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ARMY EDUCATIONAL OUTREACH PROGRAM

RESET

2018 Annual Program Evaluation Report

June 2019

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ARMY EDUCATIONAL OUTREACH PROGRAM

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3 | Introduction

The Army Educational Outreach Program (AEOP) vision is to offer a collaborative and cohesive portfolio of Army sponsored science, technology, engineering and mathematics (STEM) programs that effectively engage, inspire, and attract the next generation of STEM talent through K-college programs and expose participants to Department of Defense (DoD) STEM careers. The consortium, formed by the Army Educational Outreach Program Cooperative Agreement (AEOP CA), supports the AEOP in this mission by engaging non-profit, industry, and academic partners with aligned interests, as well as a management structure that collectively markets the portfolio among members, leverages available resources, and provides expertise to ensure the programs provide the greatest return on investment in achieving the Army's STEM goals and objectives.

AEOP Priorities

Goal 1: STEM Literate Citizenry. Broaden, deepen, and diversify the pool of STEM talent in support of our defense industry base.

Goal 2: STEM Savvy Educators. Support and empower educators with unique Army research and technology resources.

Goal 3: Sustainable Infrastructure. Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army.

This report documents the evaluation of one of the AEOP elements, the Research Experiences for STEM Educators and Teachers (RESET). The evaluation study was performed by Purdue University in cooperation with Battelle, the Lead Organization (LO) in the AEOP CA consortium.

Program Overview

Research Experiences for STEM Educators and Teachers (RESET) is sponsored by the U.S Army and managed by Tennessee Technical University (Tennessee Tech). Launched in 2016, RESET provides STEM educators (referred to as "participants" or "teachers" throughout this report) with online learning opportunities and summer research experiences at participating Army laboratories and research centers. The goal of this program is to reinforce teachers' content knowledge through research experiences and interactions with Army and Department of Defense scientists and engineers. Selected teachers participate in on-line learning as cohorts, with a subset of the cohorts selected to conduct research on-site with mentor Army scientists or engineers. The first part of the collaborative online learning module (Level I), called Introduction to Research, is conducted over 30 hours during the span of a month. A subset of the online-learning cohort, Level II participants, travel to Army research laboratories to conduct research with Army scientist or engineers for four weeks (160 hours) of mentored experiential learning. While at the labs, Level II participants stay in touch with the initial cohort and share what they are learning. At the end

of the summer, the full cohort reconvenes online for another 30 hours to collaboratively translate their knowledge and experience into enhanced STEM curricula and enriched learning experiences for students. Teachers who have completed Level II activities are eligible to act as Level III facilitators of the online component of RESET.

In FY18, 20 teachers participated in the online component of RESET and 7 of these teachers participated in Level II on-site research experiences. Table 1 summarizes participant demographics and Table 2 provides an overview of participating Army/DoD sites.

Table 1. 2018 RESET Participant Profile

Demographic Category	Number	%
Participant Gender (n =20)		
Female	15	75%
Male	5	25%
Participant Race/Ethnicity (n =20)		
Asian	1	5%
Black or African American	6	30%
Hispanic or Latino	2	10%
Native American or Alaska Native	0	0%
Native Hawaiian or Other Pacific Islander	0	0%
White	10	50%
Other race or ethnicity, (specify):[†]	0	0%
School Setting (n =20)		
Urban (city)	7	35%
Suburban	6	30%
Rural (country)	4	20%
Frontier or tribal School	0	0%
DoDDS/DoDEA School	1	5%
Home school	0	0%
Online school	0	0%

Table 2. 2018 RESET Sites		
Command and Laboratory		**Location**
U.S. Army Corps of Engineers (USACE)	U.S. Army Corps of Engineers Engineer Research and Development Center Construction Engineering Research Lab	Champaign, IL
U.S. Army Corps of Engineers (USACE)	U.S. Army Corps of Engineers Engineer Research and Development Center Environmental Laboratory	Vicksburg, MS
U.S. Army Combat Capabilities Development Command (CCDC)	U.S. Army Comabt Capabilities Development Command (CCDC) C5ISR Center	Aberdeen, MD
U.S. Army Combat Capabilities Development Command (CCDC)	U.S. Army Combat Capabilities Development Command (CCDC) Armaments Center	Picatinny, NJ

Table 3 summarizes RESET costs for 2018. In FY18 the total cost for RESET was $141,964 including a $7,098 cost per participant.

