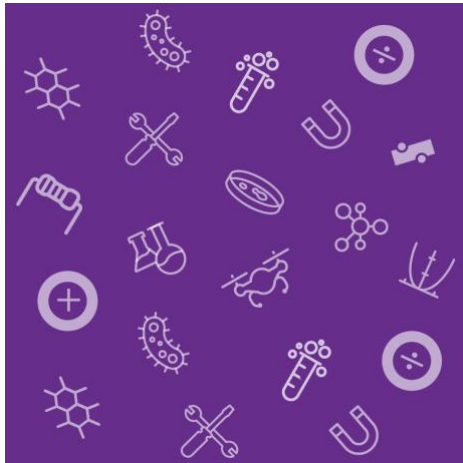
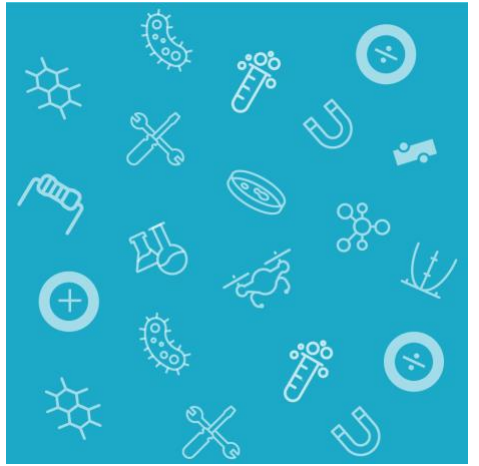


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ARMY EDUCATIONAL OUTREACH PROGRAM

RESET

2018 Annual Program Evaluation Report Executive Summary

June 2019



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2 | Executive Summary

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.

RESET 2018 Fast Facts	
Description	RESET provides a summer research experience at participating Army Laboratories and on-line for teachers and educators across the nation. The goal is to reinforce teachers’ content knowledge through research experiences and interactions with Army and DoD scientists and engineers and to support teacher participants as they translate this knowledge and experience into enhanced STEM research curricula for use in their classroom.
Participant Population	Middle school and high school STEM educators
Number of Applicants/Teachers	27
Number of Participants	20
Placement Rate (percentage)	79%
Number of Adults	25

RESET 2018 Fast Facts	
Number of Army S&Es	5
Number of Army/DoD Research Laboratories	4
Number of K–12 Teachers	20
Number of K–12 Schools	20
Number of K–12 Schools — Title I	7
Number of Colleges/Universities	1
Number of Other Collaborating Organizations	5
Total Cost	\$141,964
Administrative Costs (salaries, fringe, indirect, cost share)	\$48,505
Teacher Stipends and travel	\$79,860
Travel	\$5,137
Other costs	\$8,462
Cost Per Participant	\$7,098

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 11 in 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 JSBS, 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 is 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 is 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 initiatives.

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

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.

To view the rest of the report:

[RESET Evaluation Report Narrative Part 2](#)

