



**SmartStart:
The 3 C's for Cyber Success**

Final Evaluation Report

Year 2

June 13, 2023

TABLE OF CONTENTS

Introduction	Pg. 3
Historical Context	3
Project Scope	4
Evaluation Parameters	5
Evaluation Findings	6
Closing Comments	17
Recommendations	18
Attachment 1: SmartStart: Cohort Schedule	19
Attachment 2: Participation by District: Year-to-Year Comparison	20
Attachment 3: Smart Start Institute Agenda	21
Attachment 4: Standardized Lesson Template for Submission.....	22
Attachment 5: Blank Surveys: Pre-Institute, Post-Institute and Grand Finale	23
Attachment 6: Sample Reflections	30

Introduction

This report presents both qualitative and quantitative findings related to the implementation of the second, one-year cycle for the five-year Broome-Tioga BOCES SmartStart initiative. The reader should note that the annual budget period for the project (April 1, 2022 – March 31, 2023) does not sync with the traditional academic year (July 1, 2022- June 30, 2023). Since the activities carried out under this initiative more closely align with the traditional school year, the latter was used in developing this report. Year 2 findings are also presented separately from year 1 data. This approach was necessary as the program format, professional development content and other elements of the experience were changed prior to year 2, based on year 1 feedback. Additionally, several of the essential questions used to collect the data for evaluation and reporting purposes were modified based on these, and other, changes. The goals and objectives for the initiative, however, remain consistent over the two-year period encompassed to date. Highlights of programmatic and evaluative changes are as follows:

- The three-day institute used to kick-off the learning experience was only offered in the summer in year 1. Year two saw both summer (August) and winter (January) institutes.
- Several “Graduates” from year 1 were invited back to share their experiences with year 2 cohorts as part of the training exercise.
- Community of Practice sessions and culminating activities were conducted in an online environment in year 2 rather than in person.
- The use of Dash robots for grades K-2 was discontinued in favor of the Spero Indi.
- Distribution of ABC’s of STEM kits was discontinued as they were found by participants to have limited value in the classroom.
- Pre-institute, post institute and final evaluation survey questions were changed to more closely align with the project goals and objectives.
- Both structured and un-structured, written “reflections” were collected as part of the evaluation.
- The format for lesson/artifact development and sharing was changed (simplified) and standardized.

Historical Context

On November 20, 2019 Broome – Tioga BOCES (BT BOCES), in collaboration with 14 public school districts in, or contiguous to, the BT BOCES region submitted a five-year request for funding to the New York State Education Department (NYSED) in response to the SmartStart competitive Request for Proposals. On February 12, 2021, BT BOCES received word that the aforementioned proposal had been selected for funding in the amount of \$402,432.00 annually beginning April 1, 2021. Following is a list of participating public school districts (SD) representing a total K-12 enrollment of approximately 31,000 students:

Binghamton City SD	Maine-Endwell Central SD	Union-Endicott Central SD
Chenango Valley Central SD	Norwich City SD	Vestal Central SD
Deposit Central SD	Sidney Central SD	Whitney Point Central SD

Harpursville Central SD	Susquehanna Valley Central SD	Windsor Central SD
Johnson City SD	Tioga Central SD	Chenango Forks Central SD

The stated purpose of this initiative is to develop, implement and share innovative programs that provide professional development and support to increase expertise in computer science and/or educational technology among teachers in grades K-8. In the Broome-Tioga BOCES region, pursuit of this purpose is facilitated through a regional professional development model wherein the Professional Learning and Innovation Center (PLIC) at BT BOCES provides elements of coordination, oversight, resource management, communication and evaluation for this project, while CYBER.org, acting under contract with BT BOCES, provides the hands-on professional development and continuing support for this initiative via online synchronous and asynchronous interaction with participating teachers and related school staff. Our professional development vendor, CYBER.org, is the current recipient of the Department of Homeland Security’s Cybersecurity Education and Training Assistance Program grant and has been designated the DHS national model for STEM, cyber, and computer science curriculum development.

Specific goals for this initiative are as follows:

Goal #1: Develop regional integrated curricula for Grades K-8 that will target the knowledge and skills included in the NYS Computer Science and Digital Fluency Standards to ensure students are future-ready and well-equipped for college and career opportunities.

Goal #2: Increase teachers’ knowledge and skills, and ultimately their confidence and comfort to teach computer science concepts (coding, computational thinking, and cybersecurity awareness)

Goal #3: Integrate Computer Science and Digital Fluency Standards into content areas to increase engagement and learning, resulting in increased 3-8 ELA and Math state assessment scores to close the gap of regional scores to the state.

Goal #4: Create a foundation for a school-to-career cyber workforce pipeline.