Table 3. 2018 RESET Program Costs	
2018 RESET– Summative Cost Breakdown	
Administrative Costs (salaries, fringe, indirect, cost share)	$48,505
Teacher Stipends and travel	$79,860
Travel	$5,137
Other costs	$8,462
Total Cost	**$141,964**
No. of Participants (Registered)	20
Cost per Participant	**$7,098**

4 | Evaluation At-A-Glance

Purdue University collected the FY18 evaluation data for the RESET program. The RESET logic model below presents a summary of the expected outputs and outcomes for the RESET program in relation to the AEOP priorities. This logic model provided guidance for the overall RESET evaluation strategy.

Inputs	Activities	Outputs	Outcomes (Short term)	Impact (Long Term)
• Operations conducted by Tennessee Tech University and DoD partners • Development of online learning modules and partnership with Army labs • Centralized branding and comprehensive marketing • Centralized evaluation	• STEM educators participating in online learning cohorts • STEM educators learn to use the Legacy Cycle to structure students' active learning and research • STEM educators participate in research experiences in Army labs • Program activities that expose STEM educators to AEOP programs and STEM careers in the Army or DoD	• Number and diversity of STEM educators engaged in programs • Number of schools served through educator engagement • Army labs hosting educators for research experiences	• Increased educator proficiency in STEM teaching • Application of participant learning to teaching practices • Increased participant awareness of AEOP opportunities • Increased participant awareness of DoD STEM research and careers • Implementation of evidence-based recommendations to improve RESET programs	• Increased student learning and engagement in STEM • Increased teacher and student participation in AEOP and DoD-sponsored programs • Increased student pursuit of STEM coursework in secondary and post-secondary schooling • Increased student pursuit of STEM degrees • Increased student pursuit of STEM careers • Increased student pursuit of DoD STEM careers • Continuous improvement and sustainability of RESETS

Since 2018 was the third year of RESET operations, the first year in which all three levels of participation (Levels I, II, and III) were represented, the evaluation employed a formative approach, focusing on gathering descriptive information about RESET processes, resources, and activities and on understanding individual participants' perspectives about the program. These data were correlated with overall AEOP objectives. The assessment strategy for RESET included 7 interviews with RESET participants as well as program information from RESET administrators. Table 4 outlines the information collected in interviews and Table 5 summarizes the information provided by program administrators.

Table 4. 2018 Participant Interviews	
Category	**Description**
Profile	Teaching experience, type of participation in RESET (online only or online plus research experience)
Satisfaction & Suggestions	Value of RESET to participants and suggestions for improving RESET program components
AEOP Goals 2 and 3 - Program Efforts	Extent to which participants were exposed to other AEOP opportunities
	Extent to which participants were exposed to STEM and Army/DoD STEM jobs
	Extent to which participants were exposed to Army/DoD research and resources
	Benefits to participants, suggestions for improving programs, overall satisfaction

Table 5. 2018 Administrator-provided Information	
Category	**Description**
Program	Description of course content and activities
AEOP Goals 1,2, and 3	Data on participant demographics and school settings
	Description of program activities; Participation of Army research facilities in activities
	Description of collaboration with other AEOPs
Program Efforts Program	Description of course content and activities

Information about evaluation methods are described in Appendix A, the evaluation plan. The reader is strongly encouraged to review Appendix A to clarify how data are summarized, analyzed, and reported in this document. The participant interview protocol is provided in Appendix B.

Study Sample

A subset of 7 participants was chosen from the overall population of 20 RESET participants to participate in telephone interviews. Interviews were not intended to yield generalizable findings; rather they were intended to provide a descriptive narrative of RESET's efforts and impacts in its second year of operation and to highlight areas for future exploration in programming and evaluation.

