



JumpStarting STEM: Process Evaluation Results

Prepared for The California AfterSchool Network

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JumpStarting STEM Impact

In order to assess the overall impact of JumpStarting STEM, detailed attendance records were kept for all JumpStarting STEM training activities. Based on this tracking, it is estimated that The California AfterSchool Network (CAN) and their partners have provided over 130 hours of JumpStarting STEM training to 506 after school staff from 280 after school sites (Table 1). Program directors estimate that these staff provided JumpStarting STEM activities to over 15,000 after school students. These numbers do not necessarily capture the full breadth of JumpStarting STEM activities and outputs, as multiple partners were involved in the implementation of JumpStarting STEM. These numbers represent what was captured by CAN staff, at all trainings for which they were present.

Table 1. JumpStarting STEM Impact

Impact Area	n
Number of after school programs participating in JumpStarting STEM	17
Number of JumpStarting STEM curricula being implemented	13
Number of students receiving JumpStarting STEM curricula*	15,218
Number of staff trained on JumpStarting STEM curricula	506
Number of after school sites implementing JumpStarting STEM curricula	281
Number of JumpStarting STEM training hours provided**	136.5

* As estimated by program directors

** Training hours do not include all training hours provided by CAN partners, or virtual training opportunities

Curriculum choice and implementation

After school programs were given a choice regarding the number of curriculum they wanted to implement at their site. Sixty percent of the 17 programs participating in JumpStarting STEM chose to implement one curriculum, while 29% chose to implement two. Only 1% (n=2) chose three curriculum for implementation within their program. The most commonly selected curriculum was TechBridge, with four (24%) programs choosing to implement this curriculum. This was followed by NASA Jewel of the Solar System, Kidz Science, and Kidz Math, each with three (18%) programs choosing to implement the curriculum.

Of the 17 programs participating in JumpStarting STEM 71% report that they have other STEM activities, in addition to JumpStarting STEM, taking place within their after school program.

Program director survey results

Program directors were administered an online survey in December 2011 (pre), administered at the beginning stages of program training and implementation and an online survey in May 2012 (post) to assess their perceptions of the JumpStarting STEM trainings and the implementation of JumpStarting STEM activities. The results of the analysis of the pre and post program director survey suggest an overall

positive response to JumpStarting STEM. Furthermore, there is a general trend of improvement across responses from pre to post as described in the sections below.

What worked well

Program directors were asked to report what aspects of JumpStarting STEM were working well for their program. The most common responses were in the areas of training, professional development, and curriculum.

“The trainings were really great. Staff were very interested in being trained”

“The professional development for staff was the best aspect of the program”

Additionally, program directors indicated that student engagement was a positive aspect of the program:

“Getting students interested in scientific activities... kids liked what was offered”

Program directors were also asked to indicate what they believed to be the biggest impact of JumpStarting STEM on their program. The overwhelming response from program directors was student engagement. Program directors reported that students within their program were interested, excited, thinking, and learning to love science, for example:

“The kids love to do science!”

“Kids are excited and there is discovery around STEM”

Challenges

When asked to identify any challenges being experienced within their program related to JumpStarting STEM, there was some variation in responses across programs. The two most commonly cited challenges were related to staffing (e.g., staff turnover, identifying qualified staff) and materials (e.g., curriculum, obtaining materials, cost of materials). For example one program director stated:

“Getting curriculum on time and getting all materials in place before implementation. It would have helped to have a pre-planned schedule/timeline in advance so that we could better plan around that.”

Additionally, less commonly cited challenges included engagement of middle school students, the time required to plan and implement activities, and the appropriateness of some curricula for lower grade levels. For example, one