Project Scope

This project has thus far been implemented by voluntarily engaging unique cohorts of teachers and other school professional educators in on-going learning experiences designed to ultimately achieve the goals stated above in a sustainable and systemic fashion. Based on feedback from both year 1 participants and the PD provider, the engagement cycle for each cohort was reduced from a full academic year to a period of approximately 5 months in an effort (successful) to boost completion rates (**Attachment 1.**) While there were, in fact, three cohorts of K-8 educators involved in the 2022/23 cycle, cohorts 1 and 2 (both launched in August of 2022) are considered as a single cohort. This decision is supported by statistical analysis of their respective survey response which yielded nominal statistically significant differences between the two groups. A third cohort, launched in January of 2023 did, however, exhibit statistically significant differences in character and group composition at the point of initial engagement. Their information is therefore presented separately for the purposes of this report. **Attachment 2** presents the target numbers for recruitment in each of the participating districts alongside the

actual year 1 and year 2 numbers Participants were each compensated financially for participating per their individual district's employment contract. Compensation was parsed out in such a way that participants had to meet certain engagement targets for each phase of the learning experience in order to access 100% of their compensation package. In year one communication and information sharing was facilitated via a popular, online Learning Management System called "Canvas" (<https://www.instructure.com/k-12>) which is in wide use by the PD provider (Cyber.org). Feedback from the year 1 cohorts, however, moved the implementation team to shift to Schoology which is the platform of choice used widely among Broome-Tioga BOCES component districts.

The professional development cycle for this project includes four core components: * **A Three-day Institute**; * **Community of Practice**: ongoing, scheduled and un-scheduled opportunities for participants to engage with each other and the PD provider periodically over the course of the experience; * **Collaborative Curriculum Development**: As teachers progress through the cycle, developing concrete pedagogical skills and an increasing sense of self-efficacy, they work collaboratively to develop at least one, standards-aligned, integrated instructional module, and a * **Final Reflection**: Each participant engaged in an end-of-the-cycle reflection on their personal and collaborative learning and attended an end-of-cycle, cumulative, sharing experience. **Attachment 3** provides a more detailed look at the specific activities and deliverables that together comprise the SmartStart annual professional development experience.

In general terms, the three-day institute provided the "launch point" for the project and subsequent continuous learning was provided using the Schoology online Learning Management System as the platform for a regional, Community of Practice. Participating school staff were assigned a number of "tasks" to complete and a timeline for their completion. These tasks consisted of both output and outcome deliverables such as the creation and sharing of student lessons and the exchange of knowledge, experience and inquiry between and among other participants. Ultimately each participant was required to submit a standards-aligned instructional module using a standardized format (**Attachment 4**) within the five-month cycle for their cohort as a requirement for completion of the experience. Throughout the experience, participants continued to function as members of distinct cohorts and often worked in 3-5 member inter-district teams. This approach was designed to help facilitate scaffolding of instructional content and regional adoption of similar content and practice.

A locally hosted website for the project has also been created and is available at <https://www.btboces.org/SmartStartProject.aspx>. Evaluation reports will be archived at this site periodically during the entire period of project operation. In keeping with NYSED requirements, artifacts from the experience are also provided to NYSED for archiving on the state-wide webpage for the SmartStart initiative.

Evaluation Parameters

Efforts to measure and document the relative success of the "3 C's for Cyber Success" project are carried out in parallel with the implementation of the project in a manner consistent with the "continuous Improvement" approach utilized in project implementation. The evaluator, a retired BOCES administrator, works closely with the PD provider and the project director to gather and provide feedback at regular intervals during the annual implementation cycle.

Year two of the project was launched in the summer of 2022, with planning and recruitment activities having taken place in May, June/July of that year. As noted earlier, the first major engagement activity was a three-day institute provided by CYBER.org staff with BT BOCES handling teacher recruitment and coordination activities. A total of 48 participants engaged this experience during August 2022 attending the three-day experience on either August 2,3,4 or August 9,10,11. A second cohort was launched with an essentially identical three-day institute on January 10,11,12, 2023 which was attended by 32 participants. Ultimately a total of 80 unique individuals participated in one of the three institutes. A total of 76 (46 and 30 respectively) completed the entire five-month exercise.

Each institute was evaluated utilizing an online, multi-question pre/post survey activity via SurveyMonkey – an industry standard and highly customizable data collection tool. Pre-institute, post-institute and “grand finale” survey instruments were designed to engage participants in self-reflection regarding their relative level of comfort with, and perceived level of knowledge/mastery of, the curricular elements targeted in the proposed goals for the project. The pre-institute survey was implemented for each cohort by providing them with a link during the first hour of their summer institute experience. Likewise, the post-institute survey was administered in similar fashion during the final hour of the 3-day experience. The Grand Finale survey was conducted by making a hyperlink available to participants during a two week window of time at the end of the five-month cycle for each cohort.

The instruments were designed in such a way that all questions required an answer prior to final submission. **(Attachment 5)** All surveys were administered anonymously, however, a unique ID was developed for each respondent in order to facilitate pre/post survey pair matching. The pre and post instruments were NOT identical, but rather contained questions designed to gather demographic and baseline experiential and perceptual information (pre-institute survey) and feedback about the summer experience with respect to the PD providers performance, responsiveness, delivery, etc. along with questions designed to measure change in self perceptions among the participants themselves (post-institute survey). A third survey (the Grand Finale survey) containing the same essential questions as the pre and post institute survey was administered at the end of each cohort cycle to explore for indications of retention of knowledge and perceptions from the post institute date through the ongoing, Community of Practice and content development phases of each cohort cycle.

