create a supportive and valuable community. The program leader also commented on how well organized the resources are and – unprompted – said she thought *SciGirls* was very diligent with their funding and that the resources were a good use of NSF support. Finally, she noted that she is unsure if the *SciGirls* resources have been used in other outreach programs.

- *Use of SciGirls Seven:* When using the resources, the program leader felt that she and her staff have been able to apply the *SciGirls* Seven. Staff members have copies of the *SciGirls* Seven, and when they're selecting activities to include in their programing, they ask themselves how the overall experience fits with these key research findings of how girls learn science. She also indicated, elsewhere, that gender equity STEM teaching strategies are a part of all of the organization's outreach efforts.

- *Use of Spanish language resources*: As of May 2014, COSI had yet to use the Spanish language *SciGirls* resources but was hoping to do so in the future. One obstacle they face in that some schools with large Hispanic populations specifically request that they work with the students in English; for this reason, COSI is seeking ways to make the Spanish language resources available to parents *"so that they may play a greater role in their child's learning*." The program leader also noted that COSI has used and intends to use *SciGirls* to reach a broad demographic.

- *Program highlights:* COSI's program leader noted that they've been pleased that schools have embraced the relatively new 21st Century Learning Labs, of which the Forensics Lab is one. This success, they believe, can be credited to many factors: staff members who see the value of gender equity teaching strategies, a supportive organization (COSI), and the Learning Lab funders, among others.

- *Obstacles to implementation*: The largest challenges to COSI's programming include *limits to schools' funding and time*, particularly in relation to educational testing. For COSI, it is difficult to encourage educators to bring groups to the museum early in the year, before the educational tests, which makes the spring months somewhat hectic. In addition to spreading out attendance, COSI's program leader hopes to empower teachers to think beyond the test and "*find the time to do things that are important, even if they're not mandated*." *Financial constraints* are an additional challenge, though they're finding ways around this by integrating *SciGirls* programming into what they're already doing. This is also why they appreciate the less expensive *SciGirls* activities, like *Super Sleuths*.

- *Impact on girls:* Though COSI isn't planning to assess the gains of what the girls gained or will gain from the *SciGirls* outreach experience, they have noticed informally that the girls are seeing that science is everywhere, that science is enjoyable, and that "*they can do it.*" The program leader also hopes that *SciGirls* programming with have a lasting impact on the girls they're working with, though they aren't able to follow up with each group. However, some of the teachers they have worked with have anecdotally noted that they have seen a difference in the girls they're reaching.

- *Impact on organization*: COSI's program leader sees a large impact on the organization itself. Over the last few years, COSI has worked to make inclusion of many groups a priority – for example, girls, autistic children, and people who don't speak English as their first language, among others. COSI's initial focus on gender inclusion helped them realize how relatively easy it would be to improve their exhibits and programming in other ways, and *SciGirls* will continue to play a role in helping them move forward with this mission of inclusion in the future. As she said, "*If we hadn't taken the foray into looking at gender inclusion, I don't know if we could have gotten into including other groups quickly."* COSI's program leader has also seen a lasting impact on her staff, noting that they often make comments about girls' experiences during their weekly staff meeting's "warm and fuzzy time," and that she frequently hears staff asking "How will this work for girls?" when developing new programs.

- *Potential for sustainability*: Moving forward, COSI's program leader expressed a desire for an upcoming *SciGirls* episode to be filmed in Columbus – ideally at COSI – because "*the greater the variety of episode locations, the greater the chance that a girl will see herself in that role."* Additionally, when asked what ***tpt*** could do to support their efforts, she requested more activities, saying "*teachers love easy activities that match the standards and can be done cheaply*."

Partner 8: Chenango County 4-H

Based out of Ithaca, New York, Chenango County 4-H (CC4H) is part of the national 4-H organization. As noted on their website, "*4-H empowers youth to reach their full potential, working and learning in partnership with caring adults.*" [22] Though the Cornell University Cooperative Extension, CC4H is connected to local and county-wide 4-H clubs, afterschool groups, camps, and state-wide 4-H activities.

SciGirls training

CC4H's *SciGirls* training was held on February 1, 2014. In addition to their program leader, the training was attended by 9 other people, including one other CC4H staff member, a handful of New York 4-H staff and educators, some volunteer 4-H club leaders from Chenango County, and 2 attendees that the program leader didn't personally know but thought might have been part of 4-H. Some of the attendees were also parents. Though the program leader initially indicated that school educators would be attending the training, CC4H's outreach efforts to recruit teachers were not successful.

The program leader mentioned that there were some people, particularly local school educators, who likely would have benefitted from the training. Though she was speculating, she mentioned these people might have had scheduling conflicts, might not have wanted to attend an unpaid training on a Saturday, and/or may not have known about the event. CC4H promoted the event online and created flyers and newsletters (shown on the following page) about the training for schools and libraries in their country, but had no way of knowing if these materials were shared with teachers. The program leader noted that, when coordinating the logistics of the training and trying to advertise the opportunity, she felt that she didn't know enough about the event to advertise to target groups and "*make it catchy*." When asked if she thought the teachers who didn't attend would have benefited from an online component, the program leader said she did not think this would have been of value, mainly because a training website might have been too challenging for outsiders to navigate without guidance. Additionally, she indicated that she did not think that staff participation (or lack thereof) affected what they were able to do, as all three staff members from their office were in attendance.

- *Prior expectations:* Going into the training, CC4H's program leader expressed the same expectations for herself and her staff: "*Gain a further understanding on how to fully engage youth in STEM activities which promote inquiry and allow the youth to gain knowledge. Learning how to approach industry professionals to incorporate their expertise into 4-H programming throughout the county*." After the training, she indicated that these expectations for herself and her staff had mostly been met. She was very happy to have received activities that they could incorporate into their work immediately, and she appreciated learning about what other groups and organizations were doing to engage youth in STEM. However, she also mentioned that she would have liked to receive additional information about how to conduct outreach to people in their community who work in STEM fields. Though their trainer shared a database of STEM contacts, no one from her county was on that list, and she anticipates having to search for and reach out to people who may have never considered being a STEM role model or mentor.

  The program leader went into the training expecting that CC4H's collaborating partners would: "*Allow educators, volunteers and community members to come together and learn more about engaging youth in STEM activities that are meaningful to the youth participating. Building long-term collaborative partnerships that meet common educational goals for all youth participants.*" After the training, she indicated that this expectation had been met.

[22] About 4-H: http://www.4-h.org/about/

Cornell Cooperative Extension Chenango County

December 20, 2013

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News Reporters

Please send me an article and pictures about your club's events. I will include your article in the Club Happenings section.

SciGirls

Chenango County 4-H will be partnering with *SciGirls* to encourage girls to explore the world of science. Many STEM programs and advanced science classes still have low numbers of girls and other underrepresented populations in them. We will share research based strategies and techniques for engaging student in these content areas. As a guide, representatives from *SciGirls* will present research based strategies proven to increase girls' engagement in STEM. These strategies include: allowing extended communication and collaboration; finding real life contexts for science; promoting open-ended investigations; placing value on diverse ways of knowing, viewing, and describing the world; providing specific, positive feedback on things girls can control; offering opportunities to think critically about science and engineering; and forming relationships with role models and mentors. Educators will be encouraged to share their own experiences teaching in mixed gender or all girl environments and discuss best practices for engaging girls. **Chenango County 4-H will be hosting *SciGirls* training on February 1, 2014.** If you are interested, or know someone who would be interested, in learning more about this *SciGirls* training please contact Emily Jane Anderson at 607-334-5841 ext. 17

Front page of the Chenango County 4-H newsletter from December 20, 2013 (http://ccechenango99.squarespace.com/storage/December%2020%202013.pdf)

- *Most and least valuable aspects*: CC4H's program leader pointed to the surprisingly low cost of incorporating *SciGirls* activities into their outreach efforts as one of the most valuable aspects of the training, noting that her organization already has many of the required materials on hand. She also appreciated the focus on methods, saying, "*The SciGirls program really encourages true inquiry-based activities, because the goal is not to tell them.*" When asked what she found least valuable about the training, she pointed to the focus on video clips, saying that even though she recognizes their value to other groups and educators, CC4H generally doesn't have the ability to use DVDs and audio-visual equipment in their outreach efforts. However, she also noted that CC4H is happy to have the resources on hand, saying that if they coordinate a larger program, they might be able to find a way to incorporate the videos.

- *Impact on gender equity teaching strategies:* CC4H's program leader indicated that the training had a large impact on her and her staff's thinking about gender equity teaching strategies. Speaking personally, she said that the training opened her eyes to how to work with girls who believe they are struggling with a subject, noting that she now says to the girls, "*So and so is a scientist and she failed X times before she was successful. I think it's important to remind them that you can and do learn from your mistakes.*" She also mentioned that she used to give the students little hints but is now using the *SciGirls* Seven techniques – which she keeps on a card in her back pocket – to coach them and motivate them through the activities.

- *Use of SciGirls resources:* The program leader thought the training prepared her to implement the *SciGirls* activities, noting that the activities she has used thus far have all been very successful. As mentioned above, she and her staff are unlikely to use video and web resources in the majority of their outreach, as they don't often have access to the necessary equipment.