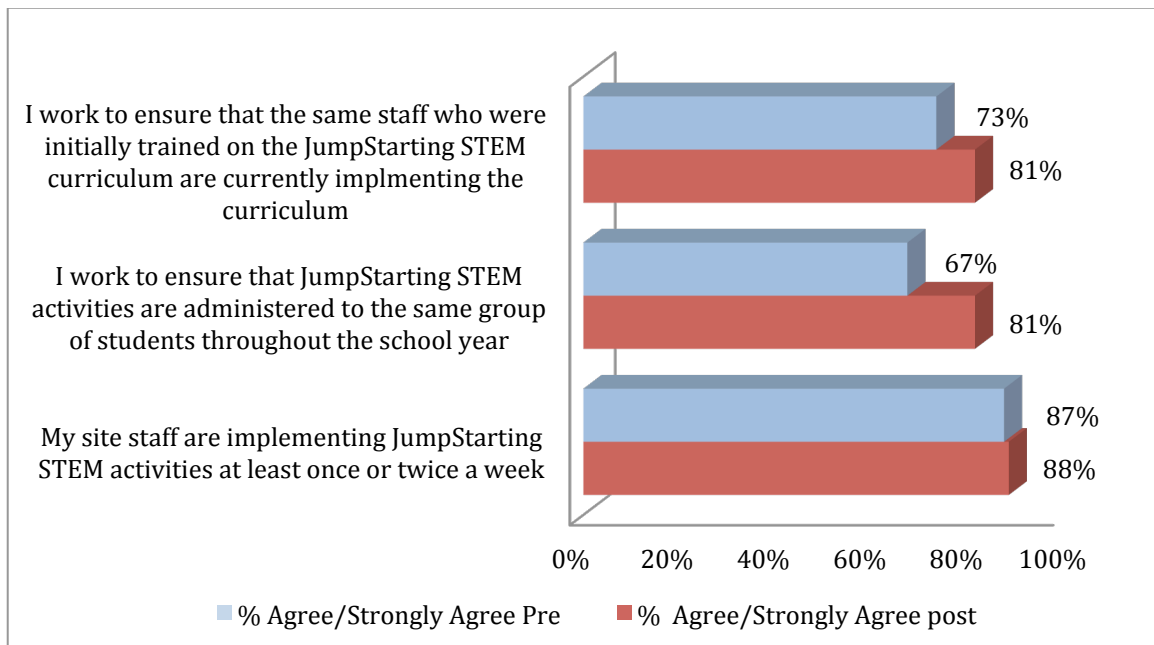
program director indicated:

“We experienced a few challenges early on with the curriculum and tweaking it for the younger grades.”

Program fidelity

Improvement was seen in program director’s responses regarding program fidelity from pre to post (Figure 1). It is promising that the majority of program directors indicate that their program is implementing the JumpStarting STEM program with fidelity (e.g., at least once a week, to the same group of students, by trained staff).

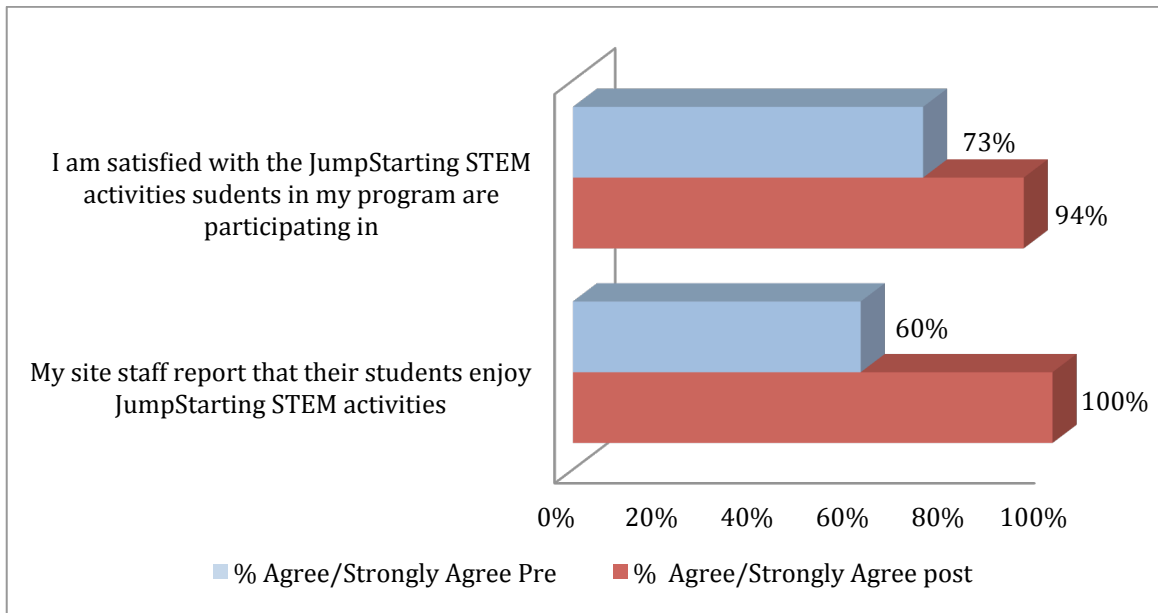
Figure 1. Program fidelity, pre post comparison



Student experiences

Program directors rated the experiences of students within their program participating in JumpStarting STEM as very high on the post survey, showing a marked improvement in their responses from pre to post (Figure 2). This can particularly be seen on the survey item “My site staff report that their students enjoy JumpStarting STEM activities” on which there was a 40% increase in overall agreement from pre to post.

