

Curriculum and Community Enterprise
for Restoration Science in New York Harbor

Pace University: Integrating Computational Science with Environmental Sciences
Associated with Habitat Restoration and Education in New York Harbor

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I. Executive Summary

Research team activities, achievements, and highlights in year 3:

Research activity	Summary
Project management	<ul style="list-style-type: none"> The research team attended biweekly meetings with the Principal Investigator (PI), evaluation team, BOP staff, and other key project staff to discuss progress toward activities, programming, instrument development and modification, data collection, and data analysis and dissemination.
Data collection	<ul style="list-style-type: none"> The research team worked with BOP staff and partners to collect data from students engaged in BOP activities and activities with partners. The research team worked with BOP staff and partners to refine the online student survey. BOP staff introduced the research to parents and students and provided survey links at various events, such as, near-peer mentoring, career panels, STEM Hub workshops, and BOP newsletters. A total of 461 students accessed a student survey link. The research team matched 209 survey responses with parental consent and student assent to use for data analysis. The rate of students accessing the survey and completing all necessary steps (i.e., parent consent, student assent, and completing survey questions) rose significantly from 22% to 41% upon the implementation of the refined instruments.
Data cleaning	<ul style="list-style-type: none"> R statistical programming software was used to clean student survey data and develop a codebook and research dataset.
Data analysis	<ul style="list-style-type: none"> The research team conducted preliminary analyses for two of the research questions using data gathered from the student survey responses. Preliminary analyses were conducted by comparing CCERS respondents (treatment) and non-CCERS (comparison) respondents' confidence in their technological abilities. In addition, exploratory analyses were conducted to analyze the impact of CCERS participation by participant grade and gender.
Findings related to CCERS students' confidence in their technological abilities	<ul style="list-style-type: none"> CCERS respondents, on average, reported higher levels of confidence in their technological abilities compared to respondents in the comparison group. Additionally, URG respondents, on average, reported higher confidence in their technological abilities compared to respondents in the comparison group.
Findings related to exploratory analysis of students' confidence in	<ul style="list-style-type: none"> Disaggregation of results by grade suggests that, on average, CCERS respondents in 10th and 12th grade reported higher confidence in their technological abilities than non-CCERS respondents in the same grade. Researchers will continue to explore the impact of

their technological abilities

CCERS participation by grade to determine the best point of intervention.

- Disaggregation of results by gender revealed that female CCERS respondents, on average, have higher confidence in their technological abilities than non-CCERS female respondents.

Research challenges encountered

Challenges occurred in collecting participant data due to the difficulty associated with obtaining parental consent, which led to an initial smaller sample size than anticipated. As a result, researchers met weekly with the PI, BOP staff, and other key partners to identify avenues that would increase parental and student engagement. In addition, researchers refined and shortened the data collection instrument. The objective of the instrument refinement was to increase the response rate by reducing participant burden and length of time required to complete all necessary survey steps. As a result of this collaborative effort, the response rate has significantly increased (22% to 41%) suggesting that these efforts have successfully increased the response rate. As the project continues, the researchers will continue to work with the PI, BOP staff, and other key partners to identify avenues of outreach and other methods to increase response rates.

I. Research Objectives

Project overview

The leadership council of the Billion Oyster Project Curriculum and Community Enterprise for Restoration Science (BOP-CCERS) in New York Harbor project aims to advance science-based STEM+C education and teacher training model with the addition of curriculum for teachers and students in computer science topics and STEM+C career exploration. The primary objective of this STEM+C proposal is to sustain and augment the success of the project to date, respond to research and evaluation findings of that work and expand the primary programmatic offerings to increase student understanding and interest in restoration-based STEM+C careers, further develop the BOP-CCERS Digital Platform, and provide support to teachers and students in learning statistical and computational concepts. In addition, the development of community-based restoration science hubs strengthens the model's ability to engage teachers and students in STEM teaching and learning by applying science theory to restoration practice. The current STEM+ Computing K-12 Education (STEM+C) project is in its third year and its second round of funding from NSF (Award # = 1839656; project awarded February 2018 to February 2022).

The curriculum model is organized around habitat restoration in New York harbor and engages students and teachers in a sequence of activities that span the middle and high school grades of the nation's largest urban school system. BOP has continued to run limited, socially distanced in-person activities during the COVID-19 pandemic and adapted activities for digital delivery.

The project has a broad partnership of institutions and community resources, including Pace University, the New York City Department of Education, the Columbia University Lamont-Doherty Earth Observatory, the New York Academy of Sciences, the New York Harbor Foundation, the New York Aquarium, and others. This project builds on and extends the BOP library of learning materials of the New York Harbor School. Below is a map that demonstrates the reach of the CCERS STEM+C project.

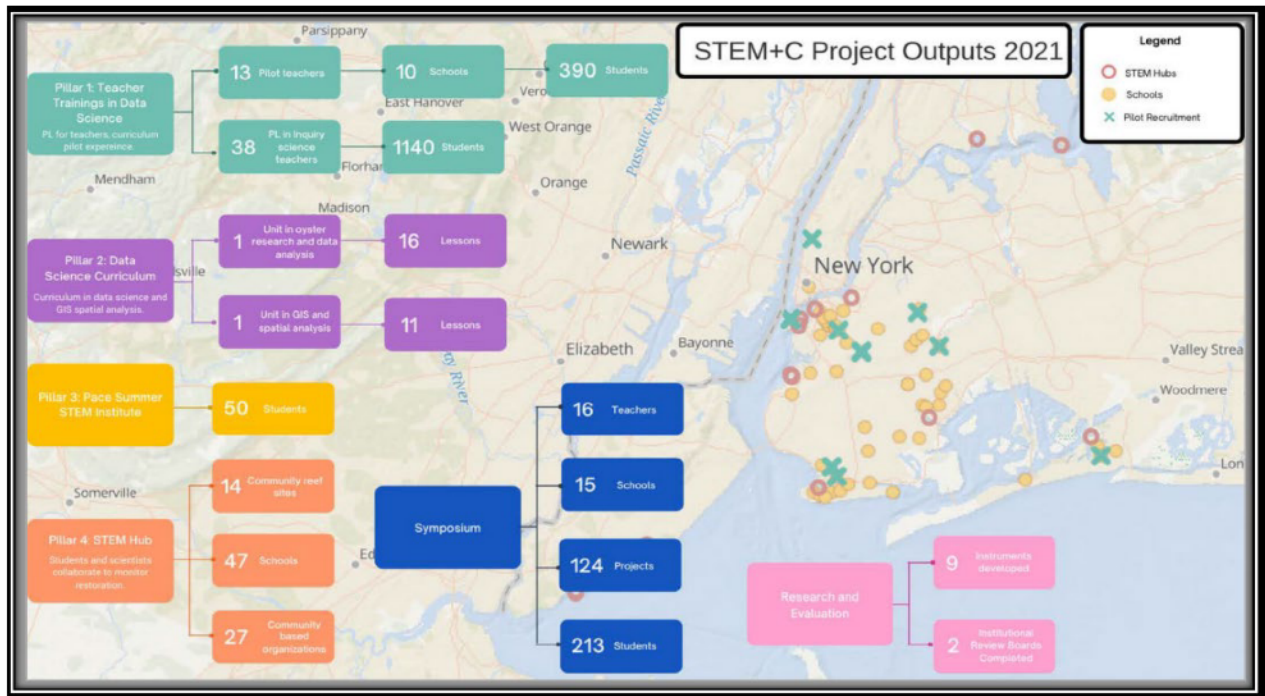


Figure 1. CCERS STEM+C project output

Research Questions

As part of this project, the research team works with the curriculum developers, BOP staff, digital platform administrators, and teachers to identify effective program implementation and assess the impact of participation on respondents. For this report, the research team is exploring the following two research questions:

- **Research question 1:** Does participation in CCERS activities increase students' confidence in their technological abilities compared to non-CCERS students?
- **Research question 2:** Does participation in CCERS activities increase URG students' confidence in their technological abilities compared to non-CCERS URG students?

The research team collaborated with the project PI and relevant stakeholders to identify the most feasible ways to embed data collection into the program activities and adapt to rapid changes in external circumstances.

II. Instrument Development and Research Design

The research team conducted literature reviews and worked with the project team to develop and refine metrics that align with the research questions. The table below illustrates how instruments and data collection align to the research questions.

Instrument development and refinement

Researchers worked alongside the PI and other key staff to further refine the instrument used in the project's current phase. The objective of the instrument refinement was to increase the response rate by reducing participant burden and length of time required to complete all necessary survey steps. Data collected from previous phases of the project was used to conduct item reduction analysis. The primary goal of this analysis was to obtain functional items (i.e., items that are correlated with each other, discriminate between individual cases, underscore single or multidimensional domain, and contribute significantly to the construct). This approach to instrument refinement allowed researchers to determine the effect of deleting a given item or set of items by examining the item information and standard error function for the item pool. Further, the refined instrument was evaluated by key project personnel for content relevance, representativeness, and technical quality. See Appendix A for the previous version of the instrument and Appendix B for the updated instrument.

