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ARMY EDUCATIONAL OUTREACH PROGRAM

Strategic Plan

March 2024

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ARMY EDUCATIONAL OUTREACH PROGRAM
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Contents

AEOP Vision Statement

A nation of STEM-inspired changemakers, problem solvers, and innovators prepared to solve the country's biggest challenges.

AEOP Mission Statement

To provide an accessible pathway of STEM opportunities to attract, develop, and mentor the next generation of our nation's diverse talent through U.S. Army educational outreach programs.

Core Objectives

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 U.S. Army research and technology resources.

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

Intent of Plan

This strategic plan is crafted to establish clear goals and objectives that will empower AEOP, its partners, and consortium members to make effective decisions that will strengthen services. By doing so, AEOP will create impactful learning opportunities for program participants, laying the foundation for their success in future STEM careers. This plan will be supplemented by an implementation program built by and for the AEOP consortium members. The implementation plan will provide more specific implementation activities to be carried out by various entities across AEOP.

AEOP: A Strategic Vision for STEM Excellence and Inclusion

In the landscape of America's educational and technological advancements, the Army Educational Outreach Program (AEOP) stands as a beacon of excellence and inclusivity. For over half a century, the U.S. Army, understanding the pivotal role of STEM (Science, Technology, Engineering, and Mathematics) literacy, has championed AEOP. This initiative is not just a program; it's a national imperative to cultivate a STEM-literate citizenry capable of navigating and solving the complexities of modern and future challenges.

This AEOP strategic plan aligns seamlessly with the Department of Defense's STEM Strategic Plan, underscoring a commitment to building strong foundations in STEM literacy, fostering diversity, equity, and inclusion, and preparing a workforce equipped for the future. It's a strategic endeavor to inspire and cultivate talent, addressing critical STEM challenges through a diversity-enriched, evidence-based approach.

At the heart of AEOP lies the recognition that STEM education is crucial for all, extending beyond traditional STEM occupations. The U.S. Army's need for a STEM-literate workforce spans a spectrum from STEM and STEM adjacent careers in fields like advanced manufacturing and logistics. AEOP, thus, offers an inclusive, comprehensive portfolio of STEM opportunities, leveraging world-class scientists, engineers, and research facilities to provide real-world experiences, competitions, and internships.

AEOP's narrative is one of progression and opportunity that starts from elementary school with various initiatives like Gains in the Education of Mathematics and Science (GEMS) and Junior Solar Sprint (JSS), to high school programs like Unite and the Junior Science and Humanities Symposium (JSHS). To foster continuous engagement in STEM, AEOP's efforts provide a journey through education that culminates in internships and fellowships, offering hands-on experience in cutting-edge research and development. These efforts are supported by first-in-class resources provided by Army researchers and laboratory resources.

The program's impact is tangible and significant: in 2022 alone, AEOP engaged nearly 18,000 students and approximately 950 adults (e.g., educators, advisors, mentors, and S&E volunteers). Evaluation survey results from 23% of students show that: 95% gained in-depth knowledge of a STEM topic; and 93% increased their interest in a new STEM topic. This strategic plan not only reiterates AEOP's commitment to these ideals but also its pivotal role in actualizing the DoD's vision for a future-ready, diverse STEM workforce.

This strategic plan presents a transformative vision for the AEOP, elevating it from a program to a nationwide crusade in STEM education. It beckons a collective effort to close the divides in STEM literacy and awareness by connecting communities, empowering educators, and inspiring students. Legislators, academic allies, industry leaders, and government agencies are implored to acknowledge and bolster AEOP's essential mission in shaping our nation's STEM future. This

initiative transcends educational boundaries; it represents a strategic investment in the United States' security, ingenuity, and economic prosperity.

Presented here is a blueprint for transformation within AEOP, extending an invitation for collective participation in a journey of change. It charts a course for nurturing innovative minds destined to guide America toward a future where challenges yield to skillful creativity and indomitable innovation.

AEOP STEM Program Pipeline

Goal 1.0 – Establish AEOP as a Premier Program for STEM Education in the Nation

Connection to Department of Defense STEM Plan

DoD STEM Goal 2.0 - Attract the Nation's and DoD's current and future STEM workforce through multiple pathways to educational and career opportunities.

DoD STEM Goal 4.0 - Advance the efficiency and effectiveness of STEM education and workforce development programs, activities, and outreach through evaluation and assessment.

