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ARMY EDUCATIONAL OUTREACH PROGRAM

RESET

2020 Annual Program Evaluation Report

Executive Summary

July 2021



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Report RESET_03_07132021 has been prepared for the AEOP Cooperative Agreement and the U.S. Army by NC State University College of Education on behalf of Battelle Memorial Institute (Lead Organization) under award W911 SR-15-2-0001.



2 | Executive Summary

Research Experiences for STEM Educators and Teachers (RESET), a division of the Army Educational Outreach Program (AEOP), is sponsored by the U.S Army and managed by Tennessee Technological 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. It is designed to provide high school and middle school educators with an authentic summer research experience at participating Army Research Laboratories and Centers. The program serves educators nation-wide while prioritizing those who serve communities with historically underserved populations. RESET immerses STEM educators in authentic research so that they are equipped to provide students with opportunities to apply STEM concepts within real-world contexts. Educators apply as Level I, Level II, and Level III participants of RESET. Educators are typically selected for Level II based on previous experience as Level I participants. Level III participants are those with previous program experience who wish to act as facilitators of the online modules.

All selected educators agree to complete three modules of work at their respective level, as well as attend three Army Scientist & Engineer Discussions. Module 1 serves as the study of best STEM practices and scientific research. This module is facilitated by Level III participants. Army Scientist & Engineer Discussions provide Level I, II, and III participants with opportunities to engage directly with world-class Army S&Es. Module 2 consists of a four-week in-person internship by Level II participants on site at an Army Research Laboratory or Center. During the internship, participants work under the mentorship of an Army scientist or engineer as a member of an Army research team, working at the bench on real-world DoD research. Throughout module 2, Level II participants document their experiences and communicate weekly with their assigned Level I partners. Module 3 serves as a collaboration between level I and II participants. During this module, Level I and Level II participants work together to create lesson plans based on the Level II participants’ research experiences. Level III facilitators lead these collaborative meetings in addition to aiding in the facilitation of all modules.

In FY20, 27 teachers representing 25 K-12 schools (18 Title I schools) participated in RESET. Program levels were altered slightly for 2020 because of COVID-19. All participants who applied for Level I and Level II were placed in the program as Enhanced Level I participants. This change was made because Army S&Es met virtually with all participants and all participants worked through three modules together with no differentiation among initial levels. Originally there were 16 Level I, eight Level II, and three Level III participants. The three Level III participants continued in that position to help facilitate the participant

teams. Four participants who were initially Level II completed a 40 hour virtual research experience with a mentor who had agreed to host remote interns. There was also an added focus in the online modules to prepare teachers for online teaching and learning in light of the shifts to online instruction that have occurred as a result of the pandemic. This was accomplished by adding content about HyperDocs and other online learning tools and transforming the lesson plan template used in FY19 to utilize the 5E Instructional model for both face-to-face and virtual instruction. The reported travel costs for FY20 programs are from pre-pandemic travel (October 2019-February 2020) and from non-refundable travel expenses that were booked prior to shifting to virtual programming.

| RESET 2020 Fast Facts | |
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| 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 | 27 |
| Placement Rate (percentage) | 100% |
| Number of Adults (Teachers and S&Es) | 44 |
| Number of Army S&Es | 17 |
| Number of Army/DoD Research Laboratories | 7 |
| Number of K-12 Teachers | 27 |
| Number of K-12 Schools | 25 |
| Number of K-12 Schools — Title I | 18 |
| Number of Colleges/Universities | 1 |
| Number of Other Collaborating Organizations | 0 |
| Total Cost | \$175,220 |
| Total Travel | \$1,331 |
| Participant Travel | \$0 |
| Total Awards | \$58,000 |
| Stipends | \$58,000 |
| Cost Per Participant | \$6,490 |

3| Summary of Findings and Recommendations

The following is summary of findings from the FY20 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

A total of 27 teachers participated in RESET in 2020, a 19% increase over the 22 teachers who participated in 2019, and a 26% increase over 2018 when 20 teachers participated. RESET continues to serve primarily female participants and, although the majority of participants in 2020 were White, the program attracted participants from a range of racial/ethnic backgrounds. Two-thirds of RESET participants in 2020 were female, a distribution similar to 2019 when 73% of participants were female. Slightly more participants were White in 2020 (56%) as compared to 2019 (41%). Just under a quarter (22%) were Black or African American (23% in 2019), and 7% were Asian (14% in 2019). As in 2019, few participants identified themselves as any other race/ethnicity. 2020 RESET participants represented 25 K-12 schools across the nation, 18 of which were Title I schools. Teachers practiced in rural (44%), urban (26%), and suburban (22%) settings.