Research design

Research Question	Hypothesis	Data Collection Tools and Methods	Sample
<p>Research Question 1 (RQ1): Does participation in CCERS activities increase students' confidence in their technological abilities compared to non-CCERS students?</p>	<p>Hypothesis 1 (H1): Science research participation and engagement with scientists via CCERS will positively influence students confidence in their technological abilities compared to non-CCERS students</p>	<p>Student survey which contains confidence in technological abilities subscale</p>	<p>Treatment group: students who participated in CCERS activities</p> <p>Comparison group: Students who had no engagement in CCERS activities (not exposed to BOP curriculum)</p>
<p>Research Question 2 (RQ2): Does participation in CCERS activities increase URG students' confidence in their technological abilities compared to non-CCERS URG students?</p>	<p>Hypothesis 2 (H2): Science research participation and engagement with scientists via CCERS will positively influence students confidence in their technological abilities among underrepresented groups compared to non-CCERS URG students</p>	<p>Same as those listed in RQ1 above</p> <p>Underrepresented groups were identified as those who self-identified as one of the following: a woman, person with disabilities, or as an underrepresented minority (Black, Hispanic, and American Indian or Alaska Native),</p>	

Figure 2. Research design

Data collection

Data in this report was collected from August 2020 to July 17, 2021. Data was collected via an online survey (through the platform Alchemer, previously known as SurveyGizmo). The survey took the participants an average of 10 minutes to complete. The research team provided partners with a general survey link that anyone could access. Due to IRB restrictions, only middle school and high school students who provided parental consent were included in the sample. In addition, due to IRB and other restrictions, this report only examines the differences between respondents who participated in CCERS activities (i.e., treatment group) and respondents who did not participate in CCERS activities (i.e., comparison group).

Process for engaging with the online survey

Clicking on the survey link would start the respondent on a 6-step process:

- Step one: A landing page, which provided the introduction to the survey and included screening questions to ensure students met participation requirements (e.g., middle or high school student)
- Step two: Obtain parental consent for their child to participate in the research
- Step three: Obtain student assent, where the student provides their consent to participate in the research study
- Step four: An evaluation survey, that captured which activities the respondents engaged in and included questions developed by the evaluation team to collect feedback on the activities
- Step five: A research survey, which included questions specific to the research study
- Step six: Reward page, where the respondent received a certificate for completing the survey

A total of 461 students opened the survey through the general link and arrived at the landing page in Step 1. A total of 209 respondents completed all the necessary steps for the surveys (i.e., steps 2 & 3), including providing parental consent, an important IRB stipulation for responses to be included in the research analyses.

The refined instrument was implemented in April 2021. Researchers noted that upon the implementation of the refined instrument, 262 students accessed the survey, with 41% (108 respondents) of students completing all necessary steps (i.e., steps 2 & 3). This is a significant increase in data collection, suggesting that the survey's refinement and item reduction successfully increased the participant response rate.

Participant demographics

This report includes responses from participants who provided both student assent and parental consent per the IRB requirements. A total of 209 students with parental consent and student assent completed the research and evaluation surveys. The respondent demographics can be seen in the table below.

Demographics	Comparison Group N=102	CCERS (Treatment) Group N=107	Total N=209
Gender			
Female	30 (30%)	44 (41%)	74 (36%)
Male	44 (43%)	35 (33%)	79 (39%)
Do not wish to specify	2 (2%)	1 (1%)	3 (2%)
No response	26 (25%)	27 (25%)	53 (25%)
Ethnicity/Race			
Asian	18 (18%)	17 (16%)	35 (17%)
Black or African American	16 (16%)	9 (8%)	25 (12%)
Hispanic/Latino	19 (19%)	23 (21%)	42 (20%)
White (non-Hispanic or Latino)	16 (16%)	26 (24%)	42 (20%)
Other	7 (7%)	5 (5%)	12 (6%)
No response	26 (26%)	27 (25%)	53 (25%)
First Generation			
Yes	21 (21%)	29 (27%)	50 (24%)
No	38 (39%)	40 (37%)	78 (38%)
Unsure	16 (16%)	11 (10%)	27 (13%)
No response	27 (24%)	27 (25%)	54 (25%)
Grade			
6 th grade	2 (2%)	0 (0%)	2 (1%)
7 th grade	6 (6%)	1 (1%)	7 (3.5%)
8 th grade	3 (3%)	2 (2%)	5 (2.4%)
9 th grade	22 (22%)	41 (38%)	63 (31%)
10 th grade	14 (14%)	7 (7%)	21 (10%)
11 th grade	14 (14%)	16 (15%)	30 (15%)
12 th grade	15 (15%)	13 (12%)	28 (14%)
No response	26 (26%)	27 (25%)	53 (25%)

Figure 3. Demographics table by participation condition and overall

In addition, researchers collected information on participants' use and access to technology. See Figure 4 for technology use and Figure 5 for access to technology. URG participants' individual item responses to access to technology and use of technology, are provided in Appendix C and D.

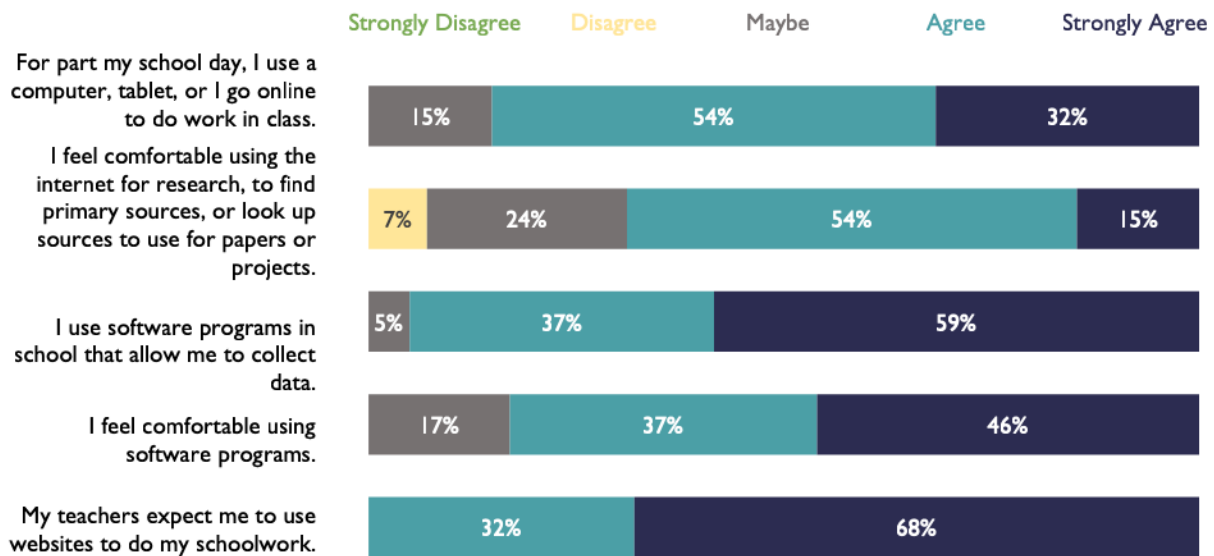


Figure 4. Participants' technology use at school

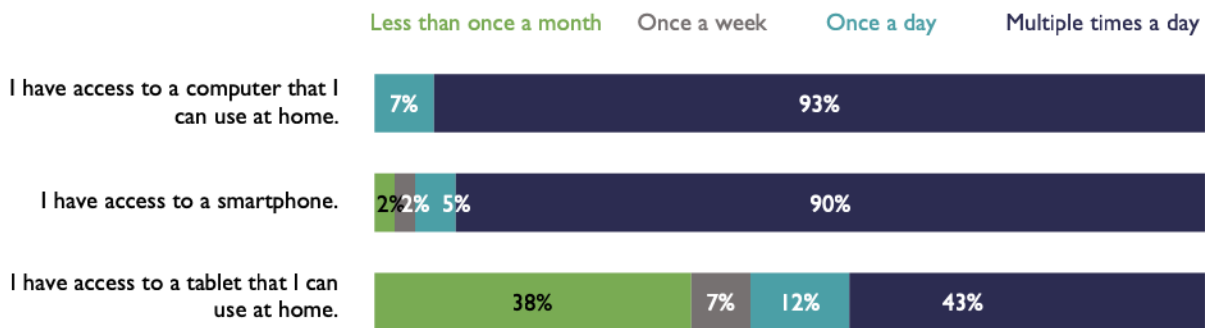


Figure 5. Participants' access to technology

Data analysis

For Research Question 1, the sample was divided into the CCERS respondents who participated in CCERS activities (treatment) and a group who did not participate in CCERS activities (comparison). There was a total of 209 student respondents across both conditions, with 107 respondents in the CCERS treatment group and 102 in the comparison group. For Research Question 2, the sample included only respondents who identified as members of an underrepresented group¹(URG). There was a total of 105 respondents across both conditions who identified as part of a URG, with 44 URG respondents in the CCERS treatment group and 61 URG respondents in the comparison group.