Objective 1.1 - Develop strategic partnerships with leading technology companies, universities, and research institutions – building off the great partnerships already established with the Army labs – to provide AEOP program partners with exposure to cutting-edge STEM applications, career pathways, and innovative pedagogical approaches in program curricula to enhance learning experiences and keep pace with the rapidly evolving STEM landscape.

Objective 1.2 - Establish a comprehensive evaluation framework for AEOP programs, focused on consistently monitoring performance metrics, integrating annual reviews of emerging STEM education best practices, standardizing practices across all program areas, systematically collecting and implementing feedback from participants and their families, and conducting regular audits to align programs with AEOP's mission, vision, and strategic goals.

Objective 1.3 - Execute a cohesive STEM program pipeline by tracking and analyzing participant transitions across programs, creating strategies that build on prior learning, and forming a comprehensive educational and developmental roadmap to guide each student's intentional and attentive journey through AEOP's offerings.

Objective 1.4 - Deploy a quality-controlled, comprehensive marketing strategy for program partners, leveraging a variety of media channels such as digital marketing, social media, community outreach, and educational partnerships, to effectively enhance AEOP's visibility and appeal.

Goal 2.0 – Expand and Facilitate Greater Access to AEOP Programs for Underserved Students

Connection to Department of Defense STEM Plan

DoD STEM Goal 3.0 - Increase participation of underserved groups in STEM education and workforce development programs, activities, and outreach.

Objective 2.1 - Utilize the findings and best practices derived from pilot projects to develop and share effective outreach strategies with AEOP program partners by providing program partners with the necessary tools and guidance to effectively reach and enroll students from underserved communities in AEOP programs.

Objective 2.2 - Leverage insights from the thorough evaluation of existing programs to identify and engage in expansion and partnership opportunities, aiming to broaden AEOP's program reach into underserved areas and thereby improve accessibility and engagement for a diverse participant body.

Objective 2.3 - Provide K-12 educators, parent groups, Army labs, and community organizations focused on reaching underserved students with a wealth of resources, including toolkits, to cultivate and strengthen relationships within underserved communities.

Objective 2.4 - Strengthen and expand partnerships through strategic participation in events aimed at reaching underserved students, like DEPSCoR, ROTC, HBCU/MI roadshows, and military family gatherings, while nurturing and intensifying connections with minority-serving STEM organizations.

Goal 3.0 – Strengthen AEOP Alumni Engagement

Connection to Department of Defense STEM Plan

DoD STEM Goal 1.0 - Inspire community engagement in DoD STEM education programs and activities to provide meaningful STEM learning opportunities for students and educators.

Objective 3.1 - Incorporate an alumni engagement element into the AEOP program pathway, utilizing it as a strategic tool to both promote AEOP programs and encourage former participants to stay involved as adult contributors in various capacities like judges, speakers, and resource teachers.

Objective 3.2 - Establish a focused alumni engagement campaign that reinforces bonds among AEOP alumni and actively fosters their sense of pride and unique identity as AEOP graduates, thereby promoting a strong community spirit and sustained affiliation with the program.

Objective 3.3 - Create a comprehensive resource guide for adult supporters of student participation, including mentors and volunteers, providing them with updated information and resources detailing ways they can assist and engage in each AEOP program.

Objective 3.4 - Create and continuously improve training and support mechanisms for AEOP educators, parents, mentors, and volunteers, focused on effectively engaging with and supporting AEOP students and programs, incorporating ongoing feedback from both student participants and adults to refine these resources.

Goal 4.0 – Enhance Organizational Collaboration and Clarity within AEOP

Connection to Department of Defense STEM Plan

Goal 4.0 of the AEOP Strategic Plan, while not directly mirroring the Department of Defense's STEM Plan, plays a crucial role in fortifying the consortium's capability to support AEOP's essential role in shaping the nation's STEM future, positioning AEOP as the premier choice for STEM programming. This goal focuses on enhancing internal organizational coherence and collaboration within AEOP. By standardizing terminology, encouraging inter-program partnerships, structuring consortium meetings for optimal collaboration, and clearly defining leadership roles, AEOP aims to build a stronger, more unified consortium. These efforts, though internally focused, are pivotal in amplifying AEOP's effectiveness and reach, directly contributing to the DoD's overarching objective of developing a skilled, diverse STEM workforce.