- *Interest in becoming a SciGirls trainer*: The CC4H program leader was initially *moderately interested* in becoming a *SciGirls* trainer and choose to attend the Train the Trainer training after her first training in February 2014, saying that she did so because she thinks it's important to show youth a range of STEM careers, particularly in skilled labor.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June of 2014, CC4H had incorporated *SciGirls* activities into two different afterschool programs and was hoping to partner with a local library to set up a summer science camp featuring the *SciGirls* curriculum.

With the first afterschool program, CC4H works with youth for one hour every other Wednesday. Half boys and half girls, CC4H works with approximately 30 middle school students on these days. The CC4H program leader noted that once she was trained by *SciGirls*, it was easy for her to incorporate the activities into the afterschool program, as she has the flexibility to structure the (primarily STEM-focused) curriculum however she sees fit. Thus far, the youth have responded well to the activities, and particularly seemed to enjoy *Deep Sea Diver* from *SciGirls Season Two*.

CC4H's second afterschool program reaches approximately 35 youth ranging from kindergarten to 10th or 11th grade, about 60% of whom are girls. Held on alternating Thursdays, CC4H works with approximately 30 of the younger students one week and 5 teens the following week. Though both groups (and all ages) do the same activities, the curriculum is modified for the younger students. Thus, for example, when CC4H used *Take it in Stride* from *SciGirls Season One*, they encouraged the teens work through the methods and measurements on their own but had the younger students focus on measuring (in metric) and adding the measurements. *Take it*

in Stride also gave CC4H the opportunity to teach the students about sample size, though the program leader could not remember if that had been part of the original activity.

To date, both afterschool groups (and all three groups of youth) have done *Deep Sea Diver* from *SciGirls Season Two* and *Take it in Stride*, a variation of *Science Cooks!* (with dog treats instead of granola), the *Light Bulb Challenge* (into which they also incorporated the use of an energy bike), and *Bouncing Balloons* from *SciGirls Season One*. CC4H also plans to do *Dough Creatures* and *High Tech Fashion* (also from *Season One*), among others, in the future.

- *How SciGirls builds on or differs from previous programs:* The program leader explained that *SciGirls* brings CC4H a range of new offerings: "*Our SciGirls program will differ from current programs by utilizing our newly-learned teaching techniques and increasing the complexity of our programming through offerings in digital technology, fiber science, botany, chemistry, entomology, and astronomy with our "A,B,C's of Science" Science Camp. We are also recruiting female instructors to incorporate a female science career aspect to the program.*" When asked what *SciGirls* would bring to the youth served by CC4H that wasn't previously available, she said that it has given them an easily adaptable program that the youth seem to greatly enjoy.

- *Number of girls reached*: CC4H initially estimated that they would reach 1,900 girls with their STEM programming throughout the year, and they still think they are on track to meet that goal between their afterschool groups, upcoming camps, and their booth (with to be determined *SciGirls* activities) at the county fair in August 2014.

- *Satisfaction with SciGirls resources*: Though the program leader indicated on their background survey that she was not interested in the *SciGirls* websites or videos (and was only interested in the activities), she has since discovered that *SciGirls* CONNECT is a more useful resource than initially expected, saying that she prints copies of the activity guides for the different afterschool groups she works with so that they may review the resources before she visits and can keep them as a reference. In general, the program leader indicated that she was "*pretty satisfied*" with the *SciGirls* resources, saying that the youth seem to enjoy the activities and that she finds them easy to use, but that she would also appreciate having more information about "next steps" or succeeding lessons for youth who are especially enthusiastic and want to learn more. In comparison to other science resources she has used to address girls' science learning, she said the *SciGirls* materials require more creative thinking from the youth and are more applicable to girls.

- *Use of SciGirls Seven*: When using the resources, the program leader felt that she and her coworkers have been able to apply the *SciGirls* Seven. She specifically noted that they have talked about the *SciGirls* Seven "*quite a bit*" and are considering applying for a grant that would allow CC4H to set up a new program or expand their current afterschool work. As discussed above, the program leader also mentioned that she keeps a card with the *SciGirls* Seven techniques in her back pocket, for reference on an as-needed basis. Finally, she mentioned that the gender equity STEM teaching strategies haven't been used in their other outreach programs.

- *Use of Spanish language resources*: As noted on the group's background survey, Chenango County lacks a heavily diversified population. Thus, CC4H does not intend to use the *SciGirls* Spanish language resources. However, the program leader indicated that the resources have allowed CC4H to reach the (underserved and rural) audience they initially intended.

- *Program highlights:* According to the program leader, the success of their project depends – at least in part – on CC4H's involvement with local afterschool programs. Noting that their 4-H clubs are run by different

leaders and only meet once a month, the program leader thought that the opportunity to meet with afterschool groups on a regular basis was the best way to impact local youth.

- *Obstacles to implementation*: Though CC4H's program leader initially indicated that she expected *financial constraints* and *access to facilities and equipment* to be the largest obstacles to the implementation of their *SciGirls* program, she noted that these are smaller challenges than anticipated. This is in part because CC4H received a $1,000 grant for afterschool programming, which allowed them to purchase some equipment for the activities. She now thinks that *time constraints* and *the search for partners and an active audience* are some of the biggest challenges facing their organization.

- *Impact on girls:* Though CC4H isn't planning to assess the gains of what the girls gained or will gain from the *SciGirls* outreach experience, the program leader and other staff members have see that their use of the *SciGirls* Seven encourages the girls and keeps them on task. She also noted that she could think of 5 girls who have been impacted by the program.

- *Impact on families:* The program leader noted that *SciGirls* has impacted some of the parents/4-H leaders who attended the training and were surprised to learn how easy it would be to implement the activities.

- *Impact on organization:* CC4H's program leader indicated that the program has already had a lasting effect on the organization, saying it "*widened their eyes*" and mentioning that she hopes to share *SciGirls* at an upcoming 4-H district meeting. She also said that she hopes *SciGirls* will have a lasting impact on her staff (as in "*I'm hoping, as a staff, to incorporate more of the activities*") and other 4-H members, who will hopefully learn about *SciGirls* in an upcoming 4-H newsletter.

- *Potential for sustainability*: When asked about increasing *SciGirls* (or a similar program's) chance for sustainability, the program leader pointed the importance of knowing your audience and getting them hooked on science, and reiterated that she would like to know more about next steps she could take with interested students. As noted above, she also mentioned that she would have liked to receive additional information about how to conduct outreach to people in their community who work in STEM fields. On the subject of what ***tpt*** could do to support their efforts moving forward, she said that they had done a "*really good job supporting us so far*."

Partner 9: Project Scientist

Based out of Charlotte, NC, Project Scientist is a 5-week summer camp for girls with an aptitude, talents, and passion for science. As noted on their website:

> *Project Scientist began nearly two years ago out of the guesthouse of founder, Sandy Marshall. While working as the Executive Director of The NASCAR Foundation, Sandy learned of the disadvantages that girls and women have in STEM majors and careers, and became committed to doing what she could to make a difference in her own community - Project Scientist had lift off! The only focused effort of its kind Project Scientist was developed as a manifold organization, complete with many phases and programs to offer girls support throughout each unique stage of a future scientists life. The need for Project Scientist was based off a vast amount of research that shows girls with a high skill, aptitude, and talent for STEM subjects are not currently served or identified at a young age. Underserved and unidentified girls are not provided STEM opportunities at a pace, depth, and breadth commensurate with their talents and interests. We created Project Scientist to change the world's view of "who" a scientist is and "what" a scientist does. The vision of Project Scientist is to transform the face of STEM by nurturing today's future scientists who will lead the world in solving tomorrow's greatest challenges!* [23]

SciGirls training

Project Scientist's *SciGirls* training was held on March 22nd, 2014. In addition to their program leader, the training was attended by 26 other people, including most of their staff, teachers, and interns; partners from their local PBS affiliate station; and a number of teachers who had applied to work in Project Scientist's 2014 summer camp and were not ultimately hired. The program leader mentioned that there were three people – one staff member and two interns – who did not attend but likely would have benefitted from the training. In these instances, they didn't attend because they didn't know about it (they hadn't been hired at the time of the training) and/or had scheduling conflicts.

When asked if she thought the staff member and two interns would have benefited from an online component, she said yes, adding that she thought this resource would be good for them and also for her, as she is a new *SciGirls* trainer. Additionally, she indicated that she did not think that staff participation (or lack thereof) has affected what they have been able to do and added that, as a trainer, she has been "*doing little trainings with [her staff] here and there*."

- *Prior expectations:* Going into the training, Project Scientist's program leader said that she expected she would: "*Make sure we make the most of the training by filling 100% with our teachers, staff, interns, volunteers.*" She expected her staff would: "*Assist in the logistics of the training day and pre / post communication to participants.*" After the training, she indicated that these expectations for herself and her staff had been met. Before the training, the program leader also said that she expected her collaborating partners would: "*Use the knowledge they receive and credit the leadership of SciGirls and Project Scientist for their inclusion in the program.*" This wasn't something that was focused on during the training, and Project Scientist didn't follow up with the PBS affiliate partners, so the program leader was "*not sure if they got what they wanted out of it*."