¹ Per NSF definition, women, persons with disabilities, and three racial and ethnic groups—Black, Hispanic, and American Indian or Alaska Natives are considered as members of underrepresented groups in STEM.

For each of the research questions, indices were created by averaging items on the survey's subscales. Where appropriate, the research team calculated Cronbach's alpha to ensure internal consistency. In addition, researchers examined the data used for normality of distribution, as assessed by Shapiro-Wilk's test, extreme outliers in the data, as assessed by boxplot method, and equality of variance, as assessed by Levene's test. For data that met all the assumptions, an independent samples t-test was used to examine if there were statistically significant differences between the CCERS (treatment) and comparison groups. For continuous data that did not meet the assumptions of equality of variance, Welch's t-test was used, and for categorical data, Fisher's exact test was used. The research team presented the means and standard deviations of the indices for each of the groups identified. Please note that sample size may vary in different sections because not every respondent answered every question (or a "N/A" option was chosen).

III. Summary of Findings

Research Question 1: Does participation in CCERS activities increase students' confidence in their technological abilities compared to non-CCERS students?

To assess how CCERS participation impacts respondents' confidence in their technological abilities, researchers examined their responses to four questions. Though non-significant, CCERS respondents, on average, had higher levels of confidence in their technological abilities than non-CCERS respondents. Results are presented below. Individual item response frequencies by condition are provided in Appendix E.

Confidence in technological abilities

Respondents answered four questions on a Likert scale with ratings from 1=strongly disagree to 5=strongly agree regarding their confidence in their technological abilities. Cronbach's alpha was run to examine internal validity (.80), and then items were averaged to compute an index, with higher average scores representing higher confidence in their technological abilities. On average, the CCERS group expressed a higher confidence in their technological abilities (n= 86, M=3.74, SD=0.79) than the comparison group (n=102, M=3.66, SD=.86). See Figure 6.



Figure 6. Average score of respondents' confidence in their technological abilities by condition

Research Question 2: Does participation in CCERS activities increase URG students' confidence in their technological abilities compared to non-CCERS URG students?

To assess how CCERS participation impacts URG respondents' confidence in their technological abilities, researchers examined respondents' responses to four questions. URG CCERS respondents, on average, had higher levels of confidence in their technological abilities than non-CCERS URG respondents. Results are presented below. URGs individual item response frequencies by condition are provided in Appendix F.

URG confidence in technological abilities

Respondents answered four questions on a Likert scale with ratings from 1=strongly disagree to 5=strongly agree regarding their confidence in their technological abilities. Cronbach's alpha was run to examine internal validity (.84), and then items were averaged to compute an index, with higher average scores representing higher confidence in their technological abilities. On average, the CCERS URG group expressed a higher confidence in their technological abilities (n= 86, M=3.70, SD=0.76) than the URG comparison group (n=61, M=3.60, SD=.85). See Figure 7.

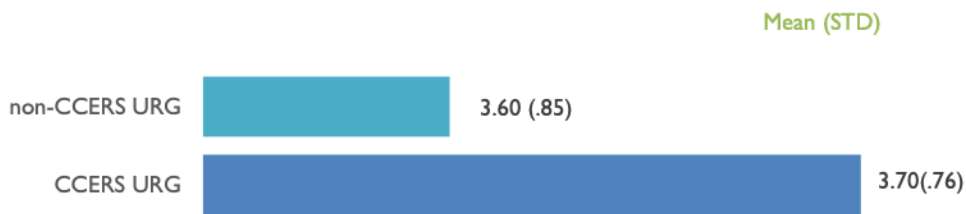


Figure 7. Average score of URG respondents' confidence in their technological abilities by condition

Exploratory Analysis

To further assess the impact of CCERS participation on students' confidence in their technological abilities, researchers disaggregated by gender (i.e., male, female) and by reported grade at the program's start (i.e., 9th, 10th, 11th, and 12th). Disaggregation by gender revealed that female CCERS participants reported higher confidence in their technological abilities than non-CCERS female participants. This pattern remained for male CCERS participants, they reported higher confidence in their technological abilities than non-CCERS male participants. Disaggregation by grade revealed that participants in the 10th and 12th grade, on average, had higher confidence in their technological abilities than non-CCERS participants. However, though non-significant, non-CCERS respondents in the 9th and 11th grade reported slightly higher average in their confidence in their technological abilities than CCERS participants. Results are presented below. Individual item response frequencies by grade is provided in Appendix G.

Disaggregation by grade

CCERS respondents in the 12th grade, on average, reported higher confidence in their technological abilities (n=13, M=4.06, SD=.56) than non-CCERS respondents in the same grade (n= 15, M=3.73, SD =.65). See Figure 8.

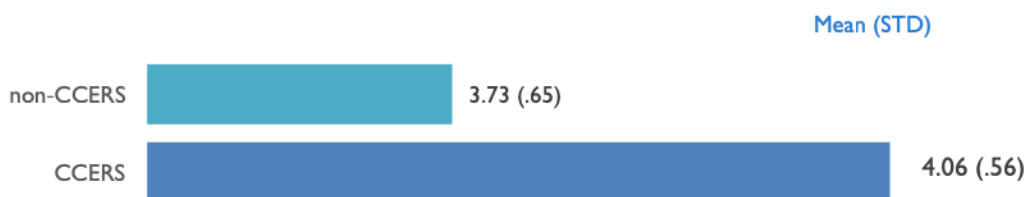


Figure 8. Average score of 12th-grade respondents' confidence in their technological abilities by condition

Though non-significant, non-CCERS respondents in the 11th grade reported slightly higher confidence in their technological abilities (n=14, M=4.20, SD=.74) than CCERS respondents in the same grade (n=16, M=3.84, SD=.65). See Figure 9.

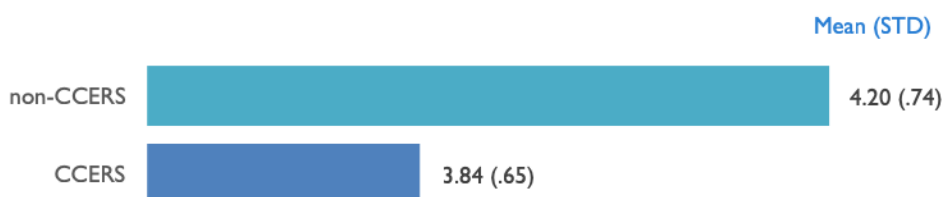


Figure 9. Average score of 11th-grade respondents' confidence in their technological abilities by condition

CCERS respondents in the 10th grade, on average, reported higher confidence in their technological abilities (n=7, M=4.14, SD=.72) than non-CCERS respondents in the same grade (n=14, M=3.46, SD=.64). See Figure 10.



Figure 10. Average score of 10th-grade respondents' confidence in their technological abilities by condition

Though non-significant, non-CCERS respondents in the 9th grade reported slightly higher confidence in their technological abilities (M=3.64, SD=.83) than CCERS respondents in the same grade (M=3.52, SD=.86). See Figure 11.

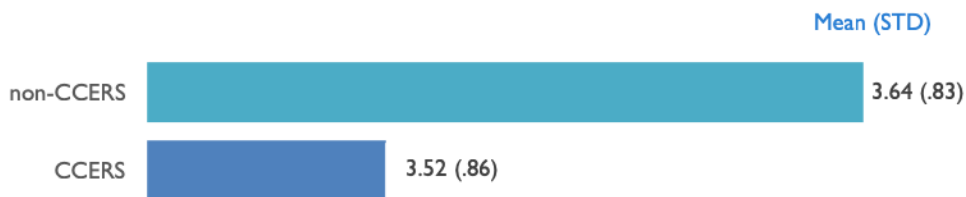


Figure 11. Average score of 9th-grade respondents' confidence in their technological abilities by condition

Disaggregation by gender

Female CCERS respondents, on average, reported higher confidence in their technological abilities (n=44, M=3.74, SD=.54) than non-CCERS female respondents (n=30, M=3.71, SD=.61). See Figure 12.

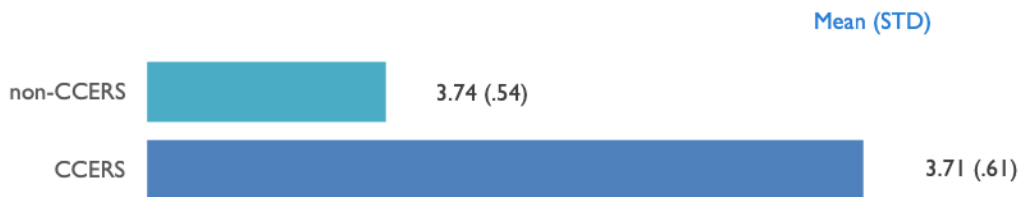


Figure 12. Average score of female respondents' confidence in their technological abilities by condition

Male CCERS respondents, on average, reported higher confidence in their technological abilities (n=44, M=3.75, SD=.84) than non-CCERS male respondents (n=35, M=3.63, SD=.76). See Figure 13.