Evaluation Findings

Statistically, there were slight differences in demographic composition between the three groups. There were no statistically significant differences in the survey responses captured from the two summer groups. These two groups were, therefore, combined in this analysis and considered as a single cohort. Statistical differences in survey responses between this combined cohort (cohort 1) and the winter cohort (cohort 2) were present but nominal. At the onset of training (pre-institute survey) cohort two scored themselves less comfortable with participating in a Community of Practice than cohort 1, but this difference disappeared upon completion of the institute (post-institute survey) and did not re-occur thereafter (grand finale survey). Another anomaly was noted when cohort 1 ranked themselves significantly less confident than cohort 2 in facilitating student learning around computer coding. Upon conclusion of the three-day institute,

however, this difference evaporated upon completion of the effort. One curious, albeit not statistically significant, difference between cohorts 1 and 2 was that, while cohort 1 generally rated themselves as more confident/more proficient across the majority of survey questions at the onset of the three-day institute, the reverse was true at the completion of the institute. However, any statistically significant differences in overall self-ratings between cohorts 1 and 2 disappeared by the end of the five month experience.

The year 2 experience collectively enrolled a total of 80 unique individuals from across the consortium, 76 of whom completed the experience 5 months later. This represents a significant increase over the 67 individuals who were enrolled in year 1 with only 50 having completed that experience. An additional 6 members of the BT BOCES administrative and professional development staff also participated, however, their engagement in the initiative was intentionally not captured by the evaluator since doing so seemed likely to erroneously influence the study results with respect to the target audience of district-based staff. Thus, approximately 76% of the targeted number (76/100) of school staff was engaged in the second round of SmartStart training from across the BT BOCES region. Documentation of change as a result of the PD experience was facilitated by statistically analyzing participants responses to six identical questions contained in all three surveys utilizing un-matched pair T testing to explore for statistically significant change in self-perception from the start to finish of each cohort/cycle.

The essential questions included in all three surveys were all structured for Lickert Scale (1-5: low to high) responses and were as follows:

- How would you rate your current level of content knowledge related to the Computer Science and Digital Fluency Standards?
- How would you rate your current level of comfort in addressing “computational thinking” with your students?
- How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?
- How would you rate your level of confident in effectively integrating other disciplines with the Next Generation Science Standards?
- How would you rate your level of confidence in addressing topics related to “cybersecurity” in your classroom?
- How would you rate your level of comfort with participating in an online “community of Practice”?

Since the total bank of questions in each survey was not identical (Only the six essential questions included on all three surveys were) the following table provides links to those summary data which can be perused at the reader’s convenience. (C1=cohort 1, C2=cohort 2)

	Pre-institute Survey results	Post-institute Survey results	Grand Finale Survey results
C 1	https://www.surveymonkey.com/results/SM-Vc8HKH_2BMwO2Hbi3Z5dOLTA_3D_3D/	https://www.surveymonkey.com/results/SM-YdB7fMwO73EsIkRmAUv oTw_3D_3D/	https://www.surveymonkey.com/results/SM-bYMjwfgUgkDn7uuHNIV Lgg_3D_3D/
C 2	https://www.surveymonkey.com/results/SM-	https://www.surveymonkey.com/results/SM-	https://www.surveymonkey.com/results/SM-

r2B7x_2Fcvtke8QD1BHQQ UbA_3D_3D/	FKjCvqCjbqC3OiaGgq_2B bSQ_3D_3D/	EBbXtZ3Bh7_2BGs2Huch htNA_3D_3D/
--	--	--

The following charts present the summary survey data and analysis for the SmartStart experience for each cohort. Changes in responses over time are expressed as:

- Extremely statistically significant
- Very statistically significant
- Somewhat statistically significant
- Not quite statistically significant
- Not statistically significant

Source: <https://www.graphpad.com/quickcalcs/ttest1.cfm>

Overall, these data suggest that the three-day institute had a profound positive impact on educator confidence and self-perceived efficacy for participants in both cohorts and that this positive change was maintained on all measures throughout the life of the experience. In fact, the only statistically significant difference noted was between the post-institute survey and the final. In that instance teacher comfort with addressing topics related to cybersecurity increased between the end of the institute and the end of the experience five month later for cohort 1. Overall gains from start to finish were greater for cohort 2 than for cohort 1 on all questions.

Cohort 1: Question 1	How would you rate your current level of content knowledge related to the computer science and digital fluency standards?		
	Lowest difference in gains between C1 and C2		
	Pre-institute	Post-institute	Grand finale
Mean	2.37	3.63	3.67
Standard Deviation	0.89	0.70	0.60
Number of population sampled	46	48	43
Margin of error@ 95% confidence	3%	0%	5%
Level of significance of difference in means C1; pre/post institute	Extremely statistically significant		

Level of significance of difference in means C1; post institute vs. finale	Not statistically significant
--	-------------------------------

Cohort 1: Question 2	How would you rate your current level of comfort in addressing “computational thinking” with your students?		
	Pre-institute	Post-institute	Grand finale
Mean	2.67	3.75	3.95
Standard Deviation	1.04	0.63	0.61
Number of population sampled	46	48	43
Margin of error@ 95% confidence	3%	0%	5%
Level of significance of difference in means C1; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C1; post institute vs. finale	Not statistically significant		

Cohort 1: Question 3	How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?		
	Pre-institute	Post-institute	Grand finale
Mean	2.70	3.60	3.84
Standard Deviation	1.23	0.70	0.86

