

Army Educational Outreach Program

Research Experiences for STEM Educators and Teachers (RESET)



2017 Annual Program Evaluation Report

PART 1: Executive Summary

January 2018

08

**Fall**

1 | AEOP Consortium Contacts



1

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2 | Executive Summary



2

Research Experiences for STEM Educators and Teachers (RESET) is a program sponsored by the U.S Army and managed by Tennessee Technological University (Tennessee Tech). As part of AEOP’s renewed effort in empowering educators by providing meaningful research experiences, AEOP launched RESET in 2016. RESET provides educators with online learning experiences and summer research experience at participating Army laboratories and research centers. The goal of RESET is to reinforce teachers’ content knowledge through research experience 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 a mentor Army scientist or engineer. At the completion of the program, teachers translate this knowledge and experience into enhanced science, technology, engineering and mathematics (STEM) research curricula and enriched learning for their students.

This report documents the evaluation of the FY17 RESET program. The evaluation addressed questions related to program strengths and challenges, and benefits to participants. The assessment strategy for RESET included interviews with 5 participating teachers.

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| **2017 Fast Facts** | |
| Description | RESET provides a summer research experience at participating Army laboratories and on-line for teachers and educators from “high need” areas (based on AEOP definition) 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 | 25 full, 128 partial |
| Number of RESET participants | 20 |
| Placement Rate (percentage) | 76% |
| Submission Completion Rate | 100% |
| Number of Army S&Es | 6 |
| Number of Army/DoD Research Laboratories | 3 |
| Number of K–12 Teachers | 19 |
| Number of K–12 Schools | 19 |
| Number of K–12 Schools — Title I | 10 |
| Number of Colleges/Universities | 1 |
| Number of Other Collaborating Organizations | 7 |
| Administrative Costs | $55,200 |
| Participant Stipends | $83,068 |
| Total Cost | $141,661 |
| Cost Per Participant | $7,083 |

# **Summary of Findings**

The FY17 evaluation of RESET included collection of interview data reflecting participants’ perceptions of program processes and activities and program information provided by program administrators. A summary of findings is provided here, with findings aligned to the 3 AEOP key priorities.

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| 2017 RESET Evaluation Findings | |
| **Priority 1: STEM Literate Citizenry**  *Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base.* | |
| **Finding #1** | RESET participants were primarily female and White, although 11% of participants were Black or African American (compared to 20% in 2016) and 16% were Hispanic or Latino (0% in 2016). These teachers represented 19 different K-12 schools, 10 of which were Title I status schools. Nearly half of teachers came from suburban schools (47% suburban, 37% urban; 16% rural in 2017 compared to 20% suburban, 50% urban, and 30% rural in 2016). |
| **Finding #2** | The number of full applications received (25) and total enrollment (19) were similar to 2016 when 24 full applications were received and 20 teachers enrolled. It is noteworthy that in 2017 the number of partial applications received jumped to 128 (up from 1 in 2016), suggesting that increasing numbers of teachers are learning about RESET through AEOP marketing efforts. |
| **Priority 2: STEM Savvy Educators**  *Support and empower educators with unique Army research and technology resources.* | |
| **Finding #1** | Interviewed participants focused on the research component of their RESET experiences. Participants appreciated the hands-on experiences in the Army labs. Teachers’ ideas about incorporating their research experiences into their teaching practice focused primarily on procedure rather than on content. For example, teachers indicated that they would incorporate research methods, teamwork strategies, data organization strategies, and enhanced career preparation information into their teaching. It was not always clear to teachers how to translate the content area of their research experiences into classroom experiences for their students, however, and, as one teacher pointed out, there may be a need to “bridge the gap” between the research experience and classroom practice. One suggestion for bridging this gap was to give the teachers more choice in their research project placement to ensure its relevance to their classroom practice. Another suggestion was to use experienced RESET teachers to guide new participants on how to create curriculum based upon laboratory experiences. |
| **Finding #2** | Suggested program improvements included disseminating information earlier to allow for Level II participants to plan more effectively; providing more Army lab placement options; matching teachers’ content areas and researchers’ projects more closely; ensuring that mentors understand their roles; and improving communication between participants and program administrators. |
| Priority 3: Sustainable Infrastructure  *Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army.* | |
| **Finding #1** | The 3 interview participants who had learned about DoD STEM careers during RESET credited their on-site experiences with this exposure. The practice of sharing journals during the final segment of the online course component was cited as another potentially useful way to share careers Level II participants had learned about with other cohort participants. |
| **Finding #2** | Most interview participants were aware of other AEOPs before their RESET experience and did not discuss AEOPs while enrolled in RESET. One participant had actively learned about AEOPs through a lab education outreach coordinator during her Level II on-site experience. |

