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ARMY EDUCATIONAL OUTREACH PROGRAM

FY23 Annual Program Evaluation Report
Summative Findings

June 2024

AEOP
ARMY EDUCATIONAL OUTREACH PROGRAM

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Contents

Executive Summary

The Army Educational Outreach Program (AEOP) offers students and teachers science, technology, engineering, and mathematics (STEM) programming that is designed to attract, develop, and mentor the next generation of the nation's diverse talent through United States (U.S.) Army educational outreach programs.

Education Development Center, Inc. (EDC), the external evaluation partner for AEOP, conducted a summative evaluation of the 2022-2023 program year. The FY23 evaluation sought to document and assess the benefits of participation, program strengths and challenges, and overall effectiveness in meeting AEOP and program objectives. The primary tools for data collection were student and mentor post-surveys. In addition to administering student and mentor surveys, the evaluation team conducted site visits to five AEOP programs. It is important to recognize that results from these evaluation activities only reflect a subset of individuals who completed surveys or participated in site visit focus groups; these findings cannot be applied across the Consortium and may not be generalizable within a specific program.

Key findings from the evaluation are presented below.

Overview of Participants

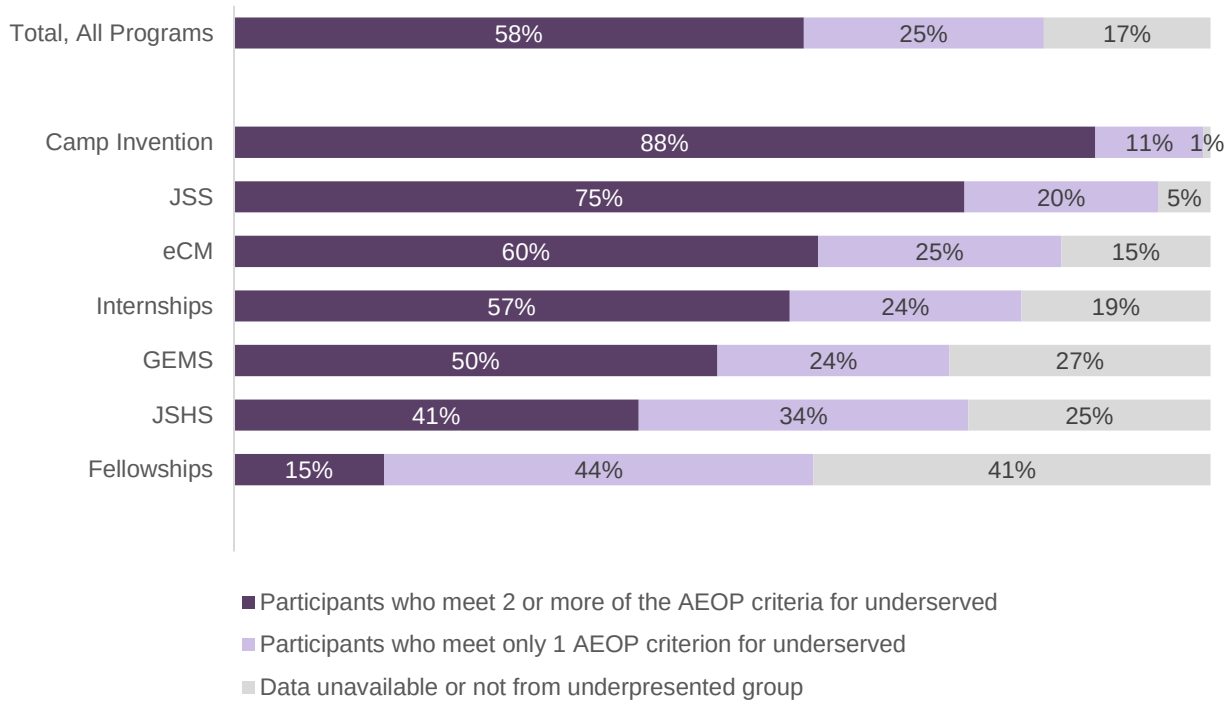
In FY23, AEOP served a total of 18,859 participants – 94% were students and 6% were educators, advisors, mentors, Science & Engineering (S&E) volunteers, or other adults. A total of 3,347 organizations also participated in FY23 AEOP programming. Eighty-six percent of organizations represented PK-12 schools and postsecondary institutions.

AEOP has a focus on reaching participants who have more limited access to STEM learning opportunities and/or who are from groups that are underserved in STEM education and careers. AEOP defines underserved participants as those who possess at least two of the following characteristics: attend a rural, urban, or frontier/tribal school; identify as female[1]; identify as racial/ethnic minority in STEM (i.e., Alaska Native, Native American, Black or African American, Hispanic, Native Hawaiian and other Pacific Islander, other); receive free or reduced meals price at school; speak English as a second language (ELL); first generation college student; students with disabilities; or a dependent of a military service member or veteran.

AEOP has identified a particular interest in reaching students who meet two or more of the underserved criteria described above (referred to hereafter as Underserved). As shown in Figure 1, in FY23, about six out of ten of all AEOP student participants (59%) meet two or more of the Underserved criteria. An additional quarter of student participants (24%) meet one of the AEOP Underserved criteria.

[1] In two programs within AEOP—Junior Science and Humanities Symposium (JSHS) and Internships—only females engaged in certain STEM fields (physical science, computer science, mathematics, or engineering) are considered as underserved. For the purpose of this analysis, we have included all students who identified a female regardless of their STEM discipline, as those data were not available. This likely overestimates numbers for JSHS and Internships and therefore the total for all programs.

Figure 1. Percentage of FY23 Student Participants Meeting AEOP Criteria for Underserved*



*Unite provided aggregate demographic counts so it was not possible to determine how many criteria were met by individual participants. Data regarding underserved status for eCYBERMISSION students includes all students who registered for eCYBERMISSION, not only those who were part of a complete team.

Participant Experience and Outcomes

Development of STEM Knowledge and Skills:

Students appear to have improved their STEM knowledge and skills as a result of their AEOP experience. Students and mentors indicated notable improvements in students' knowledge of STEM topics (reported by 98% of students and 100% of mentors) and their understanding of everyday STEM research (96% of students and 100% of mentors).

Development of 21st Century Skills

Students made notable gains in 21st Century Skills, including problem-solving, collaboration, and communication. They gained skills solving problems individually or with a team (95% of students and 100% of mentors reported at least a "small increase"), involving others in decision-making (93% and 99%), and leading and guiding others in a team or group (87% of students and 97% of mentors). The majority of students and mentors reported that AEOP contributed to gains in students' ability to communicate clearly with others orally (92% of students and 100% of mentors reported at least a "small increase") and in writing (88% of students and 99% of mentors).

Interest in STEM and STEM Careers

AEOP seems to have a positive influence on students' confidence in their STEM knowledge and skills, as well as their interest in pursuing future STEM education and careers. The majority of students agreed that they are more confident in their STEM knowledge, skills, and abilities (90%), and they expressed increased likelihood of engaging in various STEM-related activities (at least 61%). Eighty percent of students indicated that they were interested in taking a STEM class in school, and 77% were interested in pursuing a STEM degree or career.[2]

Perceptions of DoD

Participating in AEOP cultivates students' interest in and appreciation for DoD STEM research and careers. Both mentors and students reported that students had a greater appreciation of DoD STEM research (92% of mentors and 73% of students, respectively) and were more interested in pursuing a STEM career with the DoD (84% and 51%, respectively).

Impact of S&E Mentors

The structured mentorship and collaborative learning environments contribute to achieving AEOP goals. For example, 82% of students and 85% of mentors indicated that the mentor helped students become aware of STEM in their everyday lives. In addition, 80% of students and 79% of mentors reported that mentors helped students understand how they can use STEM to improve their communities.

Future Interest AEOP and other STEM Programs

Students were generally interested in participating in AEOP and other STEM programs, but there is room for greater awareness of these opportunities. Between 28% and 55% of students indicated that they were somewhat or very interested in participating in another program within AEOP or a similar STEM-focused initiative in the future. While there appears to be interest in future participation, there also is room for improving student awareness of other programs. Roughly one-third or more of students were not aware of other programs within AEOP or other STEM-focused programs.

Recommendations

This report distills evaluation findings as they align with AEOP's overarching research questions. Data collected for this evaluation are not necessarily representative of the entire program; however, based on the results presented above, we offer the following recommendations:

[2] Note that GEMS and JSS students were not asked about interest in pursuing a STEM degree or STEM career.

Programmatic Considerations

Consider targeted training and support for mentors to enhance their effectiveness in guiding students' STEM learning. In general, there was high alignment between student and mentor reports of structured learning environments. However, mentors' guidance to students on STEM career education opportunities is one potential area for improvement; 83% of mentors stated this occurred compared to 73% of students. By investing in mentor development, AEOP can ensure that mentors are well-prepared to support students effectively, ultimately enhancing the quality of the program and the learning experience for participants.