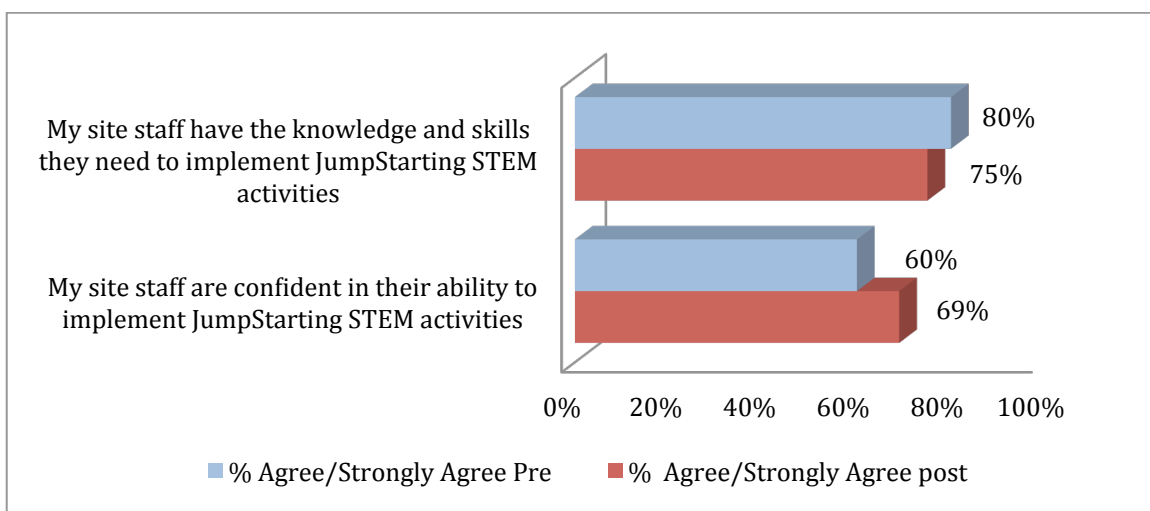
Figure 2. Student experiences, pre post comparison



Staff

Overall, program directors rated their site staffs' abilities and confidence relatively high, and a 9% increase in agreement was found in site staff confidence (Figure 3). However, a decrease was found in program directors rating of staff knowledge and skills. Multiple program directors indicated that staff turnover and staffing in general were challenges within their program, which may be a possible reason for the slight decrease in program directors' perceptions of staff knowledge and skills.

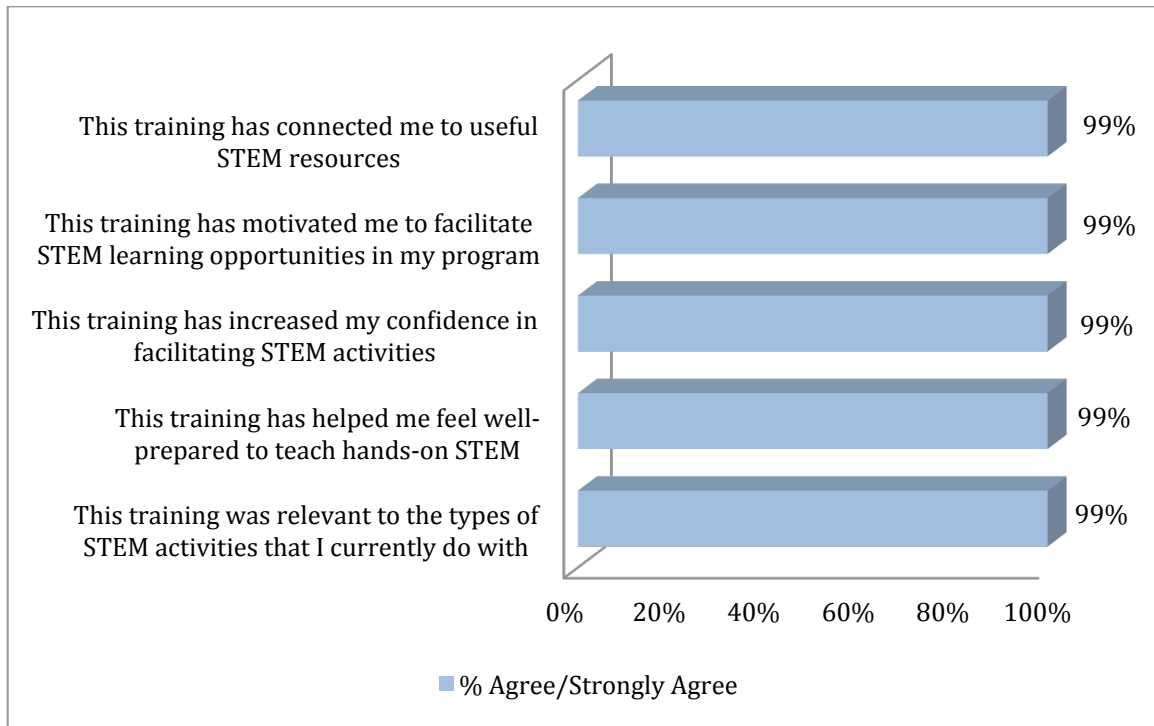
Figure 3. Staff abilities and confidence, pre post comparison