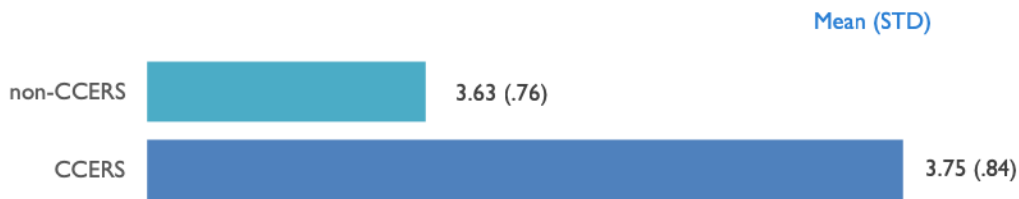


Figure 13. Average score of male respondents' confidence in their technological abilities by condition

Conclusion

Preliminary findings indicate that CCERS respondents, on average, have higher confidence in their technological abilities than those from the comparison group. In addition, URG CCERS respondents, on average, have higher confidence in their technological abilities than non-CCERS URG respondents. This suggests that CCERS has a positive impact on participants' confidence in their technological abilities, a key indicator in pursuing STEM careers. Furthermore, preliminary exploratory analysis suggests that participation in CCERS activities may have varying levels of impact across different groups (e.g., different grades, gender). In order to maximize the long-term impact of CCERS, researchers will continue to collect data to further tailor and refine its implementation.

Appendix A: Previous CCERS Research Survey

Welcome

Participation questions

The following questions are about activities you may have participated in during the previous 12 months. Please answer honestly, and if you're not sure whether you participated in something, feel free to select "no" or "Other". Thank you!

Logic: Show/hide trigger exists.

1) Did you participate in any activities related to oysters in the last 12 months?

- No
- Yes - I participated in an activity related to the Billion Oyster Project
- Other (Please explain below, thanks!)

Logic: Hidden unless: #1 Question "Did you participate in any activities related to oysters in the last 12 months?" is one of the following answers ("Other (Please explain below, thanks!)")

2) **"Other" - explanation:**

A rectangular text input field with a light gray border and a vertical scrollbar on the right side. The field is currently empty.

Logic: Show/hide trigger exists.

3) Did you participate in a STEM summer program in the last 12 months?

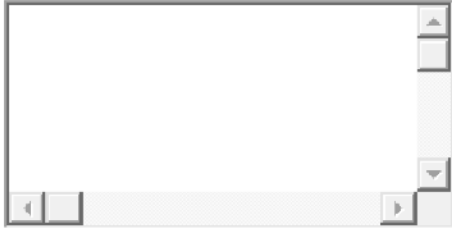
- No
- Yes- I attended STEM Camp at PACE University in 2019
- Yes- I attended STEM Camp at PACE University in 2020
- Other (Please explain below, thanks!)

Image by PACE University, <https://pace.edu/seidenberg/special-events/stem-camp/2018>

Logic: Hidden unless: #3 Question "Did you participate in a STEM summer program in the last 12 months?"

" is one of the following answers ("Other (Please explain below, thanks!)")

4) **"Other" - explanation:**



Logic: Show/hide trigger exists.

5) Did you participate as a *mentee* (person being mentored) in a science program in the last 12 months?*

- No
- Yes - I was a mentee at the NY Harbor School
- Yes - I was a mentee at 75 Morton
- Yes - I was a mentee at Petrides
- Yes - I was a mentee in another program (please write-in below)

Logic: Hidden unless: #5 Question "Did you participate as a mentee (person being mentored) in a science program in the last 12 months?" is one of the following answers ("Yes - I was a mentee in another program (please write-in below)")

6) **Please write in the name of the other school or organization you were mentored in.**

Image by Jeremy Von Wong, <https://blog.vonwong.com/billionoysterproject/>

Logic: Show/hide trigger exists.

7) Did you participate as a *mentor* in a near-peer science mentoring program in the last 12 months?*

- No
- Yes - I was a mentor, from NY Harbor School
- Yes - I was a mentor from City-as-School
- Yes - I was a mentor from Petrides
- Yes - Other (Please write in below)

Logic: Hidden unless: #7 Question "Did you participate as a mentor in a near-peer science mentoring program in the last 12 months?" is one of the following answers ("Yes - Other (Please write in below)")

8) Please write the school or organization you were a mentor with.

Image by Jeremy Von Wong, <https://blog.vonwong.com/billionoysterproject/>

Logic: Show/hide trigger exists.

9) Did you participate in any other scientific research in the past 12 months?

*

- No
- Yes - DNA barcoding in cooperation with the Cold Spring Harbor Laboratory
- Yes - eDNA with Dr. Alter's lab at City University of New York
- Yes - Water chemistry with Dr. Branco's lab the City University of New York
- Yes - Advanced monitoring and IDEXX collection with The River Project
- Yes - Other (Please write in what kind of research, and who you worked on it with. Thanks!)

Image by Cold Spring Harbor Laboratory, <https://cshl.edu/seeding-citizen-science-with-dna-barcoding/>

Logic: Hidden unless: #9 Question "Did you participate in any other scientific research in the past 12 months?"

" is one of the following answers ("Yes - Other (Please write in what kind of research, and who you worked on it with. Thanks!)")"

10) **Other** - What kind of research did you do, and who did you do it with? (including what organization, if you can remember. Thanks!)

11) Have you participated in any other science, technology, engineering, or math-related activities in the past 12 months?

- No
- Yes - (Please list some of the activities you were involved in): *

Image by Jeremy Von Wong, <https://blog.vonwong.com/billionoysterproject/>

Action: Google Spreadsheet: Participation to Respondent Tracking Spreadsheet

Page entry logic: This page will show when: (#7 Question "Did you participate as a mentor in a near-peer science mentoring program in the last 12 months?" is one of the following answers ("Yes - I was a mentor, from NY Harbor School", "Yes - I was a mentor from City-as-School", "Yes -

I was a mentor from Petrides") OR (post is exactly equal to "post" AND activity_referral_from contains the string "mentor"))

Questions for Mentors

12) Please indicate how much you agree or disagree with the following statements.

*If you are on mobile, you might need to scroll to the right or hold your phone horizontally to see the "strongly agree" option.**

	1 = Strongly disagree	2	3	4	5 = Strongly agree
I feel confident I can act as a mentor to middle school students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know I can get middle school students interested in doing waterfront activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to motivate younger students to think about following a career in one of the Harbor High School marine career programs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it rewarding to work with my mentee on activities that help protect the harbor and waterfront.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was satisfying to collaborate with each other in waterfront activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel it is important to participate in the Harbor Corps as a way to strengthen my engagement with the NY harbor and work toward a marine career.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page entry logic: This page will show when: (#5 Question "Did you participate as a mentee (person being mentored) in a science program in the last 12 months?" is one of the following answers ("Yes - I was a mentee at the NY Harbor School", "Yes - I was a mentee at 75 Morton", "Yes - I was a mentee at Petrides") OR (post is exactly equal to "post" AND activity_referral_from contains the string "mentee"))

Questions for Mentees

13) Please indicate how much you agree or disagree with the following statements.

*If you are on mobile, you might need to scroll to the right or hold your phone horizontally to see the "strongly agree" option.**

	1 = Strongly disagree	2	3	4	5 = Strongly agree
I know more about the career programs at Harbor School after my experience with my mentor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning about career programs in marine science and technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am excited about doing waterfront activities with my mentor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to be involved in a career program at the Harbor High School that gives me opportunities to work on the waterfront.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more motivated to pursue a career in marine science and technology after my experience working with my mentor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it rewarding to work with my mentor on activities that help protect the harbor and waterfront.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was satisfying to collaborate with each other in waterfront activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel it is important to participate in the Harbor Corps as a way to strengthen my engagement with the NY harbor and work toward a marine career.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions for participants in scientific research

Logic: Hidden unless: (#9 Question "Did you participate in any other scientific research in the past 12 months?" is one of the following answers ("Yes - DNA barcoding in cooperation with the Cold Spring Harbor Laboratory", "Yes - eDNA with Dr. Alter's lab at City University of New York", "Yes - Water chemistry with Dr. Branco's lab the City University of New York", "Yes - Advanced monitoring and IDEXX collection with The River Project", "Yes - Other (Please write in what kind of research, and who you worked on it with. Thanks!)") OR (post is exactly equal to "post" AND activity_referral_from contains the string "advanced_methods"))

14) Please indicate how much you agree or disagree with the following statements. *If you are on mobile, you might need to scroll to the right to see the "strongly agree" option.**

	1 = Strongly disagree	2	3	4	5 = Strongly agree
I have an understanding of what is involved in advanced level science research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable working with advanced research procedures and protocols.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that working directly with scientists, gives me an idea about what it's like to be a scientist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'd like to find out about how I can become a scientist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page entry logic: This page will show when: (post is exactly equal to "post" AND activity_referral_from contains the string "summer")

STEM Summer Institute Feedback

Page entry logic: This page will show when: ((post is exactly equal to "post" AND activity_referral_from is exactly equal to "STEMC_Hackathon_2020") AND post_research_participation)

PACE Hackathon 2020

Logic: Hidden unless: post is exactly equal to "post"

Welcome back!

