SciGirls CONNECT²

Implementation evaluation
Year 1 outreach programs

Knight Williams, Inc.

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Knight Williams Inc.

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Significant findings

The independent evaluation firm, Knight Williams, Inc., developed a two-part post-program survey to gather information about the Year 1 *SciGirls CONNECT²* outreach programs conducted by 14 partner organizations. The evaluation aimed for one educator from each organization to complete Part 1 of the survey, which consisted of program reporting questions. In all, one educator from 13 partner organizations completed Part 1, for a response rate of 93%. Part 2 of the survey asked for program reflections, with a focus on perceived program goals, impacts, highlights, and challenges. Given the qualitative nature of this feedback, the evaluation sought the perspective of two educators per site. In all, 24 educators from 13 partners completed Part 2, for a response rate of 86%. Key findings that emerged regarding the partners' Year 1 programs are summarized below.

Program locations, type, and settings
Programs took place in 12 states across the United States and the District of Columbia, and more than four-fifths of programs reached urban youth. Afterschool programs were the most common type, implemented by just under half the partners, followed by summer programs. Roughly half the programs were held in a school, a third were held in a community/recreation center, and a quarter were held in a museum/science center, while the remaining programs were held in another setting.

Program participants
About three-quarters of the programs were for all girls. Attendance at each program ranged from 8 to 120 youth, with three-quarters of programs reaching between 10 and 25 youth. In total, approximately 375 youth participated in the Year 1 programs. Almost nine-tenths of the youth were girls and four-fifths were in 3rd through 8th grade. They generally came from diverse racial and ethnic backgrounds, including Hispanic and other minority groups. Nine-tenths of programs were also attended (at least once) by parents, and two-thirds were attended (at least once) by siblings.

Between one-third and three-fifths of educators said *most* or *all* of the youth in their Year 1 programs came from non-STEM identifying families, had low exposure to STEM role models/mentors, were of low-to-moderately-low socioeconomic status, had low knowledge of STEM fields, and/or had low parental/guardian knowledge of STEM fields. None of the educators thought that *most* or *all* youth had parents/guardians with low English language proficiency or had low English language proficiency, although two-thirds and one-third, respectively, thought that *some* youth faced these barriers.

Program length, frequency, and duration
The number of sessions partners implemented ranged from a low of two to a high of 28, averaging nine per partner. Session lengths ranged from 75 minutes to nine hours, averaging four hours per session. Total program hours ranged from 10 to 47.5, averaging 27 per partner. In terms of when programs took place, the shortest started and ended in the same month, while the longest spanned eight months.

Program topics
All of the programs covered science and engineering and more than three-quarters each covered math, technology, and art, with other subjects being covered by fewer programs.

Inclusion and emphasis of SciGirls CONNECT² program components
Looking across the program reporting information provided by the partners, the evaluation confirmed that organizations generally implemented the minimum required elements listed on the partner website with respect to: serving at least 10 girls ages 8-13; implementing at least 16 hours of programming; incorporating the *SciGirls Seven*; and including three role models, a family event, and video creation. One partner each did not quite reach the expectations with respect to the minimum number of hours and girls, and two partners had fewer than three role models.

Moreover, when asked to rate the extent to which their Year 1 programs included eight components relevant to *SciGirls CONNECT²*, the educators generally indicated that their programs integrated the *SciGirls Seven* and exposed youth to STEM role models to *a great extent*. They also thought they showed youth culturally and linguistically relevant STEM media, focused on enhancing youths' STEM identity, and addressed youths' knowledge about STEM fields *to a considerable extent*. Finally, educators indicated that their programs addressed parents/guardians' knowledge about STEM fields and offered opportunities for both family participation and youth-created videos *to some extent*.

Use of SciGirls resources
Nine-tenths of programs used the *SciGirls* activities, more than four-fifths used the episodes or episode clips, and roughly three-quarters used the CONNECT website, with other resources used less often.

Use and impact of role models
The number of role models used by each program ranged from one to 15, averaging six per partner. Two-thirds of educators said their role models gave presentations/Q&As, while more than half said they participated in activities with the youth, with other ways the role models participated being mentioned by smaller groups of educators. When asked to comment on how their youth responded to the STEM role models, nine-tenths of the educators noted that their youth were engaged/excited to meet and interact with the role model, and just over half said their youth expressed interest in the role models' personal and/or professional lives, with other responses being shared less often.

Highlights and challenges of Year 1 family events
More than half of the educators identified parents' engagement, excitement, or pride as a highlight of the family events, while smaller groups commented on seeing youth share what they had done with their parents, observing families interact around the *SciGirls* activity, or watching youth teach or challenge their parents. When asked to identify any challenges faced in their family events, about three-fifths pointed to an issue related to timing, scheduling, or attendance. A third had trouble engaging or involving parents, and smaller groups pointed to the facilities and/or the challenge of selecting the right activity.

Highlights and challenges of Year 1 video projects
In terms of implementing their video projects, about half each of the educators said highlights included watching girls enjoy the process and/or seeing girls demonstrate STEM learning and growth, among other less-frequently-cited responses. When asked to identify challenges of the video projects, about a third pointed to time constraints, with smaller groups citing youths' comfort levels, the technology, youth participation, or getting parent permission/forms.

Perceived impact of Year 1 programs
When asked how they had hoped their Year 1 programs would impact participating girls, three-quarters of educators said they hoped to expose girls to STEM careers or encourage them to consider STEM careers, while roughly half hoped to increase girls' interest or excitement in STEM, among other responses. The evaluation team reviewed each educator's full set of survey responses to look for evidence that they had observed the impacts they hoped to achieve. This overarching review showed that all of the educators thought they observed the impacts they had hoped to see in Year 1.

Among the program components offered, more than half of the educators pointed to their use of role models as the component that had the greatest impact on youth, followed by about two-fifths who cited the activities, with other responses being shared less often. When asked which *SciGirls* resources they felt were most important in helping them impact youth, nearly three-quarters of educators pointed to the activities, with smaller groups citing the episodes or clips from episodes and/or the women in STEM videos, among other *SciGirls* resources.

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Introduction

Project background and goals

SciGirls CONNECT² : Investigating the Use of Gender Equitable Teaching Strategies in a National STEM Education Network is a three-year Research in Service to Practice project directed by Twin Cities Public Television (TPT) and funded by the National Science Foundation Division of Research on Learning. As summarized on the [*SciGirls CONNECT²* website](#) the project will produce an updated set of [SciGirls Seven](#) strategies, a set of seven strategies used by informal educators in diverse settings since 2010 to help engage girls in STEM studies and careers.

To achieve this goal, TPT is working with an advisor group, an independent evaluation team from Knight Williams, Inc., a research team from the Center for Integrating Research & Learning of Florida State University, and a cohort of informal STEM education organizations to: 1) evaluate educators' use and perceived effectiveness of the *SciGirls Seven* with diverse girls in informal STEM settings; 2) conduct a comprehensive literature review of the latest gender equity research; and 3) implement a research study investigating the impact of the *SciGirls Seven* on girls' STEM identity. At the end of the project, TPT will disseminate the literature review, research and evaluation findings, and the updated set of *SciGirls Strategies* to practitioners and researchers in the informal STEM education field.

Outreach program requirements

SciGirls CONNECT² partner organizations were required to include several program components in their outreach programs. As outlined on the *SciGirls CONNECT²* [partner website](#), these included:

- Offer a 16-32 hour *SciGirls* program for at least 10 girls ages 8-13
- In Year 1 (April-December 2017) use existing *SciGirls Seven* strategies
- In Year 2 (April-December 2018) use updated *SciGirls Strategies*
- Include at least three female role models
- Include the creation of short videos created by girls in pairs or groups, about their STEM experiences, including meeting role models
- Hold one culminating event for girls and families each year to engage families and girls in hands-on activities, sharing of learning, media viewing, and meeting female STEM role models

Role of independent evaluation

For the *SciGirls CONNECT²* project, the role of the independent evaluators from Knight Williams, Inc. is "to gather, analyze, and summarize data that can facilitate the project's effort to revisit, refine, and expand the *SciGirls Seven* and related strategies … [prioritizing] methods that are interactive and iterative in nature over the grant period" (NSF proposal, 2015). Using front end, formative, and implementation processes, the evaluation team has and will continue to: 1) provide the project and research teams with relevant information at key points during the grant period, such that both teams have regular access to data on the educators'

experience with the strategies that can be used to inform the project's research and practice initiatives; and 2) provide ongoing documentation and assessment of *SciGirls CONNECT²* project activities to help assess progress in achieving the grant's stated objectives.

As part of the project's independent implementation evaluation, the subject of this report, the evaluation team administered an online survey to educators from the *SciGirls CONNECT²* partner organizations at the end of their Year 1 programs. The purpose of the evaluation was to gather information about the educators' program characteristics and participants as well as the educators' reflections on their programs, including their perceptions of program impacts, highlights, and challenges.

Report outline

This report presents implementation findings on the Year 1 outreach programs conducted by *SciGirls CONNECT²* partner organizations. The findings are presented in three parts: Part 1. Year 1 program reporting; Part 2. Perceived impact of Year 1 programs, resources, and role models; and Part 3. Highlights and challenges of Year 1 family events and video projects.

Method

The evaluation aimed for two educators from each partner organization – specifically the program leader and one educator who was familiar with the *SciGirls Seven* – to participate in the evaluation after they completed their Year 1 programs. As the partners completed their Year 1 programs, between June and December of 2017, Knight Williams sent them an invitation to complete an online survey hosted on the firm's independent server.

The survey contained two sections. The first section consisted of program reporting questions. As shown in Image 1 from the online survey landing page, only one educator from each partner organization was asked to complete this program reporting section.
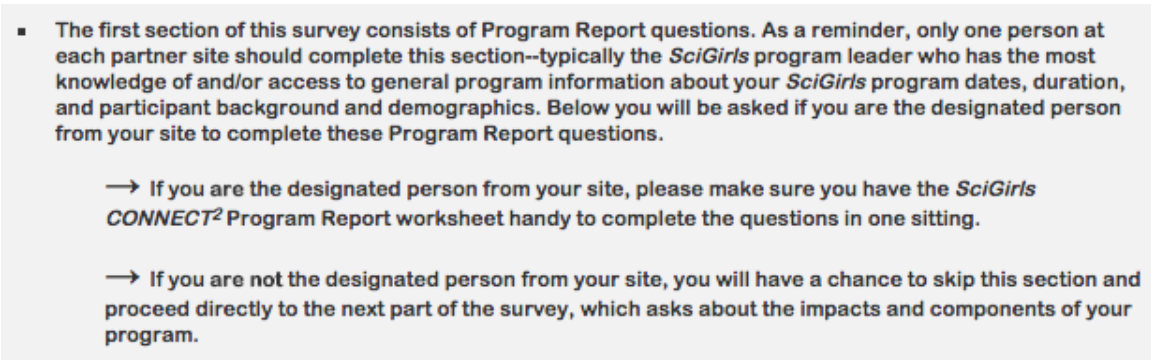
- The first section of this survey consists of Program Report questions. As a reminder, only one person at each partner site should complete this section--typically the *SciGirls* program leader who has the most knowledge of and/or access to general program information about your *SciGirls* program dates, duration, and participant background and demographics. Below you will be asked if you are the designated person from your site to complete these Program Report questions.

  → If you are the designated person from your site, please make sure you have the *SciGirls CONNECT²* Program Report worksheet handy to complete the questions in one sitting.

  → If you are not the designated person from your site, you will have a chance to skip this section and proceed directly to the next part of the survey, which asks about the impacts and components of your program.

Image 1: *SciGirls CONNECT²* post-program evaluation survey landing page instructions
(http://www.knightwilliams.com/scigc/sgc2post.aspx)

The second section of the survey asked for program reflections, with a focus on perceived program goals, impacts, highlights, and challenges. Given the qualitative nature of the feedback, the evaluation strategy in this case sought the perspective of two educators per site.

Analysis

Basic descriptive statistics were performed on the quantitative data generated from the evaluation. Content analyses were performed on the qualitative data generated in the open-ended questions. The analysis was both deductive, drawing on the project's goals and 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.

Response rate

Partner representation
Although the evaluation initially intended to examine the activities of 16 partner organizations, two organizations were unable to implement Year 1 programs and one did not complete the evaluation by the project deadline; thus, only 13 of the 14 partner organizations that completed programs are considered in this report. Further details are provided below.