JumpStarting STEM staff training surveys

Staff were asked to complete satisfaction surveys at the conclusion of each training that they participated in. These brief surveys were administered to determine if staff felt that the trainings were effective in helping them feel more prepared, confident, and motivated. The overwhelming response from staff was agreement, with 99% of staff trained indicating agreement across all five survey items (Figure 4).

Figure 4. Staff training survey results



These positive results were further supported by the open-ended responses completed by several staff. For example:

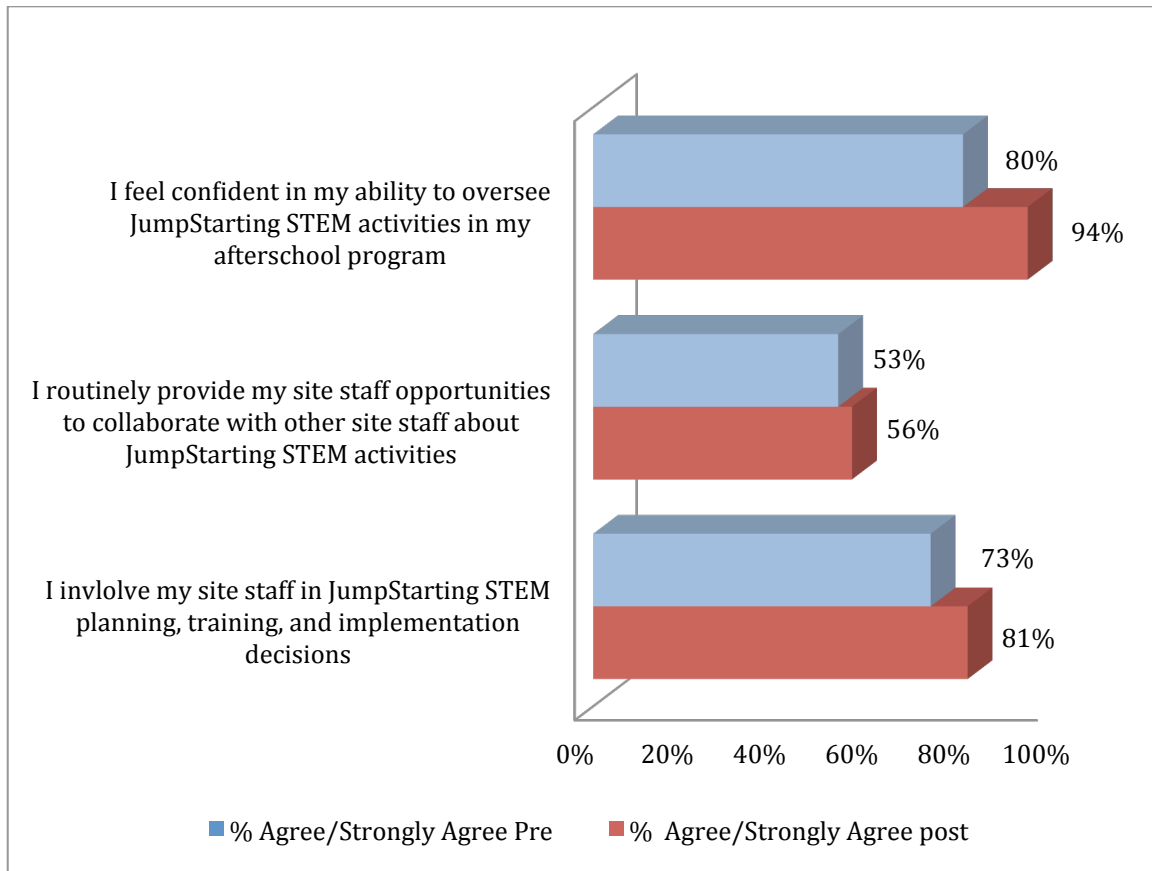
“I feel enthusiastic to incorporate these into my lesson plans. More of these trainings would be great.”