Continue to use targeted marketing and outreach campaigns to raise awareness about AEOP programs and their benefits among students, educators, and parents. These campaigns should leverage various channels such as social media, educational institutions, and community organizations to reach a diverse audience. Additionally, implementing strategies like hosting informational sessions, distributing promotional materials, and partnering with schools can effectively increase program visibility. By prioritizing these efforts, AEOP can ensure that more individuals are informed about the opportunities available, ultimately driving greater participation and engagement in STEM-related activities.

Build on partnerships with schools, community organizations, and industry stakeholders to provide students with diverse STEM learning opportunities. Collaborating with schools can facilitate the integration of AEOP programs into curricula, while partnerships with community organizations can expand outreach efforts to underserved populations. Engaging industry stakeholders can offer students exposure to real-world applications of STEM concepts, fostering a deeper understanding of STEM careers and pathways. By strengthening these partnerships, AEOP can enrich students' educational experiences and better prepare them for future success in STEM fields.

Evaluation Considerations

Continue to explore ways to improve response rates. Response rates remain a persistent challenge. While a couple of programs improved their response rates compared to FY22, overall response rates remain low (23% in FY22 and 22% in FY23). We will continue to partner with programs to tailor strategies to improve responses rates such as through personalized follow-up communications and reminders.

Improve documentation of participation and organization counts. With the rollout of Ideal-Logic, the Consortium has moved toward a standardized system and platform for program registration and participation. However, not all programs use the registration platform, which makes it challenging to accurately report program participation. Improving documentation practices is essential for ensuring the quality of program data. By implementing standardized policies and procedures, AEOP can strengthen its ability to track participation and organizational metrics accurately, ultimately leading to improved decision-making and reporting.

Explore the extent to which students sustain their involvement in multiple programs within AEOP. Future evaluation efforts could examine participation in subsequent AEOP programs over several years. Doing so would provide insights into the longer-term influence of AEOP on participants' continued engagement in STEM education and career pathways. This effort could explore the effectiveness of AEOP in fostering sustained interest and involvement in STEM, informing future program enhancements and strategic planning.

1 Introduction

1.1 AEOP Priorities & Goals

The Army Educational Outreach Program (AEOP) mission is to provide an accessible pathway of science, technology, engineering, and mathematics (STEM) opportunities to attract, develop, and mentor the next generation of our nation's diverse talent through United States (U.S.) Army educational outreach programs.

AEOP has three priorities:

1. **STEM Literate Citizenry**. Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base (DIB).
2. **STEM Savvy Educators.** Support and empower educators with unique Army research and technology resources.
3. **Sustainable Infrastructure.** Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army.

1.2 Overview of 2023 Portfolio of Programs

AEOP offers a collaborative and cohesive portfolio of STEM programs that engage, inspire, and attract the next generation of STEM talent. These programs are led by multiple partners as shown in Table 1.

Table 1. AEOP Partners and Programs

Partner	Program	Description
National Science Teaching Association (NSTA)	eCYBERMISSION (eCM)	eCM is a web-based STEM competition for students in grades 6–9 that promotes self-discovery and empowers students to recognize the real-life applications of STEM.
	Gains in the Education of Mathematics and Science (GEMS) & Camp Invention (CI)	GEMS is an Army-sponsored summer STEM enrichment program for students in grades 5–12 held in the summer at participating Army Research Laboratories. CI is a week-long summer program that engages children to develop creativity, inventive thinking, and problem-solving skills through hands-on STEM content, while also providing professional development to teachers and high school leadership interns nation-wide.
	Junior Science and Humanities Symposium (JSHS)	The JSHS is a DoD-sponsored STEM program (U.S. Secretary of the Defense and the U.S. Departments of the Army, Navy, and Air Force) which promotes original research and experimentation in STEM at the high school level and publicly recognizes students for outstanding achievement.

Partner	Program	Description
Rochester Institute of Technology (RIT)	Internships and Fellowships	A career development initiative, AEOP Internships and Fellowships provide high school, college, and graduate students with immersive STEM research opportunities in military and university laboratories across the United States and its territories.
Technology Student Association (TSA)	Junior Solar Sprint (JSS)	The JSS program is available for 5th-8th grade students and provides the opportunity for students to apply scientific understanding, creativity, experimentation, and teamwork to design, build, and race solar electric vehicles.
	Unite	Unite is a pre-collegiate, academic, summer program for rising 9th through rising 12th grade students from groups historically underserved in STEM areas.
Tennessee Tech University (TTA)	RESET	RESET is designed to provide high school and middle school educators with authentic summer research experience at participating Army Research Laboratories and Centers.

1.3 Overview of Participants

In FY23, AEOP served a total of 18,859 participants – 94% were students and 6% were educators, advisors, mentors, Science & Engineering (S&E) volunteers, or other adults (see Table 2). A total of 3,347 organizations also participated in FY23 AEOP programming. Eighty-six percent of organizations represented PK-12 schools and postsecondary institutions (see Table 3).

- 94% of student participants were in grades K-12 and 6% were post-secondary students.
- 89% were mentors or team advisors and 11% of adult participants were other teachers or educational professionals involved in AEOP (e.g., judges, volunteers, etc.).

See Appendix A for more detailed information about participant counts.

Table 2. Total number of AEOP FY23 program participants, by program

Program	Students	Adults (Educators, Advisors, Mentors, S&E Volunteers)	Total
Camp Invention	1,956	-	1,956
eCYBERMISSION	7,320	280	7,600
Fellowships	91	-	91
GEMS	2,870	65	2,935
Internships	392	284	676
JSHS	3,081	-	3,081
JSS	706	180	886
RESET	-	85	85
Unite	436	159	595
Total, All Programs	**16,852**	**1,053**	**17,905**

* JSS participant counts for FY23 include Army sites only

Note: eCYBERMISSION also tracks the following information about Complete Teams: FY23 Students registered to a complete team (Participants): 7,320; FY23 Team Advisors with at least one complete team: 280; and FY23 Number of Mission Folders submitted: 1,804.

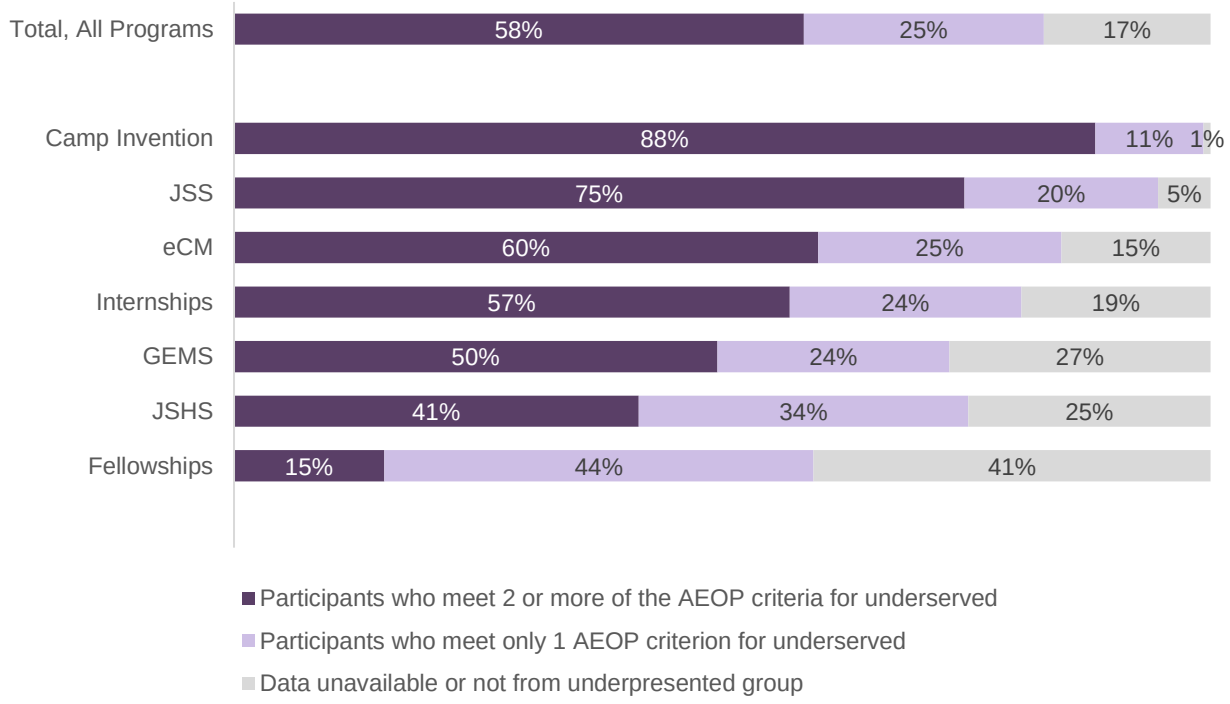
Table 3. Total FY23 Participant Counts, by Organization Type

Program	Total Number of PK-12 Schools	Total Number of Colleges & Universities	DoD Labs, Facilities or Installations	**Other** (including government, research institutions, non-profit and for-profit organizations)	Total
Camp Invention	26	-	-	-	**26**
eCYBERMISSION	348	176	39	210	**773**
Fellowships	-	-	4	-	**4**
GEMS	1,481	46	16	-	**1,543**
Internships	-	59	14	-	**73**
JSHS	770	-	-	-	**770**
JSS	72	-	-	-	**72**
RESET	59	1	4	-	**64**
Unite	-	22	-	-	**22**
Total, All Programs	**2,756**	**304**	**77**	**210**	**3,347**

AEOP has a focus on reaching participants who have more limited access to STEM learning opportunities and/or who are from groups that are underserved in STEM education and careers. AEOP defines underserved participants as those who possess at least two of the following

characteristics: attend a rural, urban, or frontier/tribal school; identify as female[3]; identify as racial/ethnic minority in STEM (i.e., Alaska Native, Native American, Black or African American, Hispanic, Native Hawaiian and other Pacific Islander, other); receive free or reduced meals price at school; speak English as a second language (ELL); first generation college student; students with disabilities; or a dependent of a military service member or veteran (referred to hereafter as Underserved). As shown in Figure 2, in FY23, about six out of ten of all AEOP student participants (59%) meet two or more of the Underserved criteria. An additional quarter of student participants (24%) meet one of the AEOP Underserved criteria. See Appendix A for full data tables and additional information.

