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ARMY EDUCATIONAL OUTREACH PROGRAM

eCYBERMISSION

2019 Annual Program Evaluation Report
Appendices

July 2020

aeop
ARMY EDUCATIONAL OUTREACH PROGRAM

2

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2 | Table of Contents

3 | Appendix A – FY19 eCM Evaluation Plan

Questionnaires

As per the approved FY19 AEOP APP, the external evaluation of eCM (conducted by NC State University) includes three post-program questionnaires:

1. AEOP Youth Questionnaire to be completed by student participants of the eCM regional events; and
2. AEOP Youth Questionnaire to be completed by student participants of the eCM national event; and
3. AEOP Team Advisor/Mentor Questionnaire to be completed by research Team Advisors, competition advisors, chaperones, teachers, or others who supported students as they prepared for or participated in eCM national and regional events.

Questionnaires are the primary method of data collection for AEOP evaluation and collect information about participants' experiences with and perceptions of program resources, structures, and activities; potential benefits to participants; and strengths and areas of improvement for programs.

The questionnaires were aligned with:

- Army's strategic plan and AEOP Priorities 1 (STEM Literate Citizenry), 2 (STEM Savvy Educators) *and* 3 (Sustainable Infrastructure);
- Federal guidance for evaluation of Federal STEM investments (e.g., inclusive of implementation and outcomes evaluation, and outcomes of STEM-specific competencies, transferrable competencies, attitudes about/identifying with STEM, future engagement in STEM-related activities, and educational/career pathways);
- Best practices and published assessment tools in STEM education, STEM informal/outreach, and the evaluation/ research communities;
- AEOP's vision to improve the quality of the data collected, focusing on changes in intended student outcomes and contributions of AEOPs like CQL effecting those changes.

The use of common questionnaires and sets of items that are appropriate across programs will allow for comparisons across AEOP programs and, if administered in successive years, longitudinal studies of students as they advance through pipelines within the AEOP. Because the questionnaires incorporate batteries of items from existing tools that have been validated in published research, external comparisons may also be possible. All AEOPs are expected to administer the student and Team Advisor questionnaires provided for their program.

Focus Group Site Visits

As per the approved FY19 AEOP APP, the external evaluation of eCM includes site visit/onsite focus groups at National Judging & Educational Event (NJ&EE). Site visits provide the evaluation team with first-hand opportunities to speak with students and their Team Advisors. We are able to observe the AEOPs in action. The information gleaned from these visits assists us in illustrating and more deeply understanding the findings of other data collected (from questionnaires). In total, evaluators' findings are used to highlight program successes and inform program changes so that the AEOPs can be even better in the future.

Evaluation Activities during eCM Site Visits

- One or two 45 minute focus group with 6-8 youth participants;
- One 45-minute focus group with 6-8 Team Advisors;
- 30-60 minutes to observe the program (specifically, to see students engaged in program activities, preferably with their Team Advisors); and
- 10-15 minute transitions between each evaluation activity for moving groups in and out and providing evaluators with time to organize paperwork and take nature breaks.

Selecting Focus Group Participants

Evaluators appreciate event administrators' assistance in helping to assemble a diverse group of focus group participants who can provide information about a range of experiences possible in the eCM. Ideally, this assistance is in the form of pre-event notifications of the focus groups, including scheduled dates, times, and locations.

Ideally, each student focus group will be inclusive of

- males and females (equal representation if possible),
- range of grade levels of students,
- range of race/ethnicities of students served by the program, and
- range of STEM interests (if known).

We prefer that students volunteer themselves after receiving the invitation to participate in the focus group, but will pursue students nominated by program staff or Team Advisors. Participants may RSVP to evaluators privately or simply show up at the focus group location; however, sign-up sheets should not be used--if they are publically displayed, they breach participant confidentiality.

A number of different adult participants of eCM--regional directors, national judges, chaperones, and even parents. We encourage any of these groups to participate in the adult focus group and have geared questions to be applicable across groups.

Data Analyses

Quantitative and qualitative data were compiled and analyzed after all data collection concluded. Evaluators summarized quantitative data with descriptive statistics such as numbers of respondents, frequencies and proportions of responses, average response when responses categories are assigned to a 6-point scale (e.g., 1 = “Strongly Disagree” to 6 = “Strongly Agree”), and standard deviations. Emergent coding was used for the qualitative data to identify the most common themes in responses.

Evaluators conducted inferential statistics to study any differences among participant groups (e.g., by gender or race/ethnicity) that could indicate inequities in the eCM program and differences between students who participated only in eCM-R and students who participated in both eCM-R and eCM-N. Statistical significance indicates whether a result is unlikely to be due to chance alone. Statistical significance was determined with t-tests, chi-square tests, and various non-parametric tests as appropriate, with significance defined at $p < 0.05$. Because statistical significance is sensitive to the number of respondents, it is more difficult to detect significant changes with small numbers of respondents. Practical significance, also known as effect size, indicates the magnitude of an effect, and is typically reported when differences are statistically significant. The formula for effect sizes depends on the type of statistical test used, and is specified, along with generally accepted rules of thumb for interpretation, in the body of the report.

4 | Appendix B – Student Focus Group Protocol

Facilitator: My name is [evaluator] and I'd like to thank you for meeting with us today! We are really excited to learn more about your experiences in eCM. In case you have not been in a focus group before, I'd like to give the group some ground rules that I like to use in focus groups. They seem to help the group move forward and make everyone a little more comfortable:

- What is shared in the room stays in the room.
- Only one person speaks at a time.
- If you disagree please do so respectfully.
- It is important for us to hear the positive and negative sides of an issue.
- This is voluntary - you may choose not to answer any question, or stop participating at any time.
- We will be audio recording the session for note-taking purposes only. Audio will be destroyed.
- Do you have any questions before we begin?

Key Questions

1. Why did you choose to participate in eCM this year?
    - How did you hear about eCM?
    - Who did you hear about it from?

The Army Educational Outreach Program (AEOP) is a primary sponsor of eCM. We do these focus groups to help the AEOP create reports and defend funding for the program. They need specific information to defend the money for the program.

2. We need to understand more about how eCM is teaching students about STEM career opportunities in the Army and Department of Defense.
    - During eCM, did you learn about anything about STEM careers in the Army or Department of Defense?
    - How did you learn about them (e.g., field trips, invited speakers, other activities, etc.)?
    - Are you interested in pursuing a career in STEM with the Army or Department of Defense?
3. The AEOP sponsors a wide range of national STEM outreach programs other than eCM. You are definitely eligible to participate in some of these programs and we need to know if you learned about them during eCM.
    - During eCM, did you learn about any of the outreach programs that the AEOP sponsors? (REAP, SEAP, CQL, SMART, etc.)
    - How did you learn about them?
    - Do you think that you will try to participate in any of those programs?
4. Were you happy that you chose to participate in eCM this year?
    - What, specifically do you think you got out of participating in eCM?
    - Were there any other benefits of participating in eCM?
5. Do you have any suggestions for improving eCM for other students in the future?
6. Last Chance - Have we missed anything? Tell us anything you want us to know that we didn't ask about.

5 | Appendix C – Mentor Focus Group Protocol

Facilitator: My name is [evaluator] and I'd like to thank you for meeting with us today! We are really excited to learn more about your experiences in eCM. In case you haven't been in a focus group before, I'd like to give you some ground rules that I like to use in focus groups. They seem to help the group move forward and make everyone a little more comfortable:

- What is shared in the room stays in the room.
- Only one person speaks at a time.
- If you disagree please do so respectfully.
- It is important for us to hear the positive and negative sides of all issues.
- We will be audio recording the session for note-taking purposes only. Audio will be destroyed.
- Do you have any questions about participating in the focus group?