5 | Priority #1 Findings

Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base

RESET participants interviewed had between 9 and 34 years of teaching experience. Five participants were female, and two were male. Two participants taught middle school science, 4 taught high school science (biology and/or chemistry), and 1 taught high school computer science. Two of the teachers interviewed were Level I RESET participants who had participated in only the online portion of the program, 3 of the teachers were part of the Level II cohort and had recently participated in hands-on experiences at Army labs or research facilities, and 2 were Level III facilitators who had previously participated in hands-on experiences and were now facilitating the online portion of the program.

Two of the interview participants indicated that they believed that RESET should recruit more broadly for program participants or provide more outreach in order to reach a more geographically diverse population of teachers. One of the Level III facilitators commented, "I think it's a little bit harder to try to recruit new participants…[funding] has been a struggle [since] the deadlines for certain things that happen for educators happen earlier [than the RESET funding cycle]. The other, Level II, teacher who commented on this issue echoed this, saying "Maybe if the application process could be done sooner…Some of it just saw it at the last minute and applied…all of my teacher friends, they had no idea what [RESET] was…I think that getting the voice out there more, maybe going to visit some different science curriculum directors [would be an improvement]." These comment suggests that broadening the pool of teachers participating in RESET may be hampered by the mismatch between school district and RESET funding cycles.

6 | Priority #2 Findings

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

Interview participants all had positive comments about their RESET experiences along with various suggestions for program improvement. Teachers' comments spanned a variety of features of program features, and focused on the overall value of RESET within both their research experiences, their experiences as RESET facilitators, and their experiences in the online component of the program.

Teachers cited a number of benefits of RESET participation. Their comments focused on the value of learning about research, connecting with other teachers and professionals, and their learning about using research in their own classrooms.

Research Experiences and Facilitator Experiences

All teachers who had participated in Level II commented favorably about their research experiences. The following participant comments were typical of those made by teachers about their on-site experiences:

> "It was a very meaningful, collaborative experience. [My mentor] was just an amazing mentor that taught me from the ground up, what I needed to do." (RESET Level II Participant)

> "[The lab experience] exceeded my expectations. Everyone that I worked with there, every research biologist or my team leader, they were all so incredibly helpful and also let me get involved so that I could really experience the projects that they were working on." (RESET Level II Participant)

Teachers also cited more specific benefits of their laboratory experience, including the exposure to advanced technology, learning about real-world research methodologies and processes, and networking with scientists and researchers. For example,

> "It was a really good opportunity to network and build a rapport with the scientists that were there, because sometimes that's difficult to do. We're on different levels, sometimes, with thinking." (RESET Level II Participant)

> “being exposed to all of the technology and the things that the Army Research Labs are doing has been very eye-opening. It's allowed me to bring those experiences back to my classroom to my students. It has greatly benefited me both professionally in my classroom and me as a professional educator.” (RESET Level III Participant)

> “I have a master's in education. I don't have a master's in biology. I didn't have that research component, so that's really helped me understand how to lead my students. It's also the story that I could share with not only my students, but with other teachers that are aspiring to do things with their students.” (RESET Level III Participant)

Three teachers commented that the timing of RESET funding means that Level II participants must use their own funds for travel to remote Army research facilities and that channels of communication about logistical issues related the on-site experience was unclear. As one teacher said,

> “Even with paying the money upfront for the program, I had to buy the plane tickets, the rental car and then pay for the motel for a month and that's a huge chunk of my money. It was like, ‘I don't even know if I'm going to get reimbursed’. A lot of the communication wasn't really there and who to communicate to, and who's who. [RESET Level II Participant]

Several teachers commented on ways that they would incorporate their research experiences into their classrooms and three participants indicated that they were eager to share their experiences with other educators. One teacher reported that she took pictures during her lab experience to share with students when they do similar labs in class. For example:

> “For 15 years of teaching science I didn't do a lot of experimenting and stuff, but now I feel like I have a whole new understanding of how to apply those real life laboratory skills right here in my classroom.” [RESET Level II Participant]

> “I'm teaching Chemistry, [and I’ll] be focusing on skills specific to my project concerning dilutions [and] conversions. I've already started recruiting students to do some authentic research, plug them into eCYBERMISSION, plug them into the Junior [Science and] Humanities Symposium; In my district, no one's really heard of AEOP or RESET, and so [I’m] going out there and talking to teachers, saying, "Hey, do you have time this summer? Is this something you would like to do?" [RESET Level II Participant]