Figure 2. Percentage of FY23 Student Participants Meeting AEOP Criteria for Underserved*



*Unite provided aggregate demographic counts so it was not possible to determine how many criteria were met by individual participants. Data regarding underserved status for eCYBERMISSION students includes all students who registered for eCYBERMISSION, not only those who were part of a complete team.

[3] In two programs within AEOP—Junior Science and Humanities Symposium (JSHS) and Internships—only females engaged in certain STEM fields (physical science, computer science, mathematics, or engineering) are considered as underserved. For the purpose of this analysis, we have included all students who identified a female regardless of their STEM discipline, as those data were not available. This likely overestimates numbers for JSHS and Internships and therefore the total for all programs.

2 Evaluation Approach

Education Development Center, Inc. (EDC) is AEOP's external evaluation partner. The primary tools for data collection were student[4] and mentor[5] post-surveys, which were designed to evaluate the benefits of participation, program strengths and challenges, and overall effectiveness in meeting AEOP and program objectives. In addition to administering student and mentor surveys, the evaluation team conducted site visits to five AEOP programs. Descriptions of these data collection efforts are included below. In general, we sought to address the overarching research questions listed in Table 4.

Table 4. Research Questions Addressed in This Report

AEOP Priority	Research Questions Regarding Participants
STEM Literate Citizenry: Broaden, deepen, and diversify the pool of STEM talent in support of our defense industry base.	*Participant Research Question #1* - To what extent do participants report growth in interest and engagement in STEM?
	Research Question #2a - To what extent do participants report increased STEM competencies, 21st Century/STEM skills, STEM knowledge, STEM abilities, and STEM confidence?
	Research Question #2b – To what extent do participants demonstrate use of and growth in 21st Century skills?
	Participant Research Question #3 - To what extent do participants and mentors report increased participant interest in STEM research and careers?
	Participant Research Question #4 - To what extent do participants and mentors report increased awareness of and interest in Army/DoD STEM research and careers?
	Research Question #5 - To what extent do participants report increased enrollment, achievement, and completion of STEM degree programs?
STEM Savvy Educators: Support and empower educators with unique Army research and technology resources.	*Research Question #6* - What is the impact of scientist and engineer (S&E) mentors on AEOP participants?
	Research Question #7 - To what extent do teacher participants report increased use of new approaches to teaching research concepts within STEM practices, and infusion of careers?
Sustainable Infrastructure: Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure across the Army.	*Research Question #8* - To what extent do participants report growth in awareness of and/or interest in AEOP opportunities?

2.1 Survey Respondents

This report includes results from student and mentor surveys. In FY23, the evaluation team significantly revised the surveys to make them shorter, more age-appropriate, and program-relevant. Some survey questions were asked of all participants across all AEOP programs,

[4] Throughout this report, we refer to students and participants interchangeably.
[5] Depending on the program, mentor surveys were administered to either mentors or team advisors. It is worth noting that the role of mentors or team advisors differs across programs. For reporting purposes, we simply refer to them throughout as "mentors." Because the role of JSHS mentors is different from other programs within AEOP, we did not survey them for the evaluation.

some questions were similar across programs but asked in slightly different ways depending on the program, and some questions were unique to a particular program. In most cases, AEOP program staff were responsible for distributing the online survey links to their student participants and mentors at the conclusion of program activities.

Table 5 shows the number of surveys by program.

Table 5. Participant and Mentor Survey Response Rates

	Participant Surveys		Mentor Surveys	
Program	**Count**	**Response Rate**	**Count**	**Response Rate**
eCYBERMISSION	520	7%	35	13%
GEMS	1,947	68%	64	98%
Internships and Fellowships	86	18%	67	24%
JSHS	356	12%	NA	NA
JSS	256	36%	54	30%
RESET	49	71%	NA	NA
Unite	310	71%	74	47%
Total, All Programs	**3,524**	**24%**	**294**	**30%**

2.2 Site Visits

EDC conducted five site visits to GEMS and UNITE summer programs as well as national competitions for eCYBERMISSION, JSS, and JSHS. The main purpose of the site visits was to learn first-hand about the range of participant experiences. EDC sought to gain understanding of program facilitation and structures through direct observation, and we spoke to participants to gather their input on how program influenced their interest in STEM as well as their perspectives on program strengths and areas of improvement. Furthermore, focus groups added depth to data collected through the surveys.

2.3 Limitations

It is important to recognize that results only reflect those individuals who participated in evaluation activities. These findings cannot be applied across the Consortium and may not be generalizable within a specific program. It is also important to consider the characteristics of survey respondents. For example, most students had not yet completed high school at the time of the survey. In this instance, it is important to note that we cannot reasonably expect respondents to report postsecondary outcomes that are long-term goals of the AEOP program. Finally, while we have presented student and mentor findings together topically, these results should be interpreted with caution since the proportions of respondents for each group vary considerably by program.

2.4 Report Organization

Evaluation findings presented below are guided by the research questions and organized thematically by topic. Sections include the following:

- Development of STEM Knowledge and Skills
- Development of 21st Century Skills
- Interest in STEM and STEM Careers
- Perceptions of DoD
- Impact of Mentors on AEOP participants
- Overall experience
- Recommendations

3 Development of STEM Knowledge and Skills

Students demonstrated notable improvement in STEM knowledge and skills through their engagement in AEOP. Both students and mentors reported progress in students' understanding of scientific concepts and their practical applications. In addition, hands-on activities and experiential learning played a crucial role in enhancing students' STEM proficiency. These findings suggest that AEOP contributes to enhancing students' understanding of core STEM concepts and research methodologies. Furthermore, the observed trend of mentors reporting larger learning gains for students highlights the valuable role of mentorship in facilitating students' educational growth within the program. Overall, these results underscore the importance of AEOP in fostering a robust STEM learning environment and preparing students for future success in STEM-related fields.

The majority of students and mentors reported substantial increases in students' knowledge of STEM and various aspects of STEM research. In the survey, students were asked to rate their learning in specific topics ranging from "did not learn anything new" to "learned a lot." As shown in Table 6, there is a consistent pattern of reported increases. Students and mentors alike reported enhancement for students in several key areas, including in-depth knowledge of STEM topics, knowledge of research processes in STEM, understanding of how scientists and engineers solve real-world problems, and insights into the daily work in STEM research. Mentors tended to report especially large learning gains for students across all surveyed topics and highlights the effectiveness of the AEOP program in improving STEM education and skills.

Table 6. Students Increased Their STEM Knowledge

Response		I/they didn't learn anything new	I/they learned a little	I/they learned more than a little	I/they learned a lot	Overall learning
In depth knowledge of a STEM topic(s)	Participant	2%	13%	30%	55%	**98%**
	Mentor	0%	3%	22%	75%	**100%**
Knowledge of how scientists and engineers work on real problems in STEM	Participant	3%	18%	31%	48%	**97%**
	Mentor	0%	6%	29%	65%	**100%**
Knowledge of research processes used in STEM*	Participant	4%	18%	28%	50%	**96%**
	Mentor	0%	6%	21%	73%	**100%**
Knowledge of what everyday research work is like in STEM	Participant	4%	19%	31%	46%	**96%**
	Mentor	0%	8%	22%	70%	**100%**

Due to rounding, totals may not equal 100%.
*This question was not asked of GEMS and JSS participants.
Participant Survey; All AEOP Programs combined (n = 3,235)
Mentor Survey (n = 290)

> *“ eCYBERMISSION helped me learn how to properly conduct an eco-audit and fully carry out my experiment using the scientific method, graphing, and most importantly analyzing data*. -AEOP Student

> *“ I have found the GEMS program to be extremely valuable to upcoming generations of students, especially those who would otherwise be unaware of the various STEM topics covered by GEMS.* -AEOP Mentor

Participants and mentors reported significant learning for students in a variety of areas. The survey results from Table 7 show a clear trend of learning and skill development in several key STEM areas. For instance, a notable percentage of respondents reported that students learned “a lot” about how to carry out an experiment (50% of students and 72% of mentors) and how to support explanations with STEM knowledge or data (47% of students and 61% of mentors). Across all areas of skills, mentors consistently reported gains in students’ learning in higher proportions than participants themselves. Since mentors typically have a broader perspective and deeper understanding of the subject matter compared to students, they may recognize and appreciate advancements that students may not fully comprehend or articulate.