Key Questions:

1. When you think about eCM, what kind of value does this program add?
    - How do you think students benefit from participating in eCM?
    - Can you think of a particular student or group of students that benefit the most from eCM?
    - How have you benefited from participating in eCM?

One of the primary sponsors of the eCM program is the Army Educational Outreach Program (AEOP). The AEOP needs specific information to create reports and defend funding for its outreach programs, eCM included.

2. We need to understand more about how eCM is helping students know more about STEM career opportunities in the Department of Defense, especially civilian positions.
    - Have you seen any efforts by eCM to educate participants about the Army, DoD, or careers in the DoD?
    - What strategies seem to be the most effective for eCM students?
    - Do you have any suggestions for helping eCM teach students about careers in the DoD?
3. The AEOP sponsors a wide range of national STEM outreach programs that these students qualify for. **The AEOP needs to know if eCM is teaching students the other STEM outreach programs that it sponsors.**
    - First, are you aware of the other programs offered by the AEOP? (e.g., REAP, SEAP, CQL, SMART, etc)
    - Have you seen any efforts at eCM to educate adults or students about the other AEOP programs?
    - What seems to work the best? The worst?
    - Any suggestions for helping the AEOP educate these students about the other programs?
4. The AEOP is trying to make sure that its programs become more effective at reaching adult and youth participants from underserved and underrepresented groups (racial/ethnic groups, low SES, etc.).
    - Have you seen any efforts by eCM to help engage underserved or underrepresented groups of adults and youth?
    - What strategies seem to work the best? The worst?
    - Any suggestions for helping eCM reach new populations of adult and youth participants?
5. What suggestions do you have for improving eCM?
6. Last Chance - Have we missed anything?

6 | Appendix D – eCM Student Questionnaire

Contact Information		
Please verify the following information:		
*First Name:		
*Last Name:		
*Email Address:		
All fields with an asterisk (*) are required.		

*1. Do you agree to participate in this survey? (required)(*Required)		
Select one.		
○	Yes, I agree to participate in this survey	
○	No, I do not wish to participate in this survey	Go to end of chapter

*2. What grade will you start in the fall? (select one)(*Required)	
Select one.	
○	6th
○	7th
○	8th
○	9th
○	Other, (specify)::

*4. What is your race or ethnicity?(*Required)

Select one.

○	Hispanic or Latino
○	Asian
○	Black or African American
○	Native American or Alaska Native
○	Native Hawaiian or Other Pacific Islander
○	White
○	Choose not to report
○	Other race or ethnicity, (specify)::

*5. Do you get free or reduced lunches at school?(*Required)

Select one.

○	Yes
○	No
○	Choose not to report

*6. What type of area is the school you attend located in?(*Required)

Select all that apply.

☐	Urban- city
☐	Suburban - near a city
☐	Rural - in the country, not near a city
☐	I don't know

*7. What is the primary language you speak?(*Required)

Select all that apply.

☐	English
☐	Other language

*8. Did at least one of your parents graduate from a college or university?(*Required)

Select all that apply.

☐	Yes
☐	No
☐	Don't know
☐	Choose not to answer

*9. STEM PRACTICES - How often did you do each of the following in science, technology, engineering, and/or mathematics (STEM) classes at school before participating in eCYBERMISSION?(*Required)

Select one per row.

	Not at all	*At least once*	*Monthly*	*Weekly*	*Every day*
*Work with a STEM researcher or company on a real world STEM research project	○	○	○	○	○
*Work with a STEM researcher on a research project topic assigned by my teacher	○	○	○	○	○
*Design my own research or investigation based on my own question(s)	○	○	○	○	○
*Present my STEM research to a panel of judges from industry or the military	○	○	○	○	○
*Interact with STEM researchers	○	○	○	○	○
*Use laboratory procedures and tools	○	○	○	○	○
*Identify questions or problems to investigate	○	○	○	○	○
*Design and carry out an investigation	○	○	○	○	○
*Analyze data or information and draw conclusions	○	○	○	○	○
*Work collaboratively as part of a team	○	○	○	○	○
*Build or make a computer model	○	○	○	○	○
Solve real world problems	○	○	○	○	○

*10. STEM PRACTICES - How often did you do each of the following in eCYBERMISSION?(*Required)

Select one per row.

	Not at all	*At least once*	*Monthly*	*Weekly*	*Every day*
*Work with a STEM researcher or company on a real world STEM research project	○	○	○	○	○
*Work with a STEM researcher on a research project topic assigned by my teacher	○	○	○	○	○
*Design my own research or investigation based on my own question(s)	○	○	○	○	○
*Present my STEM research to a panel of judges from industry or the military	○	○	○	○	○
*Interact with STEM researchers	○	○	○	○	○
*Use laboratory procedures and tools	○	○	○	○	○
*Identify questions or problems to investigate	○	○	○	○	○
*Design and carry out an investigation	○	○	○	○	○
*Analyze data or information and draw conclusions	○	○	○	○	○
*Work collaboratively as part of a team	○	○	○	○	○
*Build or make a computer model	○	○	○	○	○
Solve real world problems	○	○	○	○	○

*11. STEM KNOWLEDGE - As a result of your eCYBERMISSION experience, how much did you GAIN in the following areas?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*In depth knowledge of a STEM topic(s)	○	○	○	○
*Knowledge of research conducted in a STEM topic or field	○	○	○	○
*Knowledge of research processes, ethics, and rules for conduct in STEM	○	○	○	○
*Knowledge of how scientists and engineers work on real problems in STEM	○	○	○	○
*Knowledge of what everyday research work is like in STEM	○	○	○	○

*12. STEM SKILLS - As a result of your eCYBERMISSION experience, how much did you GAIN in the following areas?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Defining a problem that can be solved by developing a new or improved product or process	○	○	○	○
*Creating a hypothesis or question that can be tested in an experiment	○	○	○	○
*Using my knowledge and creativity to suggest a solution to a problem	○	○	○	○
*Making a model to show how something works	○	○	○	○
*Designing procedures or steps for an experiment that work	○	○	○	○
*Identifying the limitations of the methods and tools used for collecting data	○	○	○	○
*Carrying out an experiment and recording data accurately	○	○	○	○
*Creating charts or graphs to display data and find patterns	○	○	○	○
*Considering multiple interpretations of data to decide if something works as intended	○	○	○	○
*Supporting an explanation with my STEM knowledge or data from experiments	○	○	○	○
*Identifying the strengths and limitations of data or arguments presented in scientific or technical texts	○	○	○	○
*Presenting an argument that uses data and/or findings from an experiment	○	○	○	○
*Defending an argument based upon findings from an experiment or other data	○	○	○	○
*Integrating information from technical or scientific texts or other media to support your explanation of an experiment or solution to a	○	○	○	○

*13. 21st CENTURY SKILLS - As a result of your eCYBERMISSION experience, how much did you GAIN in the following areas?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Thinking creatively	○	○	○	○
*Working creatively with others	○	○	○	○
*Using my creative ideas to make a product	○	○	○	○
*Thinking about how systems work and how parts interact with each other	○	○	○	○
*Evaluating others' evidence, arguments, and beliefs	○	○	○	○
*Solving problems	○	○	○	○
*Communicating clearly (written and oral) with others	○	○	○	○
*Collaborating with others effectively and respectfully in diverse teams	○	○	○	○
*Interacting effectively with others in a respectful and professional manner	○	○	○	○
*Accessing and evaluating information efficiently (time) and critically (evaluates sources)	○	○	○	○
*Using and managing data accurately, creatively, and ethically	○	○	○	○
*Analyzing media (news) - understanding points of view in the media	○	○	○	○
*Creating media products like videos, blogs, social media	○	○	○	○
*Use technology as a tool to research, organize, evaluate, and communicate information	○	○	○	○
*Adapting to change when things do not go as planned	○	○	○	○