RESET participants had learned about the program from a wide variety of sources, suggesting that a diversified marketing approach has the potential to reach participants. Some participants had learned about the program through personal or professional connections, some through other AEOP, and others through means such as Google searches, the AEOP website, and a conference hosted at a university.

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

Participants expressed a high level of overall satisfaction with their RESET experiences. Participating teachers reported learning about scientific research and associated teaching strategies, networking with other teachers, and learning about Army research and careers first-hand from Army S&Es. Most teachers cited specific ways that they would apply their learning in RESET into their classroom practice. This

included delivering lesson plans that they or others in RESET had developed, using strategies such as 5E lesson plans and the Legacy Cycle in their classrooms, sharing Army and DoD STEM career information with their students, using examples from Army research to make real-world connections to students' learning, and using online teaching tools they learned about during RESET.

Several participants believed that RESET would have been more impactful if the Level II research experiences had been on site in Army labs or centers.

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

All interview participants reported learning about STEM careers in the Army & DoD and about other AEOP during RESET. Career information was delivered primarily by a series of Army Scientist & Engineer Discussions held by videoconference. The S&Es collaborated with participants in creating lesson plans, which were then shared with the entire cohort. This suggests that the information about Army research and careers within these lesson plans has the potential to be shared in a wide variety of setting across the country. AEOP information was delivered via a presentation from the program and through a course assignment to read about the various initiatives. This information continues to be disseminated and updated on a social media site created for the RESET cohort.

All participants found the Army Scientist & Engineer Discussions to be educational, interesting, and useful as they developed their lesson plans, and perceived these presentations and the opportunity to interact with S&Es to be a central element of the program. Participants' enthusiasm about the interactions with the S&Es suggests that this is an effective forum for connecting teachers to S&Es to learn about careers and Army research.

Likewise, participants who were previously unfamiliar with AEOP expressed enthusiasm about the range of programs available to their students. Some participants had made plans to encourage students to participate in other AEOP and one reported that she had signed up for eCYBERMISSION as a result of learning about it in RESET. The universal familiarity with and enthusiasm for AEOP among participants suggests that the program's approach to informing participants about AEOP was effective.

In addition, one interview participant reported already having registered for the Next Generation STEM Teaching Program (NGSTP), another AEOP initiative targeted toward teacher professional development. This suggests the potential for these programs to form a teacher professional development pipeline within the AEOP.

Recommendations for FY20 Program Improvement/Growth

Evaluation findings indicate that RESET was perceived favorably by participating teachers. In particular, the utilization of videoconferencing to connect participants with S&Es and to collaborate with S&Es on

lesson plans resulted in deep and nuanced teacher awareness of STEM careers and research in the Army and DoD. Other notable successes for the year include the continued high participation rate for females, continued growth in participants' learning about STEM jobs/careers, growth in participants' awareness of and enthusiasm for AEOP, and reports of classroom implementation of strategies participants learned during RESET. 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 FY21 and beyond:

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

While the program continues to grow, several participants reported learning about the program either through personal acquaintances or by broad-based Google searches rather than as the result of targeted marketing and publicity. Expanding the capacity of the program and diversifying marketing strategies may therefore broaden the reach of RESET.

Participants' comments indicating their disappointment with not being able to complete an on-site research experience highlights the impact these experiences can have. These comments, along with other participants' suggestions that all participants have the opportunity to work with S&Es and that participants have the opportunity to meet with S&Es in person, suggest that expanding relationships with Army labs and creating new and innovative ways for participants to connect with S&Es could enhance participants' learning experiences.

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

Given some participants' reluctance to try to implement their lesson plans in virtual formats, it may be productive for the program to consider incorporating information about additional technology tools to support teachers' efforts to implement inquiry learning and collaboration in their classrooms. A supplemental focus on teaching research online, providing tools and strategies for how to teach and implement research strategies such as the Lotus Blossom online may be useful for participants. In addition, the program should ensure that the videoconferencing platform used for participant discussion and collaboration has adequate capacity for robust participant discussions and interactions.

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

Because of the demand for on-site experiences, the program may wish to consider placing cohorts of participants at the same location in the future rather than placing Level II participants using the current 1:1 model.

In addition, the program may wish to coordinate with the NGSTP initiative to explore whether programs can be planned and/or marketed in a complementary manner. In addition, the programs may wish to collaborate to ensure that content is not replicated between the programs and that the aims of the two programs are not in conflict with one another. RESET and NGSTP may wish to consider whether the two programs could be coordinated to create a teacher professional development pipeline within AEOP.