Table 7. Participants and Mentors Reported Improvements in Students’ Skills in STEM Research Methods and Tools

Response		I/they didn’t learn anything new	I/they learned a little	I/they learned more than a little	I/they learned a lot	Overall Learning
How to carry out an experiment*	Participant	6%	15%	29%	50%	94%
	Mentor	4%	7%	17%	72%	96%
How to identify the limitations of the methods and tools used for collecting data*	Participant	6%	21%	30%	43%	94%
	Mentor	1%	9%	31%	59%	99%
How to support an explanation with my STEM knowledge or data from experiments*	Participant	8%	16%	29%	47%	92%
	Mentor	1%	7%	32%	61%	99%
How to present an argument that uses data and/or findings from an experiment*	Participant	8%	18%	26%	48%	92%
	Mentor	2%	11%	27%	60%	98%
How to make a model to show how something works	Participant	8%	20%	29%	44%	92%
	Mentor	2%	13%	22%	63%	98%
How to record data accurately*	Participant	10%	23%	30%	37%	91%
	Mentor	2%	12%	34%	52%	98%
How to create charts or graphs to display data and find patterns*	Participant	12%	18%	25%	44%	88%
	Mentor	3%	12%	23%	63%	97%

*This question was not asked of GEMS and JSS participants.
Participant Survey; All AEOP Programs combined (n = 3,026)
Mentor Survey (n = 272)

Across AEOP, students' experiences and STEM learning varied based on students' ages, program activities and content, and multiple other contextual factors. Overall, there was evidence of students' increased STEM knowledge and skills. For example:

- Participants in Internships & Fellowships cited opportunities to explore fields such as biomechanics and chemical laboratories, where they gained practical experience and knowledge in STEM processes.
- In eCYBERMISSION, students learned about conducting experiments, analyzing data, and applying the scientific method to community problems, enhancing participants' STEM skills and interests.
- Among GEMS participants, there were fewer comments that directly mentioned STEM skills or interests, but participants remarked on fun and informative activities about STEM topics not typically taught in schools.
- In JSHS, participants highlighted the value of exposure to STEM research and processes.
- JSS participants frequently mentioned STEM skills and interests, emphasizing the program's role in fostering STEM knowledge and personal growth.

While most AEOP participants are students, educators can also benefit through the Research Experiences for STEM Educators and Teachers (RESET) initiative, which offers them the opportunity to bolster their STEM content knowledge and improve their teaching practices. RESET teachers reported significant improvements in various STEM skills. For example, every teacher who participated in RESET reported they learned about real-world applications for STEM, with 90% of them reporting they learned "a lot." The vast majority of teachers (98%) also reported gains in their research skills, with 74% reporting they learned "a lot."

4 Development of 21st Century Skills

Students made substantial gains in 21st Century Skills, including their problem-solving and collaboration skills. Both students and mentors reported students improved their ability to solve problems individually and/or collaboratively, as well as their ability to communicate and work effectively with others. Mentors, in particular, reported that students made large gains in these areas, which is notable given that students may have a difficult time assessing growth in their own teamwork and communication skills. These findings suggest that AEOP helped students gain skills that could prepare themselves for future collaborative endeavors in a STEM field.

The surveys asked about 21st Century skills across three main domains, shown in Table 8. Results from each of these domains are described in the following sections.

Table 8. 21st Century Skills Assessed through the Evaluation

21st Century Areas	Description
Problem solving and collaboration	• Solving problems individually or with a team • Involving others in decision making • Working collaboratively with others • Leading and guiding others in a team
Communicating and interacting with others	• Communicate clearly with others orally • Communicate clearly with others in writing • Interacting with others in a respectful and professional manner
Community and real-world connections	• Thinking about how their work impacts the larger community

4.1 Problem Solving and Collaboration

Overall, students reported gains in their problem-solving and collaboration skills. They gained skills solving problems individually or with a team (95% reported at least a "small increase"), involving others in decision-making (93%), and working collaboratively with others (93%). Students were somewhat less likely to report growth in leading or guiding others in a group (87%). See Table 9 below for the full range of responses to these items.

Table 9. Students Improved their Problem-Solving and Collaboration Skills

Response		No increase	Small increase	Medium increase	Large increase	Overall Learning
Solving problems individually or with a team*	Participant	5%	16%	40%	39%	**95%**
	Mentor	0%	5%	29%	66%	**100%**
Involving others in decision making	Participant	7%	15%	33%	45%	**93%**
	Mentor	1%	12%	33%	54%	**99%**
Working collaboratively with others**	Participant	7%	19%	40%	35%	**93%**
	Mentor	0%	8%	28%	64%	**100%**
Leading and guiding others in a team or group	Participant	13%	24%	33%	31%	**87%**
	Mentor	3%	14%	32%	52%	**97%**

Due to rounding, totals may not equal 100%.
Participant Survey; All AEOP Programs combined (n = 3,214)
Mentor Survey (n = 290)
Participant and Mentor responses include those who reported “small,” "medium increase,” and “large increase.”
*The JSHS participant survey item read, *Solving problems*.
**The JSHS participant survey item read, *Working creatively with others*.

Across AEOP, the 21st Century skills students most often reported in open-ended survey comments and during focus groups were teamwork and collaboration—likely due to that fact that most of the programs focus on group projects and problem-solving in groups, as well as designing, building, and testing in teams. Participants frequently mentioned their experiences working in groups and, in doing so, improved their social and team-building skills. Other students highlighted instances where they learned to communicate effectively, solve problems collectively, and involve others in decision-making processes.

Participants also offered examples of how participating in AEOP helped them develop their critical thinking and problem-solving skills. For example, some participants described how they had to tackle various challenges, both individually and as part of a team in their program. Whether it was troubleshooting code, devising innovative solutions to engineering problems, or conducting experiments, AEOP programs provided them with opportunities to enhance their problem-solving abilities. The evaluation findings suggest that AEOP not only imparts theoretical knowledge, but also equips students with practical skills needed to address real-world challenges in science and technology.

Students and mentors offered several examples of how participants gained problem-solving and collaboration skills by engaging in the engineering design process (e.g., designing solar cars, robots, drones, and roller coasters), and by working in team environments where they practiced skills in asking questions, active listening, and sharing ideas while considering different perspectives. Mentors stated that students were learning how to divide tasks, hold each other accountable, support each other, and learn from their failures and successes as a team.

“ *I learned about solving problems with a partner. When building a robot, there was some difficulties in putting pieces together. We had to find another way of connecting them without messing up the final product.* -AEOP Student

“ *We had a class that we had to get into a group of four and test water and try to match it to the different areas. I learned how to work well with others and put my part of effort into the experiment to get it done.* -AEOP Student

“ *Students learned to be proactive to solve problems and working as a team. Brainstorming on different possible issues helped them to execute the project tasks smoothly.* -AEOP Mentor

“ *They worked on solving problem by coding in Python through developing multiple game environments and during team-based activities they strengthened their communication skills.* -AEOP Mentor

“ *There were several instances where the students in the camp spontaneously formed small and larger groups to solve problems or collaborate through their work.* -AEOP Mentor

4.2 Communicating and Interacting with Others

Students improved various communication skills. The majority of both students and mentors reported AEOP contributed to gains in students’ ability to communicate clearly with others orally (92% of students and 100% of mentors reported at least a “small increase”) and in writing (88% of students and 99% of mentors). Students also improved their skills in interacting with others in a respectful and professional manner (91% of students and 98% of mentors reported at least a “small increase”). See Table 10 below for the full range of responses to these items.

Table 10. Students Improved Various Communication Skills

Response		No increase	Small increase	Medium increase	Large increase	Overall Learning
Communicating clearly with others orally	Participant	8%	20%	35%	37%	**92%**
	Mentor	0%	8%	30%	62%	**100%**
Interacting with others in a respectful and professional manner	Participant	9%	19%	31%	40%	**91%**
	Mentor	2%	13%	32%	54%	**98%**
Communicating clearly with others in writing*	Participant	12%	27%	29%	33%	**88%**
	Mentor	1%	17%	36%	45%	**99%**

Due to rounding, totals may not equal 100%.
Participant Survey; All AEOP Programs combined (n = 3,214)
Mentor Survey (n = 290)
Participant and Mentor responses include those who reported “small,” "medium increase,” and “large increase.”
*This question was not asked of GEMS and JSS participants.

Students developed communication skills through talking with team members, writing up findings, and presenting in front of judges or peers in competitions. Mentors described how participants developed communication skills by having opportunities to discuss in small groups, present data at competitions, and use evidence to present their arguments.