*Incorporating feedback on my work effectively	○	○	○	○
*Setting goals and utilizing time wisely	○	○	○	○
*Working independently and completing tasks on time	○	○	○	○
*Taking initiative and doing work without being told to	○	○	○	○
*Prioritizing, planning, and managing projects to achieve completion	○	○	○	○
*Producing results - sticking with a task until it is finished	○	○	○	○
*Leading and guiding others in a team or group	○	○	○	○
*Being responsible to others - thinking about the larger community	○	○	○	○

*14. STEM CONFIDENCE - As a result of your eCYBERMISSION experience, how much did you GAIN in the following areas?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Interest in a new STEM topic	○	○	○	○
*Interest in pursuing a STEM career	○	○	○	○
*Sense of accomplishment from my work in the program	○	○	○	○
*Feeling prepared for more challenging STEM activities	○	○	○	○
*Confidence to try out new ideas or procedures on my own in a STEM project	○	○	○	○
*Desire to build relationships with mentors who work in STEM	○	○	○	○

*15. MENTORING STRATEGIES - The list below includes effective teaching and mentoring strategies. From the list, please indicate which strategies that your Team Advisor used when working with you in eCYBERMISSION:(*Required)

Select one per row.

	Yes - my mentor used this strategy with me	*No - my mentor did not use this strategy with me*
*Helped me become aware of STEM in my everyday life	○	○
*Helped me understand how I can use STEM to improve my community	○	○
*Used a variety of strategies to help me learn	○	○
*Gave me extra support when I needed it	○	○
*Encouraged me to share ideas with others who have different backgrounds or viewpoints than I do	○	○
*Allowed me to work on a team project or activity	○	○
*Helped me learn or practice a variety of STEM skills	○	○
*Gave me feedback to help me improve in STEM	○	○
*Talked to me about the education I need for a STEM career	○	○
*Recommended Army Educational Outreach Programs that match my interests	○	○
*Discussed STEM careers with the DoD or government	○	○

*16. PROGRAM FEATURES - Which category best describes the focus of your eCYBERMISSION Mission Folder?(*Required)

Select one.

○	Scientific inquiry
○	Engineering design

*17. PROGRAM SATISFACTION - How SATISFIED were you with the following eCYBERMISSION features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Applying or registering for the program	○	○	○	○	○
*Submission process	○	○	○	○	○
*Value of Cyber Guide live chat	○	○	○	○	○
*Variety of STEM Mission Challenges available	○	○	○	○	○
*Value of Cyber Guides feedback	○	○	○	○	○
*Value of Cyber Guides discussion form	○	○	○	○	○
*Educational materials (e.g., online resources, etc.) used during program activities	○	○	○	○	○
*eCYBERMISSION website	○	○	○	○	○
*Mission control (phone) response time	○	○	○	○	○
*Mission control (email) response time	○	○	○	○	○

*18. FUTURE INTEREST - How interested are you in participating in the following programs in the future?(*Required)

Select one per row.

	I've never heard of this program	*Not at all*	*A little*	*Somewhat*	*Very much*
*Camp Invention	○	○	○	○	○
*eCYBERMISSION	○	○	○	○	○
*Junior Solar Sprint (JSS)	○	○	○	○	○
*Gains in the Education of Mathematics and Science (GEMS)	○	○	○	○	○
*UNITE	○	○	○	○	○
*Junior Science & Humanities Symposium (JSHS)	○	○	○	○	○
*Science & Engineering Apprenticeship Program (SEAP)	○	○	○	○	○
*Research & Engineering Apprenticeship Program (REAP)	○	○	○	○	○
*High School Apprenticeship Program (HSAP)	○	○	○	○	○
*College Qualified Leaders (CQL)	○	○	○	○	○
*GEMS Near Peer Mentor Program	○	○	○	○	○
*Undergraduate Research Apprenticeship Program (URAP)	○	○	○	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○	○	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○	○	○	○

*19. STEM CAREERS - How many jobs/careers in STEM did you learn about during eCYBERMISSION?(*Required)	
Select one.	
○	None
○	1
○	2
○	3
○	4
○	5 or more

*20. DoD STEM CAREERS - How many Army or Department of Defense (DoD) STEM jobs/careers did you learn about during eCYBERMISSION?(*Required)	
Select one.	
○	None
○	1
○	2
○	3
○	4
○	5 or more

*21. DoD STEM RESEARCH - How much do you agree or disagree with the following statements about Department of Defense (DoD) researchers and research:(*Required)

Select one per row.

	Strongly Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*
*DoD researchers advance science and engineering fields	○	○	○	○	○
*DoD researchers develop new, cutting edge technologies	○	○	○	○	○
*DoD researchers solve real-world problems	○	○	○	○	○
*DoD research is important to society	○	○	○	○	○

*22. STEM INTEREST - As a result of your eCYBERMISSION experience, are you MORE or LESS likely to engage in the following activities in science, technology, engineering, or mathematics (STEM) outside of school requirements or activities?(*Required)

Select one per row.

	Much less likely	*Less likely*	*About the same before and after*	*More likely*	*Much more likely*
*Watch or read non-fiction STEM	○	○	○	○	○
*Tinker (play) with a mechanical or electrical device	○	○	○	○	○
*Work on solving mathematical or scientific puzzles	○	○	○	○	○
*Use a computer to design or program something	○	○	○	○	○
*Talk with friends or family about STEM	○	○	○	○	○
*Mentor or teach other students about STEM	○	○	○	○	○
*Help with a community service project related to STEM	○	○	○	○	○
*Participate in a STEM camp, club, or competition	○	○	○	○	○
*Take an elective (not required) STEM class	○	○	○	○	○
*Work on a STEM project or experiment in a university or professional setting	○	○	○	○	○

*23. FUTURE ENGAGEMENT - After you have participated in eCYBERMISSION, how far do you want to go in school?(*Required)

Select one.

○	Graduate from high school
○	Go to a trade or vocational school
○	Go to college for a little while
○	Finish college (get a Bachelor's degree)
○	Get more education after college

*24. RESOURCES - How much did each of the following resources help you learn about Army Educational Outreach Programs (AEOPs)?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*My eCYBERMISSION teacher or mentor(s)	○	○	○	○	○
*Participation in eCYBERMISSION	○	○	○	○	○

*25. RESOURCES - How much did each of the following resources help you learn about STEM careers in the Army or Department of Defense (DoD)?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*My eCYBERMISSION teacher or mentor(s)	○	○	○	○	○
*Participation in eCYBERMISSION	○	○	○	○	○

*26. OVERALL IMPACT - Which of the following statements describe you AFTER participating in the eCYBERMISSION program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of eCYBERMISSION*	*Agree - eCYBERMISSION somewhat made me feel this way*	*Agree - eCYBERMISSION was primary reason*
*I am more confident in my STEM knowledge, skills, and abilities	○	○	○	○
*I am more interested in participating in STEM activities outside of school	○	○	○	○
*I am more aware of other AEOPs	○	○	○	○
*I am more interested in participating in other AEOPs	○	○	○	○
*I am more interested in taking STEM classes in school	○	○	○	○
*I am more interested in earning a STEM degree	○	○	○	○
*I am more interested in pursuing a career in STEM	○	○	○	○
*I am more aware of Army or DoD STEM research and careers	○	○	○	○
*I have a greater appreciation of Army or DoD STEM research	○	○	○	○
*I am more interested in pursuing a STEM career with the Army or DoD	○	○	○	○

27. What are the three most important ways that eCYBERMISSION has helped you?	
Benefit #1:	
Benefit #2:	
Benefit #3:	

28. What are the three ways that we could make eCYBERMISSION better?	
Improvement #1:	
Improvement #2:	
Improvement #3:	

29. Please tell us about your overall satisfaction with your eCYBERMISSION experience.

7 | Appendix E – eCM Team Advisor Questionnaire

Contact Information		
Please verify the following information:		
*First Name:		
*Last Name:		
*Email Address:		
All fields with an asterisk (*) are required.		