Number of population sampled	46	48	43
Margin of error@ 95% confidence	3%	0%	5%
Level of significance of difference in means C1; pre/post institute	Extremely Statistically Significant		
Level of significance of difference in means C1; post institute vs. finale	Not statistically significant		

Cohort 1: Question 4	How would you rate your level of confidence in effectively integrating other disciplines with the Next Generation Science standards?		
	Pre-institute	Post-institute	Grand finale
Mean	2.96	3.73	3.93
Standard Deviation	0.98	0.73	0.66
Number of population sampled	46	48	43
Margin of error@ 95% confidence	3%	0%	5%
Level of significance of difference in means C1; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C1; post institute vs. finale	Not statistically significant		

Cohort 1: Question 5	How would you rate your level of confidence in addressing topics related to “cybersecurity” in your classroom?
---------------------------------	---

	Pre-institute	Post-institute	Grand finale
Mean	2.74	3.85	4.26
Standard Deviation	1.13	0.61	0.65
Number of population sampled	46	48	43
Margin of error @ 95% confidence	3%	0%	5%
Level of significance of difference in means C1; pre/post institute	Extremely statistically significant		
	most overall gain from start to finish for cohort 1		
Level of significance of difference in means C1; post institute vs. finale	Very statistically significant (positive change)		

Cohort 1: Question 6	How would you rate your level of comfort with participating in an online “Community of Practice”?		
	Pre-institute	Post-institute	Grand finale
Mean	3.13	3.83	3.93
Standard Deviation	1.08	0.55	0.66
Number of population sampled	46	48	43
Margin of error@ 95% confidence	3%	0%	5%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		

Level of significance of difference in means C2; post institute vs. finale	Not statistically significant
--	-------------------------------

Cohort 2: Question 1	How would you rate your current level of content knowledge related to the computer science and digital fluency standards?		
	Pre-institute	Post-institute	Grand finale
Mean	2.43	3.88	3.74
Standard Deviation	0.80	0.75	0.64
Number of population sampled	30	26	27
Margin of error@ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Cohort 2: Question 2	How would you rate your current level of comfort in addressing “computational thinking” with your students?		
	Pre-institute	Post-institute	Grand finale
Mean	2.57	3.81	4.07
Standard Deviation	0.84	0.79	0.66
Number of population sampled	30	26	27

Margin of error @ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Cohort 2: Question 3	How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?		
	Pre-institute	Post-institute	Grand finale
Mean	2.30	3.96	3.89
Standard Deviation	1.16	0.85	0.68
Number of population sampled	30	26	27
Margin of error@ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
		highest overall gain start to finish for cohort 2	
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Cohort 2: Question 4	How would you rate your level of confidence in effectively integrating other disciplines with the Next Generation Science standards?		
	Pre-institute	Post-institute	Grand finale

Mean	2.63	3.85	4.07
Standard Deviation	0.87	0.66	0.66
Number of population sampled	30	26	27
Margin of error@ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Cohort 2: Question 5	How would you rate your level of confidence in addressing topics related to “cybersecurity” in your classroom?		
	Pre-institute	Post-institute	Grand finale
Mean	2.57	4.08	4.15
Standard Deviation	0.80	0.73	0.59
Number of population sampled	30	26	27
Margin of error@ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Cohort 2: Question 6	How would you rate your level of comfort with participating in an online “Community of Practice”?		
	Pre-institute	Post-institute	Grand finale
Mean	2.60	4.00	4.19
Standard Deviation	0.99	0.68	0.67
Number of population sampled	30	26	27
Margin of error@ 95% confidence	5%	8%	8%
Level of significance of difference in means C2; pre/post institute	Extremely statistically significant		
	greatest difference in gains between C1 and C2 Highest overall gain start to finish for C2 (tied with Q 3)		
Level of significance of difference in means C2; post institute vs. finale	Not statistically significant		

Finally, teachers were asked a series of qualitative survey questions on the Grand Finale survey. . These questions focused on perceived strengths and weaknesses of the PD experience. Findings from these questions were as follows:

1. In your opinion, what were the strengths of this six-month experience?
 - a. Opportunity to collaborate 52%
 - b. Opportunity to gain deeper understanding of the Computer Science and Digital fluency standards.50%
 - c. Access to Cyber.org resources 34%
 - d. Hands-on learning approach to curriculum development 30%

2. In your opinion, what elements of this long-term learning experience do you think need to be strengthened?
 - a. More time for face-to-face collaboration 36%
 - b. None 36%
 - c. More technology to use in the classrooms 24%
 - d. Better communication regarding expectations 20%

3. What are the "takeaways" from your SmartStart experience that you will use in your classroom over the next 12 months?
 - a. Lessons developed 42%
 - b. Importance of addressing Cybersecurity with my students 38%
 - c. Better understanding of the standards 38%
 - d. The value of using robotics to teach coding 34%

4. Is there anything else you would like us to know about your SmartStart experience so far?
 - a. Thank you 80%
 - b. Not at this time 80%
 - c. Valuable experience 68%

Quantifiable evaluation of the QUALITY of the Professional Learning Community and curriculum development activities has been, to date, more challenging. Formal Peer Review of lessons developed was abandoned based on the year 1 experience in favor of a simple sharing of products between participants during small group dialog sessions/exchanges conducted at the end of the experience. However, all lessons were reviewed by the PD provider and editorial suggestions were provided to participants prior to final submission of the artifacts. Ultimately, the project coordinator reserved and exercised the right to edit final products for appropriate content and formatting prior to submission of the final report.