“I feel better prepared and motivated to start these activities”

Program oversight

Improvement was seen in all survey items related to program oversight, with the largest gain in agreement in the area of program director confidence (Figure 5). Ninety-four percent of program directors indicated that they agreed or strongly agreed to the item “I feel confident in my ability to oversee JumpStarting STEM activities in my after school program,” in the post-survey compared to 80% at pre.

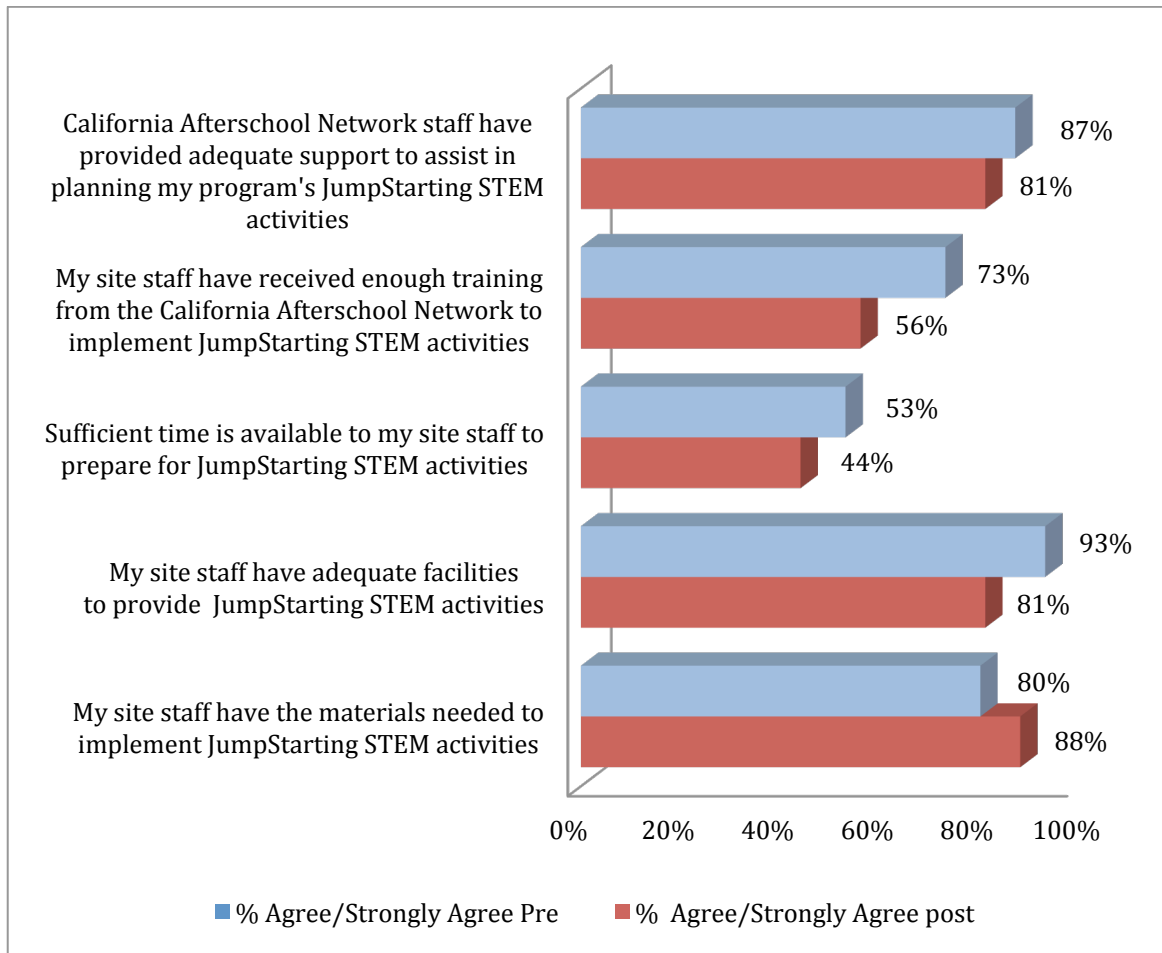
Figure 5. Program director oversight, pre post comparison