We ask that you complete the next four questions in order to give feedback on the activity you just finished. This will take less than five minutes.

All responses are compiled confidentially and reported in aggregate with all identifying information removed.

If you have any questions or comments regarding the survey, please contact:

**Gaylen Moore
Moore Evaluation
gmoore1@nyc.rr.com**

Logic: Hidden unless: post is not exactly equal to "post"

**Note: Throughout this survey, there are no right or wrong answers. There are no more-desirable or less-desirable answers. So please answer completely honestly!
Thanks!**

15) How confident do you feel about building an app or game?*

	1	2	3	4	5
Not at all confident Very confident					

16) How much do you know about tools to develop mobile apps and games?*

	1	2	3	4	5
Almos t nothin g A lot	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

17) How confident do you feel about building an app or game on the topic of the Billion Oyster Project? *

	1	2	3	4	5
Not at all confiden t Very confiden t	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

18) I received adequate knowledge about oyster restoration and the data science skills I needed to conduct an investigation based on data from the Billion Oyster Project.*

	1	2	3	4	5
Strongly Disagree Strongly Agree	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Starter questions

Logic: Hidden unless: post is exactly equal to "post"

The following questions help us learn about how your activity experience affects other things that may (or may not!) be related to the activity you participated in.

Logic: Hidden unless: post is not exactly equal to "post"

**Note: Throughout this survey, there are no right or wrong answers. There are no more-desirable or less-desirable answers. So please answer completely honestly!
Thanks!**

19) How confident do you feel about collecting and analyzing data?*

	1	2	3	4	5
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Not at all confident Very confident					
---------------------------------------	--	--	--	--	--

20) How much do you know about careers in marine, engineering, and environmental sciences?*

	1	2	3	4	5
Almost nothing A lot					

21) How much do you know about using computer and data science to conduct a scientific investigation?*

	1	2	3	4	5
Almost nothing A lot					

22) Do you have the skills to conduct a scientific research investigation?*

	1	2	3	4	5
Almost no skills A lot of skills					

Logic: Hidden unless: #3 Question "Did you participate in a STEM summer program in the last 12 months?"

" is one of the following answers ("Yes- I attended STEM Camp at PACE University in 2019", "Yes- I attended STEM Camp at PACE University in 2020")

23) I received adequate knowledge about oyster restoration and the data science skills I needed to conduct an investigation based on data from the Billion Oyster Project.*

	1	2	3	4	5
Strongly Disagree Strongly Agree	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Page entry logic: This page will show when: (post is exactly equal to "post" AND Student_Assent_UID)

Research participation

Logic: Show/hidden trigger exists. Hidden unless: post is exactly equal to "post"

24) During the application process for the activity you just completed, you were given an opportunity to take part in research on the BOP project. Please choose the option below that best describes you:*

- I already started participating in the research, and I would like to continue.
- I haven't participated in the research, but I am interested in learning more.
- I don't want to be involved in the research at this time.

Logic: Hidden unless: (post is exactly equal to "post" AND #24 Question "During the application process for the activity you just completed, you were given an opportunity to take part in research on the BOP project. Please choose the option below that best describes you:" is one of the following answers ("I already started participating in the research, and I would like to continue."))

25) In order to match the consent form to your responses to this survey, please provide your parent or guardian's names.

*Note that we store this, and all other identifying information about you, in a separate place from your responses to the research survey questions, and with an extra layer of encryption**

	First name	Middle Initial	Last name
Parent/Guardian #1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Parent/Guardian #2	<input type="text"/>	<input type="text"/>	<input type="text"/>

Page entry logic: This page will show when: post is exactly equal to "post"

Action: Google Spreadsheet: Post-Survey extra data CCERS ITEST & STEM+C Research Survey Respondent Tracking

Thank You!

Logic: Hidden unless: #24 Question "During the application process for the activity you just completed, you were given an opportunity to take part in research on the BOP project. Please choose the option below that best describes you:" is not one of the following answers ("I haven't participated in the research, but I am interested in learning more.", "I don't want to be involved in the research at this time.")

Student Survey - Part 2

Logic: Hidden unless: ((Eval_UID is exactly equal to "post" OR post is exactly equal to "post") AND post_research_participation is not exactly equal to "I haven't participated in the research, but I am interested in learning more.")

Welcome back!

This is the post-test portion of our research, where we measure what changes happened in the areas of interest to us. To do that, we repeat the questions we asked in our initial survey. So, if it looks familiar to you, don't worry, it's supposed to!

We do want to remind you that taking part in this study is your choice. You can decide not to take part in it or stop being in the study at any time. If you decide not to participate there will not be any penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your participation or non-participation in this study will in no way affect your grades, academic standing, or any other status.

This survey will take about 10-to-20 minutes to complete. Please answer each question honestly and thoroughly. All responses are compiled confidentially and reported in aggregate with all identifying information removed. As you work through the survey, responses on each page are saved when you click the "Next" button. To view the original consent form for this study, click [here](#).

If you have any questions or comments regarding the survey, please contact:

Dr. Lauren Birney
Principal Investigator, PACE University
(212)346-1889
lbirney@pace.edu

Technology

1) Please choose the answer that best expresses your opinion.*

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
I have the technical skills I need to use technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can solve my own technical problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable using software programs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can learn a new program or application (app) independently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use technology in a way that enhances my everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can learn technology easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep up with important new technologies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Logic: Show/hide trigger exists. Hidden unless: (STEM_Summer is exactly equal to "Yes- I attended STEM Camp at PACE University in 2019" OR STEM_Summer is exactly equal to "Yes- I attended STEM Camp at PACE University in 2020")

2) Have you used the BOP digital platform? (<https://platform.bop.nyc/>)**

- Yes
- No
- I don't know
- Other - Write In (Required): *






Page entry logic: This page will show when: (STEM_Summer is exactly equal to "Yes- I attended STEM Camp at PACE University in 2019" OR STEM_Summer is exactly equal to "Yes- I attended STEM Camp at PACE University in 2020")

3) Please select the answer below that tells us which devices you use in school or in your life outside of school.*






	Less than once a month	Once a month	Once a week	Once a day	Multiple times a day
I have access to a smartphone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have access to a tablet that I can use at home.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have access to a computer that I can use at home.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4) Please select the answer that best shows what you think about each of the items listed below.*

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I help my parents use their electronic devices at home.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to choose to do homework on paper or on a tablet, I would prefer to do it on a tablet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had to choose to do homework on paper or on a computer, I would prefer to do it on a computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5) These statements are about how you use technology in school:*

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
My teachers expect me to use websites to do my schoolwork.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For part of my school day, I use a computer, tablet, or I go online to do work in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In our class, we create our own excel spreadsheets or use existing excel spreadsheets to do projects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am comfortable creating and using an excel spreadsheet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable using the internet for research, to find primary sources, or look up sources to use for papers or projects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use software programs in school that allow me to collect data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use software programs in school that allow me to make sense of data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable using software programs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>






Logic: Hidden unless: #2 Question "Have you used the BOP digital platform? (<https://platform.bop.nyc/>)"" is one of the following answers ("Yes")

6) Your feedback will help us support you and improve the program. Please select the answer that best expresses your opinion. *

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I am confident I can navigate the STEM-CCE digital platform.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the digital platform easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>






Logic: Hidden unless: #2 Question "Have you used the BOP digital platform? (<https://platform.bop.nyc/>)"" is one of the following answers ("Yes")

7) These statements are about using the BOP internet site (digital platform) to collect and analyze data from your Oyster Restoration Station (ORS).*






	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I feel comfortable entering data onto the BOP CCERS internet site (digital platform).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to check the BOP data I enter to be sure it is correct and makes sense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to correct mistakes in the data that is entered on the BOP internet site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can make an Excel spreadsheet with the BOP data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to make a graph to show the BOP data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to find the BOP data that I need for my research project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know how to analyze the BOP data that I need for my research project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Science

8) Please choose the answer that best shows how you feel about doing each of the things listed below.*

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I can make good observations during a science activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can ask good questions about what is happening during a science activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident about my ability to explain how to do scientific activities to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I could be a good scientist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9)

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I want to understand science (for example, to know how computers work, how rain forms, or how airplanes fly).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What I learn in science is important to me because I need this for what I want to study later on.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to see how things are made (for example, ice cream, TV, iphone, energy etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning about science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10) Compared to most of your other activities, how useful is your learning in science class?

	1	2	3	4	5
Least useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11) Please indicate how much you agree or disagree with the following statements.

	1 = Strongly disagree, 5 = Strongly agree					
	1	2	3	4	5	N/A
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I have a sense of belonging to a community of scientists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it personally satisfying to work on a team that is doing research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Your career interests and activities

Again, note that there are no right or wrong answers. Just answer honestly. Thank you!






12) To what extent do you intend to pursue a career in science, technology, or engineering?

	1	2	3	4	5
Definitely will not Definitely will	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13) Please rate the following items on a scale of 1 to 5.

	1 = Not interested at all to 5 = Very interested				
	1	2	3	4	5
How interested are you in jobs related to science ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How interested are you in jobs related to technology ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How interested are you in jobs related to engineering ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How interested are you in jobs related to mathematics ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14) Please rate the following items on a scale of 1 to 5.

