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Army Educational Outreach Program

Undergraduate Research Apprenticeship Program (URAP)

2017 Annual Program Evaluation Report

PART 3: Appendices

February 2018

ARMY EDUCATIONAL OUTREACH PROGRAM

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Report URAP_02_02142018 has been prepared for the AEOP Cooperative Agreement and the U.S. Army by Purdue University College of Education on behalf of Battelle Memorial Institute (Lead Organization) under award W911 SR-15-2-0001.

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3 | Appendix A – FY17 URAP Evaluation Plan

Questionnaires

Per the FY16 Army Education Outreach Program (AEOP) Annual Program Plan (APP), Purdue University will conduct an evaluation study of the Undergraduate Research Apprenticeship Program (URAP) that includes two post-program questionnaires:

1. AEOP Participant Questionnaire to be completed by student participants of the URAP program at all university sites; and
2. AEOP Mentor Questionnaire to be completed by URAP mentors (typically a University Scientist or Engineer), and/or others who support students as they participate in the URAP program.

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.

From FY15 to FY16, questionnaire assessments have been revised and shorted while maintaining alignment 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., implementation and outcomes evaluation, outcomes evaluation of STEM-specific competencies, transferrable competencies, identifying with STEM, intentions to engage in STEM-related activities, and educational/career pathways);
- Best practices and published assessment tools in STEM education, informal STEM education, STEM outreach, and 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 URAP effecting those changes.

Deployment of common questionnaires with items that are appropriate for all AEOP programs allows evaluators to compare findings across AEOPs and, if administered in successive years, to establish longitudinal studies of student outcomes through the pipeline of AEOP programming. Questionnaires incorporate batteries of items from established assessments that have been validated in published research making external comparisons possible.

All AEOPs are expected to administer a Participant and a Mentor questionnaire provided to them by Purdue University. AEOP-wide Participant and Mentor questionnaires have two versions each; an "advanced" version (for JSHS and apprenticeship programs) and a "basic" version (for GEMS, JSS, and UNITE). Similar item sets are used in both versions, with slight modifications to item wording or the number of items used to accommodate the needs of participants from each individual program. Additionally, program-specific questionnaires have been customized to gather information about programmatic structures, resources, and activities that are unique to each AEOP.

Telephone Interviews

Per the FY16 Army Education Outreach Program (AEOP) Annual Program Plan (APP), Purdue University will conduct an evaluation study of URAP that includes telephone interviews with URAP mentors and apprentices.

Interviews provide the evaluation team first-hand opportunities to speak with participant and adult URAP participants. The contextual information gleaned from these interviews help evaluators understand the nuance of the evaluation data collected from questionnaires, adding depth to evaluative findings. Purdue University's interview assessment efforts focus on program successes and attempt to inform useful program changes so that URAP can improve in the future.

Evaluation activities during Purdue University's Phone Interview

- 8 – 12 one-on-one phone interviews with URAP apprentices (approx. 15-20 min. each);
- 8 – 12 one-on-one phone interviews with URAP mentors (approx. 15-20 min each);

Selecting Interview Participants

Purdue University will purposefully sample from URAP participants using CVENT enrollment data (site name, apprentice/mentor participant names, gender, & race/ethnicity). The IPA and Purdue University will "invite" selected participants that comprise the desired sample to participate via email through the CVENT portal. Participants will each RSVP prior to the scheduled interview date so that an alternate may be identified if needed.

Purposeful sampling is an attempt to assemble a sample of participants that are likely to provide information about the full range of experiences possible in URAP. The interview sample will be selected using the following information:

- Gender
- Grade level
- Racial/ethnic group
- Socio-economic status indicators (e.g., qualification for free or reduced-price lunches)

Scheduling and Technology

Purdue University will establish dates and times for each interview that accommodate the program activities for each site. The majority of these dates will occur in mid to late July – the purpose of which is to speak with participants after they have experienced the majority of experiences available in their URAP program. Purdue University will attempt to convene interviews between 10 a.m. and 2 p.m. in each site's time zone to minimize disruption to the program.