Support

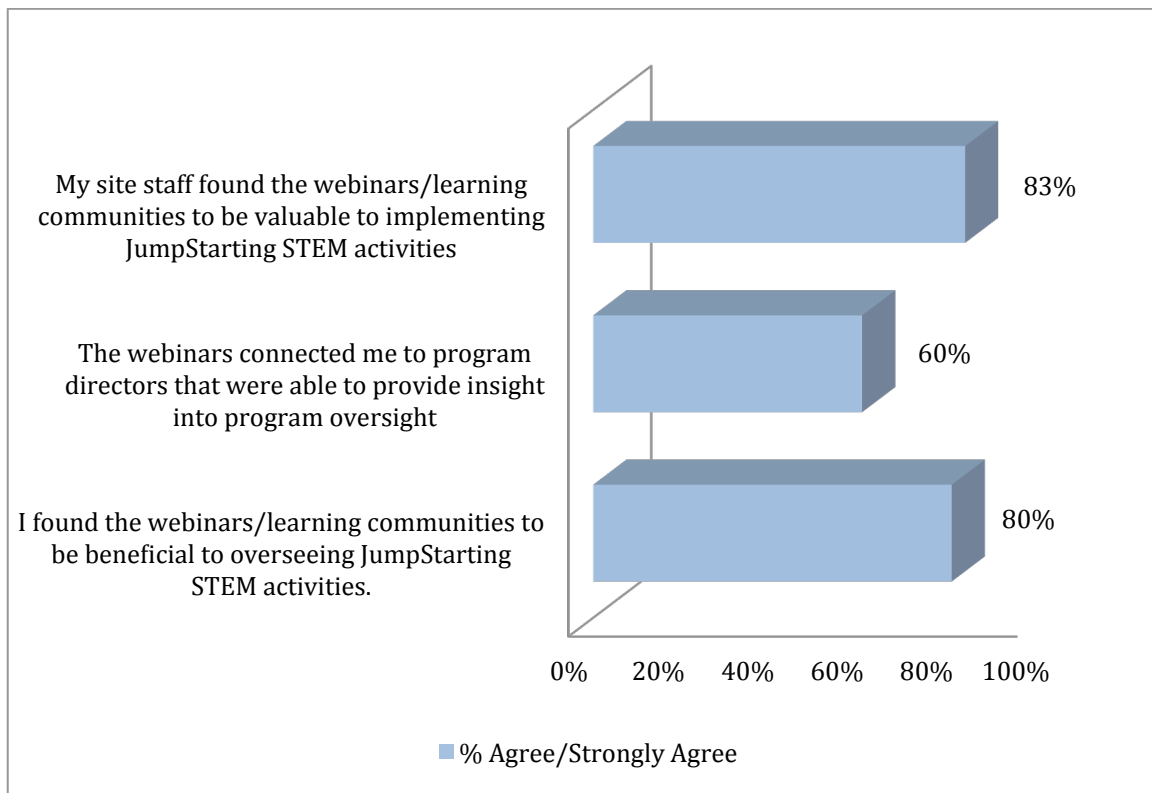
While improvement was generally seen within most of the survey areas discussed above, a slight drop in agreement to survey items was seen in the area of perceived support (Figure 6). Most notably, 73% of program directors indicated that they agreed/strongly agreed to the survey item “My site staff have received enough training from CAN to implement JumpStarting activities” at pre, while only 56% indicated that the agreed/strongly agreed at post.

Figure 6. Program support, pre post comparison



Online learning and support opportunities were available to program directors and site staff through webinars and online learning communities. However, program directors indicated that it was challenging to get staff excited about, and to participate in, webinars. Sixty-two percent of program directors indicated that their site staff participated in these online training and support opportunities. The participation rate in webinars and learning communities was even lower for program directors, with only 50% of program directors indicating that they participated in these opportunities. In future years it may be necessary to make a greater effort to generate interest in webinars and online learning communities as, overall, those who did participate in online opportunities seemed to find them valuable (Figure 7).