Through the SCHOLOGY online learning management system participants were provided with opportunities and a forum for the exchange of questions, ideas and resources at any time during and after the experience. They were also given a calendar of "assignments" intended to extend, deepen and institutionalize their learning. Rates of completion for participant assignments and rates of completion for the experience overall vary slightly between the cohorts, however, in both cases, completion rate from start to finish exceeded 90% which is proximal to, if not higher than, the overall rate of completion of many similar long-term, continuous improvement exercises available in the Broome-Tioga BOCES region.

Throughout the SmartStart experience, particular emphasis was placed on gathering and analyzing data relative to program goal 2: *Increase teachers' knowledge and skills, and ultimately their confidence and comfort to teach computer science concepts (coding, computational thinking, and cybersecurity awareness)* through both the surveys and reflective activities. Evidence of achievement linked to program goals 1 and 3 which relate to standards-based curriculum development is manifested in the 76 modules of instruction presented elsewhere in the NYSED Final Report template for SmartStart year 2 which accompanies this submission. The evaluator notes that the year two total of 76 instructional modules is markedly higher than the 49 modules submitted in year one and represents a successful artifact submission for EVERY individual who completed the year 2 experience.

Final reflections were a requirement for completion of the experience. For the summer 2022 cohort, guided reflections were "prompted" by a set of questions which were similar to those used in the Grand Finale survey. Reflection was considered an "optional" exercise for Cohort 1 while submitting a reflection was "mandatory" for cohort 2. The second (winter) cohort, was

provided with a more instructionally focused set of guiding questions in an attempt to gather more specific and programmatically relevant information as follows:

1. How did you choose the CS/DF and content area standards for your Instructional Module?
2. In what ways does your Instructional Module fit into your curriculum?
3. What experiences from teaching the Cyber.org lesson helped you to create your Instructional Module?
4. What parts of the Institute were most helpful when you were writing your Instructional Module?
5. What was the most helpful from your zoom discussion with other participants?

Cohort 1 reflections, owing perhaps to their limited numbers (12 submitted) and duplicative nature, yielded information of limited value beyond that which was captured in the extended response questions included on the Grand Finale survey. For Cohort 2, participants were specifically asked to focus on their experience with delivery of project-related lessons and were asked to identify both successes and challenges experienced therewith, value of the CYBER.org content, etc.. A representative sample of participant reflections is included with this report as [**Attachment 6**](#). 58 of 76 participants submitted relevant reflections as part of their experience; from which a subset of 20 reflections were subjected to analysis using MonkeyLearn Sentiment Analysis software. Further analysis of reflective text was conducted using MAXQDA 2022, a popular qualitative data analysis application. In broad terms, participants reported positive experiences with “testing” selected lessons in their classrooms. In the vast majority of cases, teachers reported that in-field modification of the lesson was implemented based on student observation/feedback. Several participants also noted that instruction had to be modified from the proposed lesson template format because of time constraints. Of the topics/standards covered in the PD portion of the overall experience, Cybersecurity and Coding were the topics most often addressed in the lessons developed for classroom piloting. 76% of participants reported using Cyber.org resources in lesson development and/or delivery. Collaboration with other participants via zoom was not well represented in the participant reflections sampled. One possible note of concern is that, of the 20 reflections selected for qualitative review, three indicated that the teacher was unable to complete the delivery of the selected lesson (s) with the target class for a variety of reasons.

Closing Comments

The penultimate measure of success for this project is in the degree to which it met the stated goals and objectives. To that end, a goal-by-goal analysis of outcomes is as follows:

Goal #1: Develop regional integrated curricula for Grades K-8 that will target the knowledge and skills included in the NYS Computer Science and Digital Fluency Standards to ensure students are future-ready and well-equipped for college and career opportunities.

A total of 76 instructional modules linked to the Computer Science and Digital Fluency standards were forwarded to NYSED in May 2023. This goal was met.

Goal #2: Increase teachers' knowledge and skills, and ultimately their confidence and comfort to teach computer science concepts (coding, computational thinking, and cybersecurity awareness)

In the opinion of participants, this goal was well met given data from the Summer Institute and final surveys and reflections. This goal was definitively met.

Goal #3: Integrate Computer Science and Digital Fluency Standards into content areas to increase engagement and learning, resulting in increased 3-8 ELA and Math state assessment scores to close the gap of regional scores to the state.

Quantitative progress in achieving this goal cannot be assessed at this time.

Goal #4: Create a foundation for a school-to-career cyber workforce pipeline.

Much curricular effort was placed on engaging students in awareness activities focused on cyber security careers during this project. While it will take the five-year duration of the project and beyond to obtain quantitative data linked to this goal, the effort to engage students in related dialog is well documented within the lesson plans submitted, educator assignments and posts shared in the Schoology LMS. This goal is presumptively met.

Recommendations

The year 2 model appears to have been markedly more successful with respect to quantity and quality of content development. Participant feedback suggests that efforts to strengthen communication over the five-month period should continue. Participants would like to be informed regarding fellow participants reflections and survey responses. Participants should have access to more and more diverse technology to take back to the classroom. More face-to-face time should be made available to support the Community of Practice.