> “[RESET] allowed me to network and make contacts with scientists that have connected with my students.” [RESET Level III Participant]

One Level III participant (facilitator) cited the benefit of developing leadership skills in her role as facilitator. She said,

> "It has greatly benefited me both professionally in my classroom and me as a professional educator. It's allowed me to step into leadership positions within my district and kind of encouraged me and given me a little bit of confidence that I might have lacked at other times." [RESET Level III Participant]

Another Level III participant focused on the value of connecting teachers to each other through the online component of the program, saying,

> "I've enjoyed doing work with people in Texas or California. You get a different perspective, because you get an idea of what they're doing in their classrooms. [RESET is] bigger than just learning Legacy Cycle online. It becomes more of a community of teachers." [RESET Level III Participant]

Online Component

Teachers who participated in only the online component of RESET also commented favorably on their experiences, and indicated that they would apply their learning in their own classrooms. One, a computer science teacher, has planned a student research activity for students to propose ways to increase the speed of their computers based upon the research process he learned in RESET. The other online-only participant plans to use the research skills she gained to work with students to institute a research project using data collected as part of an ongoing environmental project her school participates in.

The two Level I RESET participants cited the opportunity to connect with other educators and learning about research and research methodologies as benefits of RESET.

Teachers made a variety of comments about the online components of RESET. These comments ranged from general affirmation of their experiences such as "I can rate it ten out of ten…it was a great experience for me" (RESET Level I Participant) to comments indicating that there is need for clearer communication, organization, consistency and structure throughout the online portions of RESET. For example,

> "The first section of [the online component of RESET] went very well. Highly organized, clear goals and information. We knew exactly what we were supposed to be doing and when we were supposed to do it. I felt that was a stellar representation of how professional development should be managed. On the flip side, I have been anxiously and nervously awaiting the start of the second portion. We got no information whatsoever about when and what we were going to be doing. We just met last week for the first time and they're being back to school already. Now it's like you can go do your project. I was failing this lab because I thought we were going to have July to work on it. I'm a little bit unhappy about that portion; I don't have any idea what the third portion will be like since we haven't seen anything about it." [RESET Level I Participant]

> "Each time you went [online for RESET] - I wasn't able to go on the same time each week - I saw different facilitators, different people that logged on. It was a little bit chaotic. I think a lot of it is

> the deadlines or the dates provided weren't concrete either. I'll be waiting along for something, then it just never happens. Then two weeks later, we now hear something. Last minute, I'll hear something - just disorganized." [RESET Level II Participant]

One teacher (Level II) who had been assigned to work with a Level I teacher online to create a lesson plan, indicated that providing information early on about the expectations for the structure of the lesson plan would be useful. A Level III interview participant addressed some of the changes in the program that have been made to meet the needs of teachers. She pointed out that the online component has been moved to Google Classrooms, a platform most teachers are familiar with, and that the 5E model is being instituted for lesson plans rather than the Legacy Cycle. She noted,

> "This program has grown and changed to try to meet the needs of the educators. That's really important, especially when you talk about education across the nation, because everybody does different lesson plans...The online component, I think it has grown this year. I'm not saying it's perfected. It wasn't perfect the first year or the second year, but it's much more in line. Next year, it's really going to be a lot easier to implement. It'll be more streamlined. It's still a work in progress." [RESET Level III Participant]A Level III participant noted changes that

Suggested Improvements

RESET participants were asked in the interviews to share their ideas about ways that the program could be improved in the future. Teachers offered the following suggestions for program improvement:

- Lengthen the duration of online meetings (more than 1 hour per week)
- Speed up/move up the timing of the application process so that teachers can plan better
- Adjust the funding structure/schedule so that teachers going to Army research facilities do not need to use their own money up front
- Provide funds for teachers who want to repeat the on-site research experience
- Provide a way for Army S&E RESET mentors to partner with teacher in their communities
- Enhance the organization of the online portion of the program (see quote above in the Online Component section)
- Improve communication (see quotes above in the Research Experiences and Online Component sections)
- Provide on-site contact at hosting Army research facilities to assist with logistics of on-site research experiences
- Provide structure for the lesson plan to be completed in the online component (see quote above in the Online Component section)
- Enhance recruitment/outreach efforts to broaden the pool of participants

- Provide means for teachers to take students to participating Army research facilities after teachers have completed their on-site RESET experiences

6 | Priority #3 Findings

Develop and implement a cohesive, coordinated and sustainable STEM education outreach infrastructure across the Army.