Figure 7. Online opportunities, post survey responses



Comments from those staff that did participate in webinars also indicate that they found the experience beneficial, for example:

“The meeting was very helpful and insightful. It did a great job at addressing all the little issues that we may have been having with the curriculum, and it was really nice being able to put in our own stories and ask questions to be addressed.”

“Thank you so much for taking the time to provide us with great information and suggestions to make our lessons run smoother.”

Additionally, it may be that supplementary face-to-face trainings need to occur later in the school year, a crucial time to boost staff knowledge and morale, to help staff and directors feel supported.. This is consistent with program directors responses to the survey item, “What additional support would you find to be helpful from CAN?” where the most commonly cited response was the need for more follow-up trainings, and professional development, as one program director noted:

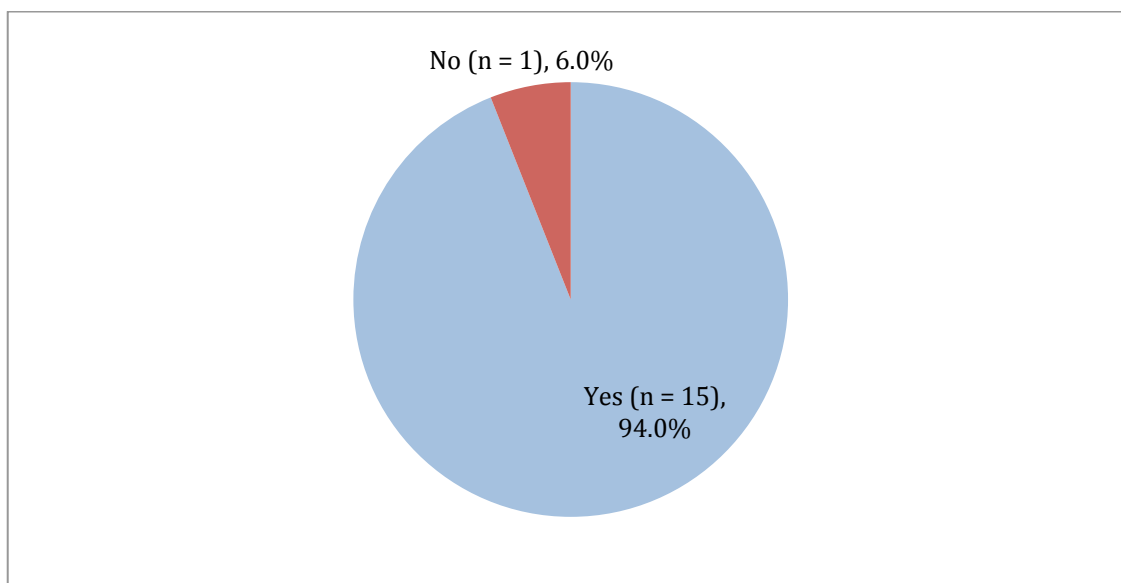
“More ideas, training opportunities and information are needed.”

Time commitment

Program directors indicated that time was one of the challenging aspects of JumpStarting STEM. Particularly the time required to plan for and implement JumpStarting STEM activities. At both pre and post the majority of program directors indicated that the time required for site staff to implement JumpStarting STEM activities (e.g., set-up, clean-up) was somewhat or too time intensive, 60% and 70% respectively. Similarly, when asked to rate the time required for program leadership and the time to plan for JumpStarting STEM activities, the majority of program directors indicated that it was “somewhat” to “too time intensive” both at pre (53%) and post (62%). However, when asked if the benefit of having these activities available to their students was worth the time required to implement the activities, program directors overwhelmingly answered yes (94%, see Figure 8). When asked to elaborate as to why or why not, program directors indicated that the opportunity for students was invaluable. For example, one program director wrote:

“The extended learning time is the prime space for students to participate and engage in STEM. For some students, this may be the only time they get exposed to STEM.”

Figure 8. Do you feel that the benefit of having JumpStarting STEM activities available to your after school participants is worth the time required to plan and implement the activities? Post survey



Correlation analysis

In order to test for statistical significance, constructs were created using related survey items with various outcome areas including; support, fidelity, site staff, and oversight (see Appendix B). T tests were run on all constructs to determine if there was significant change from pre to post in program directors' responses. Due to the small sample size, there is low statistical power which made it difficult to detect statistically significant results. However, the data suggest improvement across many responses from pre to post.