Objective 4.1 - Standardize and uniformly apply a clear set of key terminologies across AEOP programs and communications for enhanced clarity and understanding among participants, educators, and stakeholders, complemented by a comprehensive glossary outlining these terms.

Objective 4.2 - Promote and support purposeful internal and external collaborations, extending beyond consortium meetings, to include joint workshops, conferences, and crossover events, using collaborative tools to deepen mutual understanding and strengthen the AEOP program pathway.

Objective 4.3 - Implement a consistent and structured approach for AEOP consortium meetings, with established procedures focused on enhancing collaboration, building relationships, and prioritizing key elements crucial to the success of the AEOP program pathway.

Objective 4.4 - Develop an inclusive and detailed leadership plan that specifies roles and responsibilities for Individual Program Administrators, toolkit partners, the lead organization, and the Army, ensuring clear understanding of partner interrelationships and equitable involvement of consortium members in working groups.

Next Steps

As we embark on the journey to implement the strategic plan for the Army Educational Outreach Program (AEOP), beginning in 2024, we stand at the threshold that will position AEOP as a leader in STEM education programing in the nation. This plan is more than a roadmap; it's a commitment to excellence, a collaborative effort that embodies the spirit of unity and shared purpose.

The lead organization, as the orchestrator of this plan, will shepherd the strategic plan with foresight and precision, ensuring that every step taken aligns with both AEOP's goals and the Department of Defense's strategic goals for STEM education. The Army's insights and guidance will be instrumental in steering this ship, ensuring that we remain true to our mission of inspiring and cultivating talent, with a strong emphasis on diversity and evidence-based approaches. The involvement of Individual Program Administrators and toolkit partners is not just a functional necessity but a symbol of our collaborative ethos. Their role in implementing specific aspects of the plan, under the vigilant supervision of the lead organization, is a testament to the power of partnership. Each partner brings unique strengths and perspectives, enriching our collective effort.

This strategic plan is a call to action, a rally to unite under the banner of educational excellence and innovation. The emotional gravity of our mission cannot be overstated. We are not just educating the next generation of scientists, engineers, and innovators; we are shaping the future of our nation and ensuring our competitiveness in the global arena. The Department of Defense's commitment to a continuous learning structure is mirrored in our approach, where every step forward is informed by learning, evaluation, and adaptation.

Using an Implementation Matrix

An implementation matrix is a strategic tool that serves as a comprehensive guide for executing a strategic plan. It outlines specific objectives, associated actions or strategies, timelines for implementation, responsibilities for each task, resources required, and measurable performance indicators. For AEOP, the implementation matrix is not just a roadmap but also a living document that enables effective tracking and management of the strategic plan's progress. By clearly defining who is responsible for each action and when these actions are expected to be completed, the matrix facilitates accountability and organization within the consortium. It's crucial that this matrix is regularly reviewed and updated, particularly during consortium meetings. These updates allow for adjustments based on real-time feedback, changing circumstances, and progress achieved, ensuring the strategic plan remains dynamic and responsive to the needs of AEOP.

To aid in this process, the following section includes a sample implementation matrix designed for the consortium's use. This matrix exemplifies how to break down each goal of AEOP's strategic plan into actionable objectives, detailed strategies, and timelines, providing a clear path for execution. It assigns specific responsibilities to ensure each task is overseen efficiently and incorporates performance indicators for ongoing evaluation of success. This sample matrix serves as a starting point for the consortium, offering a structured framework that can be tailored to the unique aspects of each objective. It's a foundational tool that can be adapted and expanded, empowering the consortium to effectively implement and manage the strategic plan, ensuring AEOP's objectives are met, and its vision is realized.

Sample AEOP Strategic Plan Implementation Matrix

This plan will be supplemented by an implantation program built by and for the AEOP consortium members. The implementation plan will provide more specific implementation activities to be carried out by various entities across AEOP. Below is a sample of the plan for illustrative purposes. The definitive plan, created by the consortium members, will be dynamic, allowing for updates and modifications as necessary.

Goal 1.0: Establish AEOP as the Premier Programming for STEM Education in the Nation.