*1. Do you agree to participate in this survey? (required)(*Required)		
Select one.		
○	Yes, I agree to participate in this survey	(Go to question number 2.)
○	No, I do not wish to participate in this survey	Go to end of chapter

*2. Please provide your personal information below: (required)(*Required)	
*First Name::	
*Last Name::	

3. Please provide your email address: (optional)

*4. What is your gender?(*Required)	
Select one.	
○	Male
○	Female
○	Choose not to report

*5. What is your race or ethnicity?(*Required)

Select one.

○	Hispanic or Latino
○	Asian
○	Black or African American
○	Native American or Alaska Native
○	Native Hawaiian or Other Pacific Islander
○	White
○	Choose not to report
○	Other race or ethnicity, (specify)::

*6. Which of the following BEST describes the organization you work for? (select ONE)(*Required)

Select one.

○	No organization
○	School or district (K-12)
○	State educational agency
○	Institution of higher education (vocational school, junior college, college, or university)
○	Private Industry
○	Department of Defense or other government agency
○	Non-profit
○	Other, (specify):

*7. Which of the following BEST describes your current occupation (select ONE)(*Required)

Select one.

○	Teacher	(Go to question number 8.)
○	Other school staff	(Go to question number 8.)
○	University educator	(Go to question number 11.)
○	Scientist, Engineer, or Mathematician in training (undergraduate or graduate student, etc.)	(Go to question number 11.)
○	Scientist, Engineer, or Mathematics professional	(Go to question number 11.)
○	Other, (specify)::	(Go to question number 11.)

*8. What grade level(s) do you teach (select all that apply)?(*Required)

Select all that apply.

☐	Upper elementary
☐	Middle school
☐	High school

*9. Which best describes the location of your school?(*Required)

Select one.

○	Urban (city)
○	Suburban
○	Rural (country)
○	Frontier or tribal school
○	Home School
○	Online School
○	Department of Defense School (DeDEA or DoDDS) Choose not to report

*10. Which of the following subjects do you teach? (select ALL that apply)(*Required)

Select all that apply.

☐	Upper elementary
☐	Physical science (physics, chemistry, astronomy, materials science, etc.)
☐	Biological science
☐	Earth, atmospheric, or oceanic science
☐	Environmental science
☐	Computer science
☐	Technology
☐	Engineering
☐	Mathematics or statistics
☐	Medical, health, or behavioral science
☐	Social Science (psychology, sociology, anthropology)
☐	Other, (specify)::

*11. Which of the following best describes your primary area of research?(*Required)

Select one.

○	Physical science (physics, chemistry, astronomy, materials science, etc.)
○	Biological science
○	Earth, atmospheric, or oceanic science
○	Environmental science
○	Computer science
○	Technology
○	Engineering
○	Mathematics or statistics
○	Medical, health, or behavioral science
○	Social Science (psychology, sociology, anthropology)
○	N/A - I am a teacher not STEM researcher
○	Other, (specify)::

*12. In which of the eCYBERMISSION regions did you participate? (Select ONE)(*Required)

Select one.

○	West
○	North Central
○	South Central
○	North East
○	South East
○	Not Sure

*13. Which of the following describes your role during eCYBERMISSION?(*Required)

Select all that apply.

☐	Research Mentor
☐	Team Advisor
☐	Teacher
☐	Other, (specify)::

14. How many eCYBERMISSION participants did you work with this year?
_____ students.

*15. LEARNED ABOUT AEOP - How did you learn about eCYBERMISSION? (Check all that apply)(*Required)	
Select all that apply.	
☐	Academy of Applied Science (AAS) website
☐	Army Educational Outreach Program (AEOP) website
☐	AEOP on Facebook, Twitter, Pinterest, or other social media
☐	A STEM conference or STEM education conference
☐	An email or newsletter from school, university, or a professional organization
☐	Past eCYBERMISSION participant
☐	A student
☐	A colleague
☐	My supervisor or superior
☐	A eCYBERMISSION site host or director
☐	Workplace communications
☐	Someone who works with the Department of Defense (Army, Navy, Air Force)
☐	NSTA Conference
☐	Other, (specify):: _____

*16. PREVIOUS PROGRAM PARTICIPATION - How many times have YOU PARTICIPATED in any of the following Army Educational Outreach Programs (AEOPs) in any capacity? If you have heard of an AEOP but never participated select "Never." If you have not heard of an AEOP select "Never heard of it."(*Required)

Select one per row.

	Never	*Once*	*Twice*	*Three or more times*	*I've never heard of this program*
*Camp Invention	○	○	○	○	○
*eCYBERMISSION	○	○	○	○	○
*Junior Solar Sprint (JSS)	○	○	○	○	○
*West Point Bridge Design Contest (WPBDC)	○	○	○	○	○
*Junior Science & Humanities Symposium (JSHS)	○	○	○	○	○
*Gains in the Education of Mathematics and Science (GEMS)	○	○	○	○	○
*GEMS Near Peers	○	○	○	○	○
*UNITE	○	○	○	○	○
*Science & Engineering Apprenticeship Program (SEAP)	○	○	○	○	○
*Research & Engineering Apprenticeship Program (REAP)	○	○	○	○	○
*High School Apprenticeship Program (HSAP)	○	○	○	○	○
*College Qualified Leaders (CQL)	○	○	○	○	○
*Undergraduate Research Apprenticeship Program (URAP)	○	○	○	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○	○	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○	○	○	○

*17. STEM PRACTICES - How often did YOUR PARTICIPANT(S) have opportunities to do each of the following in eCYBERMISSION?(*Required)

Select one per row.

	Not at all	*At least once*	*A few times*	*Most days*	*Every day*
*Work with a STEM researcher or company on a real world STEM research project	○	○	○	○	○
*Work with a STEM researcher on a research project topic assigned by the teacher	○	○	○	○	○
*Design their own investigation based on their own question(s)	○	○	○	○	○
*Present their STEM research to a panel of judges from industry or the military	○	○	○	○	○
*Interact with STEM researchers	○	○	○	○	○
*Use laboratory procedures and tools	○	○	○	○	○
*Identify questions or problems to investigate	○	○	○	○	○
*Design and carry out an investigation	○	○	○	○	○
*Analyze data or information and draw conclusions	○	○	○	○	○
*Work collaboratively as part of a team	○	○	○	○	○
*Build or make a computer model	○	○	○	○	○
*Solve real world problems	○	○	○	○	○

*18. STEM KNOWLEDGE - AS A RESULT OF THEIR eCYBERMISSION EXPERIENCE, how much did your participant(s) GAIN in the following areas?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*In depth knowledge of a STEM topic(s)	○	○	○	○
*Knowledge of research conducted in a STEM topic or field	○	○	○	○
*Knowledge of research processes, ethics, and rules for conduct in STEM	○	○	○	○
*Knowledge of how professionals work on real problems in STEM	○	○	○	○
*Knowledge of what everyday research work is like in STEM	○	○	○	○