“ *I normally prefer to work alone rather than in groups, so when we had to work in groups, I had to communicate with team members and involve them in decision making. Collaboratively, we brainstormed ideas that we could use and then democratically selected whichever idea seemed the best.* -AEOP Student

“ *We had to work in teams in robotics, so we had to communicate and talk. We also had to get along with each other. This way we could make a robot and complete everything.* -AEOP Student

“ *I found myself struggling to explain my project initially, because even though I understood it well. The concepts were complicated and had taken me a long time to grasp, so I didn't know how to summarize it for a wide audience in a short amount of time. After practicing with my family members, I was able to refine my word choice and be able to communicate clearly with others better orally.* -AEOP Student

“ *Students who previously were introverted or quiet learned to explain their thought process and decision making to the whole group.* -AEOP Mentor

“ *Our students learned much about how to present an argument that uses data and/or findings from an experiment because we had a forensic camp where a student actually had to use science and clues to solve a murder mystery. Their argument had to be presented during the closing ceremony as a murder trial using all their supporting data.* -AEOP Mentor

4.3 Community and Real-World Connections

AEOP offered many students hands-on opportunities to understand how STEM can address real-world problems that impact the larger community. As Table 11 shows, most students reported that they increased in their thinking about how their work impacts the larger community (92% of students and 98% of mentors reported at least a "small increase").

Table 11. Students Improved Their Perspectives about How their Work Impacts the Larger Community

Response		No increase	Small increase	Medium increase	Large increase	Overall Learning
Thinking about how your work could impact the larger community	Participant	8%	19%	33%	40%	**92%**
	Mentor	2%	6%	34%	58%	**98%**

Participant Survey; All AEOP Programs combined (n = 3,214)
Mentor Survey (n = 290)

Students reported that their AEOP experiences allowed them to engage in projects to better understand and solve real-world problems. Students described learning how "using too much fossil fuels impacts the Earth," and the importance of "detecting toxins" in communities. Some students engaged in solving problems impacting their immediate school environment, such as creating a habitat and sanctuary for ducks or improving waste management.

Mentors also shared examples about how participants' projects connected to the real-world. For example, their students investigated how technology can be used to prevent oral diseases such as gingivitis and periodontitis; learned about genomics research and the importance of informed consent; and met with criminal investigators who connected content from students' labs to their own career work.

"*I definitely saw my project and own experiences on a much higher level of importance and impact in my own community, where the use of nicotine and vapes are common but never truly acknowledged.* -AEOP Student

"*Multiple times throughout the past weeks, children took the opportunity to explain how the things they saw in GEMS could be applied to the real world. During an activity we led called Brittle Bones, some children explained how they saw osteoporosis being prevented in schools and how they could relay the information they gained to their parents and grandparents.* -AEOP Mentor

5 Interest in STEM and STEM Careers

The evaluation results highlight the significant positive influences of AEOP on students' STEM confidence, interest in STEM-related activities, and aspirations for STEM education and careers. Both students and mentors overwhelmingly agreed on the program's success in boosting students' confidence in their STEM knowledge and skills. Furthermore, results indicate that AEOP plays a pivotal role in cultivating students' ongoing engagement with STEM, as evidenced by their increased interest in participating in various STEM endeavors. The results also provide evidence that the program ignites students' aspirations for future involvement in STEM education and careers, underscoring its effectiveness in inspiring the next generation of STEM leaders and innovators.

5.1 STEM Confidence

Most students and mentors indicated that AEOP increased students' STEM confidence. Both groups were asked to rate their agreement with a statement about confidence in STEM knowledge, skills, and abilities. As Table 12 shows, they overwhelmingly agreed that students were more confident in these areas as a result of their participation in AEOP (90% of students and 98% of mentors).

Table 12. Most Students and Mentors Indicated that AEOP Increased Students' STEM Confidence

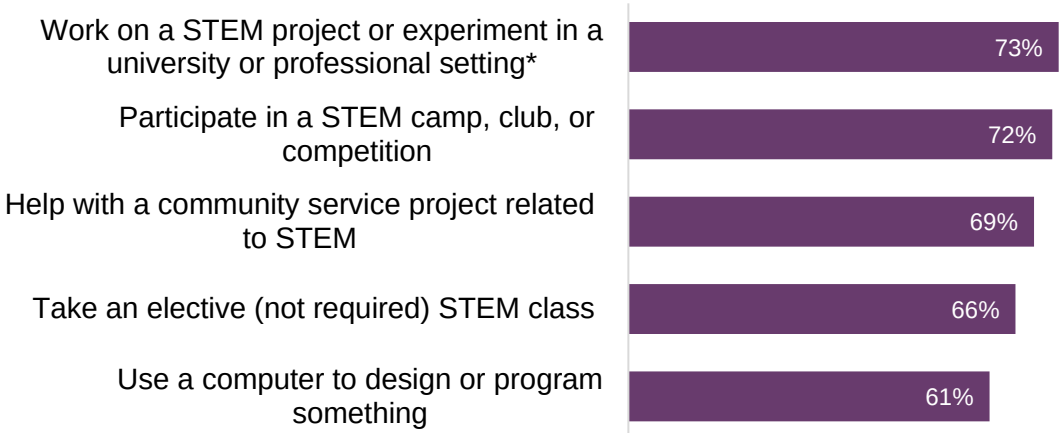
Response		Strongly Disagree	Disagree	Agree	Strongly Agree	Agree overall
I am/They are more confident in STEM knowledge, skills, and abilities	Participant	2%	8%	51%	39%	90%
	Mentor	0%	1%	38%	60%	98%

Participant Survey; All AEOP Programs combined (n = 3,136)
Mentor Survey (n = 230)

5.2 Interest in STEM-related Activities

Evaluation results show that participating in AEOP positively influenced students' likelihood of continued engagement in STEM. AEOP students were directly asked about their interest in continuing to engage in STEM activities after their AEOP experience. At least three-fifths of all students reported that they were "more likely" or "much more likely" to engage in future STEM education and training opportunities such as working on a STEM project or experiment (73%), participating in a STEM camp, club, or competition (72%), or taking a non-required elective STEM class after participating in AEOP (66%). Many students were also more interested in using a computer to design or program something (61%) after participating in AEOP (Figure 3).

Figure 3. Most Students Reported Becoming More Interested in Participating in Other STEM-Related Activities after Participating in AEOP



Participant Survey; All AEOP Programs combined (n = 3,148)
Responses include those who reported "more likely" and "much more likely."
*This question was not asked of GEMS and JSS participants.

A number of younger students expressed a newfound or deeper appreciation for STEM even if, in some instances, they were not interested in a career in STEM. Ultimately, participation in the JSS, eCYBERMISSION, and GEMS programs appeared to spark a genuine interest and enthusiasm.

"*JSS has helped me grow a liking towards STEM. Although I'm sure that I won't make a job out of it, I definitely have grown a liking towards it.* -AEOP Student

"*My overall experience with eCYBERMISSION was great. I had fun working on this project with friends. Even though I don't want to pursue a STEM career, it was great to try to help the community.* -AEOP Student

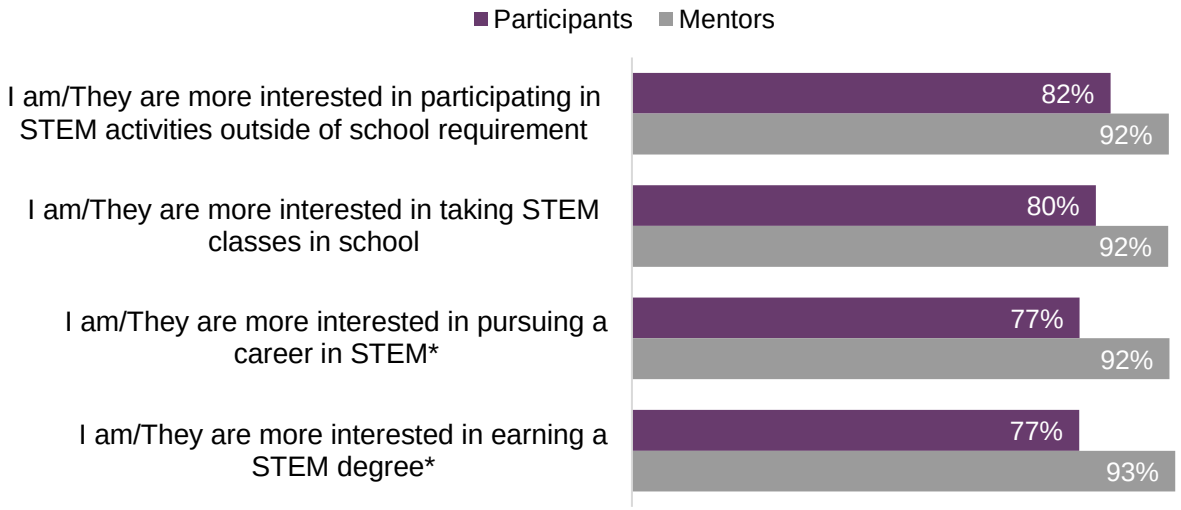
"*Overall, I had a really fun time meeting new people and exploring deeper into STEM and how everything works around us! Science has never really been my thing, but after this camp it has grown on me so much because there are so many things around us that have not been explained and even explored and there is so much stuff that I still want to see!* -AEOP Student

5.3 Interest in Pursuing STEM Education and Careers

AEOP had a positive effect on students' interest in STEM education and careers. As Figure 4 shows, on post-program surveys, the majority of students and mentors thought students became more interested in participating in STEM activities outside of school (82% of

students and 92% of mentors) and taking STEM classes in school (80% of students and 92% of mentors). Both groups also reported that students were more interested in pursuing a career in STEM (77% of students and 92% of mentors) and earning a STEM degree (77% of students and 93% of mentors). As with other areas assessed in the evaluation, mentors consistently reported higher proportions than students.