Objective	Actions/Strategies	Timeline	Responsibilities	Resources Required	Performance Indicators	Status/Progress
1.1 Strategic Partnerships	Forge partnerships with technology companies and universities Utilize Army lab connections	Q1-Q2 2024	Partnership Development Team	Partnership agreements Meeting budgets	Number of new partnerships Integration of new STEM applications	Planning
1.2 Evaluation Framework	Develop and implement an evaluation framework Train staff on best practices in STEM education	Q1-Q3 2024	Evaluation Team	Training materials Data collection tools	Framework development Staff training completion	In Progress
1.3 STEM Program Pipeline	Analyze participant progression Develop a program pipeline strategy	Q2-Q4 2024	Program Development Team	Data analysis tools Strategy development resources	Completion of pipeline strategy Analysis of participant progression	To Start
1.4 Marketing Strategy	Develop and implement a marketing strategy Utilize digital and social media platforms	Q1 2024 Onwards	Marketing Team	Marketing budget Digital media tools	Increase in program visibility Engagement metrics	Scheduled

Goal 2.0: Expand and Facilitate Greater Access to AEOP Programs for Underserved Students

Objective	Actions/Strategies	Timeline	Responsibilities	Resources Required	Performance Indicators	Status/Progress
2.1 Utilize Pilot Findings	Analyze pilot project results Develop outreach toolkits Share best practices with partners	Q1-Q3 2024		Analysis tools Toolkit production	Toolkit usage Increase in enrollment from underserved communities	Planning
2.2 Program Expansion	Evaluate existing programs Identify expansion areas Forge new partnerships	Q2-Q4 2024		Research resources Partnership development	Number of new partnerships Expanded program reach	In Progress
2.3 Resource Provision	Develop and distribute resources and toolkits Coordinate with educators and community groups	Q1-Q2 2024		Toolkit creation Distribution channels	Resource utilization Feedback from educators and groups	Scheduled
2.4 Strengthen Partnerships	Participate in key events Build relationships with STEM organizations Implement outreach strategies	Q3 2024 Onwards		Event participation Outreach materials	Number of events participated New partnerships formed	To Start

Goal 3.0: Strengthen AEOP Alumni Engagement

Objective	Actions/Strategies	Timeline	Responsibilities	Resources Required	Performance Indicators	Status/Progress
3.1 Alumni Engagement Integration	Develop alumni involvement opportunities in AEOP pathway Promote alumni roles like judges, speakers	Q1-Q2 2024		Outreach materials Program planning	Number of alumni involved Types of roles filled	Planning
3.2 Alumni Engagement Campaign	Launch an alumni campaign to strengthen community bonds Highlight alumni achievements	Q3 2024		Campaign materials Digital platforms	Campaign reach Alumni participation rates	Scheduled
3.3 Resource Guide for Supporters	Compile and distribute a comprehensive resource guide Update regularly	Q1-Q3 2024		Guide creation Distribution channels	Guide utilization Positive feedback from users	In Progress
3.4 Training and Support Improvement	Develop training modules Implement a feedback system for continuous improvement	Q2 2024 Onwards		Training materials Feedback tools	Completion of training modules Feedback implementation	To Start

Goal 4.0: Enhance Organizational Collaboration and Clarity within AEOP

Objective	Actions/Strategies	Timeline	Responsibilities	Resources Required	Performance Indicators	Status/Progress
4.1 Standardization of Terminology	Develop a glossary of key terms Implement standardized terminology in all communications	Q1-Q2 2024		Glossary development resources	Adoption of standardized terms Reduced misunderstandings	Planning
4.2 Support Collaborations	Organize joint workshops and events Utilize collaboration tools for program enhancement	Q3 2024 Onwards		Event planning, Collaboration software	Number of collaborative events Participant feedback	Scheduled
4.3 Consortium Meeting Structure	Establish structured procedures for consortium meetings Focus on key program elements	Q2 2024		Meeting resources, Agendas	Meeting effectiveness Participant engagement	To Start
4.4 Leadership Plan Development	Create a detailed leadership plan Define roles and responsibilities	Q1-Q3 2024		Plan development resources	Clarity in roles Effective team collaboration	In Progress

Definitions

AEOP Consortium is composed of the following organizations: Battelle Memorial Institute, MetriKs Amérique, the National Science Teaching Association (NSTA), Education Development Center (EDC), Rochester Institute of Technology, the Technology Student Association (TSA), Tennessee Tech University, and Widmeyer Communications.
STEM education and/or workforce development programs and activities[1]:

- Formal or informal education that is primarily focused on physical and natural sciences, technology, engineering, social sciences, or mathematics disciplines, topics, or issues (including environmental science education or stewardship).
- STEM education includes one or more of the following as the primary objective:
    - Develop learners' knowledge, skills, or interest in STEM.
    - Attract students to pursue certifications, licenses, degrees (two-year degrees through post-doctoral degrees), or careers in STEM fields.
    - Provide growth and research opportunities for post-secondary, college, and graduate students in STEM fields, such as working with researchers or conducting research that is primarily intended to further education.
    - Improve mentor/educator (K-12 pre-service or in-service, postsecondary, and informal) quality in STEM fields.
    - Improve or expand the capacity of institutions to promote or foster STEM fields.
    - Support research on effective STEM teaching and learning practices.