*19. STEM SKILLS - AS A RESULT OF THEIR eCYBERMISSION EXPERIENCE, how much did your participant(s) GAIN in their abilities to do each of the following?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Asking a question that can be answered with one or more scientific experiments	○	○	○	○
*Using knowledge and creativity to suggest a testable explanation (hypothesis) for an observation	○	○	○	○
*Using knowledge and creativity to suggest a solution to a problem	○	○	○	○
*Making a model of an object or system showing its parts and how they work	○	○	○	○
*Designing procedures for an experiment that are appropriate for the question to be answered	○	○	○	○
*Identifying the limitations of the methods and tools used for data collection	○	○	○	○
*Carrying out procedures for an experiment and recording data accurately	○	○	○	○
*Creating charts or graphs to display data and find patterns	○	○	○	○
*Considering multiple interpretations of data to decide if something works as intended	○	○	○	○
*Supporting an explanation with their STEM knowledge or data from experiments	○	○	○	○
*Identifying the strengths and limitations of data or arguments presented in scientific or technical texts	○	○	○	○
*Presenting an argument that uses data and/or findings from an experiment	○	○	○	○
*Defending an argument based upon findings from an experiment or other data	○	○	○	○
*Integrating information from technical or scientific texts or other media to support an explanation of an experiment or solution to a problem	○	○	○	○

*20. 21st CENTURY SKILLS - AS A RESULT OF THE eCYBERMISSION EXPERIENCE, how much did your participant(s) GAIN (on average) in the skills/abilities listed below?(*Required) *Select one per row.*

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Thinking creatively	○	○	○	○
*Working creatively with others	○	○	○	○
*Using creative ideas to make a product	○	○	○	○
*Thinking about how systems work and how parts interact	○	○	○	○
*Evaluating others' evidence, arguments, and beliefs	○	○	○	○
*Solving problems	○	○	○	○
*Communicating clearly (written and oral) with others	○	○	○	○
*Collaborating with others effectively and respectfully in diverse teams	○	○	○	○
*Interacting effectively with others in a respectful and professional manner	○	○	○	○
*Accessing and evaluating information efficiently (time) and critically (evaluates sources)	○	○	○	○
*Using and managing data accurately, creatively, and ethically	○	○	○	○
*Analyzing media (news) understanding points of view in the media	○	○	○	○
*Creating media products like videos, blogs, social media	○	○	○	○
*Use technology as a tool to research, organize, evaluate, and communicate information	○	○	○	○
*Adapting to change when things do not go as planned	○	○	○	○
*Incorporating feedback into work effectively	○	○	○	○
*Setting goals and utilizing time wisely	○	○	○	○
*Working independently and completing tasks on time	○	○	○	○

*Taking initiative and doing work without being told to	○	○	○	○
*Prioritizing results - sticking with a task until it is finished	○	○	○	○
*Leading and guiding others in a team or group	○	○	○	○
*Being responsible to others - thinking about the larger	○	○	○	○

*21. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to establish the relevance of learning activities for students. From the list below, please indicate which strategies you used when working with your participant(s) in eCYBERMISSION.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Become familiar with my student(s) background and interests at the beginning of the eCM experience	○	○
*Giving students real-life problems to investigate or solve	○	○
*Selecting readings or activities that relate to students' backgrounds	○	○
*Encouraging students to suggest new readings, activities, or projects	○	○
*Helping students become aware of the role(s) that STEM plays in their everyday lives	○	○
*Helping students understand how STEM can help them improve their own community	○	○
*Asking students to relate real-life events or activities to topics covered in eCYBERMISSION	○	○

*22. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support the diverse needs of students as learners. From the list below, please indicate which strategies you used when working with your participant(s) in eCYBERMISSION.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Identify the different learning styles that my student (s) may have at the beginning of the eCM experience	○	○
*Interact with students and other personnel the same way regardless of their background	○	○
*Use a variety of teaching and/or mentoring activities to meet the needs of all students	○	○
*Integrating ideas from education literature to teach/mentor students from groups underrepresented in STEM	○	○
*Providing extra readings, activities, or learning support for students who lack essential background knowledge or skills	○	○
*Directing students to other individuals or programs for additional support as needed	○	○
*Highlighting under-representation of women and racial and ethnic minority populations in STEM and/or their contributions in STEM	○	○

*23. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support students development of collaboration and interpersonal skills. From the list below, please indicate which strategies you used when working with your participant(s) in eCYBERMISSION.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Having participant(s) tell other people about their backgrounds and interests	○	○
*Having participant(s) explain difficult ideas to others	○	○
*Having participant(s) listen to the ideas of others with an open mind	○	○
*Having participant(s) exchange ideas with others whose backgrounds or viewpoints are different from their own	○	○
*Having participant(s) give and receive constructive feedback with others	○	○

*24. MENTORING STRATEGIES - The list below describes mentoring strategies that are effective ways to support students' engagement in "authentic" STEM activities. From the list below, please indicate which strategies you used when working with your participants in eCYBERMISSION.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Teaching (or assigning readings) about specific STEM subject matter	○	○
*Having participant(s) search for and review technical research to support their work	○	○
*Demonstrating laboratory/field techniques, procedures, and tools for my student(s)	○	○
*Supervising participant(s) while they practice STEM research skills	○	○
*Providing participant(s) with constructive feedback to improve their STEM competencies	○	○
*Allowing participant(s) to work independently to improve their self-management abilities	○	○

*25. MENTORING STRATEGIES - This list describes mentoring strategies that are effective ways to support students' STEM educational and career pathways. From this list, please indicate which strategies you used when working with your student(s) in eCYBERMISSION(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Asking participant(s) about their educational and/or career goals	○	○
*Recommending extracurricular programs that align with participants' goals	○	○
*Recommending Army Educational Outreach Programs that align with participants' goals	○	○
*Providing guidance about educational pathways that will prepare participant(s) for a STEM career	○	○
*Discussing STEM career opportunities within the DoD or other government agencies	○	○
*Discussing STEM career opportunities in private industry or academia	○	○
*Discussing the economic, political, ethical, and/or social context of a STEM career	○	○
*Recommending student and professional organizations in STEM to my student(s)	○	○
*Helping participant(s) build a professional network in a STEM field	○	○
*Helping participant(s) with their resume, application, personal statement, and/or interview preparations	○	○

*26. PROGRAM SATISFACTION - How SATISFIED were you with the following eCYBERMISSION features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Application or registration process	○	○	○	○	○
*Communication with National Science Teachers Association (NSTA)	○	○	○	○	○
*Submission process	○	○	○	○	○
*Value of Cyber Guide live chat	○	○	○	○	○
*The variety of STEM Mission Challenges available	○	○	○	○	○
*Value of Cyber Guides' feedback	○	○	○	○	○
*Value of Cyber Guides discussion forum	○	○	○	○	○
*eCYBERMISSION website	○	○	○	○	○
*Educational materials	○	○	○	○	○
*Mission control (phone) response time	○	○	○	○	○
*Mission control (email) response time	○	○	○	○	○

*27. PROGRAM FEATURES - Which category best describes the focus of your participant(s) eCYBERMISSION activities?(*Required)

Select one.

○	Scientific inquiry
○	Engineering design

*28. FUTURE INTEREST - Which of the following AEOPs did YOU EXPLICITLY DISCUSS with your participant(s) during eCYBERMISSION? (check ALL that apply)(*Required)

Select one per row.