[23] Project Scientist – Our Story: http://www.projectscientist.org/about

- *Most and least valuable aspects*: Project Scientist's program leader said that the opportunity to go through the hands-on experiments with an eye toward making sure to incorporate the *SciGirls* Seven was the most valuable part of the training. When asked what she found least valuable about the training, she said that some of the attendees mentioned that they would have preferred to start the day with an experiment, rather than a presentation by the trainer.

- *Impact on gender equity teaching strategies:* The program leader said the training's focus on gender equity teaching strategies was very helpful and that she and her staff appreciated learning ways to encourage girls to participate equally. When asked if and how the training had changed Project Scientist staff members' thinking about how girls learn, experience, and enjoy science, the program leader mentioned that she thought it was especially helpful for their educators to learn that they don't need to solve the problems with their students and that "*it's okay to discover with the girls*."

- *Use of SciGirls resources:* The program leader thought the training prepared the organization to implement the *SciGirls* activities, noting that she thought that the Train the Trainer training helped in this regard as well. With respect to the video and web resources, Project Scientist's program leader indicated that she felt better prepared to use these materials but was surprised that they didn't watch a full video at the training, saying, "*I felt like, since the teachers were all leaving with videos, they should have maybe watched one, to get a taste of how valuable they are and build some excitement for it."* Before the training, Project Scientist had not used video or web resources.

- *Interest in becoming a SciGirls trainer*: Prior to the training, Project Scientist's program leader was *moderately interested* in becoming a *SciGirls* trainer. She choose to attend the Train the Trainer training after her first training in March 2014, saying that she was initially concerned about the time commitment but that, when she learned more about the obligations and what it would bring to her organization, the decision was easy to make.

SciGirls outreach program implementation and longer term outcomes

At the time of their follow-up interview in June 2014, Project Scientist had planned a summer of activities – many of which made use of the *SciGirls* resources – and were on day two of their 5-week summer camp, Project Scientist Academy (described below).

Project Scientist will have two main projects taking place in the summer of 2014. The first, Project Science Academy, is a 5-week summer camp for girls ages 4-12. This year, Project Scientist Academy is operating in two locations, Queens University and Trinity Episcopal School, both in Charlotte, NC. Girls can attend for one week, two weeks, or all five weeks. Together, the camps enroll between 40-70 girls per week and will reach around 300 girls over the course of the summer.

The campers are divided by age (ages 4-6, 7-9, and 10-12). All of the instructors receive the same basic curriculum, which is themed by week, and adjust for their groups depending on the girls' ages and their own preferences. This summer, the curriculum will make use of a number of *SciGirls* activities, including: *Science Cooks!, Blowing in the Wind, Going Green, Star Power*, and *Heart to Heart* (from *SciGirls Season One*) and *Color Code* and *Plants Count* (from *SciGirls Season Two*), as well as others that will take place during the last few weeks of camp (which the program leader didn't have on hand at the time of her follow-up interview).

Project Scientist's second main project of the summer is called Project Scientist Scholars. This pilot program is for 15 girls ages 12-16, 3 to 4 of whom were Project Scientist Academy campers in 2013. The program is

scheduled to take place over 5 weeks in the summer, beginning sometime after the start of Project Scientist Academy. Though Project Scientist Scholars will have less of an overlap with *SciGirls*, the principals of *SciGirls* will still play a role in this second outreach effort.

In the fall of 2014, Project Scientists plans to start a third initiative, Project Scientist Clubs. The organization will be working with 5 local schools, meeting once a week for an hour each week over the course of 20 weeks. They plan to use 15-20 *SciGirls* activities but have not yet worked out the details. They do know, however, that they will start with activities that weren't part of the camp, as they want to provide new activities for the girls as often as possible. Finally, in the coming year, Project Scientist will be expanding to CA through a partnership with Caltech. Staff members also hope to find other partners around the country in the coming months and years.

- *How SciGirls builds on or differs from previous programs:* The program leader explained that they ended last year's camp with three goals for improvement: staff, curriculum, and process. According to the program leader, *SciGirls* has helped in all three areas, with "*instant curriculum, instant professional development, and a higher caliber of programming*." When asked what *SciGirls* would bring to the youth served by Project Scientist that wasn't previously available, the program leader pointed to their organization's use of *SciGirls* resources with parents, saying that they have incorporated the *SciGirls* Seven and some information from the training, and that they promote their involvement with *SciGirls* (as shown in the image below, from a website providing details about Project Scientist Academy) and encourage parents to visit the *SciGirls* online. As Project Scientist sees it, *SciGirls* is a way to engage parents, with the larger goal of supporting the girls.

The promise of Project Scientist is to educate, coach, and advocate for girls with an aptitude, talent, and passion for STEM. Through a partnership with Sci-Girls, a National Science Foundation funded program, our Project Scientist Academy teachers are trained and armed with the finest STEM curriculum and resources to inspire and challenge your future scientist. Each week our girls will engage with hands-on experiments, discovery-based learning, field trips/expeditions, and the arts. Daily we will engage female STEM Superstars as role models and mentors.

Information about Project Scientist Academy, highlighting their partnership with *SciGirls* (http://www.projectscientist.org/sites/default/files/Project%20Scientist%20Academy%202014.pdf)

- *Number of girls reached*: As described above, Project Scientist will reach around 315 students in the summer of 2014 through their Project Scientist Academy and Project Scientist Scholars programs. At this point, they do not know how many girls they will reach in the coming academic year with their upcoming Project Scientist Clubs and their expansion to CA.

- *Satisfaction with SciGirls resources*: As indicated on the organization's background survey, the program leader said that Project Scientist is using or planning to use the video, print and web resources (including but not limited to the activities noted above). In general, the program leader felt the resources were "*great*" and "*easy to use*." In comparison to other science resources Project Scientist has used to address girls'

science learning, she thought that *SciGirls* resources were more teacher-friendly and noted that she especially liked the female role models highlighted in the "Mentor Moments" of each activity (as shown in the *SciGirls Season Two Super Sleuths* Mentor Moment to the right, for example). She also thought that the resources were "*relevant for everyone*" and allowed her to reach her target demographics of girls with an aptitude for science, including paying clientele and scholarship (mainly Latina) girls.

Super Sleuths Mentor Moment
(http://scigirlsconnect.org/page/super-sleuths)

- *Use of SciGirls Seven*: When using the resources, the program leader felt that she and her coworkers have been able to apply the *SciGirls* Seven, but that the strategies are something that they will need to remind themselves of throughout the summer. Each teacher has a copy of the *SciGirls* Seven card, and the program leader plans to remind educators of the strategies at their weekly staff meetings. She also indicated, elsewhere, that gender equity STEM teaching strategies are a part of all of the organization's outreach efforts.

- *Use of Spanish language resources*: The program leader noted that Project Scientist has a number of Spanish-speaking students and families but that, as the girls are generally fluent in English, the most beneficial Spanish-language resources would be those directed at parents, like copies of the *SciGirls* Seven card, PowerPoint presentations, videos, and iPhone/mobile-friendly websites. Additionally, she believes there is an opportunity for *SciGirls* to use the latest research on outreach to Latino parents to target their message in a more effective way.

- *Program highlights:* According to the program leader, the success of their project depends – at least in part – on strong partnerships with established groups, such as *SciGirls*, Fab Fems, and MIT's Scratch Program.

- *Obstacles to implementation*: Project Scientist's program leader initially indicated that she expected *financial constraints* and *time constraints* to be the biggest obstacles to the implementation of their *SciGirls* program. In addition to these obstacles, she pointed to the challenge of make their project sustainable, saying, "*I think funders and the public are used to success being number of people served, but we would rather have a huge impact and longitudinal growth. That's our challenge, but it's expensive, so we either need to tweak the model or find funders who understand the value of the program*." She then went on to share the story of one of the Project Scientist Scholars, a Latina scholarship student who attended the camp last summer and has since become a math and science leader in her classroom. Working toward her goal of becoming a surgeon, she will be job shadowing a pediatric surgeon this summer. According to Project Scientist's program leader, this girl's mother "*comes to tears when she talks about [her] goals and how the whole family is behind her*." This is the kind of long-term, individual impact the organization hopes to continue to make for many years to come.

- *Impact on girls:* As part of their effort to engage girls, Project Scientist focuses on attitudinal self visions. For this aspect of the program, the girls draw pictures of a scientist on a weekly basis and complete surveys on their first and last days in the program. Project Scientist is currently working with the University of North Carolina at Charlotte and Harvard University on the research aspect of their program and its

educational approach. In terms of the lasting impact of the *SciGirls* training and materials, the program leader said she hopes the experience will impact the girls by broadening their vision of STEM careers.

- *Impact on families:* Though the program leader could not speak about the lasting impact on families, she noted that Project Scientist sends daily newsletters to parents and invites them to weekly celebrations in which the girls demonstrate experiments and speak about their goals in front of the group, and said she hopes these efforts will have a lasting impact on parents and families.