Awareness of STEM Careers in the Army or DoD and Other AEOP Initiatives

In alignment with the AEOP goal to create a pipeline of programs that attracts a diverse group of students and to provide information about STEM careers in the Army or DoD, interview participants were asked to comment on the knowledge they gained about other AEOPs and about STEM careers in the Army or DoD during their RESET experiences.

Five of the 7 interview participants indicated that they had learned about STEM careers in the Army or DoD during their RESET experiences. Of these, 3 teachers reported that their knowledge of STEM careers came from their onsite experiences at Army labs rather than through the online portion of the program. One participant reported that Level II participants who had been to labs were "highly encouraged" to share career information from those experiences with Level I participants, and it is important to note that some teachers had not yet completed the final online portion of RESET. One Level III facilitator reported that,

> "When we meet again to follow up with the Module 2 RESET members, there is a stress on careers. Especially when we're developing our lesson plans, there's a component within that lesson plan that asks you to include the career opportunities."

All but one interview participant were aware of other AEOPs. Two Level II participants reported that their knowledge of other AEOPs came from their on-site experiences at sites that hosted GEMS and SEAP apprentices. Four others indicated that they had learned about other AEOPs via emails or through program-related materials. The one participant who was not familiar with other AEOPs did indicate that he may have received emails with information about AEOPs that he had not read.

Summary of Findings

The following is summary of findings from the FY18 RESET evaluation, with findings aligned to the 3 AEOP key priorities:

1. Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base
2. Support and empower educators with unique Army research and technology resources
3. Develop and implement a cohesive, coordinated and sustainable STEM education outreach infrastructure across the Army.

AEOP Priority: Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base

RESET participants were primarily female (75%). Half of participants (50%) were White, although it is notable that in 2018 30% of participants were Black or African American compared with only 11in 2017 and 20% in 2016. Slightly fewer participants were Hispanic Latino than in 2017 (10% in 2018 compared to 16% in 2017 and 0% in 2016). These teachers represented 20 different K-12 schools, 7 of which were Title I status schools (compared to 10 in 2017). About a third of teachers came from urban schools (35% in 2018 compared to 37% in 2017 and 50% in 2016). Slightly fewer came from suburban schools (30% in 2018 compared to 47% in 2017, and 20% in 2016). Another 20% came from rural schools (compared to 16% in 2017 and 30% in 2016).

The number of full applications received (27) and total enrollment (20) were similar to 2017 when 25 full applications were received and 19 teachers enrolled.

AEOP Priority: Support and empower educators with unique Army research and technology resources

Teachers interviewed all had positive feedback about their RESET experiences and were able to articulate ways that they would apply their learning, both from the online portion of the program and the on-site portion, in their classrooms. In contrast to 2017 findings, when teachers' comments about applying their learning to their classrooms focused primarily on procedure, nearly all teachers shared how they would apply their learning in specific, content-related ways. The exception to this was the teachers who taught at the middle school level; these participants indicated that their classroom application would be primarily procedural, through implementing the engineering design process and research skills.

Teachers also valued the community-building aspect of RESET. Teachers valued the opportunity to share ideas and challenges about their classroom practice, and gained insight and ideas from their work with other teachers in the online component of the program. In addition, one participants' comments about

her experience as a Level III facilitator indicated that this experience was valuable in building leadership skills in the teaching community. This may be an important phenomenon as these teachers return to their own practice settings and are able to share their RESET learning with teachers outside the program.

Interview participants who had participated in on-site experiences all had positive things to say about these experiences. In particular, several reported that this was a unique experience in terms of gaining research skills that they had not gained through their prior educational experiences and networking with research professionals. All were enthusiastic about sharing details of their experiences with their students, and even connecting their students to Army S&Es for mentoring and support. The improvements suggested for the on-site component of the program focused on logistical issues and funding, with teachers asking for assistance in navigating logistical issues (e.g., details such as recommended hotels, safety of the local area, and ways to connect to on-site personnel in advance) and suggesting that funding for travel and lodging be provided up-front, instead of as a reimbursement.