Figure 4. AEOP Had a Positive Effect on Students' Interest in STEM Education and Careers



Participant Survey; All AEOP Programs combined (n = 3,106)
Mentor Survey (n = 274)
Participant and Mentor responses include those who reported Agree or Strongly Agree.
*This question was not asked of GEMS and JSS participants.

Older students, understandably, were more likely to remark on the influence of AEOP on their interest in STEM careers, as evidenced by the comments from Unite, JSHS, and Internships/Fellowships participants.

"*[The program] fueled my ambition to learn and accomplish a successful career in STEM as a whole.* -AEOP Student

"*It was really fun getting to know other projects and what they have done for their project. It really opened my eyes to see that there are a lot of people who have the same interests as me when it comes to science…The whole experience makes me want to go into college with my research and study even more for my love for science.* -AEOP Student

"*It has allowed me explored bio-mechanical fields and future chemical laboratories within universities. It has given me knowledge and insight on processes involved within STEM and has benefited me [in] interact[ing] with natural phenomena.* -AEOP Student

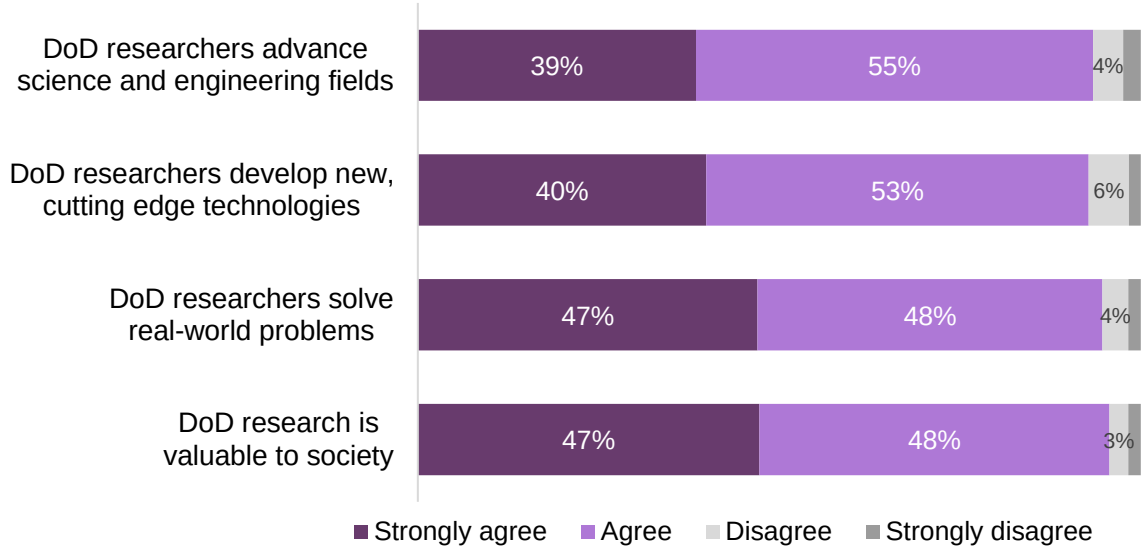
6 Perceptions of DoD

AEOP is instrumental in educating students about the significance of Department of Defense (DoD) research in addressing real-world issues. According to evaluation results, the vast majority of students recognize the value of DoD research, acknowledging its role in advancing science and engineering, developing innovative technologies, and solving practical problems. These findings underscore the potential of AEOP to not only provide theoretical knowledge, but also foster a deep appreciation for the real-world impact of DoD research. Additionally, participation in AEOP appears to cultivate students' interest in pursuing STEM careers within the DoD, as reported by both mentors and students, highlighting the capacity of these programs to shape the future workforce of the DoD.

6.1 Understanding of DoD Research

AEOP gives students an understanding of the importance of DoD research, particularly as it relates to solving real-world problems. On the survey, AEOP students were asked how much they agree or disagree with statements about DoD researchers and research. Over 90% of all students agreed or strongly agreed that DoD researchers advance science and engineering fields; that DoD researchers develop new, cutting-edge technologies; that DoD researchers solve real-world problems; and that DoD research is valuable to society (Figure 5). These results highlight the success of AEOP in instilling in students a deep understanding of the practical significance and societal consequences of DoD research efforts.

Figure 5. Students Understand that DoD Research is Important



Participant Survey; All AEOP Programs combined (n = 3,104)
For each category, 2% of respondents chose "Strongly disagree."

Students and mentors commented on value of AEOP in exposing students to DoD research and the potential influence on the future STEM workforce.

“ *[I enjoyed] meeting and working with other engineers at the US Army Corp of Engineers, Engineer Research Development Center.* -AEOP Student

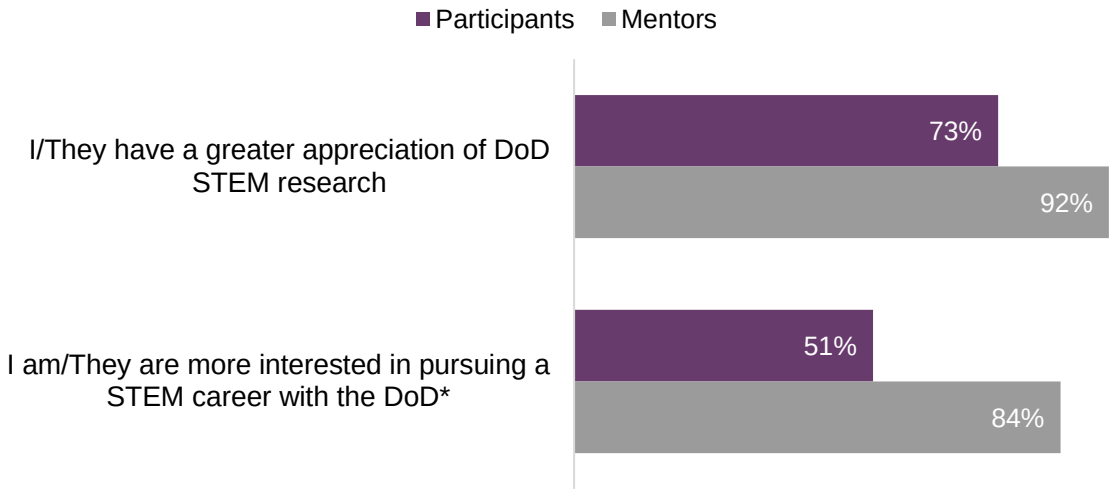
“ *[I learned] not only about science, but also about what is to be a soldier that is making science inside the DoD or the Army.* -AEOP Student

“ *It provides exposure to students at an early age. Providing college students with an opportunity to intern at a DoD facility is an amazing way to recruit future scientists and engineers. However, providing that same opportunity to high school students is the key to making sure the US has enough STEM resources to make the next technological breakthrough possible.* -AEOP Mentor

6.2 Interest in DoD STEM Research and Careers

Participating in AEOP cultivates students' appreciation for and interest in DoD STEM research and careers. As Figure 6 shows, both mentors and students reported that students had a greater appreciation of DoD STEM research (92% of mentors and 73% of students, respectively) and were more interested in pursuing a STEM career with the DoD (84% and 51%, respectively). Similar to other aspects evaluated, mentors consistently indicated larger proportions compared to students. These findings underscore the potential transformative influence of AEOP programs in not only broadening students' perspectives on DoD STEM research but also in inspiring them to consider pursuing meaningful careers in this field, thereby nurturing a future workforce equipped to address complex challenges and drive innovation within the DoD.

Figure 6. Participating in AEOP Cultivates Students' Appreciation for and Interest in DoD STEM Research and Careers



Participant Survey; All AEOP Programs combined (n = 3,106)
Mentor Survey (n = 274)
Participant and Mentor responses include those who reported Agree or Strongly Agree.
*This question was not asked of GEMS and JSS participants.

7 Impact of Mentors on AEOP Participants

The implementation of common instructional, coaching, and mentorship approaches across AEOP programs to attain program objectives was widely acknowledged by both students and mentors. The vast majority of students and mentors reported engagement in team projects during AEOP experiences, demonstrating the prevalence of collaborative learning methods.[6] Additionally, mentors employed diverse strategies to cater to students' diverse needs, with an emphasis on practical problem-solving, fostering open-mindedness, and facilitating discussions on education and career goals.