A simple telephone will be used to conduct each interview. Evaluators at Purdue University will also use a recording device to record the interview. All recordings are used for note-taking and transcription purposes only. After transcription, audio files will be destroyed.

Obtaining Informed Assent/Consent: Prior to the Interview

Apprentice and mentor participants should be informed of the evaluation interview *before* it is conducted. This ensures that individuals do not feel pressured to participate. It would be ideal if Purdue University, the IPA, and/or site coordinators work together to invite apprentices and mentors to participate and provide them with evaluation policy forms:

- Attach the Purdue University evaluation policy for URAP to the email
    - "AEOP Evaluation Policy(Parents).pdf"
    - "AEOP Evaluation Policy(Participants).pdf"
- Purdue University evaluators provide participants with a copy of the evaluation policy and will obtain verbal informed consent from participants just prior to conducting the focus group or interview. *Focus groups and interviews will be audio-recorded for transcription later.*

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 SEAP program. 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 – Apprentice 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 URAP. In case you have not been in an evaluation interview before, I'd like to give you some ground rules that I like to use in interviews. They seem to help the interview move forward and make everyone a little more comfortable:

1. What is shared in the interview stays in the room.
2. It is important for us to hear the positive and negative sides of all issues.
3. Only one person speaks at a time.
4. This is voluntary - you may choose not to answer any question, or stop participating at any time.
5. We will be audio recording the session for note-taking purposes only. Audio will be destroyed.
6. Do you have any questions before we begin?

Key Questions

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

The Army Educational Outreach Program (AEOP) is a primary sponsor of URAP. We do these interviews 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 URAP is teaching students about STEM career opportunities in the Army and Department of Defense.**
    - During URAP, did you learn 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 URAP. You are definitely eligible to participate in some of these programs and we need to know if you learned about them during URAP**
    - During URAP, did you learn about any of the outreach programs that the AEOP sponsors? (SMART, NDSEG, URAP, etc.)
    - How did you learn about them?
    - Do you think that you will try to participate in any of those programs?
4. **Tell us about your experiences in URAP this year.**
    - What, specifically do you think you got out of participating in URAP?
    - How do your experiences in URAP compare to your school experiences in STEM?
    - What would you say was the biggest benefit you gained from participating in URAP?
5. **Do you have any suggestions for improving URAP 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 URAP. 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:

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

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

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

2. **We need to understand more about how URAP is helping students know more about STEM career opportunities in the Department of Defense, especially civilian positions.**
    - Have you seen any efforts by URAP to educate participants about the Army, DoD, or careers in the DoD?
    - What strategies seem to be the most effective for URAP students?
    - Do you have any suggestions for helping URAP teach students about careers in the DoD?

The AEOP sponsors a wide range of national STEM outreach programs that these students qualify for.

3. **The AEOP needs to know if URAP is teaching students about the other STEM outreach programs that it sponsors.**
    - First, are you aware of the other programs offered by the AEOP? (e.g., REAP, CQL, SMART, etc)
    - Have you seen any efforts at URAP 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 URAP to help engage underserved or underrepresented groups of adults and youth?
    - What strategies seem to work the best? The worst?
    - Any suggestions for helping URAP reach new populations of adult and youth participants?

5. **What suggestions do you have for improving URAP?**
6. **Last Chance - Have we missed anything? Tell us anything you want us to know that we didn't ask about.**

6 | Appendix D – Apprentice 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

*4. What is your current grade level in school? (select one)(*Required)	
Select one.	
○	College freshman
○	College sophomore
○	College junior
○	College senior
○	Graduate program
○	Choose not to report
○	Other, (specify)::

*5. At which of the following URAP sites did you participate? (Select ONE)(*Required)
Select one.