Educator response
As described above, the evaluation aimed for one educator from each of the 14 partner organizations to complete Part 1 of the post-program survey. In all, 13 educators completed Part 1, for a response rate of 93%. The evaluation also aimed for two educators from each of the 14 partner organizations to complete Part 2 of the survey, for a total of 28 educators. In all, 24 of 28 educators completed Part 2, for a response rate of 86%.[1] Eleven of the 14 partner organizations submitted two surveys each, and two organizations submitted one survey each. Despite multiple requests from the evaluation team and TPT, one partner had yet to submit any surveys by the project deadline, resulting in 13 rather than 14 partner organizations being represented in this report.

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[1] In 22 cases, the educators who completed the post-program survey were also those who filled out the evaluation's pre-program survey before beginning their Year 1 programs. Where relevant, information provided in the pre-program survey is shared in this evaluation.

Educators' role and experience
at the partner organizations

Role at organization
Figure 1 shows the educators' roles at their organizations. The majority of educators identified as program leaders (58%). Smaller groups were educators (29%) or described holding other roles (13%), such as *Operations Director*, *Outreach Coordinator*, or *program volunteer*. In a few cases, the role of program leader seems to have been shared by two individuals from the same organization.

Experience at organization
Figure 2 shows the educators' years of experience at their organizations. For whom this information was available (22/24), the largest group had 2 to 4 years of experience (41%), while smaller groups of about one-fifth each indicated they had 0 to 1 year, 8 to 10 years, or more than 10 years of experience (18% each). A small group (5%) reported 5 to 7 years of experience.

Figure 1. Educators' roles at their organizations (N=24)
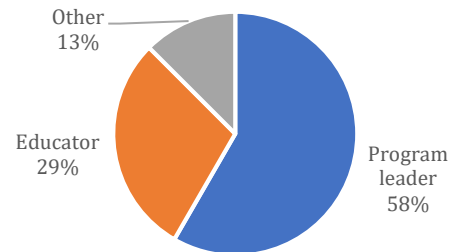
Figure 2. Educators' experience at their organizations (n=22)
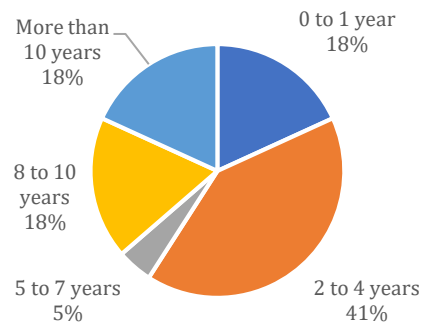
Findings

Part 1. Year 1 program reporting

Part 1 is divided into two sections. The first section focuses on the following program characteristics: location, type, length, duration, frequency, settings, STEM topics, resources used, and inclusion of specific *SciGirls CONNECT²* components. The second section presents findings on the number and background of youth participants in the partners' programs, followed by an overview of other program participants and the use of role models in the programs.

Program characteristics

1.1 Program locations

Image 2 shows where the *SciGirls CONNECT²* programs were held. The programs took place in 12 different states across the United States and the District of Columbia, although the majority were based in East coast states (62%).

Image 2. *SciGirls CONNECT²* program locations

Figure 3 shows that most educators reported that their programs reached youth from urban communities (85%). Smaller groups worked with youth in suburban (38%) and rural areas (23%).

Figure 3. Communities reached by Year 1 programs (n=13)

Percentage of educators
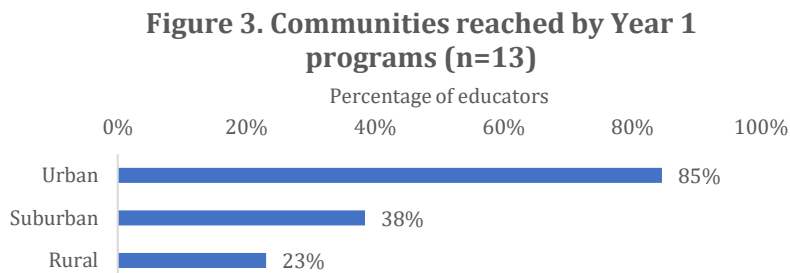
1.2 Program types

Figure 4 shows the types of programs the partner organizations implemented in Year 1. Afterschool programs (46%) were the main program type, followed by summer programs (38%) . Other program types (15%) were implemented by a few organizations, including a monthly Saturday program and a "*weekend workshop in collaboration with other organizations.*" [2]

Figure 4. Year 1 *SciGirls CONNECT²* program types (n=13)

1.3 Program length, duration, and frequency

Table 1 shows the length, duration, and frequency of the 13 partner programs. The number of sessions per program ranged from two to 28, averaging nine sessions per partner. Session length ranged from 75 minutes to nine hours, averaging four hours per session, and total program hours ranged from 10 to 47.5 and averaged 27 per partner. In terms of when the programs took place, the shortest started and ended in the same month (for example, three programs started and ended in July 2017), while the longest program started in May and ended in December 2017.
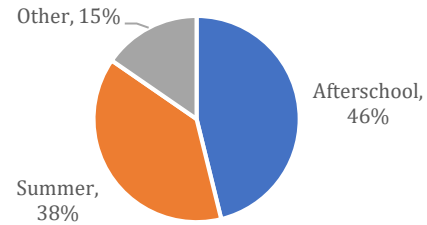
Table 1. Length, duration, and frequency of Year 1 programs (n=13)					
	Number of sessions	**Length of each session (in hours)**	**Total program hours**	**Starting Month**	**Ending Month**
Partner 1	12	2	24	April	June
Partner 2	5*	3.5	33	May	December
Partner 3	5	7	35	July	July
Partner 4	6	4	24	July	July
Partner 5	5	5.5	25	July	July
Partner 6	6	8	47.5	July	August
Partner 7	2	9	18	August	August
Partner 8	8	1.25	10	September	December
Partner 9	4	7	28	September	December
Partner 10	28	1.5	42	September	December
Partner 11	16	1	16	September	December
Partner 12	12	2	24	September	December
Partner 13	13	2	26	October	December

* Partner 2 left this question blank on the post-program survey. One of their educators was asked about this in a follow-up conversation and said she thought they held four to six programs, but that she couldn't be certain. For the purposes of determining the average number of sessions across all partners, the evaluation team used the figure five.

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[2] As detailed in Knight Williams' front-end evaluation of *SciGirls CONNECT²*, when the educators completed their pre-program surveys, half of the full group of 16 partner organizations indicated they were planning multiple kinds of programs for Year 1 (50%). In comparison, none of the 13 partner organizations that submitted the post-program survey reported that they had planned multiple kinds of programs. This discrepancy indicates that when they completed their pre-program surveys, some of the partners were likely in the early planning stage and weren't sure which type of program they were going to conduct.

1.4 Program settings

Figure 5 shows the main settings where the partner organizations held their programs. Just over half were held in a school (54%). Less often, the programs were held in a community/recreation center (31%), a museum or science center (23%), or some other location (15%), including a "*research laboratory*." Though not shown in Figure 5, two of the educators (15%) indicated that their programs took place in multiple locations.

Figure 5. Settings of Year 1 programs (n=13)

Percentage of educators
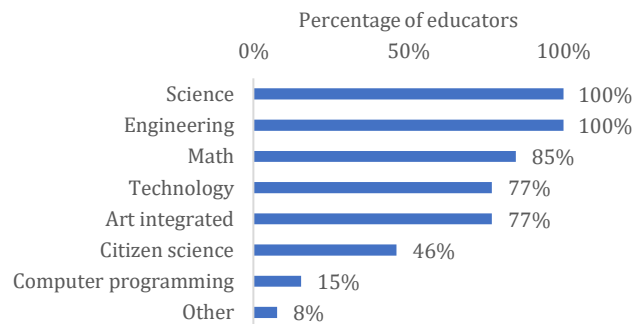

Setting	Percentage
School	54%
Community/recreation center	31%
Museum/science center	23%
Other	15%
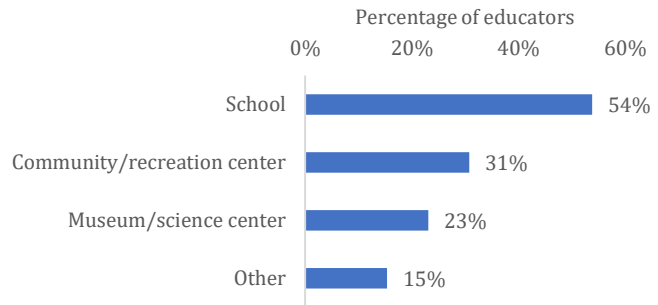
1.5 STEM topics covered

Figure 6 shows the STEM topics the partner organizations focused on in their Year 1 programs. All of the educators said their programs covered science (100%) and engineering (100%), while most pointed to math (85%), technology (77%), and art (77%). Smaller groups said their programs covered citizen science (46%), computer programming (15%), or other topics (8%), with one educator elaborating that they had focused on "*career exploration*."

Figure 6. STEM topics covered in Year 1 programs (n=13)

Percentage of educators

Topic	Percentage
Science	100%
Engineering	100%
Math	85%
Technology	77%
Art integrated	77%
Citizen science	46%
Computer programming	15%
Other	8%

1.6 Use of *SciGirls* resources

Figure 7 shows the resources that the educators used in their Year 1 programs. Most of the educators indicated that they used the *SciGirls* activities (92%), the episodes or clips from episodes (85%), and/or the CONNECT website (77%). Additionally, a majority in each case described using the women in STEM videos (69%) and/or the PBS Kids website (62%), while a smaller group used the PBS Parents website (31%).

Figure 7. Resources educators used in their Year 1 programs (n=13)

Percentage of educators

Resource	Percentage
Activities	92%
Episodes or clips from episodes	85%
CONNECT website	77%
Women in STEM videos	69%
PBS Kids website	62%
PBS Parents website	31%
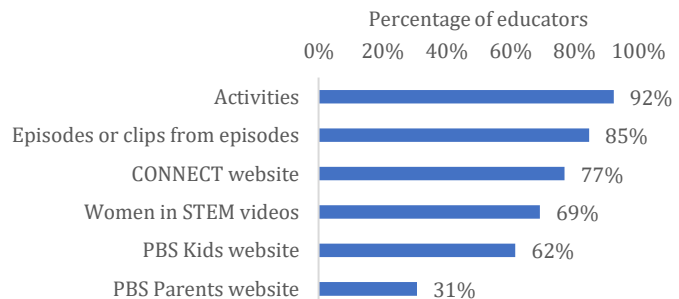
1.7 Incorporation of components relevant to *SciGirls CONNECT²*

Figure 8 shows median ratings for the extent to which educators' programs included eight components relevant to *SciGirls CONNECT²*, based on a scale from 1.0 (*not at all*) to 5.0 (*to a great extent*).

Figure 8. Median ratings of the extent to which educators' programs used components relevant to *SciGirls CONNECT²* (n=13)

Scale from 1.0 (*not at all*) to 5.0 (*to a great extent*)

Component	Rating
Integrate the SciGirls Seven	5.0
Expose youth to STEM role models	5.0
Show youth culturally and linguistically relevant STEM media	4.0
Focus on enhancing youths' STEM identity	4.0
Address youths' knowledge about STEM fields	4.0
Address parents/guardians' knowledge about STEM fields	3.0
Offer opportunities for family participation	3.0
Include opportunities for youth-created videos	3.0

Overall, the educators indicated that their programs used some components more than others. In particular, they tended to use:

- Two components to a *great extent* (*Mdn* = 5.0 each): integrating the *SciGirls Seven* and exposing youth to STEM role models.

- Three components *to a considerable extent* (*Mdn* = 4.0 each): showing culturally and linguistically relevant STEM media, focusing on enhancing youths' STEM identity, and addressing youths' knowledge about STEM fields.