Students and mentors reported a high use of common approaches across programs to achieve AEOP goals. The survey asked both students and mentors about a range of mentor techniques employed in AEOP (see Table 13). For example, 95% of students and mentors reported that students worked on a team project during their AEOP experience.[7] In addition, high percentages of students reported using strategies related to the particular work or activity within their AEOP experience. Over four-fifths of students reported that mentors helped them learn or practice STEM skills (91%), gave them extra support when they needed it (91%), and used a variety of strategies to help them learn (87%).

Mentors had the important role of helping students better understand STEM and the role it plays in their lives. Over three-quarters of mentors reported helping students become aware of STEM in their everyday lives (85%) and helped them understand how they can use STEM to improve their community (79%). Over 80% of both students and mentors reported encouragement in sharing ideas with others of different backgrounds.

In all programs except for JSS (because of participants' ages), respondents were asked if mentors provided information about the education needed for a STEM career. Mentors were more likely to suggest they provided this information (83%) than students were to indicate that they received it (73%).

Overall, these findings suggest that the structured mentorship and collaborative learning environments within AEOP programs significantly contribute to students' academic and personal growth. By engaging in team projects and receiving tailored support from mentors, students are empowered to develop essential STEM skills and gain confidence in their abilities. Moreover, mentors play a crucial role in broadening students' perspectives on the relevance of STEM in their lives and communities, fostering a greater appreciation for STEM education and potential career pathways. However, the disparity between mentors' claims and students' perceptions regarding guidance on STEM career education suggests a need for further alignment to optimize student outcomes in this aspect.

[6] It is worth noting that certain survey questions regarding the mentors' roles were omitted for GEMS and JSS participants, as these elements were not relevant to those programs. In addition, we did not administer a mentor survey for JSHS program and students were only asked to respond to related questions based on their self-reported work with a mentor.
[7] This item was not asked of GEMS and JSS participants as this is not a key component of those program's experience.

Table 13. Participants and Mentors Reported Common Strategies Used Across AEOP

Response		
Allowed me to work on a team project or activity**	Participant	95%
Allowed students to work on a team project or activity**	Mentor	95%
Helped me learn or practice a variety of STEM skills*	Participant	91%
Provided guidance to help students practice a variety of STEM skills *	Mentor	96%
Gave me extra support when I needed it	Participant	91%
Provided additional support to students as needed	Mentor	95%
Used a variety of strategies to help me learn**	Participant	87%
Used a variety of teaching and/or mentoring activities to meet the needs of all students**	Mentor	93%
Helped me become aware of STEM in my everyday life	Participant	82%
Helped students become aware of the role(s) that STEM plays in their everyday lives	Mentor	85%
Encouraged me to share ideas with others who have different backgrounds or viewpoints*	Participant	81%
Had student(s) exchange ideas with others whose backgrounds or viewpoints are different from their own *	Mentor	87%
Helped me understand how I can use STEM to improve my community	Participant	80%
Helped students understand how STEM can help them improve their own community	Mentor	79%
Talked to me about the education I need for a STEM career*	Participant	73%
Talked to students about the education they need for STEM careers *	Mentor	83%

Participant Survey; All AEOP Programs combined (n = 3,031)
Mentor Survey (n = 284)
*This question was not asked of JSS participants.
**This question was not asked of GEMS and JSS participants.

Across AEOP, the role of mentors varies by program. However, students consistently remarked positively on their experiences with mentors.

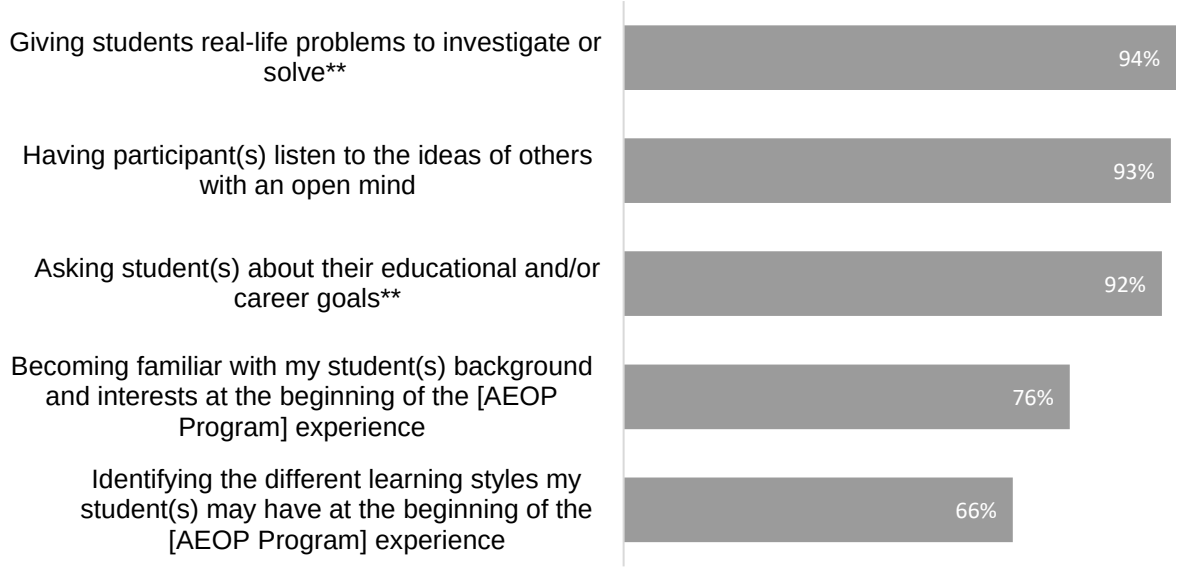
“ *[I enjoyed] being able to learn from and also teach mentors in a fun and exciting environment.* -AEOP Student

“ *Regardless of the level of STEM background students had, everyone was challenged and walked away with new information each day. I appreciated how the volunteers and teachers were very patient and open to questions. Everyone was also flexible, and lessons were easily adjusted based on the speed at which concepts were grasped. The supplemental break activities – networking, guest speakers, wonderful lunches, and team bonding tasks – gave the camp an excellent social and academic balance.* -AEOP Student

“ *My mentors have done an excellent job with 1) networking me with ARL technical experts and affiliates, and 2) making me aware of events and resources within the Army/DoD community where my research can be integrated.* -AEOP Student

Mentors employed many strategies to meet the diverse needs of students (see Figure 7). In addition to the areas above, the mentor survey asked them to indicate other ways that they supported their students. Mentors were most likely to report giving students real-life problems to solve (94%), having students listen with an open mind (93%), and discussing education and career goals (92%). Mentors were relatively less likely to report using strategies related to learning specifics about the students they were mentoring, including becoming familiar with students’ backgrounds and interests or understanding their learning styles (76% and 66%, respectively). The latter two areas could indicate an opportunity for professional development or peer learning among mentors.

Figure 7. Mentors Used Multiple Strategies to Meet Students' Needs



Participant Survey; All AEOP Programs combined (n = 3,104)
Mentor Survey; All AEOP Programs combined (n = 284)
**This question was not asked of GEMS and JSS participants.

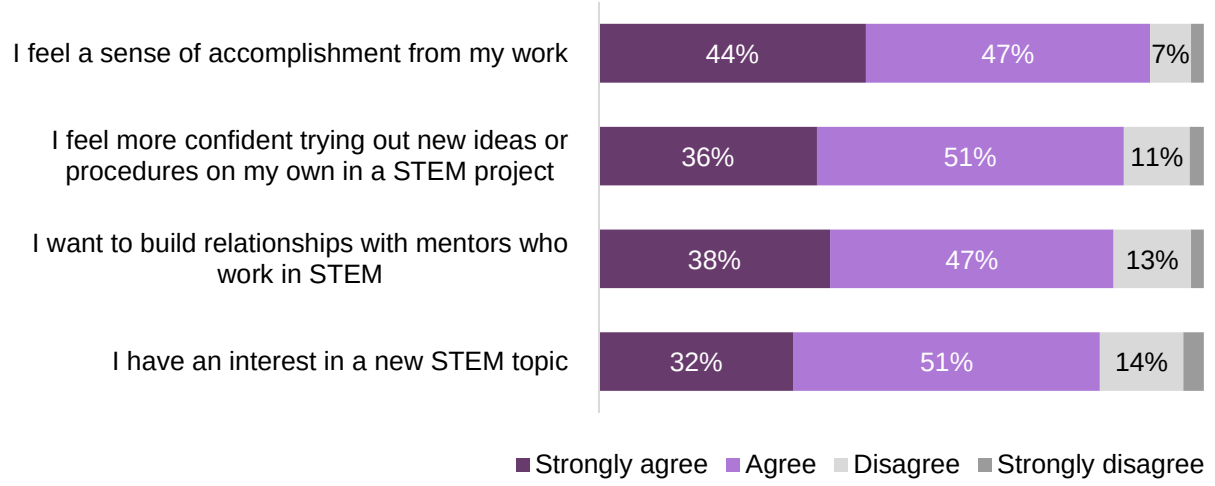
8 Overall Experience

The evaluation results reflect positive experiences for students in the AEOP. However, there is room for greater awareness of AEOP and similar STEM pathway programs, as evidenced by the findings showing a lack of awareness among a sizable portion of students. Students' suggestions for improvement include providing additional resources and tools, such as visual aids and clearer communication channels, to enhance the learning experience. Mentors also emphasized the need for better access to teaching tools, highlighting the importance of addressing this barrier to ensure effective program implementation and support for students.