Several benefits of the online component of RESET were also noted. These included the value of the community of teachers, learning about research methodologies, and information about how to apply their learning in their practice settings. Participants' suggestions for improved included lengthening the duration of the weekly online meetings and improving communication and organization.

AEOP Priority: Develop and implement a cohesive, coordinated and sustainable STEM education outreach infrastructure across the Army

Findings regarding RESET's communication about STEM careers in the Army and DoD were influenced by the fact that the interviews were conducted before teachers had participated in the third and final online portion of the program. Since a facilitator noted that this was the portion of the program in which these career connections would be introduced, it is not surprising that some participants reported not having received this information from RESET. It is noteworthy, however, that most participants had some familiarity with STEM careers in the Army or DoD either through their onsite experiences or through information they accessed online.

Similarly, teachers reported learning about other AEOPs primarily through their on-site experiences or through emails or the AEOP website. Although participant reference to emails indicate that they received information about AEOPs from the RESET program, it was not clear from interviews whether this information was to also be included in the third portion of the online component of RESET. Since, there is substantial opportunity for RESET teachers to disseminate information about RESET and other AEOPs within their own school settings, the program should ensure that information about AEOPs, particularly those directly related to student research, such as JSHS, is emphasized in program instruction.

Responsiveness to FY17 Evaluation Recommendations

The primary purpose of the AEOP program evaluation is to serve as a vehicle to inform future programming and continuous improvement efforts with the goal of making progress toward the AEOP priorities. In previous years the timing of the delivery of the annual program evaluation reports has precluded the ability of programs to use the data as a formative assessment tool. However, beginning with the FY17 evaluation, the goal is for programs to be able to leverage the evaluation reports as a means to target specific areas for improvement and growth.

Evaluation findings from FY17 made are highlighted along with a summary of efforts and outcomes reflected in the FY18 APR toward these areas.

AEOP Priority: Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base

FY17 Recommendation: The program should continue to expand its marketing and outreach efforts to broaden the pool of applicants.

RESET FY18 Efforts and Outcomes: Not specifically addressed in the FY18 APR. Feedback received from the program in June 2019:

- The IPA and two-Level II educators participated in a national science educators annual meeting to promote the RESET project and to encourage educators to apply.
- The IPA sent emails to STEM organizations and networks to post information about RESET project.
- The IPA used social media tools to promote the RESET project and to encourage applications.

FY17 Recommendation: Participants' comments about the mismatch between the RESET application funding cycle and educators' school year cycles suggest that providing earlier access to applications may broaden the pool of interested applicants. In addition, providing funding for Level II expenses associated with travel and lodging on an earlier cycle will make the Level II experience more accessible to a broad range of teachers, regardless of their ability to pay up front for significant travel and living expenses associated with the on-site experiences.

RESET FY18 Efforts and Outcomes: Not specifically addressed in the FY18 APR. Feedback received from the program in June 2019:

- The mismatch between RESET application cycle and educators' school year was addressed by opening the application process in November and leaving it open until February.
- The application for Level I and Level II was separated in CVENT in order to encourage more completers of applications. The Level I application was simplified to request fewer appended materials and the Level II remained more detailed with continued use of prior application format that required the appended files of full educator CV and a sample lesson plan.
- Level II travel funding cannot be provided in advance per the guidelines of the institution managing the funds (Tennessee Technological University). Pre-travel funds are only allowed for employees and these educators are not employees of the institution, rather they are "participants" and funding guidelines indicate they receive reimbursement at CONUS rates.
- The documentation has been improved to indicate that Level II participants MUST be able to pay for their own travel up-front and that they will be reimbursed at CONUS rates. They must indicate in the application that they understand and accept this responsibility.

AEOP Priority: Support and empower educators with unique Army research and technology resources

FY17 Recommendation: Participants' comments indicating that they felt unsure of how to translate the content of their research experiences into classroom practice suggest a need for more focus on this translation in the online component of the program following teachers' on-site research experiences. This should include additional program scaffolding of teachers' creation of lesson plans. This scaffolding could take place through group discussion, providing examples of lesson plans based upon research experiences, critical examination of Next Generation Science Standards, and mentorship. In particular, once there are sufficient numbers of teachers who have completed the on-site experience, these teachers can serve as mentors to teachers as they prepare for and write lesson plans based upon their on-site experiences.