○	Adams State University
○	Arisona State University, Tempe
○	Auburn University
○	City University of New York
○	Clarkson University
○	Clemson University
○	Duke University
○	Florida International University
○	Harvard University
○	Howard University
○	Johns Hopkins University
○	Louisiana State University
○	Michigan State University
○	North Carolina A&T
○	Northwestern University
○	Oklahoma State University
○	Portland State University
○	Purdue University
○	Rutgers, State University - New Jersey
○	San Jose State University
○	Savannah State University
○	St. John's University, New York
○	Stony Brook University
○	Texas State University
○	Tufts University
○	University of Alabama
○	University of Arizona
○	University of California, Berkeley
○	University of California, Los Angeles
○	University of California, Merced
○	University of Central Florida
○	University of Colorado
○	University of Houston
○	University of Houston, Downtown
○	University of Houston, Victoria
○	University of Kansas Center for Research

○	University of Maryland, College Park
○	University of Massachusetts, Amherst
○	University of Minnesota
○	University of New Hampshire
○	University of North Carolina, Charlotte
○	University of Notre Dame
○	University of Pennsylvania
○	University of Rochester
○	University of South Carolina
○	University of South Florida
○	University of Texas, Arlington
○	Washington State University
○	Western Michigan University
○	Yale University

*6. How often did you do each of the following in STEM classes at school over the past year?(*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 of your own choosing	○	○	○	○	○
*Design my own research or investigation based on my own question(s)	○	○	○	○	○
*Present my STEM reearch 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	○	○	○	○	○

*7. How often did you do each of the following in your Apprenticeship program this year?(*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 of your own choosing	○	○	○	○	○
*Design my own research or investigation based on my own question(s)	○	○	○	○	○
*Present my STEM reearch 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	○	○	○	○	○

*8. 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 brochure	○	○	○	○	○
*My Apprenticeship Mentor	○	○	○	○	○
*Presentations or information shared through the Apprenticeship Program	○	○	○	○	○
*Participation in the Apprenticeship Program	○	○	○	○	○

*9. 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	○	○	○	○	○
*Army Research Office (ARO) website	○	○	○	○	○
*AEOP brochure	○	○	○	○	○
*My Apprenticeship Program mentor	○	○	○	○	○
*Presentations or information shared in the Apprenticeship Program	○	○	○	○	○
*Participation in the Apprenticeship Program	○	○	○	○	○

*10. How SATISFIED were you with the following Apprenticeship Program features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Applying or registering for the program	○	○	○	○	○
*Other administrative tasks (in-processing, network access, etc.)	○	○	○	○	○
*Communicating with your host site organizers	○	○	○	○	○
*The physical location(s) of Apprenticeship Program activities	○	○	○	○	○
*The variety of STEM topics available to you in the Apprenticeship Program	○	○	○	○	○
*Teaching or mentoring provided during Apprenticeship Program activities	○	○	○	○	○
*Amount of stipend (payment)	○	○	○	○	○
*Timeliness of payment (stipend)	○	○	○	○	○
*Research abstract preparation requirements	○	○	○	○	○

*11. How much input did you have in selecting your Apprenticeship Program research project?(*Required)

Select one.

○	I did not have a project
○	I was assigned a project by my mentor
○	I worked with my mentor to design a project
○	I had a choice among various projects suggested by my mentor
○	I worked with my mentor and members of a research team to design a project
○	I designed the entire project on my own

*12. How often was your mentor available to you during the Apprenticeship Program?(*Required)

Select one.

○	I did not have a mentor
○	The mentor was never available
○	The mentor was available less than half of the time
○	The mentor was available about half of the time of my project
○	The mentor was available more than half of the time
○	The mentor was always available

*13. To what extent did you work as part of a group or team during the Apprenticeship Program?(*Required)

Select one.