- *Impact on organization:* The program leader hopes the partnership will have a positive effect on her organization and educators, as well as her staff and interns. She mentioned that they had an intern last summer who wasn't initially interested in becoming a teacher but so enjoyed working with the girls that he joined Teach for America. Additionally, a secondary goal of Project Scientist is that the educators return to their classrooms with a new set of tools and resources at their disposal. They hope to have an exponential impact on those who were hired by Project Scientist and those who were not hired but participated in the training.

  Additionally, the program leader hopes to make a lasting impact on the larger community, noting that the organization uses media and social media to "*push the girls out there*" and change the perception that girls aren't as good at math and science as boys. As of July 2014, Project Scientist had approximately 1,000 Twitter followers and 500 Facebook fans.

- *Potential for sustainability*: When asked about increasing *SciGirls* (or a similar program's) chance for sustainability, the program leader pointed to the importance of adding engineering and computer science activities to the curriculum. Additionally, on the subject of what ***tpt*** could do to support their efforts moving forward, she wondered if ***tpt*** might be able to encourage PBS affiliates around the country to promote local organizations that are using *SciGirls* materials, and reiterated the importance of having materials for parents in Spanish, including PowerPoint presentations, *SciGirls* Seven cards, videos, and iPhone/mobile compatible websites.

Summary

Part 3 presents the in-depth findings of *SciGirls Season Two* outreach activities among the lead staff (hereafter called the program leaders) of 9 member institutions of the NGCP. Eleven (11) organizations were invited to participate in this evaluation from a larger group of 40 *SciGirls Season Two* grantees. These 11 organizations were selected by ***tpt*** and Knight Williams with the goal of representing a diverse range of groups (including afterschool program, universities, science centers, and girls' clubs, among other organization types).

Of the 11 invited organizations, 9 completed a pre-training background survey and a post-training follow-up phone interview, for a response rate of 82%. All of the interviewed program leaders were women, and they came from 8 states around the U.S. – 2 from California and one each from Colorado, Minnesota, Nevada, New York, North Carolina, Ohio, and Virginia.

For this project, pre-training background feedback from the 9 program leaders was gathered by paper survey with a follow-up email and phone conversation where needed. These results are examined in Part 2 of this report. The program leaders later completed a post-training follow-up phone interview with the independent evaluation team. For their participation in these two aspects of the evaluation, each organization received a $100 honorarium. Participants were informed that the evaluation was funded by a grant provided by the National Science Foundation, and that their frank and honest input was appreciated and would help guide the direction that ***tpt*** takes in planning future programs.

In May and June 2014, a member of the evaluation team conducted in-depth telephone interviews, each lasting between 60 and 90 minutes, with the 9 program leaders. Interview questions were developed by Knight Williams and ***tpt*** with an eye toward learning how the materials had been implemented, what factors facilitated or hindered their implementation, and whether and how the trainees' skills had been enhanced. This evaluation highlights the range of programs that have been planned and implemented since each group's SciGirls training (all of which took place between January 17th and April 30th, 2014).

SciGirls training

The 9 partner trainings were attended by a range of participants, including program leaders and their coworkers or staff, representatives from partner organizations, educators, afterschool educators, volunteers, community members, board members, local youth, and parents. The majority of program leaders indicated that there were people who were unable to attend their trainings who could have benefitted from the opportunity. These people most often missed the training because of *scheduling conflicts*. A few program leaders said that people might have missed the training because they *didn't know about it*, and one thought they *might not have wanted to attend an unpaid training on a Saturday*.

When asked if those who were not able to attend the training might have benefitted from an online component, more than half of the program leaders replied *no* (saying that the hands-on experience would be impossible to duplicate, that the website might be difficult to navigate, or that they could be educated by the program leader), while just under half said *yes*. Only one of the program leaders felt that staff participation (or lack thereof) affected what her group has been able to do. This program leader felt that more involvement would have been beneficial to the individuals and the organization.

Prior expectations: Overall, the training met the expectations that program leaders had for themselves and their staff. About half of the group felt that the training met their expectations for their collaborating partners.

The other half did not, noting that they hadn't selected their partners yet or that they hoped to do more with their partners.

Most and least valuable aspects: When asked what they found most valuable about the training, program leaders pointed to a range of benefits, including: new materials and information, a chance to walk through the hands-on activities, a free training, the low cost of activity implementation, advice on how to incorporate the *SciGirls* Seven into their outreach, the opportunity to learn about gender equity teaching strategies, and the training's focus on methods. When asked what they found least valuable about the training, program leaders most often pointed to the review of resources that they and their staff are unlikely to use in the future, like the videos or online components. One program member suggested that the trainers open the workshop with an experiment instead of a presentation, another requested that ***tpt*** provide additional statistics and examples of success stories, and a third felt that the training might have been too basic for her group of educators. Finally, one program leader said she was too hot during an outdoor icebreaker where she already knew most of the attendees but acknowledged that this was a minor criticism. Three felt that the training was a generally positive experience, particularly for their staff.

Impact on gender equity teaching strategies: The majority of program leaders noted that the training positively impacted their and/or their staff members' thinking about gender equity teaching strategies, and almost all of the program leaders indicated that the training provided valuable insight into how girls learn, experience, and enjoy science.

Use of *SciGirls* resources: All but one of the program leaders thought the training prepared attendees to implement the *SciGirls* activities in their communities. The remaining program leader said she was *not sure* and that she thought the educators in her group might not be able to implement the activities unless they received additional funding. When asked if the training impacted their skill and interest in integrating video and web resources into their outreach, one program leader said *yes*. Half of the remaining program leaders noted that, while they see the value of these materials, they are not likely to use video and/or web resources in their outreach. These program leaders most often indicated that they prefer the hands-on activities or have limited time and/or access to facilities/equipment. Meanwhile, the other half of the remaining program leaders said that they already use video and/or web resources and that they intend to incorporate the *SciGirls* materials into their outreach.

Interest in becoming a *SciGirls* trainer: Four (4) of the 9 program leaders went on to complete the Train the Trainer training in the spring of 2014. Two of these program leaders indicated that they were *extremely interested* in the opportunity before their organization's training, and two were *moderately interested* before their training but gained enthusiasm when they learned more about the project. Those who did not complete the Train the Trainer training cited personal reasons, limited time, and financial constraints.

SciGirls outreach program implementation and longer term outcomes

To date, the program leaders have used or intend to use the *SciGirls* materials in a variety of ways, from afterschool programs and camps to science center programs and university outreach initiatives. Details of the 9 groups' outreach efforts may be found in sections 1-9 of this report.

How *SciGirls* builds on or differs from previous programs: When asked how *SciGirls* did or will build on previous programs implemented by their organizations, the program leaders most often commented on the benefit of having new resources and activities at their disposal. Others noted that *SciGirls* has helped improve their staff and educational process – for example, by teaching them how to work with youth, making them more intentionally accepting of the things that interest girls, and helping them increase their focus. Additionally, one

program leader said she hopes to use her position to tell people in her area about *SciGirls*. When asked what *SciGirls* will bring to the youth served by their organizations that wasn't previously available, the program leaders pointed to the resources/activities and the opportunity for their educators to engage the girls more effectively. One mentioned that *SciGirls* provided a connection to public television, while another said her group's partnership with *SciGirls* validated her program and made it stronger.

Number of girls reached: When they completed their pre-training background surveys, the program leaders were asked to approximate the number of girls they expected to reach. Responses ranged from a low of 20 to a high of 10,000+, and the total number girls reported was 21,555+. Of the program leaders who answered the question (n=8), the mean number of girls reached was 2,694 per program leader. The table below compares program leaders' pre-training estimates with their post-training estimates and, when applicable, qualifications. Since the trainings, the conservative number of girls who will be reached by the resources has grown slightly, to 21,585+, with responses ranging from 15 to 10,000+. Of the program leaders who answered the question (n=9), the mean number of girls reached is 2,398 per program leader.

Estimated number of girls reached (or to be reached) with the *SciGirls* resources	
Pre-training estimates	**Post-training estimates**
Initially I hope about 20 in the core group, but more as we continue.	15
35 with the "A,B,C's of Science" camp; ~1,900 with 4-H STEM programming throughout the year	1900
50	50+
50+	170-230
100 per week for 5 weeks (some will attend several weeks, all 5 weeks or just 1 week)	300 campers + clubs throughout the school year
1000+	1000+
8,000 nationally	8,000, including those reached through social media and online promotion
10,000+	10,000+
Unknown	150+
TOTAL: 21,555+	**TOTAL: 21,585+**

Satisfaction with *SciGirls* resources: Each program leader has used or plans to use some combination of video, print, and/or web resources as best suits their needs and their access to facilities/equipment. A handful of program leaders specifically mentioned that they appreciated the range of materials, from activities to PowerPoint presentations to information for parents. In general, the program leaders are pleased with the resources and have found that they compare favorably to other resources they've used to address girls' science learning. In particular, they pointed to the value of "*the exhaustive educational standards*," the female-focused Mentor Moments, their focus on inquiry, the low cost of materials, and their ease of use. The activities from *SciGirls Season One* and *Season Two* are both of interest to the program leaders. When asked if the SciGirls resources have or will be used in other outreach programs, some program leaders pointed to groups that were represented at their training (like the Boys & Girls Club, or local teachers), while others said they weren't sure.