8.1 Overall Impressions

Students had positive overall experiences with AEOP. As noted in the above sections, students developed their STEM skills and knowledge while gaining valuable real-world experience. Figure 8 shows that overall, roughly four-fifths or more of students "agreed" or "strongly agreed" that they have an interest in a new STEM topic (83%), want to build relationships with mentors who work in STEM (85%), feel more confident trying out new ideas or procedures (87%), and feel a sense of accomplishment from their work in AEOP (91%).

Figure 8. Students had Positive Overall Experiences With the AEOP



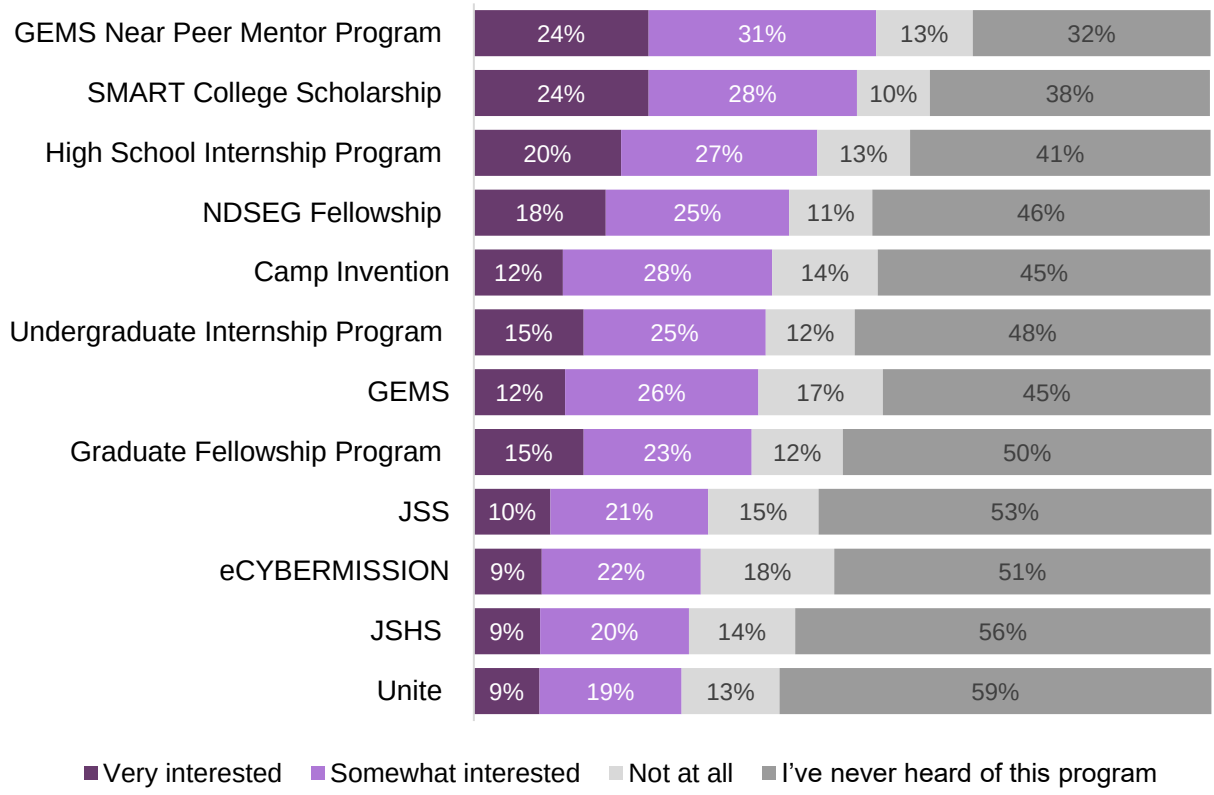
Participant Survey; All AEOP Programs combined (n = 3,106)

8.2 Future Interest in AEOP and Other STEM Programs

Students were generally interested in participating in AEOP and other STEM programs, but there is room for greater awareness of these opportunities. Between 28% and 55% of students indicated that they were somewhat or very interested in participating in another program within AEOP or a similar STEM-focused initiative in the future (see Figure 9). While there appears to be interest in future participation, there also is room for improving student awareness of other programs. Roughly one-third or more of students were not aware of other programs within AEOP or other STEM-focused programs. This suggests an opportunity for

increasing communication and outreach efforts to ensure students are informed about the array of educational opportunities available to them.

Figure 9. Students were Interested in AEOP and other STEM Programs but there is Room for Greater Awareness



8.3 Participants' Suggestions for Improvement

The participant surveys included a question which asked, "What are two ways [this program] could be improved?" In general, students' suggestions for program improvement were specific to their individual program, but there were two areas that were common across all programs.

Roughly one-tenth of students expressed a desire for additional resources and tools. For example, some mentioned that providing more visual aids such as pictures or videos could be helpful to "go more in depth" with better explanations for visual learners. Participants also wanted exemplars to refer back when developing their "written abstract" and "better resources that help people explore their topics." These findings suggest that students value supplementary resources and tools to enhance their learning experience. Specifically, the request for more visual aids and exemplars indicates a need for diversified instructional materials to accommodate various learning styles and facilitate deeper comprehension of subject matter.

A smaller proportion of students highlighted the need for improved communication and organization, such as more frequent outreach from program staff, clearer schedules,

transparency regarding pay, and overall clearer expectations. Moreover, participants indicated a desire for more user-friendly technology tools and website enhancements, citing issues with navigation. While a smaller subset of students voiced concerns about communication and organization, their feedback underscores the pivotal role of these factors in shaping the overall program experience. By prioritizing these areas for improvement, program staff could enhance participant satisfaction and facilitate more effective engagement with program content and activities.

9 Recommendations

This report distills evaluation findings as they align with AEOP's overarching research questions. Data collected for this evaluation are not necessarily representative of the entire program; however, based on the results presented above, we offer the following recommendations:

Programmatic Considerations

Consider targeted training and support for mentors to enhance their effectiveness in guiding students' STEM learning. In general, there was high alignment between student and mentor reports of structured learning environments. However, mentors' guidance to students on STEM career education opportunities is one potential area for improvement; 83% of mentors stated this occurred compared to 73% of students. By investing in mentor development and tailoring this support to the focus of the program and student population, AEOP can ensure that mentors are well-prepared to support students effectively, ultimately enhancing the quality of the program and the learning experience for participants.

Continue to use targeted marketing and outreach campaigns to raise awareness about AEOP programs and their benefits among students, educators, and parents. These campaigns should leverage various channels such as social media, educational institutions, and community organizations to reach a diverse audience. Additionally, implementing strategies like hosting informational sessions, distributing promotional materials, and partnering with schools can effectively increase program visibility. By prioritizing these efforts, AEOP can ensure that more individuals are informed about the opportunities available, ultimately driving greater participation and engagement in STEM-related activities.

Build on partnerships with schools, community organizations, and industry stakeholders to provide students with diverse STEM learning opportunities. Collaborating with schools can facilitate the integration of AEOP programs into curricula, while partnerships with community organizations can expand outreach efforts to underserved populations. Engaging industry stakeholders can offer students exposure to real-world applications of STEM concepts, fostering a deeper understanding of STEM careers and pathways. By strengthening these partnerships, AEOP can enrich students' educational experiences and better prepare them for future success in STEM fields.

Evaluation Considerations

Continue to explore ways to improve response rates. Response rates remain a persistent challenge. While a couple of programs improved their response rates compared to FY22, overall response rates remain low (23% in FY22 and 22% in FY23). We will continue to partner with programs to tailor strategies to improve responses rates such as through personalized follow-up communications and reminders.

Improve documentation of participation and organization counts. With the rollout of Ideal-Logic, the Consortium has moved toward a standardized system and platform for program

registration and participation. However, not all programs use the registration platform, which makes it challenging to accurately report program participation. Improving documentation practices is essential for ensuring the quality of program data. By implementing standardized policies and procedures, AEOP can strengthen its ability to track participation and organizational metrics accurately, ultimately leading to improved decision-making and reporting.

Explore the extent to which students sustain their involvement in multiple programs within AEOP. Future evaluation efforts could examine participation in subsequent AEOP programs over several years. Doing so would provide insights into the longer-term influence of AEOP on participants' continued engagement in STEM education and career pathways. This effort could explore the effectiveness of AEOP in fostering sustained interest and involvement in STEM, informing future program enhancements and strategic planning.