Individual Program Administrators (IPAs): Individual Program Administrators are professionals entrusted with comprehensive oversight and management of specific programs within AEOP. This role involves program administration responsibilities, implementation, and coordination of designated programs to ensure alignment with AEOP's overarching goals and objectives. The Individual Program Administrator collaborates with key stakeholders, including consortium members and relevant partners, to facilitate program success. Responsibilities encompass various aspects, including resource allocation, participant engagement, and the integration of feedback to enhance program effectiveness.

Consortium-Wide Partners: Consortium-Wide Partners play a vital role in AEOP, undertaking a diverse range of responsibilities aimed at magnifying the impact and reach of AEOP programs. Their multifaceted role encompasses tasks, including strategic marketing and outreach initiatives, program evaluation, and coordinating alumni engagement efforts. Operating collaboratively with Individual Program Administrators, the lead organization, and the Army, Consortium-Wide Partners are essential to the success of AEOP programs.

AEOP Pathway Programs: create an accessible pathway of STEM opportunities to attract, develop, and mentor the next generation of our nation's diverse talent through U.S. Army educational outreach programs. Below is the list of programs in the AEOP pathway.

[1] https://dodstem-assets.dodstem.us/files/DoD_STEM_Strategic_Plan_2021.pdf

- **Camp Invention:** A program of National Inventors Hall of Fame (NIHF), Camp Invention is a confidence-boosting STEM summer camp where kids build creative inventions and lasting friendships. Grades K-6.

- **Junior Solar Sprint (JSS):** A competition where students design, build and race solar-powered cars using hands-on engineering skills and principles of science and math. Grades 5-8.

- **Gains in the Education of Mathematics and Science (GEMS):** A summer STEM enrichment program where students experience real-world, hands-on STEM activities at select U.S. Army Research Labs. GEMS also recruits Teachers and Near-Peer Mentors (college students) who receive a stipend for their assistance. Grades 5-12.

- **eCYBERMISSION:** A virtual STEM competition where students, in teams of 2-4, choose a problem in their community to investigate with science or solve with engineering, competing for Savings Bond prizes. Grades 6-9.

- **Junior Science and Humanities Symposium (JSHS):** A DoD-sponsored STEM competition where students submit original research to their regional symposium and compete individually to win scholarships and a chance to advance and compete at the National JSHS. Grades 9-12.

- **Unite:** A summer STEM enrichment program held on university campuses where students learn about STEM careers, collaborate and solve problems as a team, and participate in STEM-related, hands-on and project-based activities. Grades 9-12.

- **Internships:** A bridge between academic learning and real-world applications, offering participants a chance to explore their chosen field, acquire valuable skills, and enhance their employability.

- **Fellowships:** A paid, professional research opportunity at U.S. Army Research Labs and Centers. Graduate students, PhD candidates, recent master's graduate, or postdoctoral students.

Traditionally or **historically underserved** populations in STEM, as defined by AEOP, include the following[2]:

- Attend a rural, urban, or frontier/tribal school
- Low-income students (FARMS)

[2] https://www.usaeop.com/program/unite/#:~:text=The%20AEOP%20defines%20underserved%20participants,computer%20science%2C%20mathematics%20or%20engineering)