- Three components *to some extent* (*Mdn* = 3.0 each): addressing parents/guardians' knowledge about STEM fields, offering opportunities for family participation, and including opportunities for youth-created videos.

  o Related to family participation, one educator commented on the challenges of encouraging family involvement:
    - *Parents were invited to the parent event and also received [numerous] communications from us during the course of the program. Response from parents was minimal. I would like to engage them more but it is hard with this group of students. They often said that their parents were tired and couldn't come out and also they were working long hours which did not allow them to attend.*

  o Related to the youth-created videos, a few educators elaborated on their experience with the videos:
    - *We didn't have devices for the girls so we didn't have the opportunity for youth-created videos. They did decide how they wanted to group together for the pre/post videos for the program.*
    - *This year, I feel like we could have done better with encouraging our youth the create videos of their experiences. Considering that we were new to the community we needed time to build relationships and trust among the community that we were serving. I believe we have done that in the last 6 months and 2018 would be more involvement in that area.*
    - *The oldest group of girls 5th - 7th grade have had opportunities to incorporate youth-created videos but we do not use that strategy as much in the younger grade levels.*
    - *The students were more interested in the STEM activities than videoing themselves. We had some girls who did not have permission to be videoed and that made it difficult to shoot group activity. The students got silly and lost focus in their activities when shooting videos of each other, so we did some but did not focus on this.*

1.8 Youth participants

Overall attendance

Figure 9 shows Year 1 programs by number of youth participants. Most of the programs had between 10 and 25 youth (77%). About a tenth each had fewer than 10 youth, between 75 and 100 youth, or more than 100 youth (8% each). None of the programs had between 26 and 74 youth.

Estimates ranged from a low of 8 to a high of 120 youth. Combining the educators' estimates across the 13 partner programs, approximately 375 youth participated in Year 1 programs.

Gender distribution

Figure 10 shows the estimated percentages of youth in the Year 1 programs by gender. Most of the youth in the *SciGirls CONNECT²* programs were girls (87%), while about a tenth were boys (13%).

Figure 11 shows the gender composition of the Year 1 programs that provided participant information. Most were all girls (77%), while more than a tenth were mostly girls (15%) and less than a tenth were half girls and half boys (8%).

Grade level

Figure 12 shows the estimated percentages of youth in the Year 1 programs by grade level. The largest groups of youth were either in grades 6th through 8th (43%) or 3rd through 5th (40%). Much smaller groups were in Kindergarten through 2nd grade (12%) or high school (6%).

Figure 9. Year 1 programs, by number of youth participants (n=13)

Percentage of programs

Fewer than 10	8%
10 to 25	77%
75 to 100	8%
More than 100	8%
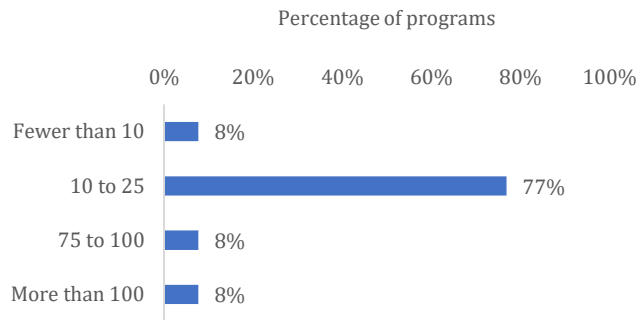
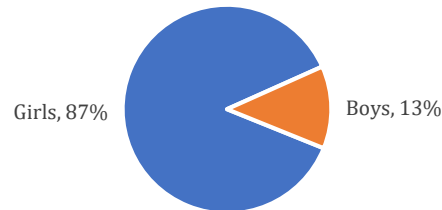**Figure 10. Estimated percentages of youth in Year 1 programs, by gender (n=375)**

Girls, 87%   Boys, 13%

Figure 11. Gender composition of Year 1 programs (n=13)

Mostly girls, 15%
All girls, 77%
Half and half, 8%
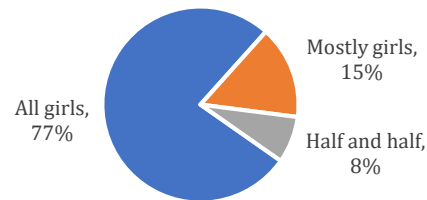
Figure 12. Estimated percentages of youth in Year 1 programs, by grade level (n=375)

6th through 8th, 43%
9th through 12th, 6%
3rd through 5th, 40%
K through 2nd, 12%
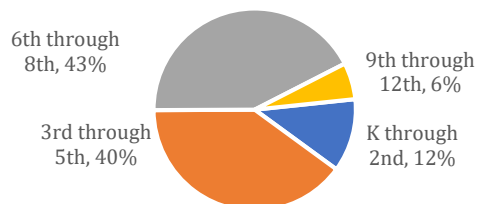
Racial/ethnic background

Figure 13 shows the estimated percentages of youth in the Year 1 programs with respect to race/ethnicity. About a third each of the youth were White (34%) or African-American/Black (30%), while about a fifth were of Hispanic/Latino origin (21%). Less than a tenth each were Asian (7%) or multiracial (7%).

Figure 13. Estimated percentages of youth in Year 1 programs, by race/ethnicity (n=375)
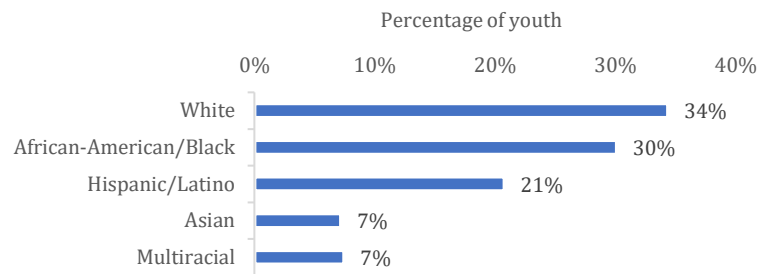
Barriers to STEM engagement

Figure 14 shows the percentages of educators who said that *all*, *most*, *some*, or *none* of the youth in their program faced the seven STEM barriers depicted in the chart. These barriers were among those described in the NSF project proposal as the types of barriers preventing many girls, especially girls from minority and lower socioeconomic groups, from fully participating in STEM studies and career paths (NSF proposal, 2015). In each case, responses from educators who said they *did not know* are not considered in Figure 13.

Figure 14. Educators' assessment of youths' barriers to STEM engagement
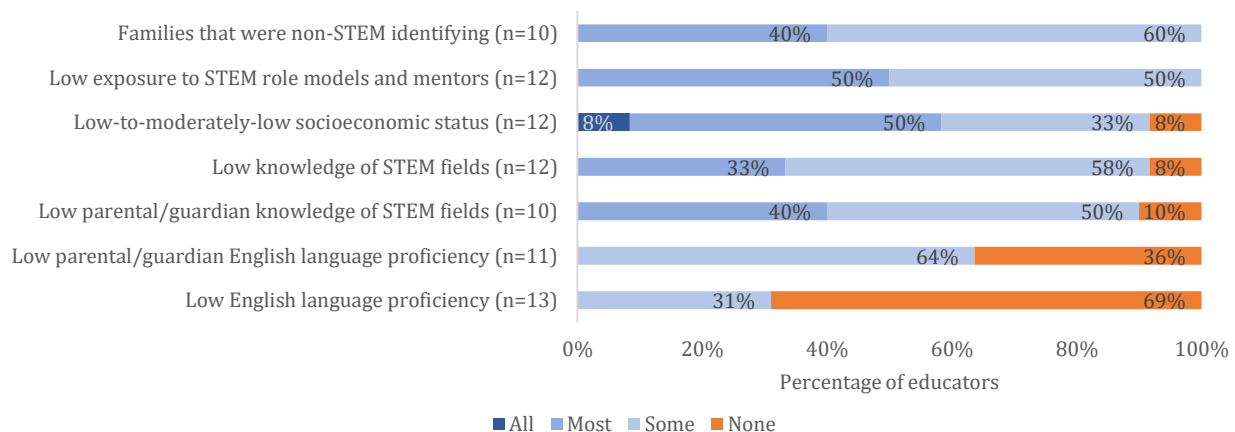
Among those who shared a response and thought *most* or *all* of their youth faced each barrier:

- More than half thought that *most* or *all* youth were of low-to-moderately-low socioeconomic status (58%).
- Half thought that *most* youth had low exposure to STEM role models and mentors (50%).
- Two-fifths each thought that *most* youth came from families that were non-STEM identifying (40%) and/or had low parental/guardian knowledge of STEM fields (40%).
- A third thought that *most* youth had low knowledge of STEM fields (33%).
- None thought that *most* or *all* youth had parents/guardians with low English language proficiency or had low English language proficiency, although two-thirds (64%) and one-third (31%), respectively, thought that *some* youth faced these barriers.

1.9 Other types of participants

Figure 15 shows the other types of individuals that participated in some aspect of the partners' Year 1 programs, beyond the youth participants. Most often the educators pointed to the presence of parents (92%) and siblings (69%). Smaller groups pointed to grandparents (31%) and/or family friends (23%). None of the educators indicated that cousins or aunts and uncles attended their programs.

Figure 15. Other individuals present at Year 1 programs (n=13)

Percentage of educators

Parents	92%
Siblings	69%
Grandparents	31%
Family friends	23%
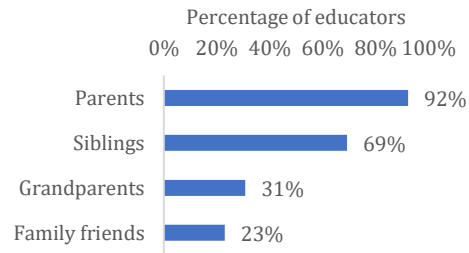
1.10 Role model participation

Number of role models that participated
Figure 16 shows the Year 1 programs by the number of role model that participated. More than a third of the programs had between one and three role models (38%), while less than a third each had four to nine (31%) or 10 or more role models (31%). The number of role models used by each program ranged from one to 15 and averaged six per program.

Figure 16. Year 1 programs, by number of role models (n=13)

10 or more, 31%
1 to 3, 38%
4 to 9, 31%
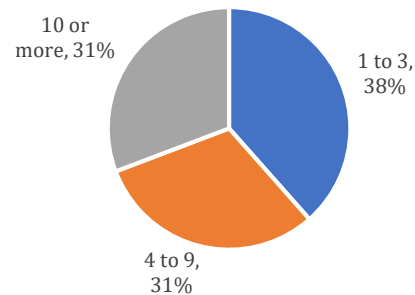
How role models participated
Figure 17 shows how the role models participated in the Year 1 programs. Most often they gave presentations or held Q&As (69%) and/or participated in activities (54%). Smaller groups explained that they interacted with families (31%), led a field trip or tour (15%), or participated in miscellaneous ways (15%). Examples of their responses are in Table 2 on the following page.

Figure 17. How role models participated in Year 1 programs (n=13)

Percentage of educators

Presentations/Q&As	69%
Activities	54%
Interacted with families	31%
Led field trip or tour	15%
Miscellaneous	15%

Table 2. How role models participated in Year 1 programs (n=13)

Gave presentations or held Q&As (69%)
- *Gave presentations, talked about program, encouraged students to do STEM fields of study.*
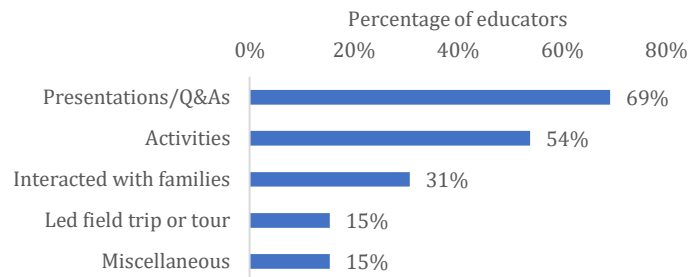- *These mentors visited with SciGirls during one meeting for 30 minutes and shared a little bit about their backgrounds, education, careers and inspiration for becoming a STEM professional. They then participated in a Q&A session with the girls …*
- *Two mentors did presentations to the group, spoke about their experience, and had a Q&A session with the group.*
- *Each made their own unique presentation including hands-on activities. Some joined us for the parent event and had smaller presentations for whole families.*

Participated in activities (54%)
- *… two of them also worked with the girls on activities.*
- *Each made their own unique presentation including hands-on activities.*
- *They each helped with an activity that was in their expertise.*
- *They came and did hands on activities, presentations, games and interacted with students on personal levels.*

Interacted with families (31%)
- *One role model participated during our family event in November; she is a professor at a local college & shared her experience in the STEM field.*
- *During this week, we also had [our role models] visit during the programming and family celebration.*
- *Some joined us for the parent event and had smaller presentations for whole families.*
- *The school science teacher participated in the parent meeting.*

Led a field trip or tour (15%)
- *… some added a special behind the scenes tour featuring their work/research.*
- *They led activities and field trip visits during the week.*

Miscellaneous (15%)
- *Camp mentors/counselors throughout the program (engineering students, community volunteers).*
- *Some of [our role models] also supported students in academic areas in school.*

Part 2. Perceived impact of Year 1 programs, resources, and role models

Part 2 first presents findings on the educators' goals for their Year 1 programs and whether and how they evaluated if these goals were met. It then addresses educators' reflections on the program components that they thought had the greatest impact on their youth, their perceptions of the impact of the *SciGirls* resources, and how they thought youth responded to participating STEM role models.