○	I worked alone (or alone with my research mentor)
○	I worked with others in a shared laboratory or other space, but we work on different projects
○	I worked alone on my project and I met with others regularly for general reporting or discussion
○	I worked alone on a project that was closely connected with projects of others in my group
○	I work with a group who all worked on the same project

*14. How SATISFIED were you with each of the following:(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*My working relationship with my mentor	○	○	○	○	○
*My working relationship with the group or team	○	○	○	○	○
*The amount of time I spent doing meaningful research	○	○	○	○	○
*The amount of time I spent with my research mentor	○	○	○	○	○
*The research experience overall	○	○	○	○	○

*15. The list below includes effective teaching and mentoring strategies. From the list, please indicate which strategies that your mentor(s) used when working with you in the Apprenticeship Program:(*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. Which of the following statements apply to your research experience in the Apprenticeship Program? (Choose ALL that apply)(*Required)

Select all that apply.

☐	I presented a talk or poster to other students or faculty
☐	I presented a talk or poster at a professional symposium or conference
☐	I attended a symposium or conference
☐	I wrote or co-wrote a paper that was/will be published in a research journal
☐	I wrote or co-wrote a technical paper or patent
☐	I will present a talk or poster to other students or faculty
☐	I will present a talk or poster at a professional symposium or conference
☐	I will attend a symposium or conference
☐	I will write or co-write a paper that was/will be published in a research journal
☐	I will write or co-write a technical paper or patent
☐	I won an award or scholarship based on my research

*17. As a result of your apprenticeship 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	○	○	○	○

*18. Which category best describes the focus of your apprenticeship activities?(*Required)

Select one.

○	Science
○	Technology
○	Engineering
○	Mathematics

*19. As a result of your apprenticeship experience, how much did you GAIN in your ability to do each of the following?(*Required)

Select one per row.

If answered, go to question number 21.

	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	○	○	○	○
*Considering different interpretations of data when deciding how the data answer a question	○	○	○	○
*Supporting an explanation for an observation with data from experiments	○	○	○	○
*Supporting an explanation with relevant scientific, mathematical, and/or engineering knowledge	○	○	○	○
*Identifying the strengths and limitations of explanations in terms of how well they describe or predict observations	○	○	○	○
*Defending an argument that conveys how an explanation best describes an observation	○	○	○	○
*Identifying the strengths and limitations of data, interpretations, or arguments presented in technical or scientific texts	○	○	○	○
*Integrating information from technical or scientific texts and other media to support your explanation of an observation	○	○	○	○
*Communicating about your experiments and explanations in different ways (through talking, writing, graphics, or mathematics)	○	○	○	○

*20. As a result of your apprenticeship experience, how much did you GAIN in your ability to do each of the following?(*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 object, process, or system	○	○	○	○
*Using knowledge and creativity to propose a testable solution for a problem	○	○	○	○
*Making a model of an object or system to show 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	○	○	○	○
*Using computer models of an object or system to investigate cause and effect relationships	○	○	○	○
*Considering different interpretations of the data when deciding if a solution works as intended	○	○	○	○
*Organizing data in charts or graphs to find patterns and relationships	○	○	○	○
*Supporting a solution for a problem with data from experiments	○	○	○	○
*Supporting a solution with relevant scientific, mathematical, and/or engineering knowledge	○	○	○	○
*Identifying the strengths and limitations of solutions in terms of how well they meet design criteria	○	○	○	○
*Defend an argument that conveys how a solution best meets design criteria	○	○	○	○
*Identifying the strengths and limitations of data, interpretations, or arguments presented in technical or scientific texts	○	○	○	○
*Integrating information from technical or scientific texts and other media to support your solution to a problem	○	○	○	○
*Communicating information about your design experiments and solutions in different ways (through talking, writing, graphics, or math equations)	○	○	○	○

*21. As a result of your apprenticeship experience, how much did you GAIN in each of the skills/abilities listed below?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Learning to work independently	○	○	○	○
*Setting goals and reflecting on performance	○	○	○	○
*Sticking with a task until it is finished	○	○	○	○
*Making changes when things do not go as planned	○	○	○	○
*Working well with people from all backgrounds	○	○	○	○
*Including others' perspectives when making decisions	○	○	○	○
*Communicating effectively with others	○	○	○	○
*Viewing failure as an opportunity to learn	○	○	○	○