Smart Start 12 Month Schedule August, 2022 - August, 2023

	August	Sept-Oct	Nov-January	Feb-March	March-April
August 2022 Cohort	<p>3-Day Institute. Participants choose from Session A: Aug 2-4 or Session B Aug 9-12, 2022</p>	<p>Participants pilot a CyberOrg lesson / activity in classroom</p> <p>Synchronous 1-hour after school Zoom Mtg for participants to share reflection on lesson/ activity pilot.</p> <p>Participants select from 3 synchronous meeting dates: November 1, 2 or 3, 2022</p>	<p>Participants create a new Integrated Instructional Module design and pilot in classroom</p> <p>Instructional Module is due to DHamilton by December 19, 2022</p> <p>Some August 2022 Participants invited to share their Instructional Module with January 2023 Cohort on January 12, 2023</p>		
January 2023 Cohort			<p>3-Day Institute January 10, 11 and 12, 2023</p>	<p>Participants pilot a CyberOrg lesson / activity in classroom</p> <p>Synchronous Zoom Mtg from 3:00-4:00pm for participants to share reflection on lesson/ activity pilot. Participants select from 3 synchronous meeting dates: March 7, 8, or 9, 2023</p>	<p>Participants create a new Integrated Instructional Module design and pilot in classroom</p> <p>Instructional Module is due to DHamilton by April 15, 2023</p> <p>Some January 2023 Participants share their Instructional Module with August 2023 cohort on August 3 or 11, 2023</p>
August 2023 Cohort					<p>3-Day Institute. Participants choose from Session A: Aug 1-3 or Session B Aug 8-11, 2023 >>>></p>

SMARTSTART
Annual Enrollment Comparison
by District

District	Year 1	Year 2
Binghamton	6	13
BOCES	1	4
Chenango Forks	6	6
Chenango Valley	5	11
Greene	0	5
Harpursville	3	3
Johnson City	2	1
Maine Endwell	8	15
Norwich	2	0
Sidney	5	4
Susquehanna Valley	6	4
Union Endicott	3	1
Vestal	12	5
Whitney Point	1	3
Windsor	8	2
Total Enrolled	68	80
Total completed	50	76
Percent completed	74%	95%

Smart Start Institute Agenda 2023

Day 1

- Welcome/Presurvey/Canvas requests/Google folder access
- Smart Start Intro and Expectations
- CYBER.ORG Intro
- Cybersecurity Activities (digital footprint, password, weather app - handout)
- Cybersecurity Basics (Avatar - handout, Castle)

Lunch

- Cybersecurity Standard Connections in grade level groups
- Lesson plan expectations/template

Day 2

- Computational Thinking in Science and Math (airplane, typical shoe)
- CT Standards Connections

Lunch

- Computational thinking in ELA (Cinderella)
- CT Standards Connections
- Meet the micro:bit; Indi introduction
- micro:bit tutorials; Indi tutorials

Day 3

- Explore curricula options on CYBER.ORG dashboard
- Activities on CYBER.ORG website and cipher disk
- Career profile cards
- Keys to Cybersecurity
- Palo Alto Cyber A.C.E.S.
- micro:bit projects

Lunch

- Specificity game
- Standards Unpacking and Q & A
- 3 lessons and discussions in grade level groups
- Survey



Author: Provide the complete name and school email address of the teacher who was responsible for creating, piloting, and revising this plan. Other teachers may be used as collaborators or co-developers, however, each teacher is required by the NYS Smart Start Grant to create at least one **UNIQUE** lesson.

Lesson Title: A simple title that gives some indication of what students would learn and do in this lesson.

Grade Level: Specific grade (e.g. 5) or grade span (e.g. grades 6-8)

CS/DF Standard(s): List NYS Computer Science / Digital Fluency standards with ref number and descriptor (e.g. CS/DF 4-6.CT.3 Visualize a simple data set in order to highlight relationships and persuade an audience)

Subject Area (Course Taught):

General subject (e.g. Math, ELA), specific course title (e.g. "STEM", "American History 7", etc) if applicable, AND specific NYS Standards (e.g. Math 6.sp.4. Display quantitative data in plots on a number line, including dot plots, and histograms. 6.sp.5. Summarize quantitative data sets in relation to their context)

Lesson Outcomes: A simple description of what the students can demonstrate as a result of this lesson. This may be a direct quote from the NYS standards if appropriate.

Lesson Structure: Provide a general structure (e.g. "1 lesson of 40 minutes", "4 warm-up activities of 10 minutes each") and a general time frame when this would occur during the school year such as first week of October, end of 4th unit, beginning of second semester, etc

Assessment: How will the teacher know that students have met the lesson outcome(s)? Informal methods could include teacher observation of each student all the way to formal assessments that involve rubrics or student artifacts.

Description

Write a detailed outline of the lesson including relevant instructional strategies, learning tasks, assessments, and conclusion. Your outline should be detailed enough that another teacher could use them. Include what the teacher and students will be doing during each lesson phase. Include a few key time guidelines.

NOTE: Attach any relevant devices, handouts, PPTs, online links, etc. that you used in this lesson. Do not worry about whether those resources are available to your teacher audience. Please Note: Only materials obtained with proper copyright or licensing may be used in your lesson. Commercial materials your district does not own, Teacher-pay-Teacher, or other for-profit materials may not be used without proper permission and/or purchase.