Unlike Part 1 of this report – which largely shares quantitative program information that only needed to be reported by the one educator from each partner organization who could most readily gather the data – Part 2 presents findings on the educators' program reflections. As the Part 2 questions asked educators for qualitative perceptions of their programs, the evaluation team requested two educators per partner complete the questions. In all, 24 of the possible 28 educators across 14 partner organizations completed this requirement.

2.1 Educators' program goals and whether realized

Impact(s) educators hoped their programs would have on participating girls
Figure 18 shows the main impacts educators hoped their Year 1 programs would have on participating girls. Though they shared a range of goals, the educators most often said they hoped to expose girls to STEM careers or encourage them to consider STEM careers (75%), followed by increasing girls' interest or excitement in STEM (54%). Smaller groups wanted their girls to increase their knowledge or awareness of STEM and its applications (38%), increase girls' confidence (38%), connect girls with role models (33%), help girls build their collaboration skills (13%), or shared miscellaneous feedback (17%). Examples of their responses in each case are in Table 3 on the next page.

Figure 18. Impacts educators hoped Year 1 programs would have on girls (N=24)

Percentage of educators

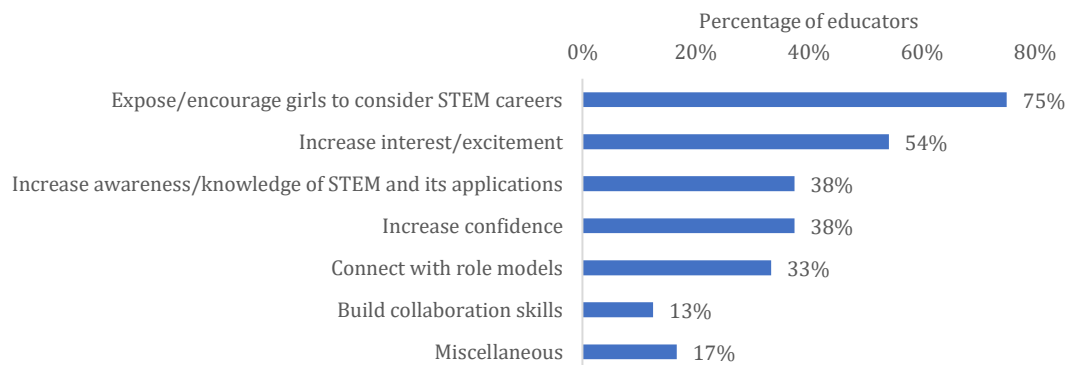| Category	Percentage
Expose/encourage girls to consider STEM careers	75%
Increase interest/excitement	54%
Increase awareness/knowledge of STEM and its applications	38%
Increase confidence	38%
Connect with role models	33%
Build collaboration skills	13%
Miscellaneous	17%

Table 3. Impacts educators hoped their Year 1 programs would have on participating girls (N=24)

Expose/encourage girls to consider STEM careers (75%)
- *I hoped that girls would gain a sense of opportunities in STEM fields …*
- *I was hoping to expose new STEM careers through role models to these girls.*
- *We hoped that the program would expose the girls to the various STEM opportunities available to them.*
- *I also wanted demonstrate the variety of STEM careers and subjects. For many, disinterest in one subject led to a disinterest in others that were related. For example, if math wasn't a favorite for a student, the student also stayed away from sciences like chemistry or biology.*

Increase interest/excitement (54%)
- *I hoped that girls would … gain an interest in STEM …*
- *Hoped they'd get excited about the activities …*
- *We hoped it would increase the girls' interest in STEM …*

Increase awareness/knowledge of STEM and its applications (38%)
- *I hoped that the program would get the participants … more aware of the science going on around them, outside, all the time.*
- *We want to increase their exposure to … subjects in STEM.*
- *Our goal was for our female students to have positive, educational STEM experiences.*
- *We hoped that our girls would have a better understanding of science & STEM field.*

Increase confidence (38%)
- *We hoped it would … make them feel more confident in their STEM abilities.*
- *We hope that girls increase their confidence with STEM subjects.*
- *I wanted to expand their knowledge about STEM and give them confidence to do STEM as a career.*

Connect with role models (33%)
- *I hoped that girls would … meet role models in STEM fields.*
- *Hoped they'd get excited about the activities and connect with the volunteers and role models.*
- *We wanted to … introduce them to women who are successful in STEM Careers.*
- *I wanted the girls participating in the SciGirls program to be impacted by seeing women in science. I wanted them to be able to recognize that women could play a part in science.*

Build collaboration skills (13%)
- *Increase in willingness and ability to collaborate.*
- *We hoped that students would learn the benefits of collaboration and teamwork.*

Miscellaneous (17%)
- *Hoped the families would experience the excitement their students had during the camp*
- *… improving overall critical thinking …*
- *I believe the program can influence and provide learning opportunities for these girls, that is meaningful and beneficial. It's my goal to keep it going at the school.*

Whether program impacts were realized
Figure 19 shows whether the educators had an opportunity to evaluate if their hoped-for program impacts were realized. Three-quarters of the educators said *yes* (75%) and one-quarter said *no* (25%).

Those who said *yes* were asked to explain how they evaluated these impacts and what their evaluation showed.[3]

Figure 19. Whether educators were able to evaluate if these impacts were realized (N=24)

No, 25%

Yes, 75%

Figure 20 shows that the majority in this group described using qualitative observation or interaction to evaluate their program's impact on youth (61%). Smaller groups said they used surveys or tests other than the program's research and evaluation surveys (including the Draw A Scientist Test) (22%), the videos made by youth (11%), the program surveys (11%), or shared miscellaneous comments (6%).

Figure 20. How educators evaluated impacts on youth in their Year 1 programs (n=18)

Percengage of educators

Qualitative observation/interaction	61%
Other surveys/tests	22%
Video projects	11%
Program surveys	11%
Miscellaneous	6%
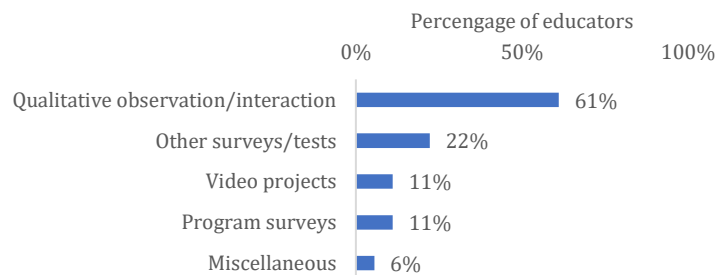
Although they were also asked to share what their evaluations showed, only some of the educators addressed this question in their comments. Given the relative lack of feedback shared in direct response to this survey question, the evaluation team reviewed each educator's full set of survey responses to look for other evidence that they had observed the impacts they hoped to achieve. This overarching review showed that all of the educators thought they observed the impacts they had hoped to see in Year 1 of *SciGirls CONNECT²*. Table 4 on the following page highlights six examples of the educators' Year 1 impact goals and whether and how they observed that these impacts were achieved.

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[3] Those who said *no* were asked to describe the impact(s) they thought their program had on participating girls. Of the six educators in this group, five said they saw an increased interest in STEM, two said their program goals were met, and one each said they saw girls gain problem-solving skills, communication skills, and confidence. These responses were also considered in the evaluation team's overarching review to determine whether and how educators thought they observed the impacts they had hoped to achieve.

Table 4. Examples of Year 1 impacts educators hoped to see and whether and how these impacts were observed (N=24)

Impacts educators hoped to see	Whether/how these impacts were observed
Educator 1: Impact goals *We hoped it would increase their knowledge of and confidence in STEM fields in addition to improving overall critical thinking and collaboration skills.*	***Educator 1: Impacts observed*** *We asked review questions each session to test the girls' retainment of the previous lesson and overall the girls remembered most of what was taught. Though we did not complete a formal evaluation, we could tell through observation that the girls became increasingly more confident through their interactions with the other girls and approach to problem solving.*
Educator 2: Impact goals *We hoped it would increase the girls' interest in STEM and make them feel more confident in their STEM abilities.*	***Educator 2: Impacts observed*** *[The girls] were very excited to do each individual project ... It did increase their confidence and performance because it allowed them to see exactly how their actions were impacting the projects.*
Educator 3: Impact goals *I was hoping to expose new STEM careers through role models to these girls. I was [also] hoping to encourage open ended hands on activities around engineering with the girls.*	***Educator 3: Impacts observed*** *I had a meteorologist come in and share how she does her job and three women from [the university] from the Ecology lab with wetland science ... I [also] had them design and create a candy dispenser. We did this once they had a chance to become more confident with the engineering design process and open-ended activities. They really enjoyed this activity.*
Educator 4: Impact goals *That the girls would see STEM differently, and that it would encourage them to get more involved with STEM-related activities/groups, and even maybe wanting to pursue a career in STEM later on in life.*	***Educator 4: Impacts observed*** *Throughout the program, I did notice that the girls became more excited to learn about STEM each day. I also sent them home with each program script that we did, and a few of them stated that they were going to do some of the activities again with their parents or siblings.*
Educator 5: Impact goals *I wanted the girls participating in the SciGirls program to be impacted by seeing women in science. I wanted them to be able to recognize that women could play a part in science.*	***Educator 5: Impacts observed*** *In the beginning of the program we asked the girls to describe a person working in the field of science and almost all described a man in a lab coat. At the end of the program many of the girls thought of themselves as scientist.*
Educator 6: Impact goals *Increased interest in STEM, both in school and as future careers, increased confidence in STEM, greater understanding of the diversity of STEM fields, increase in willingness and ability to collaborate.*	***Educator 6: Impacts observed*** *Based on feedback from the girls and their parents, I believe that all of our goals were met in most of the girls. Some came in with such a strong love of STEM, there wasn't much we could do to increase that interest, but we were able to expand their understanding of what it meant. Across the board we saw an increase in their creativity in problem solving. As they developed their projects, they thought way outside the box and came up with so many amazing creative ideas to test. Several of the girls who were very introverted and shy opened up and became an active part of their group. We were happy to break some of the stereotypes of STEM careers as evidenced by the surprise the girls showed when certain careers were featured that utilized STEM, and some of the actual jobs done in those careers (geologists rappelling down mountains; biologists investigating bizarre animal deaths; boat captains using physics, etc.) Initially the instructors were the ones who mediated any conflicts or disagreements, but we also saw girls learning to mediate problems within their groups and learning to more effectively communicate with each other.*

2.2 Program aspects educators thought had the greatest impact on youth

Figure 21 shows the program aspects educators thought had the greatest impact on participating youth. Most often the educators pointed to their use of role models (58%), followed by the activities/hands-on learning they implemented (38%). A few cited the *SciGirls* videos (13%) and/or the opportunity to make and share the video projects (8%). One said the whole program was impactful (4%) and less than a fifth shared miscellaneous responses (17%). Examples in each case are shared in Table 5.