# **Responsiveness to FY17 Evaluation Recommendations**

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

FY16 Finding: RESET participants were primarily female and White, although 20% of participants were Black or African American. No data was available on the Title I status of schools in which teachers were employed

(this item will be added to FY17 registration materials), however half of participants taught in urban schools. The RESET participants for 2016 were from six states: Florida (5), Michigan (1), Montana (1), Pennsylvania (2), Tennessee (10), Virginia (1). While six states were represented, the majority come from two states, Florida and Tennessee, suggesting that the overall participant population may have had limited geographic diversity in this first program year.

RESET FY17 Efforts and Outcomes:

FY16 Finding: The primary method employed to recruit participants was to reach out to teachers through the National Science Teachers Association (NSTA). Recruitment was complicated in FY16 by the short timeframe for recruitment. In future years, the program plans to collaborate with the AEOP consortium partner base to reach teachers involved in AEOPs such as eCybermission and Junior Solar Sprint. The program has developed a rubric for teacher selection although no details of the criteria for selection were provided in the APR.

RESET FY17 Efforts and Outcomes: According to the FY17 RESET APR, no action was taken in FY17. In FY18 the rubric will be posted in the CVENT application site for educators to review prior to application to understand the weighting/scoring process to help guide their time completing the application.

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

FY16 Finding: Program administrators acknowledged in the APR that there were slips in scheduling during the FY16 program year. These slips were due to factors such as delays in activation of funds at Tennessee Tech, the need to recruit mentors at Army/DoD sites, a lack of marketing materials for the program, and the short timeframe for applicant registration.

RESET FY17 Efforts and Outcomes: in FY17 a weekly listing of discussion topics and reading resources, as well as links to recorded sessions were provided via email to the RESET cohort. The RESET staffing model had insufficient time allocated for constant communication, once the GA left the position. In FY18, a new staffing model is being proposed to address this weakness.

FY16 Finding: RESET administrators plan to address the issues in security clearance and computer access by creating a flowchart to determine what sort of security clearance and IT access are necessary for teachers. In addition, earlier selection of participants in FY17 will permit a longer timeframe in which security clearance activities can be completed.

RESET FY17 Efforts and Outcomes: In FY17, the IPA asked mentors what level of security would be required to ensure we were not asking for CAC approval if it would not be needed. Also, the mentors were asked to identify who the lab contact was that would help the Level II educators understand the process required at the lab. In FY18, the IPA will re-contact the site mentors for FY16 and FY17 and ask them to review a summary developed for this process across the participating Army Lab site, to create a dedicated document explaining the process for future Level II participants.

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

FY16 Finding: While several of the interview participants had heard of AEOPs, three had no knowledge of other AEOPs. Participants learned about AEOPs either through on-site research experiences or through the AEOP website. Some efforts at cross-program collaboration between RESET and eCybermission, as eCybermission encouraged participating teachers to apply for RESET at a NSTA conference and plans to reach out to RESET teachers with information about eCybermission.

RESET FY17 Efforts and Outcomes: Not addressed in the FY17 APR for RESET.

# **Recommendations for FY18 Program Improvement/Growth**

Evaluation findings indicate that FY17 was a successful year for the RESET program.

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

1. The program should continue to expand its marketing and outreach efforts to broaden the pool of applicants.
2. Participants’ comments about the mismatch between the RESET application funding cycle and educators’ school year cycles suggest that providng 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.

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

1. 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.
2. 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.

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

1. 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.
2. 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 e-Cybermission, JSS, and JSHS, by which teachers can engage students in research and connect them with the pipeline of AEOPs.