Additionally, multiple regression analyses were run using the constructs to determine if relationships existed between after school program characteristics (region of program, number of curricula, number of training hours completed, number of staff trained, and number of after school sites) and survey constructs (support, fidelity, site staff, and oversight). Unfortunately, significant results were not achieved ($p > .05$). However, there were positive correlations between survey constructs. There was a strong, positive correlation between Support and Fidelity, which was statistically significant ($r = .708, p < .01$). There was also a strong, positive correlation between Support and Site Staff, which was statistically significant ($r = .727, p < .01$). Finally, there was a strong, positive correlation between Fidelity and Site Staff, which was statistically significant ($r = .655, p < .01$). Results are presented in Table 2 below.

These findings suggest that program directors' perceived support is related to their perceptions of site staff confidence and ability, indicating that higher perceived support is associated with positive staff outcomes. There is also a relationship between program directors' perceived support and program fidelity, such that higher levels of perceived support are associated with higher levels of program fidelity. Additionally, these findings suggest that higher perceived staff ability and confidence is associated with higher levels of program fidelity.

Table 2. Variable Correlations

Variable	1	2	3	4	5
1. After school Program	-				
2. Support	-.259	-			
3. Fidelity	-.250	.708*	-		
4. Site Staff	-.222	.727*	.655*	-	
5. Oversight	.554	-.090	.282	.266	-

* $p < 0.01$

APPENDIX A.

Overview of JumpStarting STEM Trainings by Curriculum

Curriculum	Number of Programs Implementing	Number of Training Hours	Number of Staff Trained	Number of Sites
Science Explorer	1	6	43	28
Fantasy Baseball	2	3 - 6	34	19
NASA Jewel of the Solar System	3	6 - 7	70	46
TechBridge	4	6 - 7.5	87	45
Project Wild	1	6	21	12
Project WET	2	4 - 7	52	33
Project Learning Tree	2	5.5 - 8	43	25
Kid Science	3	3 - 4	87	53
Kid Math	3	3 - 4	113	67
TechXcite	1	6	24	7
Discovery Science	1	5	12	7
Junk Drawer Robotics	1	6	47	27

Overview of JumpStarting STEM Trainings by Program

Program	Region	Number of Curricula	Number of Training Hours	Number of Staff Trained	Number of Sites
Anaheim Achieves	9	2	6	43	28
Bay Area After school All Stars	5	2	12	7	6
SAY San Diego	9	3	20	24	12
Bay Area Community Resources	4	2	16	67	32
Give Every Child a Chance	6	1	5.5	26	16
Twin Rivers	3	1	3	27	15
Lucia Mar Unified	8	1	7	14	8
THINK Together Moreno Valley	10	1	4	20	18
Pro Youth Heart	7	1	4	5	12
Woodcraft Rangers	11	1	6	20	17
THINK Together Ontario - Montclair	10	1	8	41	27
CAPS	10	1	7	59	39
Boys & Girls of Central Sonoma	1	2	6	19	12
Harmonium	9	1	4.5	17	11
THINK Together Tustin/Santa Ana	9	2	5	22	8
Pomona Unified School District	11	3	16.5	71	24
Butte County Office of Education	2	1	6	24	7
TOTAL	-	-	136.5	506	280

APPENDIX B

Table 2. Program director survey construct items

Staff Support ($\alpha = .75$)	
	My site staff have the materials needed to implement JumpStarting STEM
	My site staff have adequate facilities to provide JumpStarting STEM activities
	Sufficient time is available to my site staff to prepare for JumpStarting STEM activities
	My site staff have received enough training from CAN to implement JumpStarting STEM activities
	CAN staff have provided adequate support to assist in planning my program's JumpStarting STEM activities
Program Oversight ($\alpha = .70$)	
	I involve my site staff in JumpStarting STEM planning, training, and implementation decisions
	I routinely provide my site staff opportunities to collaborate with other site staff about JumpStarting STEM activities
	I feel confident in my ability to oversee JumpStarting STEM activities in my after school program
Site Staff ($\alpha = .84$)	
	My site staff are confident in their ability to implement JumpStarting STEM activities
	My site staff have the knowledge and skills they need to implement JumpStarting STEM activities
Program Fidelity ($\alpha = .91$)	
	My site staff are implementing JumpStarting STEM activities at least once or twice a week
	I work to ensure that JumpStarting STEM activities are administered to the same group of students throughout the school year
	I work to ensure that the same staff who were initially trained on the JumpStarting STEM curriculum are currently implementing the curriculum