Figure 21. Program aspects educators thought had the greatest impact on youth (N=24)
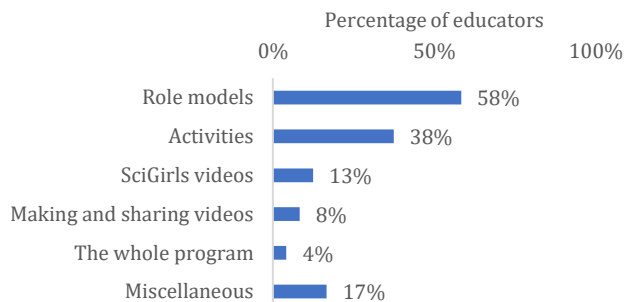

Table 5. Aspects of Year 1 programs educators thought had the greatest impact on youth and why (N=24)

Role models (58%)
- *I believe the girls enjoyed the … role models. They asked great questions to the role models and continued to speak about them days after they were part of the program.*
- *They also loved the mentor talks. They asked lots of great questions and seemed to gain a lot from seeing women in these fields. Interestingly, almost all of the mentors gave them the same message which was to find what you love (or think you may love doing) and try it out. The girls discussed this message often and would talk about all of the things they would like to try.*
- *Because we could not connect with any of the Fab Fems, I interviewed a young female astronomer and shared that with the girls. They loved it. Two or three of them expressed an interest in that field, combining it with their study of constellations. I am so glad I did that.*

Activities and hands-on learning (38%)
- *The hands-on activities always have the greatest impact, especially as we have our volunteers/mentors/role models engage with them throughout the activities.*
- *The girls absolutely loved the more exploratory activities where they created something or tested somethings (chemistry and physics days were some of the favorites). They seemed to recall the most information from these days during later meetings.*
- *The hands on and mentoring sessions had the greatest impact on the students. Our scholars often state that they don't always get the opportunity to make STEM click in the classroom settings. Our hands on and mentoring sessions allow students to engage in the topics and connect with individuals who are already in the field doing the work.*

SciGirls videos (13%)
- *… also, the girls thoroughly enjoyed the SciGirls videos, as they gave the girls a great first-hand look at how experiments they did during SciGirls activities, were used in real life.*
- *Watching the SciGirls videos … really put it into perspective how these activities that they participated in linked to real life jobs in the science field.*

Making and sharing video projects (8%)
- *The girls got to have mini-documentaries filmed and got to watch themselves talk about plants. They also got to see how others responded to them sharing what they knew when the videos were shared with parents later in the week. I think this was impactful in helping them to feel more confident about sharing what they know.*

The whole program (4%)
- *There wasn't really one specific thing that had the greatest impact, the program as a whole was an impact to the girls.*

Miscellaneous (17%)
- *… I found that the girls were most impacted by their inquiry-based group project. They felt empowered by the ability to develop a question, design an experiment to test it, implement the methods, and present their findings to their peers and family.*
- *I think the relationships the girls have with each other, seemed to have strengthened. I am sure their confidence is increased as a result.*

2.3 Most important *SciGirls* resources for facilitating desired youth impact(s)

Figure 22 shows the *SciGirls* resources the educators felt were most important in helping them achieve their desired youth impacts. The majority of educators pointed to the activities (71%), with smaller groups citing the episodes or clips from episodes (38%) and/or the women in STEM videos (21%). A few educators described the CONNECT website (8%), the PBS Kids website (4%), or miscellaneous resources (8%) as being most important in helping achieve youth impacts. Examples of their responses are shared in Table 6.

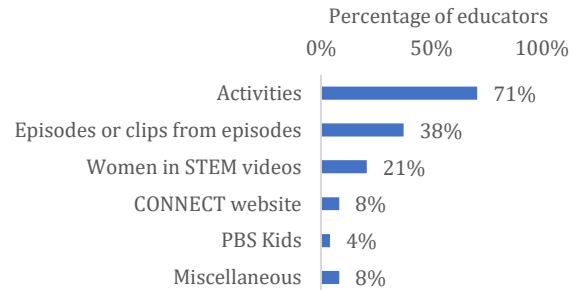**Figure 22. *SciGirls* resources educators found most helpful in impacting youth (N=24)**

Table 6. Resources educators found most helpful in impacting youth (N=24)

Activities (71%)
- *The camp couldn't be done without the activities but could be done without the other resources. The activities are by far the most important during the actual program.*
- *The SciGirls activities are amazing! The open-ended projects are great and the girls enjoy the topics and the materials. They are drafted in a way that is natural for girls and they fit well into our overall curriculum and themes!*
- *The SciGirls activities is what I felt were the most important in helping me achieve a positive youth impact for these young ladies. The activities were what I exposed them to every week and gradually they become more interested in what the next activity would be. Each activity we did introduced the girls to something new and they retained what they learned because of how much fun they had doing the activities … [the] hands- on activities really had a great impact on this learning experience.*
- *The SciGirls activities and the SciGirls episodes planned a major role. The activities are what got the girls excited to come to the program the next day.*

Episodes or clips from episodes (38%)
- *As they would eat lunch I would show a SciGirls episode that was related to our activity/theme for that day, and it helped them to understand what we just did or what we were about to do. They also showed the girls how you are able to meet new friends and have fun with your friends and learn at the same time.*
- *The episodes were great for getting the girls excited to see young women doing STEM and being themselves. We used them as an introduction to each meeting and I think it set the tone for learning, fun and explorations.*
- *The videos of the episodes were especially useful in demonstrating to the girls the potential careers in STEM and also how to overcome any obstacles along the way. The girls could relate directly to the girls' inquiry-projects in the episodes and gain insight into potential testing methods and strategies for working together as a team.*

Women in STEM videos (21%)
- *The one that stood out was seeing women in the STEM world and how much impact they made in their world.*
- *The … videos of women in STEM helped the most with our impact because the girls were able to see women that were holding important positions in the STEM field and felt like they could too, which increased their confidence.*
- *I feel like the … mentor moments helped us the most because we were able to expose our girls to more STEM careers beyond ones in our community.*

CONNECT website (8%)
- *SciGirls CONNECT website, SciGirls activities and both the video clips and Women in STEM videos were extremely helpful tools in designing the program delivery/planned experience for the girls.*

PBS Kids (4%)
- *The website is very important because students could engage with the online program even when we could not meet with them.*

Miscellaneous (8%)
- *While not a resource, the SciGirls Seven was probably the most important tool we used, being sure to incorporate all seven in to each meeting and allow opportunities for girls to apply the strategies in what they were doing.*

2.4 Perception of how youth responded to the STEM role models

Figure 23 shows the main ways educators observed their youth responding to participating role models. Almost all of the educators said their youth were engaged/excited to meet and interact with the role model (92%) and more than half said they were interested in the role models' personal and/or professional lives (54%). Smaller groups said their youth were inspired or encouraged in some way (33%), enjoyed doing activities with the role models (17%), and/or learned from seeing role models in their work settings (13%). A fifth shared miscellaneous feedback (21%), with a few commenting on how the role models interacted with families. Examples of their responses are in Table 7, below and on the next page.

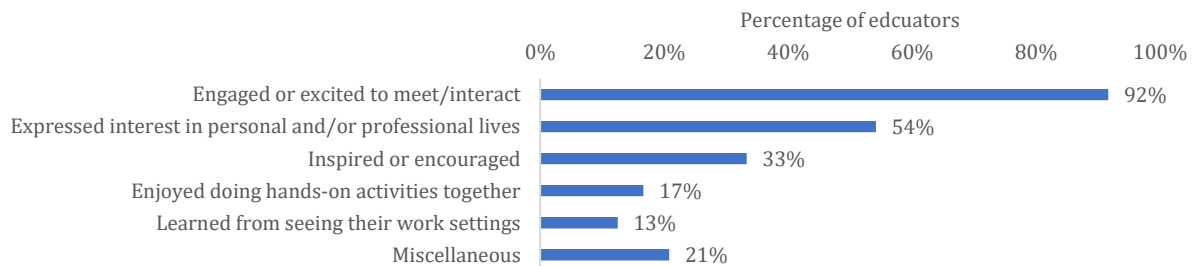**Figure 23. How educators observed youth responding to role models (N=24)**

Percentage of edcuators

Engaged or excited to meet/interact	92%
Expressed interest in personal and/or professional lives	54%
Inspired or encouraged	33%
Enjoyed doing hands-on activities together	17%
Learned from seeing their work settings	13%
Miscellaneous	21%

Table 7. How educators observed youth responding to role models (N=24)

Engaged or excited to meet/interact with role models (92%)
- *Youth were in awe of the role models. They were respectful, asked great questions and engaged.*
- *As I mentioned in the other question, the girls loved the role models/mentors … they were engaged.*
- *The girls were very excited to meet women in STEM fields.*
- *Youths were excited to see women come share their personal experiences and how much they achieved being in the STEM field.*
- *The girls were enthralled with the astronomer interview. Visits from the other role model were eagerly anticipated.*
- *Our youngest girls (Grades K-4) have high engagement with the role models however the older students aren't as engaged. I don't know if it's because of the large group setting or if we don't do a good enough job preloading the girls with information about the role model but there is a gap there.*

Expressed interest in personal and/or professional lives (54%)
- *They were able to ask questions and interact …*
- *They were respectful, asked great questions and engaged. Students came up with their own questions based on what the role models were saying such as "why should I participate in an internship?" and "how did you get where you are today?"*
- *They girls seemed very interested in their personal lives and intrigued by their professional lives. They were eager to ask questions to get a better understanding of their job and how their lives may be similar to one another.*
- *… they asked many questions pertaining to the role models' profession and pathway leading to it.*

Inspired or encouraged (33%)
- *… they were inspired to consider STEM fields.*
- *After one of our geologist role models spoke with the girls, a parent let us know that her daughter decided to become a marine geologist that day!*
- *In the beginning of the program we asked the girls to describe a person working in the field of science and almost all described a man in a lab coat. At the end of the program many of the girls thought of themselves as scientist.*
- *The role models gave our students hope for their own futures. There were several situations where some of our students felt like they were not smart enough to pursue STEM but one of their mentors encouraged them to be persistent and push through any failing situations. "The only shame in failing is when you do nothing about failing."*
- *I think it was encouraging to them to see someone become so successful in STEM whose family came from outside the US.*
- *[The role model's presentation] allowed the students to reflect on their families and how support of STEM interests at a young age can lead to careers in STEM. As a young Latina, [she] was an excellent mentor and role model for our Latino female group. She truly embodied that idea of female minorities in STEM, which led to a very engaged classroom!*

Table 7 Continued.

Enjoyed doing hands-on activities together (17%)
- *The girls loved the mentors. I even was able to bring in some mentors to demonstrate and lead an activity and it was the best.*
- *They really enjoyed having the role models engage with them on the SciGirls activities. For example, 2 of our role models joined in with a couple teams on their hands-on activity projects for Wetland Band. They gave the role models roles on their teams and got the role models having just as much fun with the activity as they were having.*
- *They were excited to have a "visitor" join us and to hear what they had to offer for them. For example, one of our role models came in and helped us with Science Cooks and we all made our own parfaits and learned about the nutrition facts in each other's different parfaits.*

Learned from seeing their work settings (13%)
- *The behind the scenes aspects also added a great visual for the girls to not only hear about their work, but see where they do it, what kind of specialized equipment or tools they use, and even get to meet some of the animals they work with. It also allowed them to see how many other females worked with their role models and in the field, whether staff, interns or volunteers and see how many opportunities there are.*
- *I think they really enjoyed meeting the role models at the farm and river especially.*

Miscellaneous (21%)
- *… we had the role models return so the families could ask questions too and support their students' learning.*
- *The videos we show are impactful to a certain extent but the role models feel far away and there is no personal connection so the older girls aren't as interested either.*
- *This area will get better next semester. The girls always benefit from exposure to positive learning opportunities and experiences.*

Part 3. Highlights and challenges of Year 1 family events and video projects

Part 3 presents the educators' thoughts about the highlights and challenges of the culminating family events and the video projects created by girls in pairs or groups about their STEM experiences. As in Part 2, the Part 3 questions asked educators for qualitative perceptions of their programs; thus, the evaluation team requested two educators per partner complete these survey questions. In all, 24 of the possible 28 educators across 14 partner organizations completed this requirement.

3.1 Highlights and challenges of family events

All of the *SciGirls CONNECT²* Year 1 programs were expected to close with a culminating family event. As detailed in the *SciGirls CONNECT²* project description, "Because family participation is fundamental to girls' development of a STEM identity, we will empower partners to invite and engage siblings, parents, grandparents and other caretakers in family events which are opportunities for hands-on STEM activities, *SciGirls* media viewing, role modeling, and general STEM celebrations." All but one of the educators indicated they had attended a family event.

Highlights of family events
Figure 24 shows what educators considered to be the main highlights of their Year 1 family events. Most often they pointed to seeing parents' engagement, excitement, or pride (57%), seeing youth share what they had done with their parents (48%), and/or seeing families interact around a *SciGirls* activity (43%). Smaller groups of educators pointed to watching youth teach or challenge their parents (17%), or shared miscellaneous responses (13%). Examples of their comments in each case are shared in Table 8 on the following page.