*22. As a result of your apprenticeship 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	○	○	○	○
*Deciding on a path to pursue a STEM career	○	○	○	○
*Sense of accomplishing something in STEM	○	○	○	○
*Feeling prepared for more challenging STEM activities	○	○	○	○
*Confidence to try out new ideas or procedures on my own in a STEM project	○	○	○	○
*Patience for the slow pace of STEM research	○	○	○	○
*Desire to build relationships with mentors who work in STEM	○	○	○	○
*Connecting a STEM topic or field to my personal values	○	○	○	○

*23. AS A RESULT OF YOUR APPRENTICESHIP 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	○	○	○	○	○

*24. After you have participated in your Apprenticeship Program, how far do you want to go in school?(*Required)	
Select one.	
○	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
○	Get a master's degree
○	Get a Ph.D.
○	Get a medical-related degree (M.D.), veterinary degree (D.V.M), or dental degree (D.D.S)
○	Get a combined M.D. / Ph.D.
○	Get another professional degree (law, business, etc.)

*25. 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*
*College - College Qualified Leaders (CQL)	○	○	○	○	○
*College - Undergraduate Research Apprenticeship Program (URAP)	○	○	○	○	○
*College - Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○	○	○	○
*College - National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○	○	○	○
*High School and College - GEMS Near Peer Mentor Program	○	○	○	○	○

*26. How many jobs/careers in STEM did you learn about in your Apprenticeship Program?(*Required)

Select one.

○	None
○	1
○	2
○	3
○	4
○	5 or more

*27. How many Army or Department of Defense (DoD) STEM jobs/careers did you learn about in your Apprenticeship Program?(*Required)

Select one.

○	None
○	1
○	2
○	3
○	4
○	5 or more

*28. 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	○	○	○	○	○

*29. Which of the following statements describe you after participating in the Apprenticeship Program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of URAP*	*Agree - URAP contributed*	*Agree - URAP 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 requirements	○	○	○	○
*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	○	○	○	○

*30. What are the three most important ways that the Apprenticeship Program has helped you?(*Required)	
*Benefit #1:	
*Benefit #2:	
*Benefit #3:	

*31. What are the three ways that the Apprenticeship Program should be improved for future participants?(*Required)	
*Improvement #1:	
*Improvement #2:	
*Improvement #3:	

32. Please tell us about your overall satisfaction with your Apprenticeship Program experience.

7 | Appendix E – Mentor 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

*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 10.)
○	Scientist, Engineer, or Mathematician in training (undergraduate or graduate student, etc.)	(Go to question number 10.)
○	Scientist, Engineer, or Mathematics professional	(Go to question number 10.)
○	Other, (specify)::	(Go to question number 10.)

*8. What grade level(s) do you teach (select all that apply)?(*Required)	
Select all that apply.	
☐	Upper elementary
☐	Middle school
☐	High school
☐	N/A

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

Select all that apply.

If answered, go to question number 11.

☐	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)::
☐	N/A

*10. 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)
○	Other, (specify)::
○	N/A

*11. At which of the following URAP sites did you participate? (Select ONE)(*Required)	
Select one.	
○	Adams State University
○	University of Alabama
○	Arizona State University
○	Children's Hospital of Philadelphia
○	City University of New York
○	Clark Atlanta University
○	Colorado School of Mines
○	Duke University
○	Florida International University
○	Georgia Regents University - Augusta
○	Georgia State University
○	Georgia Tech
○	Louisiana State University
○	Michigan State University
○	North Carolina A&T
○	North Carolina State University
○	Oklahoma State University
○	Purdue University
○	Rutgers, the State University of New Jersey (Camden Campus)
○	Savannah State University
○	Stonybrook University of New York
○	Texas State University
○	N/A

*12. Which of the following BEST describes your role during URAP?(*Required)	
Select one.	
○	Research Mentor
○	Research Team Member but not a Principal Investigator (PI)
○	Other, (specify)::