Use of *SciGirls* Seven: When working with the girls, all of the program leaders felt that they were or will be able to apply the key research findings about how girls learn science, the *SciGirls* Seven. Additionally, most of the program leaders noted that gender equity teaching strategies are part of everything they do.

Use of Spanish language resources: Though none of the program leaders have had the opportunity to use the *SciGirls* Spanish language resources in their outreach programs, all but one said that they hoped to do so soon. The remaining program leader noted that her region lacks a heavily diversified population. Those who pointed to a specific use for the Spanish language resources most often indicated that they hoped to use them with parents, to teach them about *SciGirls* and get them "on board" with the program. With their outreach efforts spanning broad demographic groups, the program leaders generally felt that the resources (i) allowed them to reach their intended audiences and (ii) are "*relevant for everyone.*"

Program highlights: According to the program leaders, the success of their work depends on a number of factors, including: supportive staff, an established network of educators, ready-to-use materials and activities from *SciGirls*, strong partnerships with established groups, and good relationships with the girls.

Obstacles to implementation: The program leaders identified a number of challenges or obstacles that they have encountered or expect to encounter while implementing their *SciGirls* outreach programs. As on their background surveys, almost all of the grantees pointed to *financial constraints*. However, two of the program leaders noted that financial constraints were a smaller issue than originally anticipated, due to the relatively low cost of the *SciGirls* activities. As for other challenges, a handful each cited *competing institutional priorities*, *access to facilities/equipment*, and/or *time constraints*. Some also commented on the challenges of *connecting with partners*, *resistance to gender themes*, *finding an audience*, and *building enthusiasm* in their communities.

Impact on girls and families: In general, the program leaders noted that they do not intend to use any formal methods to asses the gains made by the girls in their programs, though a few said that they have informally seen positive changes in the girls, including increased confidence, openness to collaboration, and creativity. Those who *do* intend to formally assess the gains made by girls in their programs do not yet have any results to share. Though most felt that it was too early to say that there had been a lasting impact on the girls and their families, they certainly hope this will be the case.

Impact on organizations: Many of the program leaders indicated that their involvement with *SciGirls* had already made a lasting impact on their organizations and staff.

Potential for sustainability: When asked what a program like *SciGirls* could do to increase its chances for sustainability, just under half of the program leaders suggested that ***tpt*** continue to make new episodes and resources, both online and in print, and one specifically suggested computer science and engineering activities. A few commented on the need for more diversity in the materials, in terms of demographics and filming locations, and one recommended that the program be expanded to include "next steps" for girls who are especially interested in STEM. Other program leaders said that a group like *SciGirls* could be more sustainable by providing funding on the local level and/or guidance regarding funding sources, mentor outreach, and ways to build interest in the community. Finally, one program leader suggested that *SciGirls* do more outreach and advertising, noting that she doesn't think the program is very well known.

On the subject of what ***tpt*** could do to support their efforts moving forward, the program leaders made a range of recommendations. Just under half requested increased communication with ***tpt*** through things like: email check ins; online trainings and refresher courses; and the opportunity to meet with trainers and partners every year or few years to refresh, reenergize, and learn about new resources. A few pointed to the importance of funding, suggesting ***tpt*** provide stipends for their trainers or help pay volunteers on the local level, while a handful requested additional materials, including new activities and Spanish language materials for parents. One program leader asked that ***tpt*** encourage PBS affiliates to promote the work of local *SciGirls* partner

organizations, while another suggested ***tpt*** continuously conduct evaluations that assess program implementation and execution. Finally, a few praised the program and had no suggestions for improvement.

Final thoughts

This report provides information about the 9 background partners' use of the *SciGirls Season Two* resources, lessons learned from attending the training and using the materials, and the impact of both on their programs moving forward. At the time of their follow-up interviews with the independent evaluation team, the 9 partners had made varying degrees of progress in the planning and implementation of their *SciGirls* programs.[24]

Overall, the program leaders expressed great enthusiasm for *SciGirls* and shared clear and developed goals for their *SciGirls* outreach programs. In general, they indicated that their participation in the project provided four main opportunities: to use STEM education to reach out to girls, to increase educator knowledge and awareness, to build collaborative partnerships with community members, and to expand or strengthen their organizations.

Looking across the findings and at themes that emerged in numerous places, we briefly summarize a few issues that might help inform this and other projects:

- Responses from some program leaders indicate that there is room for ***tpt*** to provide more pre-training communication with organizations in order to: (i) clarify expectations and responsibilities, (ii) help program leaders better advertise their trainings to target groups, and/or (iii) potentially tailor the training to particular limitations or needs. For example, groups that won't have DVD access when working with kids might prefer a shorter information section about the video resources, and groups that primarily work with educators might like additional information about adult learning.

- Though most of the program leaders were familiar with gender equity STEM teaching strategies prior to the training, they saw this aspect of the experience as a valuable "refresher" and appreciated the opportunity to share the information with their staff and/or collaborating partners, most of whom were not as knowledgeable on the subject. Additionally, the program leaders who were less familiar with gender equity teaching strategies generally now feel prepared to work with girls.

    - It is important to note that gender equity teaching strategies might also encourage partner organizations to find other ways to make their programs and outreach efforts more inclusive. Said one partner, speaking about her organization's (pre-*SciGirls*) focus on gender inclusion, "*If we hadn't taken the foray into looking at gender inclusion, I don't know if we could have gotten into including other groups quickly*."

- The program leaders greatly value the quality and variety of *SciGirls* materials. In general, even those groups that do not have the ability (or interest) to use the video and/or web resources appreciate having them available, both for potential future use and ease of sharing with others.

    - In addition to being effective and easy to use, the program leaders also appreciate that the activities are inexpensive, well researched, focused on inquiry, and fun for the girls.

[24] This is not surprising, as the 9 partner trainings took place between January and April 2014 and the follow-up phone interviews occurred in May and June 2014.

- The program leaders also generally appreciate that the *SciGirls* activities are easily adaptable for different ages, group sizes, time frames, and facility and equipment limitations. Furthermore, a few organizations have successfully incorporated them into pre-existing curricula. Finally, a handful of program leaders noted that they have also been able to apply the *ideas* behind the *SciGirls* materials to some of their other (non-*SciGirls*) activities, in order to make them more open-ended and collaborative.

- Some program leaders commented on the added value of their partnership with *SciGirls*, indicating that – in addition to benefiting girls – their involvement in the program has increased the validity of their organizations while helping community members learn about the value of informal education. For example, one program leader noted that her organization's involvement with *SciGirls* has helped parents see that afterschool programs aren't "*just a place to do homework and then play*."

- All but one of the program leaders said that they hope to use the Spanish language resources with girls, parents, or educators in the near future. Though only a handful of program leaders indicated on their background surveys that their organizations have implemented programs for Hispanic youth ages 8-13 within the past 5 years, the majority of the 9 surveyed background partners value the Spanish language resources and hope to use them whenever necessary and possible.

- On their background surveys and in their follow-up interviews, the program leaders noted that funding is one of the biggest obstacles to project implementation. At the same time, a few of the program leaders said in their follow-up interviews that funding has been a smaller obstacle than initially anticipated because of the low cost of most *SciGirls* activities and/or grants they have received.

- The program leaders are generally enthusiastic about the program. In addition to sharing *SciGirls* through their official, organizational roles, a number of program leaders have used or hope to use the materials with their friends, family members, and other community members (through their child's school or their Girl Scout troop, for example).

    - On a related note, a few of the program leaders mentioned that *SciGirls* is not very well known in their area, indicating that there is room for growth and outreach or advertising by ***tpt***. Here, ***tpt*** might tap into the enthusiasm mentioned above and rely – at least in part – on their program leaders and trainers to help "spread the word." If this is something ***tpt*** decides to encourage, they might want provide guidance on how program leaders and trainers can most effectively share *SciGirls* with their networks of educators and regional or national organizations.

- Finally, from their pre-training surveys and post-training interviews, it seems the program leaders generally believe that strong, collaborative partnerships (often with a variety of partners) are the foundation of successful, sustainable programs. However, as many of the 9 program leaders' outreach efforts are still in the planning or early implementation stages, additional research will be needed to better evaluate the impact and importance of collaborating partners.

Consideration of the key evaluation questions

In closing, below we consider the key evaluation questions relating to the *SciGirls* training, program, and multimedia resources and summarize the findings in each case, as evidenced by the training evaluations, program report forms, and the pre-training background surveys and post-training follow-up interviews.

***SciGirls* training**

- *To what extent did the training improve the participants' abilities to implement SciGirls activities in their local communities?*

  The training evaluations completed by the 359 educators indicated that the training increased participants' skills in implementing the *SciGirls* activities covered at the training and their skills in incorporating the *SciGirls* Seven Strategies, the Engineering Design Process, and the Science Inquiry Process.

  Moreover, in the background surveys of the 9 partners that participated in the in-depth evaluation, most of the program leaders indicated that their organizations had implemented programs for youth ages 8-13 in the last five years, with about half of the program leaders noting that they had specifically implemented programs for girls ages 8-13. In spite of their experience coordinating youth-focused programs, in their follow-up interviews, all but one of the program leaders commented on how the training had prepared them and/or their staff to implement the *SciGirls* activities in their communities. In general, they said it gave them ideas for activities, information about the *SciGirls* Seven, and the opportunity to learn the best ways to engage youth.