Figure 24. Highlights of the family events (n=23)

Percentage of educators

Parents' engagement/excitement/pride	57%
Youth sharing with their parents	48%
Family activity interaction	43%
Youth teaching or challenging parents	17%
Miscellaneous	13%
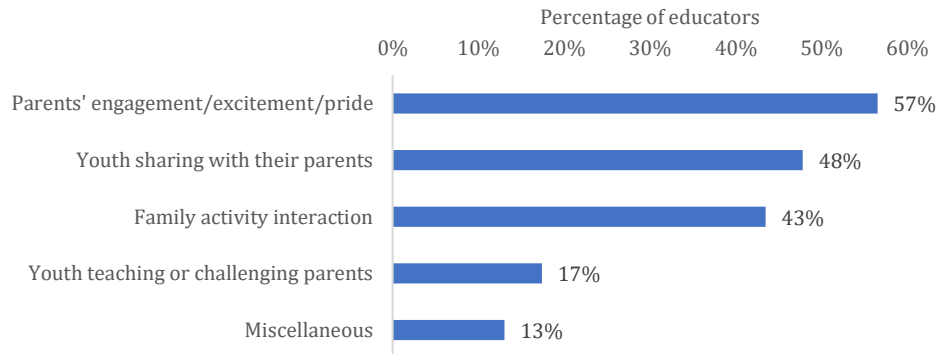
Challenges of family events
Figure 25 shows what educators considered to be the main challenges of the family events. Most often the educators pointed to an issue related to timing, scheduling, or attendance (61%). About a third had trouble engaging or involving parents (35%), and smaller groups pointed to the facilities (13%), the challenge of selecting the right activity (9%), or said they hadn't faced any challenges (9%). Examples of their responses in each case are shared in Table 8 on the following page.
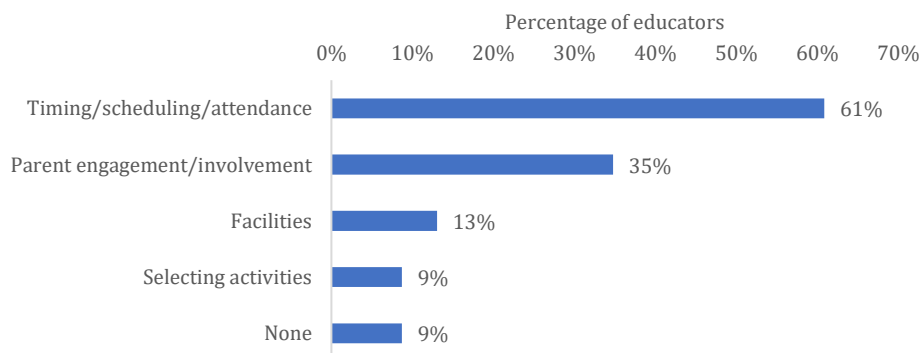
Figure 25. Challenges of the family events (n=23)

Percentage of educators

Timing/scheduling/attendance	61%
Parent engagement/involvement	35%
Facilities	13%
Selecting activities	9%
None	9%

Table 8. Educators' highlights and challenges of implementing family events (n=23)

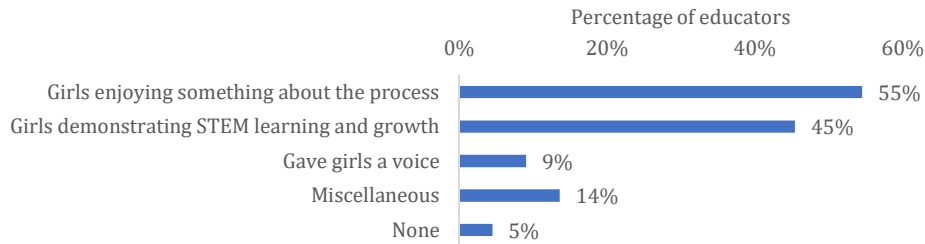| Highlights	Challenges
Parents' engagement/excitement/pride (57%) • Seeing how delighted the parents were watching their girls talk about science in videos was a highlight for me. • I also enjoy seeing the interaction between the girls and all parents and the looks on the parents' faces when they hear the girls explaining that they learned using science vocabulary. • … the positive feedback from the parents [to the girls was a highlight]. • The families were excited to see what their girls had been up to … Many of the parents came up to us during this event to thank us for providing this opportunity for their children. **Youth sharing with their parents (48%)** • The girls got to share what they did during the week, including videos and posters about plants they had created. • The girls got to share videos and multi-media presentations they made with their parents. • Letting the girls show off all their creations … • Our parent event was great! Each research team created a poster to showcase their mini inquiry project and each girl tool a turn sharing part of the project. The pride that the girls showed in their works [was a highlight]. • … the girls got an opportunity to practice communicating their research findings. **Family activity interaction (43%)** • We had the girls challenge their parents/families to do the dough creatures activity • The families were very engaged in the activities; they expressed an interest in the topics we had been working on, and clearly enjoyed the evening. • Parents came and worked on activities with girls and they loved having focused time with families. • The activities were engaging for families … working together on projects as a team embraced that sense of family, which is an important principle in the Latino community. • The interaction with the parents as they participated in hands-on activities with the students. Parents were delighted and engaged. We had a small but excited group of parents. **Youth teaching or challenging parents (17%)** • … teaching their parents what them learned. • Seeing the girls be the expert of an activity and the parents as the students • We had the girls challenge their parents/families to do the dough creatures activity. It was great seeing the girls explain the challenge, help their parents, and to see the parents having fun accepting the challenge and getting the lights to come on. The girls loved having the responsibility of challenging their families to the activity. **Miscellaneous (13%)** • Engaging families with resources to use SciGirls at home • … seeing everyone interested in the guest speaker/mentor was nice to see because even the parents were asking questions out of curiosity.	**Timing/scheduling/attendance (61%)** • Timing--late in the afternoon is hard for families and they live far out in the country, and it is winter. • Because our event was a day camp program during the summer, some girls had to leave early for family vacations or other commitments. They were really upset that they didn't get to stay and share what they'd worked so hard on. If we didn't save the event for the last part of the final day this may not have been such an issue, but that is how we run all our camp programs. • Some challenges that we have is finding the perfect time. We have tried having the celebration around lunch time as well as at the end of the day. Both times we seem to attract about 3/4ths of our parents. • The most challenging aspect of family night was attendance and timing of the event. The majority of the families worked away from the program site which added a natural challenge (traffic), work schedules and other conflicts to full participation in the planned family activity. • It was hard to get every parent to attend the dinner. • Not all parents arrive on time, so it can feel rushed. **Parent engagement/involvement (35%)** • Some parents aren't engaged no matter what. • We wished for more parental involvement and support. • It was difficult to get all the parents to participate and fill out all of the paperwork. • We worked the event into a scheduled school wide family night, and the parents seemed distracted with other class visits that they had to attend. • Getting parental permission was a challenge. It was also difficult to get parents to fill out the SciGirls surveys, which were a bit long … • Lack of communication and response with parents. We sent our multiple communications for the parents but seldom heard back … This was probably the most frustrating part of the whole project. I had hoped for more contact with families. **Facilities (13%)** • Finding a big enough space for all the families to gather. • The only challenges I can think of were mostly logistical - volume of all the talking and space. **Selecting activities (9%)** • Picking activities that would appeal to all age groups, and keep the interest throughout the event of both the youth, as well as adults. • A challenge that I faced was choosing an activity that a wide age range would both understand and enjoy. **None (9%)** • None - it went really well.

3.2 Highlights and challenges of video projects

All of the *SciGirls CONNECT²* partners were expected to participate in the research team's video project. As detailed in the *SciGirls CONNECT²* project description, "Girls at all partner sites will create short-form videos that will allow the research team to gather insight into girls' personal STEM experiences, and explore how these experiences may contribute to their STEM-related identity construction against gender-based stereotypes." Two of the educators said they were not present for their organizations' implementation of the video projects and thus could not comment.

Highlights of video projects
Figure 26 shows what the educators considered to be the main highlights of implementing the video projects. Most often they pointed to watching girls enjoy the process (55%) and/or seeing girls demonstrate STEM learning and growth (45%). Smaller groups mentioned the videos giving girls a voice (9%), shared miscellaneous highlights (14%), or said they didn't have any highlights to share (5%). Examples of their responses in each case are in Table 9 on the next page.

Figure 26. Highlights of the video projects (n=22)

Percentage of educators

Girls enjoying something about the process	55%
Girls demonstrating STEM learning and growth	45%
Gave girls a voice	9%
Miscellaneous	14%
None	5%

Challenges of video projects
Figure 27 shows what the educators considered to be the main challenges of implementing the video projects. The largest group of educators pointed to time constraints (36%) while smaller groups cited youths' comfort levels (23%), something about the technology (23%), youth participation (18%), getting parent permission/forms (14%), miscellaneous issues (14%), or said they hadn't experienced any challenges (5%). Examples of their responses in each case are shared in Table 9 on the next page.

Figure 27. Challenges of the video projects (n=22)
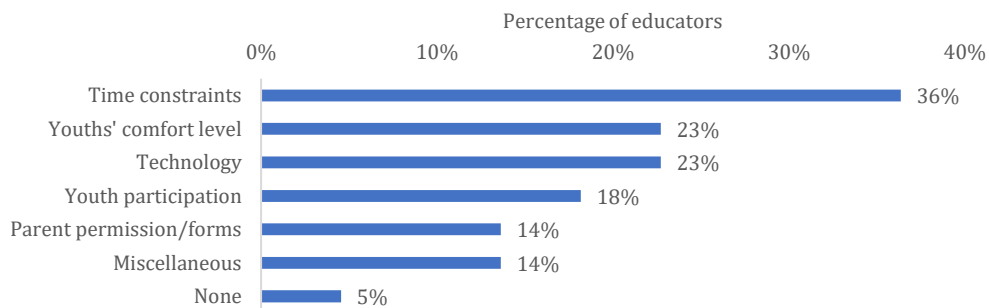
Percentage of educators

Time constraints	36%
Youths' comfort level	23%
Technology	23%
Youth participation	18%
Parent permission/forms	14%
Miscellaneous	14%
None	5%

Table 9. Educators' highlights and challenges of implementing video projects (n=22)

Highlights	Challenges
Girls enjoying the process (55%) • *They loved expressing things and talking to the cameras!* • *It was nice to see the girls get excited about the video project and voluntarily want to participate. I watched them think carefully about what they wanted to say about their experience and they enjoyed seeing the final product. For them, it felt like they made their own SciGirls episode like the ones they watched.* • *Students had fun doing the videos.* • *The girls seem to really enjoy recording each other to talk about their favorite parts of camp and new concepts they learned.* • *The girls liked being able to talk about their opinions.* • *The students LOVED working with cameras.* • *Girls got to feel comfortable in front of the camera.* **Girls demonstrating STEM learning and growth (45%)** • *Seeing how much the girls' thoughts and perspectives on STEM changed over the course of the program.* • *The girls seem to really enjoy recording each other to talk about … new concepts they learned.* • *The videos provided a great reflection for the class, showing where they started in the program, and where they are now.* • *It was great to get to know a little about the girls right in the beginning and see them progress throughout the program. The final interviews were definitely the highlight. Seeing how excited the girls were in general (and even after a long day) and the changes in those who started out unenthused about STEM who had shifted their perceptions completely.* • *This … was a great way to see the changes in the girls over time.* • *The highlights were hearing the girls talking about themselves as scientist.* **Gave girls a voice (9%)** • *The opportunity that it allows for the girls to go back and see themselves and their voice about the program.* • *Project that allows girls to have voice in the creation of their own media project.* **Miscellaneous (14%)** • *This was a very easy way to get a better idea of the girls' personalities and goals.* • *Need to work more diligently on this part of the program.* • *Continuing project.* **None (5%)** • *None I can think of.*	**Time constraints (36%)** • *Given more time … it would have been great to teach the girls how to do the film editing for themselves.* • *Trying to complete all activities and requirements in the time frame we had …* • *Putting it all together was time consuming.* **Youths' comfort level (23%)** • *Doing videos at the very beginning of the program was not very helpful. These students did not necessarily know each other when they came into the SciKids class. Most were very shy and hesitant to speak up and share about themselves on camera. They became more vocal and self-assured as the program continued. Since we didn't know the girls at first, the comfort level and trust in us was lower at the beginning than at the end, so this may have skewed the results a bit.* • *Building the relationships needed to allow girls to be videotaped.* **Technology (23%)** • *We didn't have devices the girls could use throughout the camp so we couldn't allow them to freely video and engage that way. We videoed at the beginning and end, but it wasn't integrated throughout and that would have … been a different experience.* • *I think the biggest challenge for me (I can't speak for the whole team) was just my lack of experience with technology! The girls often had to help me with the iPads and it took me longer than it should have to upload the videos. However, through the program I also grew in my STEM knowledge, because I feel more confident in my use of technology now!* • *The leaders were uncomfortable with the technology so I was the guest videographer.* **Youth participation (18%)** • *Not all of the girls wanted to participate in the video.* • *The challenges was not all the girls participated.* • *Because not all of the girls arrived at the same time and schedule conflicts, sports and school required activities impacted attendance.* **Parent permissions/forms (14%)** • *Not all parents had given permission for girls to be a part of the video, but they wanted to answer the questions. Some of them had the best answers!* • *One other challenge was that the forms that the parents had to complete were very confusing. I highlighted the areas they had to sign but there was a lot of confusion about licensors and some of the terminology.* **Miscellaneous (14%)** • *Getting the girls to speak loudly enough to be heard clearly.* • *… it was challenging to keep them on task at times.* • *… we had students involved with the videos on the first day who did not continue in the program and others who were not there for the initial videotaping because they entered the program later. I would want to rethink how we would better use videos again in the future.* **None (5%)** • *I don't know that there were any.*