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I am interested in learning more about possible careers in environmental science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some day when I tell others about my career, they will respect me for doing scientific work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scientists make a meaningful difference in the world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A career in science would enable me to work with others in meaningful ways.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will have a successful professional career and make substantial scientific contributions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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15) Please rate your interest in the following items on a scale of 1 to 5.

These jobs listed below are ones that you can get with a community college certificate or associate degree. *

	1 = Not interested at all to 5 = Very interested					
	1*	2*	3*	4*	5*	NA*
Wastewater Engineer Conduct technical studies, computer modeling, technical report writing, design and provide construction service support for wastewater projects	()	()	()	()	()	()
Marine System Technician Equipment installation and repair, metal fabrication, carpentry, rigging, painting	()	()	()	()	()	()
Hydrologist Study water movement, and mitigate issues related to water quality and availability	()	()	()	()	()	()
Biological Technician Set up and clean laboratory equipment, collect biological samples in lab, execute experiments and tests, document test results and compose reports of findings	()	()	()	()	()	()

Your activities related to STEM Careers

The following questions are about things related to science, technology, engineering, or math that you may or may not have done outside of the classroom.

Logic: Hidden unless: Eval_UID is exactly equal to "post"

We are asking these questions again to understand what STEM-related activities you may have been involved in since you took the research pre-survey.

Logic: Show/hide trigger exists.

16) Have you interned or worked in a science, technology, engineering and/or math field?*

- Yes
- No
- No change from when I took the pre-survey

17) Please select all the activities you participated in, in the last 12 months:*

	Yes	No	No change from when I took the pre-survey

Participated in extracurricular activities involving robotics or engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteered in a science, technology, engineering and/or math field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteered in a field related to environmental cleanup and restoration, including environmental activism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participated in any science fairs or tournaments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Logic: Show/hide trigger exists.

18) Have you job-shadowed someone in a science, technology, engineering and/or math field in the past 4 years?*

- Yes
- No
- No change from when I took the pre-survey

19) The following questions are about other people in your life who provide guidance on how to prepare for a job in a scientific field. *

	Yes	No
Are there family members who provide you with guidance on preparing for a job in science?	<input type="radio"/>	<input type="radio"/>
Are there mentors outside of your home who provide guidance on preparing for a job in science?	<input type="radio"/>	<input type="radio"/>

Page entry logic: This page will show when: (((OR Question "Volunteered in a science, technology, engineering and/or math field" is one of the following answers ("Yes")) OR Question "Volunteered in a field related to environmental cleanup and restoration, including environmental activism" is one of the following answers ("Yes")) OR Question "Participated in any science fairs or tournaments" is one of the following answers ("Yes"))

Followup on activities you have been involved in
Thanks for letting us know about some of your science-related activities. The following questions ask about some more details on the activities you indicated you were involved in above.

We know this could be a lot of questions, especially if you're very involved in science-related activities, so we really appreciate you taking the time to give us the details.

Validation: Must be numeric Whole numbers only

Logic: Hidden unless: (((Question "Participated in extracurricular activities involving robotics or engineering" is one of the following answers ("Yes")) OR Question "Volunteered in a science, technology, engineering and/or math field" is one of the

following answers ("Yes")) OR Question "Volunteered in a field related to environmental cleanup and restoration, including environmental activism" is one of the following answers ("Yes")) OR Question "Participated in any science fairs or tournaments" is one of the following answers ("Yes"))

20) This question is about your experience participating in corresponding activities. Please answer by typing a number in the following textboxes.

Please type in a period (".") if you don't want to answer a question.

	Enter number here
Number of science fairs or tournaments participated in the last 12 months	<input type="text"/>
Number of awards received at science fairs or tournaments in the last 12 months	<input type="text"/>
Number of extracurricular activities involving computer coding in the last 12 months	<input type="text"/>
Number of extracurricular activities involving robotics or engineering in the last 12 months	<input type="text"/>
Number of extracurricular activities involving astronomy in the last 12 months	<input type="text"/>
Number of extracurricular activities involving using Excel or Google Sheets for statistics in the last 12 months	<input type="text"/>

Engagement with Scientists

The following questions have to do with how much interaction you have had with scientists.

21) How would you rate your level of engagement with scientists in general?*

	1	2	3	4	5
Not at all engaged with scientists Extremely engaged with scientists	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

22) Have you participated in any of the following in the last 12 months:*

	Yes	No	No change from when I took the pre-survey
Received direct guidance on projects from a scientist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Watched videos made by scientists (For example, YouTubers Veritassium, Mark Rober, Smarter Every Day)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attended any talks where a scientist spoke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Read articles written by scientists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listen to podcasts by scientists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Logic: Show/hide trigger exists.

23) Do you or your family have acquaintances who are scientists?

Note: an acquaintance is a person you know who doesn't have to be a friend. For example, a neighbor can be an acquaintance.

- Yes
- No
- No change from when I took the pre-survey

Logic: Hidden unless: ((((((Question "Received direct guidance on projects from a scientist" is one of the following answers ("Yes") OR Question "

Watched videos made by scientists

(For example, YouTubers Veritassium, Mark Rober, Smarter Every Day)

" is one of the following answers ("Yes")) OR Question "Attended any talks where a scientist spoke" is one of the following answers ("Yes")) OR Question "Read articles written by scientists" is one of the following answers ("Yes")) OR Question "Listen to podcasts by scientists" is one of the following answers ("Yes")) OR Question "Do you have family members who are scientists?" is one of the following answers ("Yes")) OR #23 Question "Do you or your family have acquaintances who are scientists?

***Note: an acquaintance is a person you know who doesn't have to be a friend. For example, a neighbor can be an acquaintance." is one of the following answers ("Yes"))**

Details about your engagement with scientists

Thanks again for letting us know about your interaction with scientists. Again, we'd love to get some more details from you.

You're almost done, just one more section after this!

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: Question "

Watched videos made by scientists
(For example, YouTubers Veritassium, Mark Rober, Smarter Every Day)
" is one of the following answers ("Yes")

24) How many videos made by scientists do you watch **in an average month**?

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: Question "Attended any talks where a scientist spoke" is one of the following answers ("Yes")

25) How many talks have you attended where a scientist spoke **in the last 12 months**?

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: Question "Read articles written by scientists" is one of the following answers ("Yes")

26) How many **articles written by scientists** do you read **in an average month**?

Validation: Must be numeric Whole numbers only Positive numbers only

Logic: Hidden unless: Question "Listen to podcasts by scientists" is one of the following answers ("Yes")

27) How many **podcasts led by scientists** do you listen to **in an average month**?

Demographic Questions

We are asking you about these demographic questions to find out if our project activities are having a positive effect on people from groups who have been under-represented in the national science, technology, engineering, and mathematical workforce.

We would like to remind you that all of these questions are optional, you may choose to stop your participation at any time.

28) What grade are you in?

(If you are in between, please select the grade you were in most recently)

6th

- 7th
- 8th
- 9th
- 10th
- 11th
- 12th

29) With which gender do you most closely identify?

- Male
- Female
- Do not wish to specify

30) With which ethnicity do you most closely identify?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic/Latino
- Pacific Islander or Native Hawaiian
- White (non-Hispanic or Latino)
- Other - Please specify: *

31) Will you be the first-generation college student if you attend college in the future?

The term "first generation college student" means: An individual both of whose parents or guardians did not complete a baccalaureate degree; OR in the case of an individual who regularly resided with and received support from only one parent or guardian, an individual whose only parent or guardian did not complete a baccalaureate degree.

- Yes
- No
- I'm not sure

32) Would you like to give us feedback about this survey?

- Yes, I'd like to give you feedback!

- No. Seriously. I'm done.
- No.

Logic: Hidden unless: (#32 Question "Would you like to give us feedback about this survey?" is one of the following answers ("Yes, I'd like to give you feedback!") OR Question "Survey feedback branch" is one of the following answers "Always show feedback questions")

33) How would you rate this survey on the following metrics?

	-2	-1	0	1	2
I hated taking this survey I loved taking this survey					
This survey was worse than most surveys I've taken This survey was better than most survey's I've taken					
Because of this survey, I am less interested in STEM					

careers Because I took this survey I am more interested in STEM careers					
---	--	--	--	--	--

34) The text box below is for any final comments, suggestions, or complaints related to this survey that you would like to share with us.

Page entry logic: This page will show when: (((Student_Survey_UID AND Student_Assent_UID) AND Parental_Consent_UID) AND Eval_UID)

Thank you

Thank You! We appreciate the time you have taken to complete this survey. All of your responses are confidential and will be reported as an aggregate of all responses.

If you have any questions, please feel free to contact me at the following email address.

**Joshua Penman, Senior Evaluator
The Mark USA
jpenman@themarkusa.com**

Page entry logic: This page will show when: ((((((Student_Survey_UID AND Student_Assent_UID) AND Parental_Consent_UID) AND Pre_Approval_UID) AND consentvar) AND reward is one of the following answers "khamsa5,ashera10")

Rewards

Page entry logic: This page will show when: Parental_Consent_UID

Parental consent needed

We appreciate the time you have taken to complete this survey. All of your responses are confidential and will be reported as an aggregate of all responses.