- *Did participants feel the training was well-organized and run?*

  The training evaluations completed by the 359 educators indicated that participants felt the training was well run and organized, that they found the training to be a good use of their time, and that they had fun at the training.

  The follow-up interviews conducted with the 9 partners also indicated that the program leaders generally felt that that the training was well-organized and run.

- *What features of the training did they find most and least valuable?*

  The training evaluations completed by the 359 educators indicated that the most valuable aspects of the training were the focus on hands-on activities, the focus on the *SciGirls* Seven strategies, and the *SciGirls* resources, particularly the activities and videos. A small group of educators pointed to the opportunity to network, or other aspects of the training. When asked to describe what they found *least* valuable about the training, no one aspect stood out for the majority of the educators and nearly three-quarters of the group either indicated there were no least valuable aspects or left the question blank. A small group of educators pointed to some aspect of the training conditions, typically the facilities used, the length of the training, the time of day, the room temperature, or the training setting. Smaller groups commented that their training featured too much of a focus on the *SciGirls* Seven or too much time spent on projects.

  In their follow-up interviews, the 9 program leaders pointed to a range of things that they found most valuable about the training, including: new materials and information, a chance to walk through the hands-on activities, a free training, the low cost of activity implementation, advice on how to incorporate the

SciGirls Seven into their outreach, the opportunity to learn about gender equity teaching strategies, and the training's focus on methods. When asked what they found *least* valuable, they most often pointed to the review of resources that they and their staff are unlikely to use in the future, like the videos or online components. One program member suggested that the trainers open the workshop with an experiment instead of a presentation, another requested that ***tpt*** provide additional statistics and examples of success stories, and a third noted that the training might have been too basic for her group of educators. Finally, one program leader said she was too hot during an outdoor icebreaker where she already knew most of the attendees but acknowledged that this was a minor criticism. Three felt that the training was a generally positive experience, particularly for their staff.

- *To what extent did the training increase awareness within participants' departments of issues in gender-equity teaching and learning? In particular, did the training raise staff awareness of how girls learn, experience, and enjoy science?*

  The training evaluations completed by the 359 educators indicated that these educators generally agreed that they learned a lot about how girls learn, experience, and enjoy science. Overall, the educators also found all of the training sessions valuable. While there were some differences of opinion, in general, the Gender Equity/*SciGirls* Seven and *SciGirls* activity sessions were both rated as *extremely valuable*, each receiving a median rating of 5.0 (*extremely valuable*) on a scale of 1.0 (*not at all valuable*) to 5.0 (*extremely valuable*). The Introductions/overview to *SciGirls* mission and program elements session and the Wrap-up reflections session were each rated as *very valuable* (median rating 4.0).

  In their post-training follow-up interviews, the majority of the 9 program leaders noted that the training positively impacted their and/or their staff members' thinking about gender equity teaching strategies, and almost all of the program leaders indicated that the training provided valuable insight into how girls learn, experience, and enjoy science. As a group, the program leaders talked about changes they had noticed in their staff (such as pronoun use and greater awareness of girls' responses to activities) and the positive ways the training impacted their personal approaches to working with girls and the mindsets of their collaborative partners and other community members.

- *To what extent did the training improve participants' skills in integrating video and web resources into their programming?*

  The training evaluations completed by the 359 educators did not specifically ask about the issue of integration but did ask about skill improvement in other areas covered at the training. While there were some differences of opinion, the educators generally reflected that they had *little skill* implementing the *SciGirls* activities prior to the workshop but *moderate skill* after. Educators were also asked to reflect on their skill incorporating three strategies or processes when implementing the *SciGirls* activities covered at the training. While there were again differences of opinion, the educators generally reflected that they had *little skill* incorporating the *SciGirls* Seven Strategies prior to the training but *moderate skill* after the training. They further indicated that previously they had *some skill* incorporating the Engineering Design Process and incorporating the Science Inquiry Process, and that after the training they had *moderate skills* incorporating the Engineering Design Process and *advanced skills* incorporating the Science Inquiry Process.

  In their follow-up interviews, only 1 of the 9 program leaders indicated that the training had increased her skill and interest in integrating video and web resources into their outreach. Half of the remaining program leaders noted that, while they see the value of these materials, they are not likely to use video and/or web resources in their outreach. These program leaders most often indicated that they prefer the hands-on

activities or have limited time and/or access to facilities/equipment. Meanwhile, the other half of the remaining program leaders said that they already use video and/or web resources and that they intend to incorporate the *SciGirls* materials into their outreach.

- *Did participants have suggestions for improving the training experience?*

  Although this question was not addressed in the training evaluation completed by the 359 educators for the *Season Two* evaluation, when asked about omitted topics, the majority of educators indicated that no topics or activities were omitted from the training or covered in insufficient depth. Small groups of educators indicated there were some topics or activities they would have liked to see covered or addressed more fully, including: biology activities, other STEM activities, differentiation (gearing activities to older and younger students, underlying gender issues accounting for *SciGirls* Seven, and guidelines for reaching or working with underrepresented youth.

  A handful of the 9 program leaders provided suggestions for improving the training during their follow-up interviews, including: increasing communication with ***tpt*** prior to the training; providing additional guidance regarding funding sources, mentor outreach, and ways to build interest in the community; presenting more statistics and examples of success stories; finding ways to tailor the training to more experienced groups (if need be); and starting the training with an activity instead of a presentation.

SciGirls program

- *What types of SciGirls programs did the educators hold and what were the lengths of their programs?*

  The majority of the 49 educators who completed a program report and reflection form indicated that they held afterschool programs. Summer, evening, school, and weekend programs were implemented far less frequently. Most of the educators said they either held ongoing programs or one-time programs that lasted between 1-3 hours.

  In their follow-up interviews, the 9 program leaders described a range of program types, from in-school visits to afterschool programs, camp activities, and curriculum fairs, among others. Though many of the program leaders described ongoing programs, others held one-time activities. The length of one-activities was not discussed in the follow-up interviews.

- *When and in what types of settings did the educators hold their programs?*

  The majority of the 49 educators who completed a program report and reflection form indicated that they held their programs in 2013, with April and November being particularly active program months. Two-thirds of the educators held programs at a school, with community centers, libraries, and museum/science centers hosting programs far less frequently.

  In their follow-up interviews, the 9 program leaders highlighted a range of programs that have been planned and implemented since each organization's *SciGirls* training. Some groups held events in the spring of 2013 or were planning programs for the summer of 2014 and beyond, while others were still in the early planning stages. The 9 program leaders described settings ranging from classrooms and college campuses to community centers, camps, museums, and local businesses.

- *How did youth participate in their programs?*

  The 49 educators who completed the program report and reflection form were asked to check off which of the ways that youth participated in their programs. The 10 activity strategies described on the questionnaire are reflected in the *SciGirls* Seven. The majority of educators indicated that their youth *collaborated in groups*, *engaged in projects*, *approached projects in their own way*, *received positive feedback*, and *expressed viewpoints*. Other strategies were reported somewhat less frequently.

  In their pre-training evaluations, all but one of the 9 program leaders indicated that their organizations currently use one or more gender equitable teaching strategies. Almost all of the program leaders noted that they use *hands-on, open-ended projects and investigations* and *relationships with role models or mentors*. Some reported that their youth: *are exposed to a variety of STEM careers; receive specific, positive feedback on their effort, strategies, and behaviors*; and/or *collaborate in groups*. Others indicated that their youth: *are encouraged to express their individual viewpoints within a group setting; communicate findings to the group using a variety of techniques; are allowed to approach projects in their own way;* and/or *work on a project designed to be personally relevant and meaningful to them*. Finally, a handful noted that their youth *use solid evidence to support claims when communicating findings*. The program leaders were not asked about specific *SciGirls* Seven strategies in the open-ended follow-up interviews, though they did all note that they think they have been or will be able to apply the *SciGirls* Seven.

- *How many youth attended their programs, what were the community types in which the youth lived, and what were the grade levels, gender, and racial/ethnic backgrounds of the youth?*

  The 49 educators who completed the program report and reflection form were asked to estimate the number of youth participants who attended their programs. Their estimates ranged from a low of 6 to a high of 254. On average there were 34 youth per program, with a total of 1618 youth attending across the programs. About half of the educators indicated that they served youth from urban communities, and suburban and rural communities were each listed by about two-fifths of the educators.

  The 49 educators estimated that the majority of the youth who participated in their program were in upper elementary school or middle school. Specifically: 3rd through 5th graders made up more than half of the youth who participated, while a slightly smaller group of youth participants were in grades 6 through 8. Very few participants were in kindergarten through 2nd grade, and even fewer participants were in 9th through 12th grade.

  The 49 educators indicated that the majority of the youth who participated in their programs were female. More than four-fifths were female, compared to less than one-fifth male. They also reported that nearly two-thirds of youth served were White. More than a tenth each were of Hispanic or Latino origin, or were African-American or Black. Less than a tenth each were Multiracial, Native American or Alaskan Native, or Asian or Indian. Participants were also invited to comment on or explain the numbers that they reported. Several participants indicated that they did not formally keep track of race/ethnicity information or that they did not have a formal sign in process, explaining either that their numbers were estimates or that they could not provide an estimate. A few educators qualified their estimates to help explain the way they were calculated.