	Yes - I discussed this program with my student(s)	*No - I did not discuss this program with my student(s)*
*UNITE	○	○
*Junior Science & Humanities Symposium (JSHS)	○	○
*Science & Engineering Apprenticeship Program (SEAP)	○	○
*Research & Engineering Apprenticeship Program (REAP)	○	○
*High School Apprenticeship Program (HSAP)	○	○
*College Qualified Leaders (CQL)	○	○
*GEMS Near Peer Mentor Program	○	○
*Undergraduate Research Apprenticeship Program (URAP)	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○
*I discussed AEOP with participant(s) but did not discuss any specific program	○	○
*eCYBERMISSION	○	○

*29. DoD RESEARCH - How much do you agree or disagree with the following statements about Department of Defense (DoD) researchers and research:(*Required)

Select one per row.

	Strongly Disagree	*Disagree*	*Neither Agree nor Disagree*	*Agree*	*Strongly Agree*
*DoD researchers advance science and engineering fields	○	○	○	○	○
*DoD researchers develop new, cutting edge technologies	○	○	○	○	○
*DoD researchers solve real-world problems	○	○	○	○	○
*DoD research is valuable to society	○	○	○	○	○

*30. RESOURCES - How useful were each of the following in your efforts to expose participants to Army Educational Outreach Programs (AEOPs) during eCYBERMISSION?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*eCYBERMISSION Program administrator	○	○	○	○	○
*Invited speakers or “career” events	○	○	○	○	○
*Participation in eCYBERMISSION	○	○	○	○	○

*31. RESOURCES - How USEFUL were each of the following in your efforts to expose your participant(s) to Department of Defense (DoD) STEM careers during eCYBERMISSION.(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP printed materials	○	○	○	○	○
*eCYBERMISSION Program administrator or site coordinator	○	○	○	○	○
*Invited speakers or “career” events	○	○	○	○	○
*Participation in eCYBERMISSION	○	○	○	○	○

*32. OVERALL IMPACT - Which of the following statements describe YOUR PARTICIPANT(S) after participating in the eCYBERMISSION program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of eCM*	*Agree - eCM contributed*	*Agree - eCM was primary reason*
*More confident in STEM knowledge, skills, and abilities	○	○	○	○
*More interested in participating in STEM activities outside of school requirements	○	○	○	○
*More aware of other AEOPs	○	○	○	○
*More interested in participating in other AEOPs	○	○	○	○
*More interested in taking STEM classes in school	○	○	○	○
*More interested in earning a STEM degree	○	○	○	○
*More interested in pursuing a career in STEM	○	○	○	○
*More aware of DoD STEM research and careers	○	○	○	○
*Greater appreciation of DoD STEM research	○	○	○	○
*More interested in pursuing a STEM career with the DoD	○	○	○	○

33. What are the three most important strengths of eCYBERMISSION?	
Strength #1:	
Strength #2:	
Strength #3:	

34. What are the three ways eCYBERMISSION should be improved for future participants?	
Improvement #1:	
Improvement #2:	
Improvement #3:	

35. Please tell us about your overall satisfaction with your eCYBERMISSION experience.

8 | Appendix F – 21st Century Skills Assessment

*1. Enter the first and last name of your apprentice that you are assessing with this instrument:(*Required)

*2. Please indicate if this is the PRE (first) or POST (second) assessment you are completing for this apprentice:(*Required)	
Select all that apply.	
☐	Pre
☐	Post

*3. Enter today's date:(*Required)

4. Please rate the Apprentice on this Creativity and Innovation Skill:

Select one per row.

	Needs improvement - selects one idea without evaluation of others and/or uses existing ideas without imagining new ones	*Progressing - develops some original ideas; evaluates ideas, but not thoroughly before selection; shows some imagination in shaping ideas but stays within conventional boundaries*	*Demonstrates mastery - uses a wide range of idea creation techniques to develop several original ideas; elaborates, refines, analyzes and evaluates own ideas in order to improve and maximize creative efforts*	*Did not observe*
Ability to think creatively	○	○	○	○

5. Please rate the Apprentice on this Creativity and Innovation Skill:

Select one per row.

	Needs improvement - does not ask new questions or elaborate on the selected ideas and/or does not contribute to group discussions and/or distracts from group progress	*Progressing - considers and uses some feedback but does not seek it out; asks questions but only makes minor tweaks; contributes to group discussions and activities occasionally*	*Demonstrates mastery - asks new questions and takes different perspectives to elaborate on ideas; seeks and uses group feedback and critique to revise ideas and formulate new ones; contributes to group discussions frequently; takes initiative to ensure all group members are on task*	*Did not observe*
Ability to work creatively with others	○	○	○	○

6. Please rate the Apprentice on this Creativity and Innovation Skill:

Select one per row.

	Needs improvement - shows a lack of originality and/or understanding	*Progressing - makes some attempts of relevant originality; solutions demonstrate some understanding and creativity*	*Demonstrates mastery - implements innovative ideas to make a tangible and meaningful product; attempts creativity multiple times and understands the cyclical process of small successes and frequent mistakes; product/solution displays unique, detailed perspective*	*Did not observe*
Ability to implement innovations	○	○	○	○

7. Please rate the Apprentice on this Critical Thinking and Problem Solving Skill:

Select one per row.

	Needs improvement - does not use reasoning as appropriate to the situation	*Progressing - uses one type of reasoning appropriate to the situation*	*Demonstrates mastery - uses various types of reasoning (inductive, deductive, etc.) as appropriate to the situation*	*Did not observe*
Ability to reason effectively	○	○	○	○

8. Please rate the Apprentice on this Critical Thinking and Problem Solving Skill:

Select one per row.

	Needs improvement - fails to demonstrate how parts of a whole interact with each other	*Progressing - inconsistent in analyzing how parts of a whole interact with each other to produce overall outcomes in complex systems*	*Demonstrates mastery - analyzes how parts of a whole interact with each other to produce overall outcomes in complex systems*	*Did not observe*
Ability to use systems thinking	○	○	○	○

9. Please rate the Apprentice on this Critical Thinking and Problem Solving Skill:

Select one per row.

	Needs improvement - lacks analysis and evaluation of evidence, arguments, claims, and beliefs and/or lacks alternative points of view and/or lacks connections between information and arguments and/or does not interpret information and draw conclusions and/or does not reflect critically on learning experiences and processes	*Progressing - limited analysis and evaluation of evidence, arguments, claims, and beliefs; missing key alternative points of view; missing key connections between information and arguments; interprets information and draws conclusions based on inaccurate analysis; limited reflection on the learning experiences and processes*	*Demonstrates mastery - effectively analyzes and evaluates evidence, arguments, claims, and beliefs; analyzes and evaluates major alternative points of view; synthesizes and makes connections between information and arguments; interprets information and draws conclusions based on the best analysis; reflects critically on learning experiences and processes*	*Did not observe*
Ability to make judgments and decisions	○	○	○	○

10. Please rate the Apprentice on this Critical Thinking and Problem Solving Skill:

Select one per row.

	Needs improvement - does not attempt to solve problems and/or does not identify and ask significant questions that clarify various points of view and lead to better solutions	*Progressing - attempts to solve different kinds of non-familiar problems; identifies and asks questions occasionally that clarify a point of view and lead to better solutions*	*Demonstrates mastery - solves different kinds of non-familiar problems in both conventional and innovative ways; identifies and asks significant questions that clarify various points of view and lead to better solutions*	*Did not observe*
Ability to solve problems	○	○	○	○

11. Please rate the Apprentice on this Communication, Collaboration, Social and Cross-Cultural Skill:

Select one per row.