Discussion

This implementation evaluation has presented an overview of the *SciGirls CONNECT²* partners' Year 1 outreach programs. Below, we look across the findings to briefly comment on a few issues that may help inform Year 2 of the project, as well as future *SciGirls* programs. The first section of the discussion examines the *SciGirls CONNECT²* Year 1 program characteristics in comparison with partners' previous STEM programs. The second section looks at the partner educators' use of the Year 1 program elements and perceived impacts. Finally, the third section looks at the extent to which partner organizations generally implemented the program elements TPT envisioned for *SciGirls CONNECT²*.

SciGirls CONNECT² Year 1 programs in comparison with partners' previous STEM programs

This section looks at the Year 1 programs implemented across the 13 *SciGirls CONNECT²* partner organizations with respect to three areas: participant demographics, participant barriers to STEM engagement, and the inclusion of program components relevant to *SciGirls CONNECT²*. [4] In each area, comparable information about the STEM programs that partners implemented the year prior to *SciGirls CONNECT²* is also included. While Appendix 1 provides a detailed evaluation of each area, only general comparisons are provided below.

Note that in considering these comparisons, it is important to keep in mind that the Year 1 numbers are based on program reporting information provided by the 13 partner organizations that ultimately fulfilled this evaluation reporting requirement. Moreover, the 13 educators who represented these organizations completed the program reporting at the conclusion of their programs; as such, their reporting was part of a formal requirement they could coordinate in advance. The year-prior program estimates, meanwhile, were shared by 30 educators from the full, original group of 16 partner organizations recruited to participate in *SciGirls CONNECT²* (hereafter called pre-program educators). Their estimates were necessarily based on their own retrospective estimates and were gathered as part of a front-end evaluation to inform outreach planning.

Participant demographics
Most of the Year 1 *SciGirls CONNECT²* programs reached youth from urban communities (85%), although some programs reached youth from suburban (38%) and/or rural locales (23%). Most of the Year 1 programs were all girls (77%), while more than a tenth were mostly girls (15%) and less than a tenth were half girls and half boys (8%). Most of the participating youth were girls (87%), while about a tenth were boys (13%). Most of the youth were either in 6th through 8th grade (43%) or 3rd through 5th grade (40%), while much smaller groups were in Kindergarten through 2nd grade (12%) or in high school (6%). About a third each of the total number of Year 1 youth were White (34%) or African-American/Black (30%), while

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[4] The post-program survey contained two sections. The first consisted of program reporting questions, while the second asked about program impacts and components. Only one educator from each partner organization was asked to complete the first section of the survey.

about a fifth were of Hispanic/Latino origin (21%). Less than a tenth each were Asian (7%) or multiracial (7%).

As detailed in Appendix 1, in comparison, the majority of pre-program educators said their programs primarily reached urban youth and that they mainly served girls who were in middle or elementary school. Although the number of youth reached in the year before *SciGirls CONNECT²* wasn't available by race and ethnicity, the majority of pre-program educators described working with at least some Hispanic youth and/or working with youth of other minorities.

When considered together, educators' pre- and post-program responses indicate an ongoing focus on the project's target demographic of middle school girls from diverse backgrounds in both all-girls and co-ed informal STEM education programs.

Barriers to STEM engagement
When considering the youth that participated in their Year 1 programs, in each case between approximately one-third and three-fifths of the educators said *most* or *all* of their youth: came from non-STEM identifying families (40%), had low exposure to STEM role models/mentors (50%), were of low-to-moderately-low socioeconomic status (58%), had low knowledge of STEM fields (33%), and/or had low parental/guardian knowledge of STEM fields (40%). None thought that *most* or *all* of their youth had parents/guardians with low English language proficiency or had low English language proficiency themselves, although two-thirds (64%) and one-third (31%), respectively, thought *some* youth faced these barriers. The barriers above were among those described in the NSF project proposal as preventing many girls, especially girls from minority and lower socioeconomic groups, from fully participating in STEM studies and career paths (NSF proposal, 2015).

As detailed in Appendix 1, in comparing the Year 1 programs with programs coordinated in the year before *SciGirls CONNECT²,* educators' pre-program responses generally indicated that higher percentages of youth faced these barriers to STEM engagement in the year before *SciGirls CONNECT²*, although here again it is important to note that educators' pre-program responses were estimates that were not based on program reporting. However, regardless of the differences between educators' pre- and post-program responses, their feedback generally fits TPT's expectations of the types of audiences served by *SciGirls* programs.

Extent to which programs incorporated components relevant to SciGirls CONNECT²
In general, educators thought their Year 1 programs integrated the *SciGirls Seven* and exposed youth to STEM role models *to a great extent*. They thought their programs showed youth culturally and linguistically relevant STEM media, focused on enhancing youths' STEM identity, and addressed youths' knowledge about STEM fields *to a considerable extent*. Finally, they thought their programs addressed parents/guardians' knowledge about STEM fields, offered opportunities for family participation, and included opportunities for youth-created videos *to some extent*.

As with the sections above, it is important to note that educators' pre-program responses were estimates that were not based on program reporting. However, given the focus of *SciGirls CONNECT²* on the *SciGirls Seven* and youths' STEM identity, it is not surprising that

some components were generally incorporated into educators' Year 1 programs to a greater extent than they had been in previous STEM programs. For example, as detailed in Appendix 1, integration of the *SciGirls Seven* and exposure to STEM role models were both incorporated *to a great extent* in Year 1, compared with *a considerable extent* the previous year. Showing youth culturally and linguistically relevant STEM media was integrated *to a considerable extent* in Year 1, compared with *some extent* the previous year, and the inclusion of youth-created videos was incorporated *to some extent* in Year 1, compared with *a little extent* the previous year. As educators become even more comfortable with these program components, this feedback will be particularly useful to have for comparison with the Year 2 post-program surveys.

Use and perceived impact of the Year 1 program elements

This section considers educators' feedback regarding the use and perceived impact of Year 1 program elements, including: role models, activities, episodes or clips from episodes, women in STEM videos, *SciGirls* websites, family events, and video projects. The evaluation team requested two educators per partner complete the qualitative questions considered below. In all, 24 of the possible 28 educators across 14 partners completed this requirement.

Role models
At least one role model participated in each of the 13 Year 1 programs reported on by the educators. The number of role models used by each program ranged from one to 15, averaging six per partner organization. When asked how the role models participated, the majority of educators noted that they gave presentations or held Q&As (69%) and/or participated in activities (54%). Smaller groups explained that the role models interacted with families (31%) and/or led a field trip or tour (15%), among other responses.

When asked which aspect of their programs had the greatest impact on their youth, the largest group of educators pointed to the role models (58%). Elsewhere in the survey, when asked to comment on how their youth responded to STEM role models, almost all of the educators noted that youth were engaged/excited to meet and interact with the role model (92%), while the majority said their youth expressed interest in the role models' personal and/or professional lives (54%). Smaller groups said their youth were inspired or encouraged in some way (33%), enjoyed doing activities with the role models (17%), learned from seeing the role models in their work settings (13%), or shared miscellaneous feedback (21%), with a few in this group commenting on how the role models interacted with families.[5]

Activities
Most of the educators indicated that they used the activities in their Year 1 programs (92%). Additionally, when asked which of the *SciGirls* resources were most important in helping them impact youth, the majority pointed to the activities (71%), with many going on to praise these resources as a critical element of their programs, as in, "*The camp couldn't be done without the activities but could be done without the other resources. The activities are by far the most*

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[5] Additional feedback from educators about *SciGirls Seven* strategy #7, Girls benefit from relationships with role models and mentors, may be found in Knight Williams' *Formative evaluation of educators' use of the SciGirls Seven strategies in Year 1*.

important during the actual program" and "*The SciGirls activities were most important. They took the careers of mentors and turned them into fun learning activities that can be done now, as a child. It really got the students excited about what they can do now in STEM.*"

When asked which aspects of their programs had the greatest impact on youth, more than a third of the educators pointed to the activities or hands-on learning (38%). Throughout their surveys, a few educators elaborated on the value of combining program elements and having girls do the activities with role models, as in, "*The hands-on activities always have the greatest impact, especially as we have our volunteers/mentors/role models engage with them throughout the activities*" and "*They really enjoyed having the role models engage with them on the SciGirls activities. For example, two of our role models joined in with a couple teams on their hands-on activity projects for Wetland Band. They gave the role models roles on their teams and got the role models having just as much fun with the activity as they were having.*"

Episodes or clips from episodes
Most of the educators indicated that they used the episodes or clips from episodes in their Year 1 programs (79%). When asked which of the *SciGirls* resources were most important in helping them impact youth, nearly two-fifths pointed to the episodes or clips from episodes (38%). Some went on to praise how these resources helped frame their lessons (as in, "*As they would eat lunch I would show a SciGirls episode that was related to our activity/theme for that day, and it helped them to understand what we just did or what we were about to do*"), while others explained that they liked how the episodes highlighted inspiring social interactions and STEM opportunities (as in, "*They … showed the girls how you are able to meet new friends and have fun with your friends and learn at the same time*" and "*Watching the SciGirls videos … really put it into perspective how these activities that they participated in linked to real life jobs in the science field*").

Women in STEM videos
The majority of educators indicated that they used the women in STEM videos in their Year 1 programs (63%). When asked which of the *SciGirls* resources were most important in helping them impact youth, a fifth cited the women in STEM videos (21%), with a few educators going on to praise them as replacements for in-person role model visits, as in, "*The [videos of] STEM professionals were extremely helpful, as it was hard arranging role model visits*" and "*I feel like the … mentor moments helped us the most because we were able to expose our girls to more STEM careers beyond ones in our community.*" However, elsewhere in the survey, one educator indicated that s/he thought older students had a hard time connecting with the women in STEM videos, saying, "*The videos we show are impactful to a certain extent but the role models feel far away and there is no personal connection so the older girls aren't as interested either.*"

SciGirls websites
The majority of Year 1 educators described using the CONNECT website (67%) and/or the PBS Kids website (54%), while a smaller group used the PBS Parents website (21%). When asked which of the *SciGirls* resources were most important in helping them impact youth, a few educators pointed to the CONNECT website (8%) or the PBS Kids website (4%). Though the educators as a whole didn't share a lot of detailed feedback about the websites, a few mentioned an appreciation for the CONNECT website (as in, "*extremely helpful … in designing*

the program delivery/planned experience for the girls") and a couple said they liked the PBS Kids site because it allowed youth to stay engaged outside of the *SciGirls CONNECT²* program.

Family events

As detailed in the *SciGirls CONNECT²* project description, "Because family participation is fundamental to girls' development of a STEM identity, we will empower partners to invite and engage siblings, parents, grandparents, and other caretakers in family events which are opportunities for hands-on STEM activities, *SciGirls* media viewing, role modeling, and general STEM celebrations*.*" When asked which other types of individuals participated in some aspect of their Year 1 program, most educators pointed to parents (92%). The majority also pointed to siblings (69%), and smaller groups pointed to grandparents (31%) and/or family friends (23%). It is likely that many of these attendees were present at the Year 1 family events.