Here are your next steps:

1. **We do not have a parental consent connected to your response.** This is required for participation.
2. If your parent or guardian is not available right now, please save the link below to return to the same place when they are ready. Otherwise, you will have to begin again.

[http://www.surveygizmo.com/s3/4896577/Student-Survey//?snc=\[survey\('session id'\)\]](http://www.surveygizmo.com/s3/4896577/Student-Survey//?snc=[survey('session id')])

If you have any questions, or you know that the parent or guardian consent was filled out and somehow got unlinked from your response, please feel free to contact me at the following email address:

Joshua Penman, Senior Evaluator

The Mark USA

jpenman@themarkusa.com

CC: gabdelsalam@themarkusa.com

To go to the parental consent form click "Submit" below:

Thank You!

Logic: Hidden unless: ParentaIt's more important that she/yourself touchbase to talk through expectations and our approach as well as timeline and when you can expect to hear back from us with a budget, etcl_Consent_UID






Thank You!

You are being redirected to the Parental Consent survey

Appendix B. Updated CCERS Annual Survey






ID:

1) Please choose the answer that best expresses your opinion.

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I have the technical skills I need to use technology.	()	()	()	()	()
I can learn a new program or application (app) independently.	()	()	()	()	()
I use technology in a way that enhances my everyday life.	()	()	()	()	()
I keep up with important new technologies.	()	()	()	()	()






ID:

2) These statements are about how you use technology in school:

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
My teachers expect me to use websites to do my schoolwork.	()	()	()	()	()
For part of my school day, I use a computer, tablet, or I go online to do work in class.	()	()	()	()	()
I feel comfortable using the internet for research, to find primary sources, or look up sources to use for papers or projects.	()	()	()	()	()
I use software programs in school that allow me to collect data.	()	()	()	()	()
I feel comfortable using software programs.	()	()	()	()	()

ID:

3) Please choose the answer that best shows how you feel about doing each of the things listed below.

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I can make good observations during a science activity.	()	()	()	()	()
I can ask good questions about what is happening during a science activity.	()	()	()	()	()
I feel confident about my ability to explain how to do scientific activities to others.	()	()	()	()	()
I think I could be a good scientist.	()	()	()	()	()
I am interested in learning about science.	()	()	()	()	()

ID:

4) Please select the answer below that tells us which devices you use in school or in your life outside of school.

	Less than once a month	Once a month	Once a week	Once a day	Multiple times a day
I have access to a smartphone.	()	()	()	()	()
I have access to a tablet that I can use at home.	()	()	()	()	()
I have access to a computer that I can use at home.	()	()	()	()	()

ID:

5) Have you used the BOP digital platform? (<https://platform.bop.nycl>)"

() Yes

() No






() I don't know

() Other - Write In (Required): _____ *

BOP Digital Platform






ID:

6) Your feedback will help us support you and improve the program. Please select the answer that best expresses your opinion.

	Strongly Disagree 	Disagree 	Maybe 	Agree 	Strongly Agree 
I am confident I can navigate the STEM-CCE digital platform.	()	()	()	()	()
I find the digital platform easy to use.	()	()	()	()	()

ID:






7) These statements are about using the BOP internet site (digital platform) to collect and analyze data from your Oyster Restoration Station (ORS).

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
I know how to check the BOP data I enter to be sure it is correct and makes sense.	()	()	()	()	()

I can make an Excel spreadsheet with the BOP data.	()	()	()	()	()
I know how to make a graph to show the BOP data.	()	()	()	()	()
I know how to find the BOP data that I need for my research project.	()	()	()	()	()
I know how to analyze the BOP data that I need for my research project.	()	()	()	()	()

ID:

8) Please choose the answer that best expresses your opinion.

	Strongly disagree 	Disagree 	Maybe 	Agree 	Strongly agree 
Scientists make a meaningful difference in the world.	()	()	()	()	()
A career in science would enable me to work with others in meaningful ways.	()	()	()	()	()
I am interested in jobs related to science.	()	()	()	()	()
I am interested in pursuing a career in science, technology, or engineering.	()	()	()	()	()

ID:

9) Have you interned, volunteered or worked in a science, technology, engineering and/or math field?

() Yes

() No

() No change from when I took the pre-survey

The following questions have to do with how much interaction you have had with scientists.

ID:

10) How would you rate your level of engagement with scientists in general?

	1	2	3	4	5
Not at all engaged with scientists	_____	_____	_____	_____	_____
Extremely engaged with scientists	_____	_____	_____	_____	_____

ID: _____

11) Have you participated in any of the following in the last 12 months:

	Yes	No	No change from when I took the pre-survey
Received direct guidance on projects from a scientist	()	()	()
Watched videos made by scientists	()	()	()
Attended any talks where a scientist spoke	()	()	()
Read articles written by scientists	()	()	()
Listened to podcasts by scientists	()	()	()

Demographics

We are asking you about these demographic questions to find out if our project activities are having a positive effect on people from groups who have been under-represented in the national science, technology, engineering, and mathematical workforce.

We would like to remind you that all of these questions are optional, you may choose to stop your participation at any time.

ID: _____

12) What grade are you in?

(If you are in between, please select the grade you were in most recently)

- () 6th
- () 7th
- () 8th
- () 9th
- () 10th
- () 11th

12th

ID:

13) With which gender do you most closely identify?

- Male
- Female
- Do not wish to specify

ID:

14) With which ethnicity do you most closely identify?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic/Latino
- Pacific Islander or Native Hawaiian
- White (non-Hispanic or Latino)
- Other - Please specify: _____ *

ID:

15) Will you be the first-generation college student if you attend college in the future?

The term "first generation college student" means: An individual both of whose parents or guardians did not complete a baccalaureate degree; OR in the case of an individual who regularly resided with and received support from only one parent or guardian, an individual whose only parent or guardian did not complete a baccalaureate degree.

- Yes
- No
- I'm not sure

Thank you

ID:

Thank You! We appreciate the time you have taken to complete this survey. All of your responses are confidential and will be reported as an aggregate of all responses.

If you have any questions, please feel free to contact me at the following email address.

Robbie Matz, Senior Evaluator
The Mark USA
rmatz@themarkusa.com

Rewards

Parental consent needed

ID:

We appreciate the time you have taken to complete this survey. All of your responses are confidential and will be reported as an aggregate of all responses.

Here are your next steps:

1. **We need your parent or guardian's signature! We do not have a parental consent connected to your response. This is required for participation.**
2. If your parent or guardian is not available right now, please click the link below to return to the same place when they are ready. Otherwise, you will have to begin again.

[CLICK HERE](#)

If you have any questions, or you know that the parent or guardian consent was filled out and somehow got unlinked from your response, please feel free to contact me at the following email address:

Robbie Matz, Senior Evaluator
The Mark USA
rmatz@themarkusa.com

To go to the parental consent form click "Submit" below:

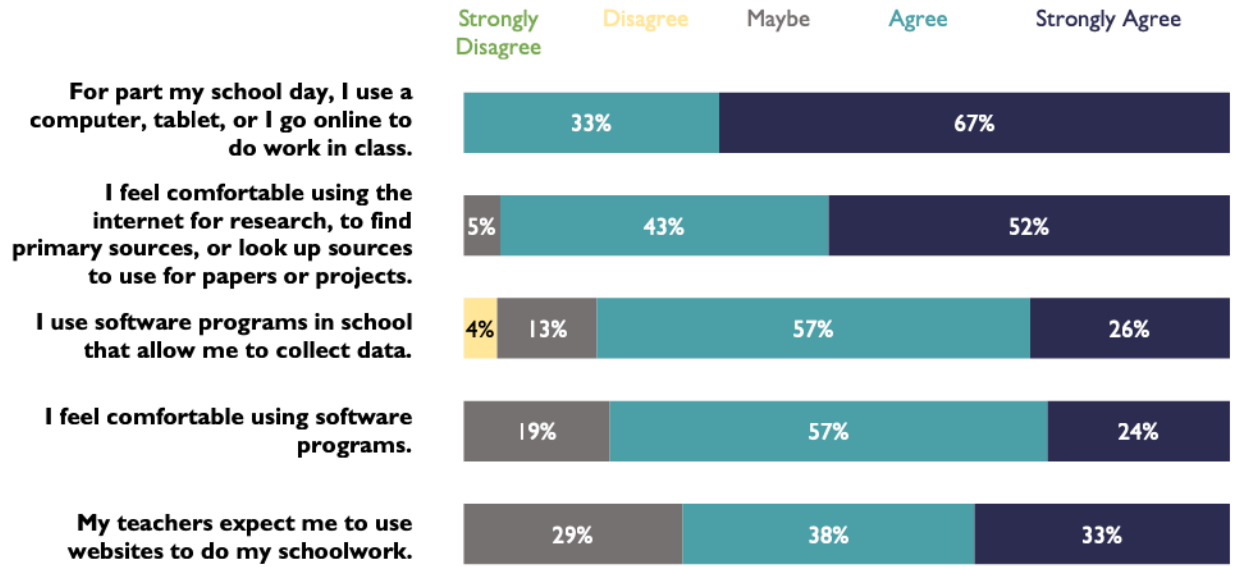
Thank You!