  When they completed their pre-training background surveys, the 9 program leaders were asked to approximate the number of girls they expected to reach. Responses ranged from a low of 20 to a high of 10,000+, and the total number girls reported was 21,555+. Of the program leaders who answered the

question (n=8), the mean number of girls reached was 2,694 per program leader. Since the trainings, the conservative number of girls who will be reached by the resources has grown slightly, to 21,585+, with responses ranging from 15 to 10,000+. Of the program leaders who answered the question (n=9), the mean number of girls reached is 2,398 per program leader. As a group, the 9 program leaders pointed to a range of grade levels (kindergarten through high school) and demographics. Though many of their programs served both girls and girls, others were female-focused.

- *To what extent were other individuals present during the program?*

  The 49 educators who completed the program report and reflection form indicated that beyond themselves and their youth participants, educators and community volunteers were also frequently present at their programs, followed by parents/guardians and grandparents. Specifically: educators were present at about two-thirds of the programs, while community volunteers were present at half of programs. Parents and guardians were present at more than one-quarter of the programs; and grandparents and other individuals were each present at one-tenth of the programs. Examples of other individuals present at the programs included: County Science Coordinator, scientist, interns, STEM role models, and guest speakers from the community.

  Though the 9 program leaders were not specifically asked about other *SciGirls* program attendees during their follow-up interviews, many mentioned the presence of STEM role models, interns, educators, volunteers, and parents, among others.

***SciGirls* multimedia resources (video, print, and web resources)**

- *Which of the video, print, and web resources did participants engage and why? How satisfied were participants with the resources?*

  The 49 educators who completed a program report and reflection form indicated they used various *SciGirls* activities, videos, and website, as outlined below.

  - Activities The educators indicated they used some *Season One* activities more than others in their programs. From *Season One, Passion for Pixels* was most frequently used followed by *This Bitter be Good, Sink or Swim?, Bouncing Balloons, Breathing Room, Dough Creatures,* and *Blowin' in the Wind.* With respect to *Season Two*, the educators also used some *Season Two* activities more than others, though they were generally used less widely than those from *Season One*. The three most frequently used *Season Two* activities were *The Awesome Game Race, Insulation Station,* and *Super Sleuths.* None of the educators reported using the *Season Two* activities in Spanish.

    Reflecting on the overall value of the *SciGirls* activities used in their program, the educators indicated that the activities were generally *very valuable*. When invited to elaborate on their ratings, they praised various aspects of the activities, such as their ease of use, adaptability, interactivity, applicability to boys and girls, synergistic value with the *SciGirls* videos, and overall motivational and learning value.

  - Videos: Educators used some *Season One SciGirls* videos in their programs more than others. *Blowin' in the Wind* was used most often followed by *Going Green, Puppet Power*, and *High Tech Fashion.* The *Season Two* videos were less widely used as a whole than the *Season One* videos, and some were used more than others. The two most frequently used *Season Two* videos were *Aquabots* and *Super Sleuths.*

Reflecting on the overall value of the *SciGirls* videos used in their programs, educators indicated that the videos were generally *very valuable*. When invited to elaborate on their ratings, the majority of educators praised some aspect of the videos, typically noting that they were an excellent lesson starter, fed well into discussion, featured excellent role modelling of scientists, and/or did a good job of showing regular girls discovering science. Some educators, however, did not find the videos particularly valuable for use in their programs. Most often these educators indicated that they not find a way to use them due to space, access, or time constraints, or they reflected that their participants (particularly older girls) were not interested in the videos.

- *SciGirls* PBS Kids website: Less than half of the educators reported using the PBS Kids site in their programs. Among the 20 educators who *did use* the website, the most common uses were watching videos and playing games, followed by free time for participants, presenting findings, or uploading projects.

  Reflecting on the overall value of the *SciGirls* PBS website used in their program, the educators indicated that the website was generally *very valuable*. When invited to elaborate on their ratings, a few educators praised some aspect of the website, typically noting that it was easy to navigate and came in hand for easy access. A few educators said they had technical difficulty showing the videos online.

- *SciGirls* CONNECT website**:** Nearly two-thirds of the educators indicated that they used the CONNECT site to develop their programs. In general the educators found the site *very valuable*. When invited to elaborate on their ratings, many educators praised some aspect of the website, typically that they found it helped with program structure, that it served as a full-service resource, that it had high repeat visit value, and/or that it has helpful information and resources

- *SciGirls* Parents website**:** About one-sixth of the educators indicated that they used the Parent site to develop their *SciGirls* programs.

In their follow-up interviews, the 9 program leaders each described how they have used or plan to use some combination of video, print, and/or web resources. Most of the program leaders have used or are also planning to use activities, and are incorporating activities from *SciGirls Season One* and *Season Two*. In general, they are selecting the materials that best suit their needs and (often) their established curricula, as well as their access to facilities and equipment.

In general, the program leaders noted during their follow-up interviews that they were pleased with the resources and have found that they compare favorably to other materials they've used to address girls' science learning. In particular, they pointed to the value of "*the exhaustive educational standards*," the female-focused Mentor Moments, their focus on inquiry, the low cost of materials, and their ease of use.

- *What did participants find to be the main challenges and highlights of implementing the resources they chose to use?*

  Just under one-quarter of the 49 educators who completed the program report and reflection form reported that they experienced challenges implementing their programs, with time constraints and/or getting girls to attend or stay involved in their program the two most common reasons provided. Other challenges that did not pertain directly to the resources included facility/equipment issues, managing girl dynamics, money issues, and coordinating/managing staff. Issues with coordinating, gathering or using the

supplies/materials used in their programs were reported by a small percentage of educators, approximately one-tenth.

In their follow-up interviews, the 9 program leaders identified a number of challenges or obstacles that they have encountered or expect to encounter while implementing their *SciGirls* outreach programs. As they indicated on their background surveys, almost all of the grantees pointed to *financial constraints*. However, two of the program leaders noted that financial constraints were a smaller issue than originally anticipated, due to the relatively low cost of the *SciGirls* activities. As for other challenges, a handful each cited *competing institutional priorities*, *access to facilities/equipment*, and/or *time constraints*. Some also commented on the challenges of *connecting with partners*, *resistance to gender themes*, *finding an audience*, and *building enthusiasm* in their communities.

When asked to describe the highlights of their programs, the 9 program leaders generally noted that the success of their work depends on a number of factors, including: supportive staff, an established network of educators, ready-to-use materials and activities from *SciGirls*, strong partnerships with established groups, and good relationships with the girls. They also identified

- *From the participants' perspective, what did the girls gain from their experience with the resources? What methods if any, did they or other project staff use to assess these gains?*

  The 49 educators who completed the program report forms were asked to reflect upon what participants gained from their involvement with the *SciGirls* activities, videos, and PBS website.

  - Activities**:** Most often the educators observed their participants gain STEM content knowledge, scientific inquiry/process skills, teamwork/collaboration skills, and/or the experience of having fun/being engaged. Somewhat less often the educators pointed to their participants: gaining enrichment in seeing women and girls doing science, developing greater confidence, discovering STEM as being more personally relevant, developing career insight in STEM fields, and/or benefitting from mentoring.

  - Videos**:** Most often the educators pointed to the benefits their participants gleaned from seeing women and girls doing science in the videos, followed by gains they observed in their participants' use of scientific inquiry/process. Somewhat less often the educators observed gains in STEM content knowledge and/or STEM applications and relevance. A small number of educators believed that their participants did not connect to the videos or that their students did not gain anything from viewing.

  - *SciGirls* PBS website**:** The educators who used the website reflected that their participants gained from the site in different ways. The largest group said participants benefitted from the opportunity for leisure/at home exploration. Smaller groups pointed to the opportunities for participants to play games and activities, share and track investigations online, and/or engage in social networking with girls/female scientists.

Although the above impacts were generally based on educator reflections on their programs, nearly one-fifth of the educators indicated that they had an opportunity to evaluate how their programs impacted their youth. Most often these educators pointed to positive findings with respect to STEM engagement, confidence, and attitudes. While some educators did not describe how they evaluated these outcomes, several mentioned using group discussions or youth and/or parent written surveys. Several also indicated a willingness to share their evaluation findings with ***tpt*** once available

In their follow-up interviews, the 9 program leaders generally noted that they do not intend to use any formal methods to assess the gains made by the girls in their programs, though a few said that they have informally seen positive changes in the girls, including increased confidence, openness to collaboration, and more creativity. Those who intend to formally assess the gains made by girls in their programs do not yet have any results to share. Though most felt that it was too early to say that there had been a lasting impact on the girls and their families, they certainly hope this will be the case.

- *Did participants use the resources in ways that took advantage of the inquiry-based and authentic investigation approaches reflected in SciGirls?*

  Although this question wasn't directly addressed in the program report and reflection forms completed by the 49 educators, when the educators were asked to describe the highlights of their *SciGirls* programs, they most often they pointed to the hands-on elements, the fun and engaging aspects, and/or the opportunities for teamwork/collaboration. Other aspects were pointed to somewhat less frequently, including elements that involved scientific inquiry, learning of STEM content, mentoring, developing confidence, and STEM career insights. Use of the resources more specifically tied to the *SciGirls* Seven is addressed below.