13. How many URAP students did you mentor this year?
_____ students.

*14. How did you learn about URAP? (Check all that apply)(*Required)	
Select all that apply.	
☐	Army Research Office (ARO) website
☐	Academy of Applied Science (AAS)
☐	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 HSAP participant
☐	A student
☐	A colleague
☐	My supervisor or superior
☐	A URAP site host or director
☐	Workplace communications
☐	Someone who works with the Department of Defense (Army, Navy, Air Force)
☐	Other, (specify): _____

*15. 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)	○	○	○	○	○
*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	○	○	○	○	○

*16. Which of the following were used for the purpose of recruiting your student(s) for apprenticeships? (select ALL that apply)(*Required)

Select all that apply.

☐	Applications from Army Research Office (ARO) or the AEOP
☐	Personal acquaintance(s) (friend, family, neighbor, etc.)
☐	Colleague(s) in my workplace
☐	K-12 school teacher(s) outside of my workplace
☐	University faculty outside of my workplace
☐	Informational materials sent to K-12 schools or Universities outside of my workplace
☐	Communication(s) generated by a K-12 school or teacher (newsletter, email blast, website)
☐	Communication(s) generated by a university or faculty (newsletter, email blast, website)
☐	STEM or STEM Education conference(s) or event(s)
☐	Organization(s) that serve underserved or underrepresented populations
☐	The student contacted me (the mentor) about the program
☐	I do not know how student(s) were recruited for HSAP
☐	Other, (specify)::

*17. How SATISFIED were you with the following URAP features?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Application or registration process	○	○	○	○	○
*Other administrative tasks (in-processing, network access, etc.)	○	○	○	○	○
*Communicating with Army Research Office (ARO)	○	○	○	○	○
*Communicating with URAP organizers	○	○	○	○	○
*Support for instruction or mentorship during program activities	○	○	○	○	○
*Stipends (payment)	○	○	○	○	○
*Research abstract preparation requirements	○	○	○	○	○
*Communicating with Academy of Applied Science (AAS)	○	○	○	○	○

*18. 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 student(s) in URAP.(*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 URAP 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 URAP	○	○

*19. 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 student(s) in URAP.(*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 URAP 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	○	○

*20. 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 student(s) in URAP.(*Required)
Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Having my student(s) tell other people about their backgrounds and interests	○	○
*Having my student(s) explain difficult ideas to others	○	○
*Having my student(s) listen to the ideas of others with an open mind	○	○
*Having my student(s) exchange ideas with others whose backgrounds or viewpoints are different from their own	○	○
*Having my student(s) give and receive constructive feedback with others	○	○
*Having students work on collaborative activities or projects as a member of a team	○	○
*Allowing my student(s) to resolve conflicts and reach agreement within their team	○	○

*21. 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 student(s) in URAP.(*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 my student(s) search for and review technical research to support their work	○	○
*Demonstrating laboratory/field techniques, procedures, and tools for my student(s)	○	○
*Supervising my student(s) while they practice STEM research skills	○	○
*Providing my student(s) with constructive feedback to improve their STEM competencies	○	○
*Allowing students to work independently to improve their self-management abilities	○	○
*Encouraging students to learn collaboratively (team projects, team meetings, journal clubs, etc.)	○	○
*Encouraging students to seek support from other team members	○	○

*22. This list describes mentoring strategies that are effective ways to support students' STEM educational and career pathways. The list also includes items that reflect AEOP and Army priorities. From this list, please indicate which strategies you used when working with your student(s) in URAP.(*Required)

Select one per row.