The remainder of the form is completely blank so the creator can format it as needed to match the content, organization, and sequence of the instructional module.

SmartStart: The 3 C's for Cyber Success - Year 2

We'd like to know . . .

The New York State Education Department requires that we conduct an evaluation of the SmartStart grant initiative. In order to meet that requirement, we will ask you to answer survey questions periodically throughout the coming year. Your responses to the following questions will help us establish a baseline of information regarding your engagement with certain elements of the Next Generation Science Standards and related pedagogy. All responses will remain anonymous.

BOCES and Cyber.org will also use a few pieces of information to create a “unique project ID” for you so we can track your responses over time WITHOUT tagging you by name. The first question below is for that purpose.

Please click "ok" to advance through each section of the survey. Thank you for participating in this effort!

* 1. Please create a unique **SEVEN DIGIT** ID using the following format. Enter the **FIRST** letter of your **LAST** name, followed by the month, day and **LAST TWO DIGITS** of the year of your birth. Please do **NOT** include spaces, slashes or dashes (for example “ Pat Doe, February 10 1974” would be D021074):

* 2. Please tell us the grade level you typically teach (please check all that apply)

K-2

3-5

6-8

other (Library Media Professional, Administrator, Coach, etc.)

I am a BOCES PLIC Team Member

* 3. What subject(s) do you teach?

* 4. Which of the following best describes your school setting?

rural

town

suburban

urban

* 5. Is your school a Title 1 school?

yes

no

not sure

Please answer the next 6 questions using a 1-5 scale, where 1 = very low/minimal and 5 = very high/extensive

* 6. How would you rate your current level of content knowledge related to the Computer Science and Digital Fluency standards?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 7. How would you rate your current level of comfort in addressing "computational thinking" with your students?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 8. How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 9. How would you rate your level of confidence in effectively integrating other disciplines with the Next Generation Science standards?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 10. How would you rate your level of confidence in addressing topics related to "cybersecurity" in your classroom?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 11. How would you rate your level of comfort with participating in an online "Community of Practice"?

1 = very low/minimal 2 3 4 5 = very high/extensive

* 12. How often do you use robotics in your classroom?

- Daily
- Weekly
- Monthly
- 3 or 4 times per year
- less than three times per year

* 13. How often do you talk to your students about digital safety and basic cybersecurity?

- Daily
- Weekly
- Monthly
- 3 or 4 times per year
- less than 3 times per year

* 14. How often do you talk to your students about cyber career opportunities?

- Daily
- Weekly
- Monthly
- 3 or 4 times per year
- less than 3 times per year

* 15. Before attending this workshop, how familiar were you with CYBER.ORG?

- Extremely familiar
- Very familiar
- Somewhat familiar
- Not so familiar
- Not at all familiar

* 16. Which of the following best describes your gender identity?

- Male
- Female
- Prefer not to say
- Another Identity

* 17. Which of the following best describes your racial/ethnic identity?

- American Indian or Alaskan Native
- Asian or Asian American
- Black or African American
- Hispanic or Latino/a/x
- Multiracial or Biracial
- Native Hawian or other Pacific Islander
- White or Caucasian
- Prefer not to say
- Another race/ethnicity not listed above

SmartStart: Year 2 - Wrapping Up the Institute

We'd like to know . . .

Now that your SmartStart journey is underway, we'd like to ask you a few questions about your experiences and perceptions to date. Some of these questions will look familiar and we will ask them a couple more times during the next several months. However, some questions will be new/different each time you take the survey so please read each question carefully before responding.

Unfortunately, we need to ask you to answer the "unique ID" question below again in order to anonymously track your data over time. The first question below is for that purpose.

Please click "ok" to advance through each section of the survey.

Thanks again for being a part of this project!

* 1. Please create a unique **SEVEN DIGIT** ID using the following format. Enter the **FIRST** letter of your **LAST** name, followed by the month, day and **LAST TWO DIGITS** of the year of your birth. Please do **NOT** include spaces, slashes or dashes (for example " Pat Doe, February 10 1974" would be D021074):

Please answer the next 6 questions using a 1-5 scale, where 1 = very low/minimal and 5 = very high/extensive

* 2. How would you rate your current level of content knowledge related to the Computer Science and Digital Fluency standards?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 3. How would you rate your current level of comfort in addressing "computational thinking" with your students?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 4. How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 5. How would you rate your level of confidence in effectively integrating other disciplines with the Next Generation Science standards?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 6. How would you rate your level of confidence in addressing topics related to "cybersecurity" in your classroom?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 7. How would you rate your level of comfort with participating in an online "Community of Practice"?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. In your opinion, what were the strengths of this workshop?

9. In your opinion, what elements of this workshop do you think need to be strengthened?

10. What are the "takeaways" from this workshop that you will use in your classroom this fall?

11. Is there anything else you would like to know about your SmartStart experience so far?

SmartStart: - your grand finale!

May your SmartStart journey never end - - but now its time for US to just move on!

As you wrap up the the final phase of your SmartStart experience for this year, we'd like to ask you a few questions about your perceptions to date. Most of these questions will look familiar because we have asked them more than once over the past six months. Some of these questions are designed to measure change over time. Please read every question carefully before you respond.