  Throughout the follow-up interviews, a number of the program leaders commented on their appreciation for the inquiry-based *SciGirls* approach, saying that they appreciated the focus on inquiry and methods, as in, "*The SciGirls program really encourages true inquiry-based activities, because the goal is <u>not</u> to tell them.*"

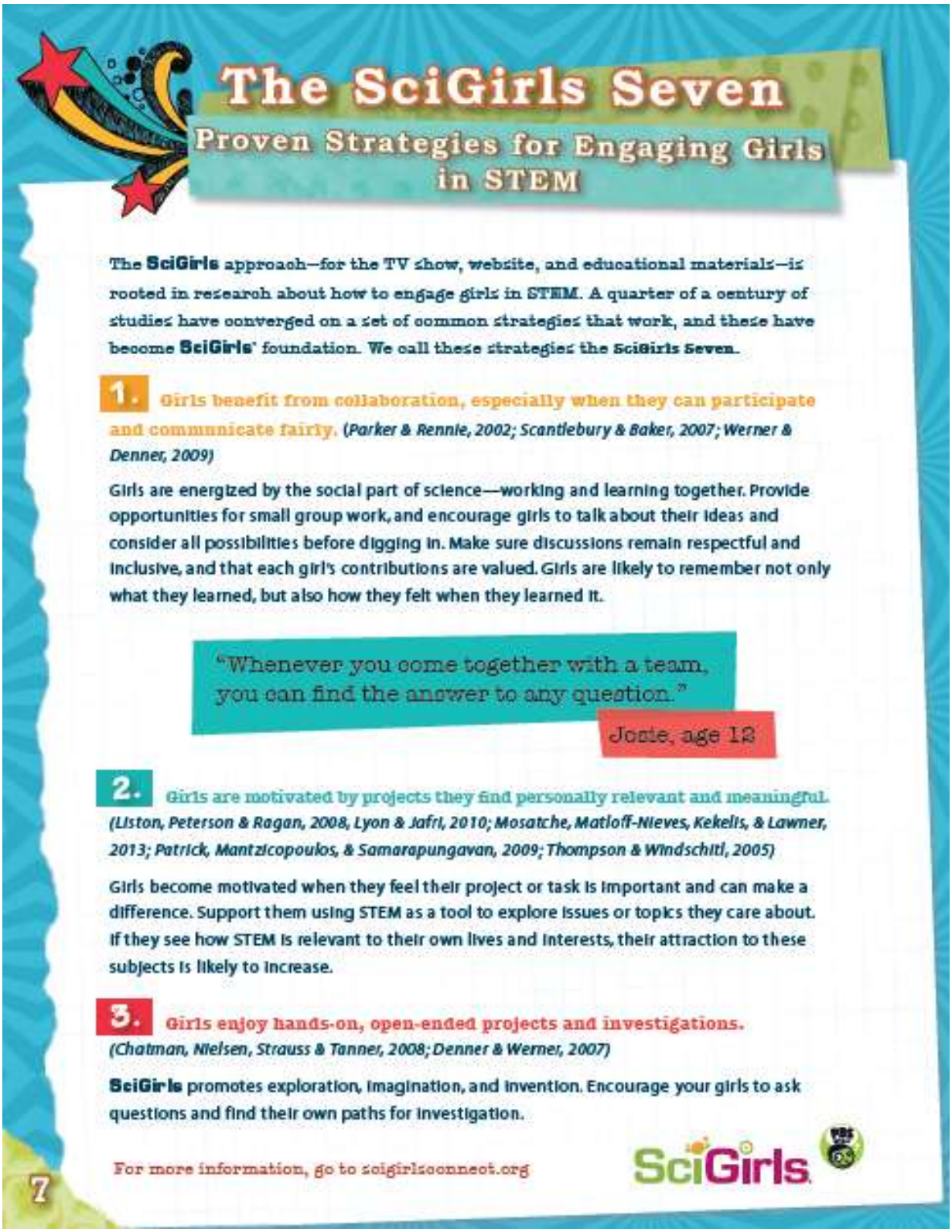
- *In implementing the resources, did participants apply the key research findings built into the SciGirls materials?*

  The 49 educators who completed program report and reflection forms were asked to check off the ways in which youth participated in their programs, choosing from among 10 activity strategies reflected in the SciGirls Seven. Nearly three-quarters or more of the educators indicated that their youth collaborated in groups, engaged in projects, approached projects in their own way, received positive feedback, and expressed viewpoints. Half or just over half of the educators reported that their youth: worked on a project designed to be personally relevant and meaningful to them, discussed STEM careers, communicated findings to the group using a variety of techniques, and/or developed relationships with role models or mentors. Just over one-fifth of the educators indicated youth used solid evidence to support claims when communicating findings.

  In their follow-up interviews, all of the program leaders felt that they were or will be able to apply the key research findings about how girls learn science, the *SciGirls* Seven when using the resources. Some talked about keeping *SciGirls* Seven cards in the back pockets, while others noted that their staff members are keeping the strategies in mind when they coordinate outreach projects or design new programs. Additionally, most of the program leaders noted that gender equity teaching strategies are part of everything they do.

Appendix 1: *SciGirls* Seven

Please see below for screenshots of the *SciGirls* Seven, as detailed in the online book *SciGirls* Seven: How to Engage Girls in STEM, available at: http://scigirlsconnect.org/page/scigirls-seven.



The SciGirls Seven

Proven Strategies for Engaging Girls in STEM

The **SciGirls** approach—for the TV show, website, and educational materials—is rooted in research about how to engage girls in STEM. A quarter of a century of studies have converged on a set of common strategies that work, and these have become **SciGirls'** foundation. We call these strategies the **SciGirls Seven.**

1. **Girls benefit from collaboration, especially when they can participate and communicate fairly.** *(Parker & Rennie, 2002; Scantlebury & Baker, 2007; Werner & Denner, 2009)*

Girls are energized by the social part of science—working and learning together. Provide opportunities for small group work, and encourage girls to talk about their ideas and consider all possibilities before digging in. Make sure discussions remain respectful and inclusive, and that each girl's contributions are valued. Girls are likely to remember not only what they learned, but also how they felt when they learned it.

"Whenever you come together with a team, you can find the answer to any question."

Josie, age 12

2. **Girls are motivated by projects they find personally relevant and meaningful.** *(Liston, Peterson & Ragan, 2008; Lyon & Jafri, 2010; Mosatche, Matloff-Nieves, Kekelis, & Lawner, 2013; Patrick, Mantzicopoulos, & Samarapungavan, 2009; Thompson & Windschitl, 2005)*

Girls become motivated when they feel their project or task is important and can make a difference. Support them using STEM as a tool to explore issues or topics they care about. If they see how STEM is relevant to their own lives and interests, their attraction to these subjects is likely to increase.

3. **Girls enjoy hands-on, open-ended projects and investigations.** *(Chatman, Nielsen, Strauss & Tanner, 2008; Denner & Werner, 2007)*

SciGirls promotes exploration, imagination, and invention. Encourage your girls to ask questions and find their own paths for investigation.

For more information, go to scigirlsconnect.org

SciGirls

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4. **Girls are motivated when they can approach projects in their own way, applying their creativity, unique talents, and preferred learning styles.** *(Calabrese Barton et al., 2013; Calabrese Barton, Tan, & Rivet, 2008; Eisenhart & Finkel, 1998; Lyon & Jafri, 2010)*

Encourage girls to develop their own ways of exploring and sharing knowledge, paying attention to the unique learning styles that motivate your group. You may be surprised by what creative, exciting approaches girls come up with when designing investigations, collecting data, and communicating results.

5. **Girls' confidence and performance improves in response to specific, positive feedback on things they can control—such as effort, strategies, and behaviors.** *(Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2000; Halpern et al., 2007; Kim et al., 2007; Mueller & Dweck, 1998)*

Self-confidence can make or break girls' interest in STEM. Foster their efforts, compliment their strategies for problem solving, and let them know their skills can be improved through practice. Celebrate the struggle. Wrestling with problems and having experiments fail is a normal part of the scientific process!

6. **Girls gain confidence and trust in their own reasoning when encouraged to think critically.** *(Chatman, Nielsen, Strauss & Tanner, 2008; Eisenhart & Finkel, 1998; Kim et al., 2007)*

Cultivate an environment in which asking questions and creative thinking are a must. Throughout the centuries, this same trust in logic and re-examination of ideas made advances in science, technology, and engineering possible.

7. **Girls benefit from relationships with role models and mentors.** *(Holmes, Redmond, Thomas, & High, 2012; Liston, Peterson & Ragan, 2008; Lyon & Jafri, 2010; Mosatche et al., 2013; Weber, 2011)*

Seeing women who have succeeded in STEM helps inspire and motivate girls, especially when they can relate to these role models as people with lives outside of the lab. Role models and mentors not only broaden girls' views of who does science, but expand girls' vision of what's possible in their own lives.