	Needs improvement - does not consistently articulate thoughts and ideas effectively and/or does not listen to others and/or does not consistently communicate with others to instruct, motivate, or persuade and/or utilizes media and technologies in ineffective ways	*Progressing - articulates thoughts and ideas occasionally using oral, written and nonverbal communication skills; listens occasionally to decipher meaning, including knowledge, values, attitudes, and intentions; uses communication for some purposes (inform, instruct, motivate, or persuade); utilizes some media and technologies and knows how to judge their effectiveness as well as assess their impact*	*Demonstrates mastery - articulates thoughts and ideas effectively using oral, written, and nonverbal in a variety of forms and contexts; listens effectively to decipher meaning, including knowledge, values, attitudes and intentions; uses effective communication for a range of purposes (inform, instruct, motivate and persuade); utilizes multiple media and technologies and knows how to judge their effectiveness as well as assess their impact*	*Did not observe*
Ability to communicate clearly	○	○	○	○

12. Please rate the Apprentice on this Communication, Collaboration, Social and Cross-Cultural Skill:

Select one per row.

	Needs improvement - does not work effectively and respectfully with others and/or not willing to be flexible and work toward a common goal and/or not willing to be responsible for shared work and/or does not value the individual contributions of others	*Progressing - demonstrates ability to work effectively and respectfully with diverse teams; assumes shared responsibility some of the time for collaborative work and values the individual contributions made by each team member*	*Demonstrates mastery - demonstrates ability to work effectively and respectfully with diverse teams; exercises flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal; assumes shared responsibility for collaborative work and values the individual contributions made by each team member*	*Did not observe*
Ability to collaborate with others	○	○	○	○

13. Please rate the Apprentice on this Communication, Collaboration, Social and Cross-Cultural Skill:

Select one per row.

	Needs improvement - does not contribute to the group or does not allow others to contribute and/or displays disrespect to other members of the group	*Progressing - conducts themselves in respectful, professional manner*	*Demonstrates mastery - knows when it is appropriate to listen and when to speak; conducts themselves in a respectful, professional manner; leverages social and cultural differences to create new ideas and increase both innovation and quality of work*	*Did not observe*
Ability to interact effectively with others	○	○	○	○

14. Please rate the Apprentice on this Information, Media, and Technological Literacy Skill:

Select one per row.

	Needs improvement - does not use time efficiently (time) and effectively (sources) and/or does not evaluate information	*Progressing - does not consistently access information efficiently (time) and effectively (sources); does not consistently evaluate information critically and competently*	*Demonstrates mastery - accesses information efficiently (time) and effectively (sources); evaluates information critically and competently*	*Did not observe*
Ability to access and evaluate information	○	○	○	○

15. Please rate the Apprentice on this Information, Media, and Technological Literacy Skill:

Select one per row.

	Needs improvement - does not use information to solve the issue or problem at hand and/or does not attempt to use a wide variety of valid and relevant sources and/or does not apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information	*Progressing - does not consistently use information accurately for the issue or problem at hand; does not consistently manage the flow of information from a wide variety of valid and relevant sources; does not apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information*	*Demonstrates mastery - uses information accurately and creatively for the issue or problem at hand; manages the flow of information from a wide variety of valid and relevant sources; applies a fundamental understanding of the ethical/legal issues surrounding the access and use of information*	*Did not observe*
Ability to use and manage information	○	○	○	○

16. Please rate the Apprentice on this Information, Media, and Technological Literacy Skill:

Select one per row.

	Needs improvement - does not understand how media messages are constructed and for what purposes and/or does not examine how individuals interpret messages differently and/or how values and points of view are included or excluded and how media can influence beliefs and behaviors and/or does not apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media	*Progressing - does not consistently understand both how and why media messages are constructed and for what purposes; does not consistently examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors; does not apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media*	*Demonstrates mastery - understands both how and why media messages are constructed and for what purposes; examines how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors; applies a fundamental understanding of the ethical/legal issues surrounding the access and use of media*	*Did not observe*
Ability to analyze media	○	○	○	○

17. Please rate the Apprentice on this Information, Media, and Technological Literacy Skill:

Select one per row.

	Needs improvement - does not utilize the most appropriate media creation tools, characteristics, and conventions and/or does not understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments	*Progressing - does not consistently utilize the most appropriate media creation tools, characteristics, and conventions; does not consistently understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments*	*Demonstrates mastery - understands and utilizes the most appropriate media creation tools, characteristics, and conventions; understands and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments*	*Did not observe*
Ability to create media products	○	○	○	○

18. Please rate the Apprentice on this Information, Media, and Technological Literacy Skill:

Select one per row.

	Needs improvement - does not use technology as a tool to research, organize, evaluate, and communicate information and/or does not use digital technologies (computers, PDAs, media players, etc.) communication/networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge community and/or does not apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies	*Progressing - does not use technology as a tool consistently to research, organize, evaluate, and communicate information; does not consistently use digital technologies (computers, PDAs, media players, etc.) communication/networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge community; does not consistently apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies*	*Demonstrates mastery - uses technology as a tool to research, organize, evaluate, and communicate information; uses digital technologies (computers, PDAs, media players, etc.) communication/networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge community; applies a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies*	*Did not observe*
Ability to apply technology effectively	○	○	○	○

19. Please rate the Apprentice on this Flexibility, Adaptability, Initiative, and Self-Direction Skill:

Select one per row.

	Needs improvement - does not adapt to varied roles, job responsibilities, schedules and contexts and/or does not work effectively in a climate of ambiguity and changing priorities	*Progressing - adapts to varied roles, job responsibilities, schedules and contexts OR works effectively in a climate of ambiguity and changing priorities*	*Demonstrates mastery - adapts to varied roles, job responsibilities, schedules and contexts AND works effectively in a climate of ambiguity and changing priorities*	*Did not observe*
Ability to adapt to change	○	○	○	○

20. Please rate the Apprentice on this Flexibility, Adaptability, Initiative, and Self-Direction Skill:

Select one per row.

	Needs improvement - does not incorporate feedback effectively; does not deal positively with praise, setbacks, or criticism; does not understand, negotiate, and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments	*Progressing - incorporates feedback effectively; deals positively with praise, setbacks, and criticism; does not understand, negotiate, and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments*	*Demonstrates mastery - incorporates feedback effectively; deals positively with praise, setbacks, and criticism; understands, negotiate, and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments*	*Did not observe*
Ability to be flexible	○	○	○	○

21. Please rate the Apprentice on this Flexibility, Adaptability, Initiative, and Self-Direction Skill:

Select one per row.

	Needs improvement - does not set goals with tangible and intangible success criteria; does not balance tactical (short-term) and strategic (long-term) goals; does not utilize time and manage workload effectively	*Progressing - does not set goals with tangible and intangible success criteria; does not balance tactical (short-term) and strategic (long-term) goals; utilizes time and manage workload effectively*	*Demonstrates mastery - sets goals with tangible and intangible success criteria; balances tactical (short-term) and strategic (long-term) goals; utilizes time and manage workload effectively*	*Did not observe*
Ability to manage goals and time	○	○	○	○

22. Please rate the Apprentice on this Flexibility, Adaptability, Initiative, and Self-Direction Skill:

Select one per row.

	Needs improvement - does not monitor, define, or prioritize and does not complete tasks without direct oversight	*Progressing - occasionally monitors, defines, prioritizes and completes tasks without direct oversight.*	*Demonstrates mastery - monitors, defines, prioritizes and completes tasks without direct oversight.*	*Did not observe*
Ability to work independently	○	○	○	○

23. Please rate the Apprentice on this Flexibility, Adaptability, Initiative, and Self-Direction Skill:

Select one per row.