	Yes - I used this strategy	*No - I did not use this strategy*
*Asking my student(s) about their educational and/or career goals	○	○
*Recommending extracurricular programs that align with students' goals	○	○
*Recommending Army Educational Outreach Programs that align with students' goals	○	○
*Providing guidance about educational pathways that will prepare my student(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 students build a professional network in a STEM field	○	○
*Helping my student(s) with their resume, application, personal statement, and/or interview preparations	○	○

*23. How useful were each of the following in your efforts to expose student(s) to Army Educational Outreach Programs (AEOPs) during URAP?(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Research Office (ARO) website	○	○	○	○	○
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP brochure	○	○	○	○	○
*URAP Program administrator or site coordinator	○	○	○	○	○
*Invited speakers or "career" events	○	○	○	○	○
*Participation in URAP	○	○	○	○	○

*24. How USEFUL were each of the following in your efforts to expose your student(s) to Department of Defense (DoD) STEM careers during URAP.(*Required)

Select one per row.

	Did not experience	*Not at all*	*A little*	*Somewhat*	*Very much*
*Army Research Office (ARO) website	○	○	○	○	○
*Army Educational Outreach Program (AEOP) website	○	○	○	○	○
*AEOP on Facebook, Twitter, Pinterest or other social media	○	○	○	○	○
*AEOP brochure	○	○	○	○	○
*HSAP Program administrator or site coordinator	○	○	○	○	○
*Invited speakers or "career" events	○	○	○	○	○
*Participation in URAP	○	○	○	○	○

*25. Which of the following AEOPs did YOU EXPLICITLY DISCUSS with your student(s) during URAP? (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)*
*College Qualified Leaders (CQL)	○	○
*GEMS Near Peer Mentor Program	○	○
*Science Mathematics, and Research for Transformation (SMART) College Scholarship	○	○
*National Defense Science & Engineering Graduate (NDSEG) Fellowship	○	○
*I discussed AEOP with my student(s) but did not discuss any specific program	○	○

*26. 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	○	○	○	○	○

*27. How often did YOUR STUDENT(S) have opportunities to do each of the following in URAP?(*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 of their own choosing	○	○	○	○	○
*Design their own research investigation based on their own questions	○	○	○	○	○
*Present their STEM research to a panel of judges from industry or the military	○	○	○	○	○
*Interact with STEM researchers	○	○	○	○	○
*Use laboratory or field techniques, 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	○	○	○	○	○

*28. AS A RESULT OF THEIR URAP EXPERIENCE, how much did your student(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	○	○	○	○

*29. Which category best describes the focus of your student(s) URAP activities?(*Required)		
Select one.		
○	Science	(Go to question number 30.)
○	Technology	(Go to question number 31.)
○	Engineering	(Go to question number 31.)
○	Mathematics	(Go to question number 31.)

*30. AS A RESULT OF THEIR URAP EXPERIENCE, how much did your student(s) GAIN in their abilities to do each of the following?(*Required)
Select one per row.
If answered, go to question number 32.

	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	○	○	○	○
*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	○	○	○	○
*Using computer models of objects or systems to test cause and effect relationships	○	○	○	○
*Organizing data in charts or graphs to find patterns and relationships	○	○	○	○
*Considering different interpretations of data when deciding how the data answer a question	○	○	○	○
*Supporting an explanation for an observation with data from experiments	○	○	○	○
*Supporting an explanation with relevant scientific, mathematical, and/or engineering knowledge	○	○	○	○
*Identifying the strengths and limitations of explanations in terms of how well they describe or predict observations	○	○	○	○
*Defending an argument that conveys how an explanation best describes an observation	○	○	○	○
*Identifying the strengths and limitations of data, interpretations, or arguments presented in technical or scientific texts	○	○	○	○
*Integrating information from technical or scientific texts and other media to support your explanation of an observation	○	○	○	○
*Communicating about your experiments and explanations in different ways (through talking, writing, graphics, or mathematics)	○	○	○	○