ID:

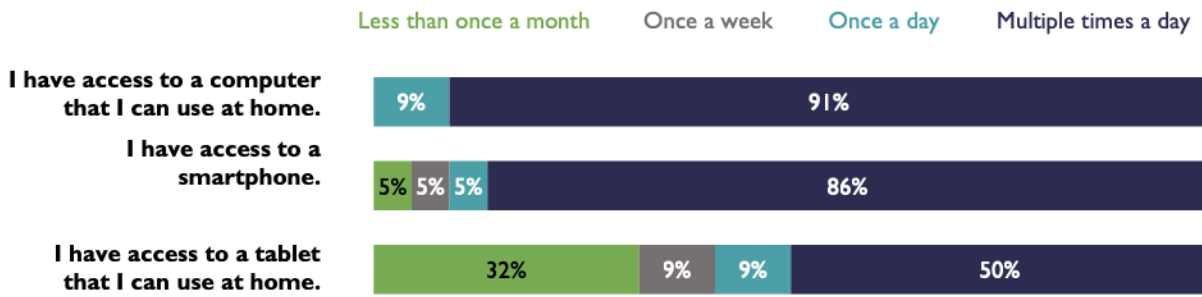
Thank You!

You are being redirected to the Parental Consent survey.

Appendix C: Individual item response frequencies for URGs technology use

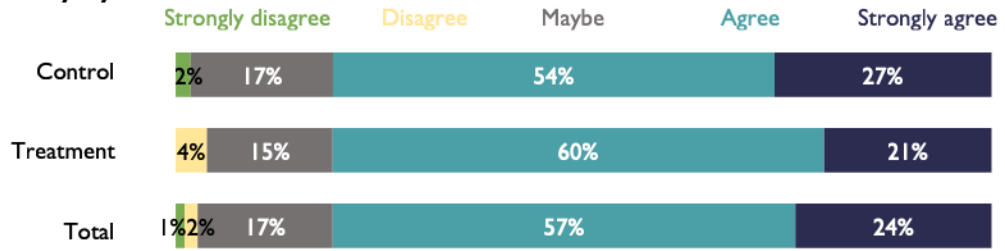


Appendix D: Individual item response frequencies for URGs access to technology

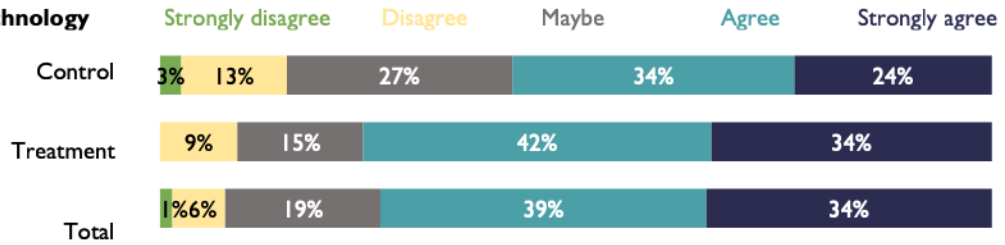


Appendix E: Individual item response frequencies by condition

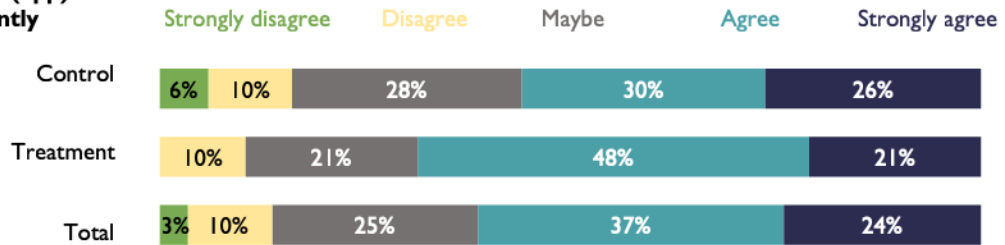
I use technology in a way that enhances my everyday life



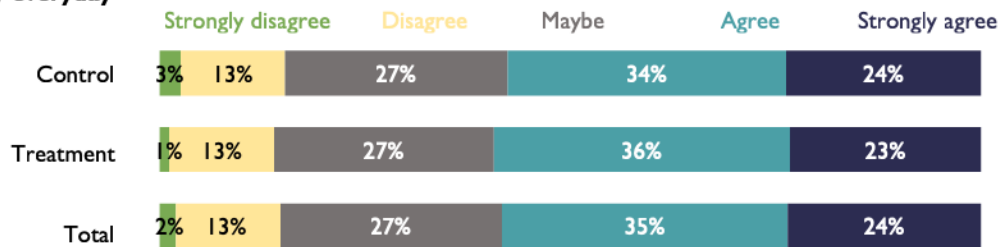
I have the technical skills I need to use technology



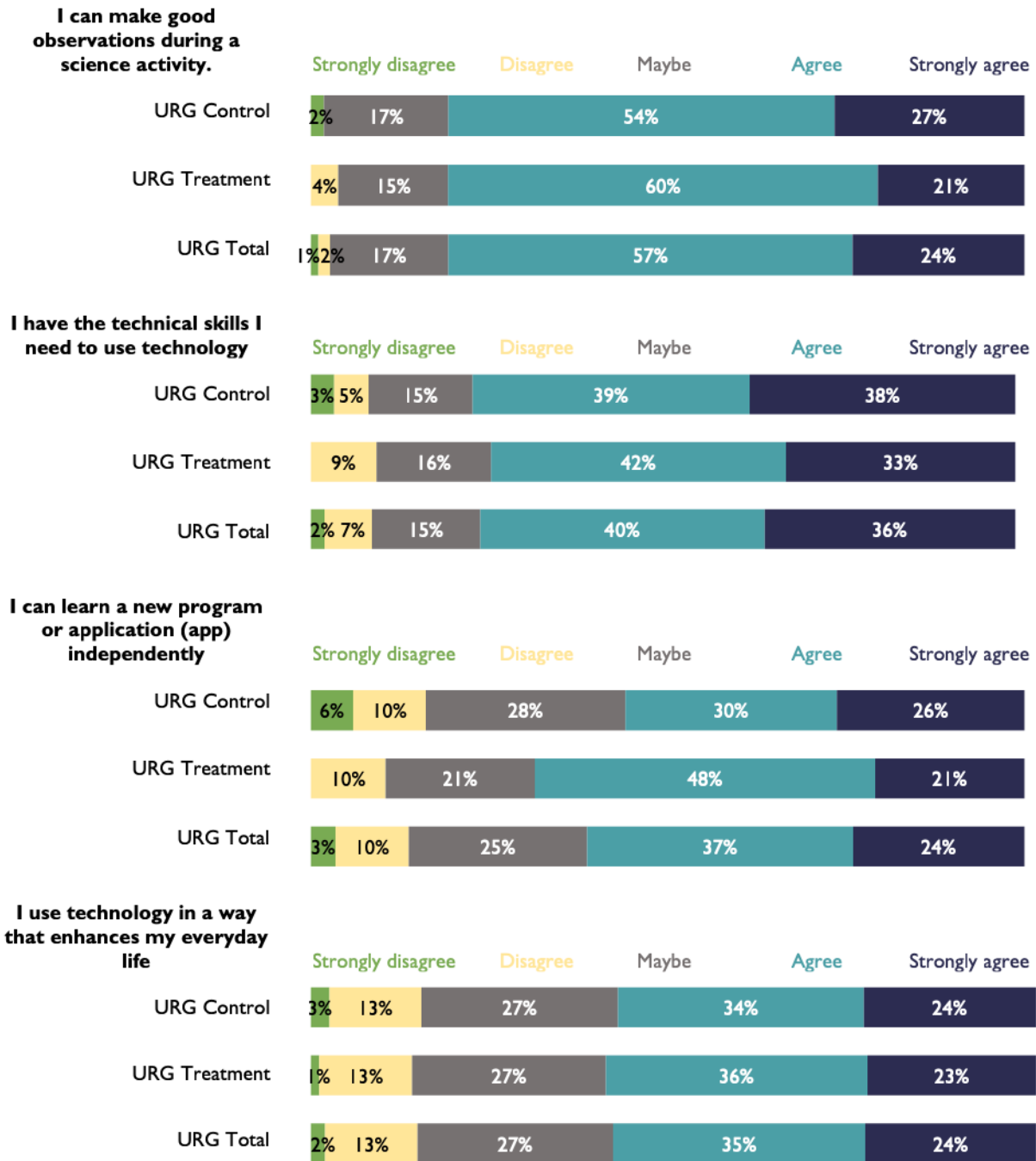
I can learn a new program or application (app) independently



I use technology in a way that enhances my everyday life.



Appendix F: URGs individual item response frequencies by condition



Appendix G: Individual item response frequencies by grade