	Needs improvement - does not go beyond basic mastery of skills and curriculum to explore and expand one's own learning and opportunities; does not demonstrate initiative to advance skill levels toward a professional level; does not demonstrate commitment to learning as a lifelong process; does not reflect critically on past experiences in order to inform future progress	*Progressing - goes beyond basic mastery of skills and curriculum to explore and expand one's own learning and opportunities; demonstrates initiative to advance skill levels toward a professional level; does not demonstrate commitment to learning as a lifelong process; does not reflect critically on past experiences in order to inform future progress*	*Demonstrates mastery - goes beyond basic mastery of skills and curriculum to explore and expand one's own learning and opportunities; demonstrates initiative to advance skill levels toward a professional level; demonstrates commitment to learning as a lifelong process; reflects critically on past experiences in order to inform future progress*	*Did not observe*
Ability to be self-directed learner	○	○	○	○

24. Please rate the Apprentice on this Productivity, Accountability, Leadership, and Responsibility Skill:

Select one per row.

	Needs improvement - does not set appropriate goals; no plan or management strategy is created to achieve the intended result	*Progressing - sets goals, but does not complete them in a timely manner; manages work with an incomplete plan to achieve the intended result*	*Demonstrates mastery - sets and meets goals, even in the face of obstacles and competing pressures; prioritizes, plans and manages work to achieve the intended result*	*Did not observe*
Ability to manage projects	○	○	○	○

25. Please rate the Apprentice on this Productivity, Accountability, Leadership, and Responsibility Skill:

Select one per row.

	Needs improvement - demonstrates less than half of the attributes associated with producing high quality products including abilities to: work positively and ethically; manage time and projects effectively; appropriately multi-task; participate actively; reliable and punctual; present oneself professionally with proper etiquette; collaborate and cooperate effectively with teams; respect and appreciate team diversity; be accountable for results.	*Progressing - demonstrates more than half of the attributes associated with producing high quality products including abilities to: work positively and ethically; manage time and projects effectively; appropriately multi-task; participate actively; reliable and punctual; present oneself professionally with proper etiquette; collaborate and cooperate effectively with teams; respect and appreciate team diversity; be accountable for results.*	*Demonstrates mastery - demonstrates all of the attributes associated with producing high quality products including abilities to: work positively and ethically; manage time and projects effectively; appropriately multi-task; participate actively; reliable and punctual; present oneself professionally with proper etiquette; collaborate and cooperate effectively with teams; respect and appreciate team diversity; be accountable for results.*	*Did not observe*
Ability to produce results	○	○	○	○

26. Please rate the Apprentice on this Productivity, Accountability, Leadership, and Responsibility Skill:

Select one per row.

	Needs improvement - shows no use of interpersonal skills and/or problem solving skills	*Progressing - uses interpersonal and problem solving skills to work toward a goal; leverages strengths of others to accomplish a goal*	*Demonstrates mastery - uses interpersonal and problem solving skills to influence and guide others toward a goal; leverages strengths of others to accomplish a goal; inspires others to reach their very best via example and selflessness; demonstrates integrity and ethical behavior in using influence and power*	*Did not observe*
Ability to guide and lead others	○	○	○	○

27. Please rate the Apprentice on this Productivity, Accountability, Leadership, and Responsibility Skill:

Select one per row.

	Needs improvement - does not act responsibly on a consistent basis	*Progressing - acts responsibly with the interests of the group or project in mind*	*Demonstrates mastery - acts responsibly with the interests of the larger community in mind*	*Did not observe*
Ability to be responsible to others	○	○	○	○

9 | Appendix G – Next Generation STEM Teaching Project Interview Protocol

NGSTP Interview Protocol

Interviewer: My name is [evaluator] and I'd like to thank you for talking with me today. We would like to to learn more about your experiences in NGSTP. This is a voluntary interview- you may choose not to answer any question, or stop participating at any time. We will be audio recording the session for note-taking purposes only. Audio will be destroyed. Do you have any questions before we begin?

Key Questions

1. What grade and subject do you teach this year?
2. What is your current teaching licensure/certification?
3. Why did you decide to participate in the NGSTP program?
4. Did you find the professional development helpful? Please explain.
5. What was the focus of your lesson plans you developed based on the program? Can you describe the unit plan briefly?
6. How have you interacted with the Army Lab scientists and/or engineers across the year after the training? Did you find the partnership valuable? Explain.
7. What were the strengths of the PD program?
8. How could the PD program be improved next year?
9. Do you have any other comments or suggestions to provide to the program?

10 | Appendix H – NSTA Response to FY19 Evaluation

NSTA commends the evaluation team for completing the evaluation earlier than in previous years. The suggestions and recommendations will be taken into consideration for FY21, since this report was received on Jan 9,2020, and registration for the program was completed on December 18, 2019. The calendar year for eCYBERMISSION is early August – the end of February. Evaluation survey links are send in mid-February with replies asked by end of March. Focus groups and another survey for the National Judging and Educational Event (NJ&EE) occur on site in June. The evaluation does provide us with many items to consider for the upcoming NJ&EE for FY20.

NSTA looks forward to the upcoming AEOP semi-annual consortium meeting, with ideas on how to increase participation, especially to the U2 populations. NSTA agrees that there is definitely areas for growth within the program.

Recommendation: Braoden, deepen, and diversify the pool of STEM talent….
A comment is made of reaching out to underserved groups of past participants to help grow the U2 population. In FY19, registration data does show that 27% of students have previously participated in eCYBERMISSION. Further breakdown shows that 12.2% of students that have previously participated are from U2 populations.
The following recommendations from NSTA will be considered for the FY21 competition.

- A possible recruitment idea is to put on a week-long summer workshop for team advisors from U2 populations to introduce them to the competition and give them support as they begin working with their students.
- Additionally, the mini-grant program did in FY20 change the rubric to focus more on U2 populations than previously. This new rubric will again be used in FY21.

Recommendation: Support and empower educators with unique Army research and technology resources.

- NSTA worked with Widmeyer to develop the “What’s Next Flyer” for eCYBERMISISON. This was completed in January, 2020 and will be shared electronically in a future newsletter with all team advisors yet this spring. This document will also be distributed in

FY21 as part of the welcome to the team advisors when they register for eCYBERMISSION .

Recommendation: Develp and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army

- NSTA is considering inviting some 9th grade team advisors from U2 populations to the National JSHS event this spring to encourage them to mentor 9th grade students next year in JSHS or to encourage them to promote JSHS to current 9th grade students.
- This coming summer, the Project Manager for eCM will work with the Project Manager for GEMS to promote eCM to GEMS students and to learn first hand what GEMS has to offer to help promote GEMS with eCM students. This can be accomplished via web seminars and social media.

NGSTP

It is a recommendation to not only continue the Next Generation STEM Teaching Project, but to increase the number of teachers that participate in the program. By increasing teacher knowledge of good STEM teaching in the classroom, pairing these teachers with Army personnel, each of the above recommendations could benefit.

Since this program has been contingent on funding each year, the opportunity to promote fully (we have had a disclaimer in both FY19 and FY20) has been limited. We have had to let the applicants know that the funding for the supplies and stipends paid to the NGSTP participants is contigent on the federal budget being passed. This does not give us the latitude to fully promote and recruit. If the program coordinator would know in the summer that the program is definitely going to occur, we could connect the teachers to a scientist/engineer earlier in the process.