RESET FY18 Efforts and Outcomes: Not specifically addressed in the FY18 APR. Feedback received from the program in June 2019:

- The Module 2 on-line materials have been modified to address the use of prior examples of how an educator can incorporate a research experience into a lesson plan.
- The facilitation role of the Level III peer mentors has been used to improve the articulation of working examples of how experiences in a research lab can be used to enhance classroom instruction.
- The scaffolding of lesson plan creation has taken place by on-line support via discussion of steps in both creation of lesson plans and consideration of SWOT (strengths, weaknesses, opportunities, and threats) analysis in the potential implementation of the lesson plan. A reflection exercise of

what might occur during first implementation is then used to help improve the lesson plan with participation and feedback from the full writing team of the lesson plan.

FY17 Recommendation: There is continued need for improved communication between program coordinators and participants. In particular, the program should provide ways for Level II participants to access logistical support, perhaps through connecting them with past Level II participants and/or on site contacts.

RESET FY18 Efforts and Outcomes:

- In FY18, the IPA has made a more concerted effort to communicate with the mentors and to establish what labs would be able to host Level II participants. A separate mentor application form was developed and implemented for CVENT, and the link to the form was distributed with email notification to prior mentors who served in FY16 and FY17.
- In FY18 not much progress was made in moving the timeline earlier to identify the Level II participants and the mentors, since each group was late in completing applications. The ability to match educators with their optimal mentor and/or Army lab location relied on the IPA's experience in looking for key words in the applicants' file and in the mentors' descriptions of potential projects.
- Communications with mentors about their role is important, and while RESET does have some expectations, it is vital that the mentors not feel constricted to mentor in a certain way, since they are volunteering for the role. The IPA decided to keep the expectations to a minimum and gather data about mentoring practices through post experience interviews with both the mentors via phone, and with the Level II participants via a survey. During early FY19, the IPA will review this data collected from both FY17 and FY18 to help improve and clarify the mentoring expectations.

AEOP Priority: Develop and implement a cohesive, coordinated and sustainable STEM education outreach infrastructure across the Army

FY17 Recommendation: The program should ensure that STEM careers in the Army or DoD are an integral component of the online portion of RESET. The practice of having Level II participants share their experiences with STEM careers from their on-site experiences should be maintained, and additional STEM career connections, such as recorded talks by Army S&Es, could be incorporated into the program.

RESET FY18 Efforts and Outcomes: Not specifically addressed in the FY18 APR. Feedback received from the program in June 2019:

- The on-line Module 1 materials have been adjusted to include bios of the mentors and the the Level I educators are requested to read and consider who they would choose to work with IF they

were going to be experiencing on-site research. The Level I participants are thus "primed" to hear from their Level II counterparts who will be working directly with the mentors described. Hence the conversations about what a STEM career presents as in the lab is likely to be more pertinent.

- The use of recorded talks will be explored. The concern about impact on mentor time may be alleviated by using other DoD prepared materials such as lab personnel profiles posted on the web, and/or videos that are available on other DoD websites. The use of these resources would then be "modeled" through discussion with the Level I and Level II participants during Module 2 as they are writing the lesson plans.

FY17 Recommendation: The program should likewise ensure that information about AEOP initiatives other than RESET are incorporated into program materials. The program should move beyond relying on Level II participants' on-site experiences and emails to make these connections, and should explicitly include programs, such as eCYBERMISSION, JSS, and JSHS, by which teachers can engage students in research and connect them with the pipeline of AEOPs.

RESET FY18 Efforts and Outcomes: Not specifically addressed in the FY18 APR. Feedback received from the program in June 2019:

- The on-line format for Module 1 and Module 2 are modified to include discussion of the on-line and/or print materials about the larger set of AEOP projects.
- Discussion time is allocated to ensure participants have engaged with these materials and to encourage active planning for participation with the other AEOP initiaitives.