The majority of educators identified parents' engagement, excitement, or pride as one of the highlights of implementing their family event (57%), as in, "*The families were excited to see what their girls had been up to … Many of the parents came up to us during this event to thank us for providing this opportunity for their children*." Smaller groups commented on seeing youth share what they had done with their parents (48%), and/or observing families interact around the *SciGirls* activity (43%), among other responses.

When asked to identify any challenges faced in implementing their family events, the majority pointed to an issue related to timing, scheduling, or attendance (61%), as in, "*The most challenging aspect of family night was attendance and timing of the event. The majority of the families worked away from the program site which added a natural challenge (traffic), work schedules and other conflicts to full participation in the planned family activity*." About a third had trouble engaging or involving parents (35%), with other responses being shared less often. Elsewhere in the survey, one person summed up a frustration expressed by a number of educators, saying, "*Parents were invited to the parent event and also received [numerous] communications from us during the course of the program. Response from parents was minimal. I would like to engage them more but it is hard with this group of students. They often said that their parents were tired and couldn't come out and also they were working long hours which did not allow them to attend.*" Given this feedback – and that, as a group, the educators thought their programs addressed parents/guardians' knowledge about STEM fields and offered opportunities for family participation *to some extent* – the educators may be interested in additional support or ideas on the topic of how to increase family involvement in Year 2.

Video projects

As detailed in the *SciGirls CONNECT²* project description, "Girls at all partner sites will create short-form videos that will allow the research team to gather insight into girls' personal STEM experiences, and explore how these experiences may contribute to their STEM-related identity construction against gender-based stereotypes."

When asked about the highlights of implementing their video projects, the largest groups of educators commented on watching girls enjoy the process (55%) (as in, "*It was nice to see the girls get excited about the video project and voluntarily want to participate. I watched them think carefully about what they wanted to say about their experience and they enjoyed seeing the final product. For them, it felt like they made their own SciGirls episode like the ones they*

watched") and/or seeing girls demonstrate STEM learning and growth (45%) (as in, "*The girls seem to really enjoy recording each other to talk about … new concepts they learned*" and "*The videos provided a great reflection for the class, showing where they started in the program, and where they are now*"), with other responses being shared less often. Elsewhere in the survey, a few of the educators elaborated on the video projects' value to their youth (for example, "*The girls got to have mini-documentaries filmed and got to watch themselves talk about plants. They also got to see how others responded to them sharing what they knew when the videos were shared with parents later in the week. I think this was impactful in helping them to feel more confident about sharing what they know*").

When asked to identify any challenges faced in implementing their video projects, no one element stood out to the educators, with the largest groups pointing to time constraints (36%), youths' comfort levels (23%), something about the technology (23%), or youth participation (18%), among other responses. Given this feedback – and that, as a group, they thought their programs included opportunities for youth-created videos *to some extent* – the educators would likely be interested in additional support or ideas about how to highlight the value of the video projects to youth and their families. However, since the videos are a relatively new *SciGirls* element, educators may organically experience fewer challenges in Year 2 as they and their participants grow more comfortable with this particular program element. As noted by one educator, "*This year, I feel like we could have done better with encouraging our youth the create videos of their experiences … we needed time to build relationships and trust among the community that we were serving. I believe we have done that in the last 6 months and 2018 [will have] more involvement in [the video project].*"

Fulfillment of *SciGirls CONNECT²* program elements

To further inform *SciGirls CONNECT²* Year 2 program planning, this final section briefly reviews, where possible, the extent to which the partner organizations implemented the programming elements TPT expected partners to include in their Year 1 programs. Looking at each element listed on the partner website and outlined on page 5 of this report, the evaluation found the following:

- **Offer a 16-32 hour *SciGirls* program for at least 10 girls ages 8-13.** Total program hours in Year 1 ranged from 10 to 47.5 and averaged 27 per partner. Only one of the 13 partners held a program shorter than the required 16 total hours (8%), while four programs were longer than 32 hours (31%). With respect to youth participants, one program had fewer than 10 girls ages 8-13 (8%), while the rest had more than 10 girls in this age group (92%).

- **Include at least three female role models.** Most partners had at least three role models (85%). One partner had one role model (8%) and another partner had two (8%).

- **In Year 1 (April-December 2017) use existing *SciGirls Seven* strategies. In Year 2 (April-December 2018) use updated *SciGirls Strategies.*** As outlined in Knight Williams, Inc.'s *Formative evaluation of educators' use of the SciGirls Seven strategies in Year 1*, all of the Year 1 programs implemented the existing *SciGirls Seven* strategies as requested.

- **Include the creation of short videos created by girls in pairs or groups, about their STEM experiences, including meeting role models.** Although this evaluation did not specifically ask about role models being incorporated into the videos, all of the Year 1 programs included short video creation.

- **Hold one culminating event for girls and families each year to engage families and girls in hands-on activities, sharing of learning, media viewing, and meeting female STEM role models.** Although this evaluation did not specifically ask if each component was in the culminating event, all of the Year 1 programs held at least one family event.

Overall, the evaluation found that the partner organizations generally implemented the required elements, short of one partner each not quite reaching the expectations with respect to the minimum number of hours and girls, and two partners hosting fewer than three role models. One of the partners who hosted fewer than three role models was the same organization that fell short of coordinating the required number of program hours.

Given this feedback, and looking ahead to Year 2 of *SciGirls CONNECT²*, TPT will likely want to remind partner organizations of the required program elements while continuing to support their efforts to connect with local role models, highlight the value of the video projects to their youth and families, and increase parent/guardian involvement in the culminating events.

Appendix 1

SciGirls CONNECT² Year 1 programs in comparison with partners' previous STEM programs

Appendix 1 compares the *SciGirls CONNECT²* Year 1 programs with the partners' previous STEM programs in terms of participant demographics, barriers to STEM engagement, and the extent to which programs incorporated components relevant to *SciGirls CONNECT²*. Year 1 program reporting information was shared by 13 educators from 13 partner organizations.[6] In comparison, the pre-program survey was submitted by 30 educators from 16 partners organizations (hereafter called pre-program educators). In their front-end surveys, pre-program educators shared estimates regarding the STEM programs they coordinated in the year before *SciGirls CONNECT²* that were based on personal recollections, rather than any form of program reporting. With this qualification in mind, findings are presented below.

Participant demographics

When considered together, educators' pre- and post-program responses indicate an ongoing focus on the project's target demographic of middle school girls from diverse backgrounds in both all-girls and co-ed informal STEM education programs. Comparing the pre- and post-Year 1 program responses, the evaluation specifically found:

- **Most of the Year 1 programs reached youth from urban communities (85%), with smaller groups working with youth from suburban (38%) and/or rural locales (23%).** In comparison, the majority of pre-program educators said their programs reached youth from urban communities (66%), with smaller groups pointing to youth from suburban (45%) and/or rural areas (28%).

- **Most of the youth in the Year 1 programs were girls (87%), while about a tenth were boys (13%). Most of the programs were all girls (77%), while more than a tenth were mostly girls (15%) and less than a tenth were half girls and half boys (8%).** Although the number of youth reached in the year before *SciGirls CONNECT²* wasn't available by gender, about half of the pre-program educators said they coordinated STEM programs in the year before *SciGirls CONNECT²* that were all girls (48%), while approximately one-quarter coordinated programs that were mainly for girls (28%).

- **Less than half each of the total number of Year 1 youth were in 6th through 8th grade (43%) or 3rd through 5th grade (40%). Much smaller groups were in Kindergarten through 2nd grade (12%) or high school (6%).** Although the number of youth reached in the year before *SciGirls CONNECT²* wasn't available by grade level, almost all of the pre-program educators reported that their programs were attended by middle school youth

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[6] The post-program survey contained two sections. The first consisted of program reporting questions, while the second asked about program impacts and components. Only one educator from each partner organization was asked to complete the first section of the survey.

(97%), with smaller groups saying their programs reached elementary and younger (66%) or high school youth (21%).

- **About a third each of the total number of Year 1 youth were White (34%) or African-American/Black (30%), while about a fifth were of Hispanic/Latino origin (21%). Less than a tenth each were Asian (7%) or multiracial (7%).** Although the number of youth reached in the year before *SciGirls CONNECT²* wasn't available by race and ethnicity, the majority of pre-program educators described working with at least some Hispanic youth (59%) and/or working with youth of other minorities (72%).

Barriers to STEM engagement

In comparing the Year 1 programs with programs coordinated in the year before *SciGirls CONNECT²,* it is important to note again that educators' pre-program responses were estimates that were not based on program reporting. With that being said, pre-program educators generally thought higher percentages of youth faced specific barriers to STEM engagement in the year before *SciGirls CONNECT²*. However, regardless of the differences between educators' pre- and post-program responses, their feedback generally fits TPT's expectations of the types of audiences served by *SciGirls* programs. Comparing the pre- and post-Year 1 program responses, the evaluation specifically found:

- **Two-fifths of educators said *most* or *all* of their Year 1 youth came from non-STEM identifying families (40%).** In comparison, three-quarters of pre-program educators said this was the case for *most* or *all* of their youth (75%).

- **Half of the educators thought *most* or *all* of their Year 1 youth had low exposure to STEM role models/mentors (50%).** In comparison, about half of pre-program educators said this was the case for *most* or *all* of their youth (48%).

- **Three-fifths of educators thought *most* or *all* of their Year 1 youth were of low-to-moderately-low socioeconomic status (58%).** In comparison, two-thirds of pre-program educators said this was the case for *most* or *all* of their youth (65%).

- **One-third of educators thought *most* or *all* of their Year 1 youth had low knowledge of STEM fields (33%).** In comparison, more than half of pre-program educators said this was the case for *most* or *all* of their youth (59%).

- **Two-fifths of educators said *most* or *all* of their Year 1 youth had parents/guardians with low knowledge of STEM fields (40%).** In comparison, more than two-thirds of pre-program educators said *most* or *all* of their youth faced this barrier (70%).

- **None of the educators thought that *most* or *all* of their Year 1 youth had parents/ guardians with low English language proficiency (0%), and two-thirds thought *some* youth faced this barrier (64%).** In comparison, a tenth of pre-program educators said *most* or *all* of their youth faced this barrier (13%), and nearly three-quarters said it was the case for *some* (71%).

- **None of the educators thought that *most* or *all* of their Year 1 youth had low English language proficiency (0%), and one-third thought *some* youth faced this barrier (31%).** In comparison, a tenth of pre-program educators said this was the case for *most* or *all* of their youth (7%), and two-thirds said it was the case for *some* (63%).

Extent to which programs incorporated components relevant to SciGirls CONNECT[2]

As with the sections above, it is important to note that educators' pre-program responses were estimates that were not based on program reporting. However, given the focus of *SciGirls CONNECT[2]* on the *SciGirls Seven* and youths' STEM identity, it is not surprising that some components were generally incorporated into educators' Year 1 programs to a greater extent than they had been in previous STEM programs. Comparing the pre- and post-Year 1 program responses, the evaluation specifically found:

- **Educators generally thought their Year 1 programs integrated the *SciGirls Seven* *to a great extent*.** Pre-program educators thought this component was incorporated *to a considerable extent*.

- **Educators generally thought their Year 1 programs exposed youth to STEM role models *to a great extent*.** Pre-program educators thought this component was incorporated *to a considerable extent*.

- **Educators generally thought their Year 1 programs showed youth culturally and linguistically relevant STEM media *to a considerable extent*.** Pre-program educators thought this component was incorporated *to some extent*.

- **Educators generally thought their Year 1 programs focused on enhancing youths' STEM identity *to a considerable extent*.** Pre-program educators also thought this component was incorporated *to a considerable extent*.

- **Educators generally thought their Year 1 programs addressed youths' knowledge about STEM fields *to a considerable extent*.** Pre-program educators also thought this component was incorporated *to a considerable extent*.

- **Educators generally thought their Year 1 programs addressed parents/guardians' knowledge about STEM fields *to some extent*.** Pre-program educators also thought this component was incorporated *to some extent*.

- **Educators generally thought their Year 1 programs offered opportunities for family participation *to some extent*.** Pre-program educators also thought this component was incorporated *to some extent*.

- **Educators generally thought their Year 1 programs included opportunities for youth-created videos *to some extent*.** Pre-program educators thought this component was incorporated *to a little extent*.