*31. **AS A RESULT OF THEIR URAP EXPERIENCE, how much did your student(s) GAIN in their ability to do each of the following?**(*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 object, process, or system	○	○	○	○
*Using knowledge and creativity to propose a testable solution for a problem	○	○	○	○
*Making a model of an object or system to show 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	○	○	○	○
*Using computer models of an object or system to investigate cause and effect relationships	○	○	○	○
*Considering different interpretations of the data when deciding if a solution works as intended	○	○	○	○
*Organizing data in charts or graphs to find patterns and relationships	○	○	○	○
*Supporting a solution for a problem with data from experiments	○	○	○	○
*Supporting a solution with relevant scientific, mathematical, and/or engineering knowledge	○	○	○	○
*Identifying the strengths and limitations of solutions in terms of how well they meet design criteria	○	○	○	○
*Defend an argument that conveys how a solution best meets design criteria	○	○	○	○
*Identifying the strengths and limitations of data, interpretations, or arguments presented in technical or scientific texts	○	○	○	○
*Integrating information from technical or scientific texts and other media to support your solution to a problem	○	○	○	○
*Communicating information about your design experiments and solutions in different ways (through talking, writing, graphics, or math equations)	○	○	○	○

*32. AS A RESULT OF THE URAP EXPERIENCE, how much did your student(s) GAIN (on average) in the skills/abilities listed below?(*Required)

Select one per row.

	No gain	*Small gain*	*Medium gain*	*Large gain*
*Learning to work independently	○	○	○	○
*Setting goals and reflecting on performance	○	○	○	○
*Sticking with a task until it is finished	○	○	○	○
*Making changes when things do not go as planned	○	○	○	○
*Including others' perspectives when making decisions	○	○	○	○
*Communicating effectively with others	○	○	○	○
*Confidence with new ideas or procedures in a STEM project	○	○	○	○
*Patience for the slow pace of research	○	○	○	○
*Desire to build relationships with professionals in a field	○	○	○	○
*Connecting a topic or field with their personal values	○	○	○	○

*33. Which of the following statements describe YOUR STUDENT(S) after participating in the URAP program?(*Required)

Select one per row.

	Disagree - This did not happen	*Disagree - This happened but not because of URAP*	*Agree - URAP contributed*	*Agree - URAP 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	○	○	○	○

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

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

36. Please tell us about your overall satisfaction with your URAP experience.

8 | Appendix E – 21st Century Skills Rubric

*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 | AAS/ARO Response to FY17 Evaluation Report

While REAP specifically targets underrepresented populations, URAP will continue to work with the REAP Administrator to learn best practices for reaching and recruiting diverse participants. URAP will market to those groups to increase the number of underrepresented applicants.

Additionally, URAP will continue to communicate to PIs/Mentors the AEOP priority of growing the diversity pool of STEM talent and encourage them to make efforts to select qualified underrepresented applicants (during their application review process) to participate in the limited number of URAP opportunities. URAP has communicated the selection of underrepresented participants as an AEOP priority to PIs/Mentors during the FY 18 RFP Kickoff email, will communicate the same to the PI/Mentor in the URAP welcome email and will include as an item in the PI/Mentor best practices document.

During FY 17 a Meet & Greet was developed and implemented at several universities where students and mentors came together to talk about their experiences and learn about other AEOP programs. We will expand this effort in FY 18 and will include discussion of other AEOP opportunities as an item in the PI/Mentor best practices with roles and responsibilities document. Additionally, URAP will share available AEOP quick reference programs overview fliers and brochures with PI/Mentors to further facilitate their AEOP discussions with students.

In FY 18 URAP will consult with Metriks and Widmeyer to make a coordinated effort to drive URAP participants and mentors to AEOP social media and website. URAP will ensure that all AEOP promotional material, program information and correspondence is branded with social media and website links/web addresses.

ARO will continue to work with AAS to finalize and distribute a written communication plan to PIs/Mentors in an effort to standardize and improve the delivery of information from the program leadership, program requirements, etc. to the PIs/mentors and site directors.

URAP will work with AAS to promote the CQL, SMART and NDSEG opportunities by including information in current promotional and marketing activities. Additionally, in FY 18 URAP will explore ways to leverage the Alumni Association to promote other college level opportunities to URAP students.