Recommendations for FY19 Program Improvement/Growth

Evaluation findings indicate that RESET was perceived favorably by participating teachers, and the addition of Level III facilitators to the program has resulted in improved communication in the online portion of the program by providing additional points of contact for participants. Notable successes for the year include the continued high participation rate for females, growth in percentage of participants that learned about STEM jobs/careers, growth in student reported acquisition of 21st Century Skills and STEM knowledge, and student reported gains in self-confidence and interest in STEM. While these successes are commendable, there are some areas that remain with potential for growth and/or improvement. The evaluation team therefore offers the following recommendations for FY19 and beyond:

AEOP Priority: Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base

1. The program should explore options for aligning its and funding cycle more closely with educators'. This may result in an increased number of participants, since teachers in interviews

noted that the application process seemed "last minute" for teachers, and did not accord well with school cycles. In addition, the program should explore ways to provide earlier funding for Level II on-site experiences since participation in this element of RESET may be limited by teachers' ability to pay up-front for significant travel and housing costs.

2. The program should consider, as one possible means of reaching more teachers, partnering with the Junior Science and Humanities Symposium (JSHS), an AEOP in which teachers have the opportunity to encourage, facilitate, and mentor students' independent research projects. Findings from the JSHS program that teachers with little research experience feel in need of additional support and resources suggest that a strong partnership between RESET and JSHS could be mutually beneficial in expanding the reach of each program and providing educators with skills needed to support student research.

AEOP Priority: Support and empower educators with unique Army research and technology resources

1. The programs should consider strategies by which participating teachers can disseminate their learning with other educators in their own practice setting. Teachers' comments about their lack of research competencies suggests that there may be an opportunity to informally increase the reach of the program by providing teachers with avenues to share their learning with others outside the program.

AEOP Priority: Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army

1. The RESET program should continue its efforts to educate participants and STEM careers in the Army and DoD and about other AEOPs. Teachers also have a unique opportunity to act as ambassadors for RESET and other AEOPs in their own practice settings, by informing other educators and students about AEOP opportunities and advising students in independent research associated with AEOP initiatives such as JSHS.

Appendix A FY18 RESET Evaluation Plan

Participant Interviews

Purpose:

The evaluation for FY18 was formative in nature and was intended to refine the delivery of RESET program activities after the third year of the program's operation. As per the approved FY17 AEOP APP, the external evaluation of RESET included telephone interviews with participants.

Interviews provide the evaluation team with first-hand opportunities to speak with RESET participants. The information gleaned from these interviews assists us in illustrating and more deeply understanding and describing the program's operation in its first year.

Data Analyses

Qualitative data were compiled and analyzed after all data collection concluded. Emergent coding was used for the qualitative data to identify the most common themes in responses.

Appendix B FY17 RESET Participant Interview Protocol

2017 RESET Evaluation Study

Participant Phone Interview 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 RESET. I will be audio recording our interview today so that I do not have to take notes and can more closely focus on your shared experiences. The interview will take about 15-20 minutes. Do you agree to participate in this interview?

Key Questions:

1. **Please describe briefly your background and tell me a bit about your current teaching assignment.**
2. **Please describe to me what the primary activities were in the RESET program that you participated in this summer?**
    a. Did you complete the face to face portion of the program? How was that?
    b. What did you think about the online component of the program?
3. **When you think about RESET, what kind of value does this program add**?
    - How do you think you personally benefitted from participating in RESET?
    - What were the best parts about the program?
    - What aspects of the program could be improved?
    - How will you use what you have learned in your classroom this year?

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

4. **We need to understand more about how RESET is helping participants know more about STEM career opportunities in the Department of Defense, especially civilian positions.**
    a. Did you experience any efforts by RESET to educate participants about the Army, DoD, or careers in the DoD? Please explain.

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

5. **The AEOP needs to know if RESET is teaching participating teachers about the other STEM outreach programs that it sponsors.**
    a. First, are you aware of the other programs offered by the AEOP? (e.g., JSHS, REAP, SEAP, CQL, etc)
    b. Have you seen any efforts at RESET to educate participants about the other AEOP programs?
6. **Last Chance - Have we missed anything? Tell us anything you want us to know that we didn't ask about.**