Unfortunately, we also need to ask you to answer a "unique ID" question as we did back when you started your SmartStart adventure. This is so we can anonymously track your unique set of responses over time. The first question below is for that purpose.

Please click "ok" to advance through each section of the survey. Thanks again for being a part of this project!

* 1. Please create a unique **SEVEN DIGIT** ID using the following format. Enter the **FIRST** letter of your **LAST** name, followed by the month, day and **LAST TWO DIGITS** of the year of your birth. Please do **NOT** include spaces, slashes or dashes (for example " Pat Doe, February 10 1974" would be D021074):

Please answer the next six questions using a 1-5 scale, where 1 = very low/minimal and 5 = very high/extensive

* 2. How would you rate your current level of content knowledge related to the Computer Science and Digital Fluency standards?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 3. How would you rate your current level of comfort in addressing "computational thinking" with your students?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 4. How would you rate your level of confidence in your ability to facilitate student learning involving basic computer coding?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 5. How would you rate your level of confidence in effectively integrating other disciplines with the Next Generation Science standards?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 6. How would you rate your level of confidence in addressing topics related to "cybersecurity" in your classroom?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 7. How would you rate your level of comfort with participating in an online "Community of Practice"?

1 = very low/minimal	2	3	4	5 = very high/extensive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. In your opinion, what were the strengths of this six-month experience?

9. In your opinion, what elements of this long-term learning experience do you think need to be strengthened?

10. What are the "takeaways" from your SmartStart experience that you will use in your classroom over the next 12 months?

11. Is there anything else you would like to know about your SmartStart experience so far?

REFLECTION

I completed these two lessons with four second grade library classes.

In their classrooms, second grade students had been listening to different gingerbread man stories. Their culminating assignment is to write an imaginative narrative about a gingerbread character.

By the time students had library class, they were very familiar with various gingerbread man stories. Students easily compared and contrasted the traditional version of *The Gingerbread Man* and *The Gingerbread Cowboy*. Students had some difficulty with writing using sequencing words, but they surprised me with their ability to sequence. Many students told me that I needed to have more spaces to write.

The second lesson, the unplugged programming, proved to be much more difficult. Students had trouble understanding the assignment, placing the coding pieces on the board, and writing the code. For my last two classes, I glued the sequence pieces and start and end on the coding map. I had the students place the arrows on the coding map and the partners worked together to write only one example of code. This worked much better. I also added a gingerbread man piece. I clipped the bottom of the piece with a binder to use it like a game token. This helped the students track their coding.

In the future, I will change Lesson 1 so that students can freely write what they think the steps are to make a gingerbread man. In Lesson 2, I will glue the sequence pieces and the start and end pieces onto the coding map. Then, I will laminate all the components for the activity so that they can be reused. I will also have students track with the game token to help with writing the code.

My computational thinking/manufacturing lesson went very well. The computational thinking and manufacturing use much of the same thought processes including sequencing, decomposition, and patterns. The main propose of my lesson was to breakdown the process for developing clear and concise steps to perform a task. For my lesson, they were given instructions to write Instructions for a wood project they completed in 6th grade. The peg game (a wooden triangle with holes drilled for pegs) is a simple project with not many steps. The end goal was for the student to think through the process and develop instructions for how to build. Overall, the lesson went very well. The students understand the connection between computational thinking and how it impacts problem solving. Specifically, the students were able to develop the sequence in which a peg game can be built, splitting the problem into small do able steps that must be in a certain order. We also build upon the idea of constraints in manufacturing such as limitations in ability, personnel and ensuring the steps in the process were not too much for one or two “workers”.

I taught my lesson to a group of 7th graders over the course of 4 (40 minute) class periods. This lesson was during my Child Development Unit and I did this lesson after teaching the students about the 5 Areas of Development (physical, intellectual, social, emotional and moral). I'm not going to re-cap what I did for the lesson, as it is all in my lesson plan that I've attached, but I wanted to reflect on what worked well and what I could change or improve.

I felt that this lesson was a great fit for Computational Thinking. I took the students through 4 Pillars of Computational Thinking, so they knew what it was and how it relates to the digital fluency standards. Then, I had them apply each step in brainstorming, sorting, categorizing and then creating a visual display. The lesson was incredibly engaging and hands on. It was a great way for students to demonstrate teamwork, communication, problem solving and time management skills. You can see in the Images file (attached at the bottom of the lesson plan) that the students were doing all of these things.

I feel like I'd like to take this a little further next time, especially with the Abstraction step. I think a great way to do this would be to pose the question to students: Let's consider if the child has a disability of some sort. I think I'd have cards that had a few different things that could change the course of development such as hearing impairment, vision impairment, learning disability, a physical disability, etc. This would allow students to see that development isn't always the same for each person AND what are some things that can impact it and how.

I'm looking forward to continuing learning about the digital fluency standards and how I can incorporate them into my curriculum and make it relevant to FACS. I think computation thinking can be applied to many content areas that I teach. I will have to work a little harder to teach coding and/or cyber security standards in my content...unless I add a unit to cover these. I did feel like the creating a strong password is a great lesson to teach in all classes. Students can always use this reminder in any content area. That is a lesson I will keep doing with 6th grade.

If anyone has any questions or needs any more info on my lesson, please reach out!

Mrs. Fara Shoudy