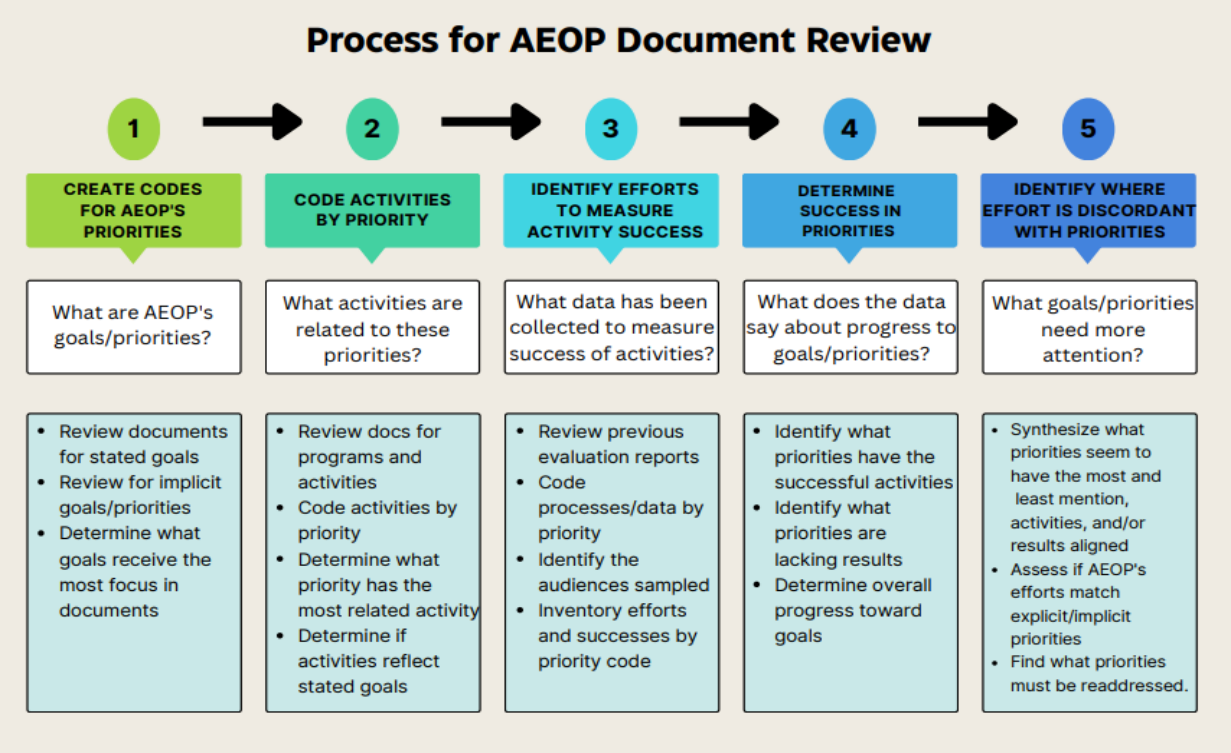
- Females in certain STEM fields (e.g., physical science, computer science, mathematics or engineering)
- Identify as racial/ethnic minority in STEM (i.e., Alaska Native, Native American, Black or African American, Hispanic, Native Hawaiian and other Pacific Islander, other)
- Students with English as a second language (ELL)
- First generation college student (1stGEN)
- Students with disabilities (ADA)
- A dependent of a military service member or veteran.
    - Military child – dependents of members of the Active-Duty Armed Forces
    - Military-connected – military child plus the dependents of members of the National Guard and Reserves
    - Military-affiliated – military-connected plus the dependents of Veterans
    - Military-connected schools – schools where a minimum of 15% of the student population is military-connected dependent of a military service member or veteran

NOTE: Students must meet **at least two** of the criteria mentioned.

Appendix A – Organizational Audit Report

The organizational audit conducted by the TPMA project team involved a comprehensive examination of documents provided by the AEOP Team, observations of consortium meetings, and thorough interviews with staff and organizational leaders. These documents, integral to the Document Review, encompassed key elements such as the Department of Defense STEM Strategic Plan (FY2021-FY2025), the AEOP mission statement, and various annual program evaluation reports, including those for the Army Educational Outreach Program (AEOP) in 2021 and 2020. The observations and interviews provided context for the document examined and filled in vital information. The findings of the audit were crucial for developing the strategic plan.

The methodology employed in this organizational audit was centered on discerning the alignment or deviation of AEOP's focus with its stated core objectives. To achieve this, a thorough analysis of the explicit (stated) priorities and implicit priorities within the aforementioned documents was conducted. Once the document review was completed, the staff were interviewed about the implementation of AEOP's core objectives, and meetings were observed with AEOP's stated and implicit goals in mind. By utilizing these identified priorities as a framework, the organizational audit sought to evaluate the emphasis placed on different objectives in AEOP's initiatives.



The examination of AEOP's activities and outcomes, as documented in the summative reports and interviews, formed a crucial aspect of the audit process. This review aimed to ascertain the degree of attention given to various priorities within the scope of AEOP's efforts.

AEOP Mission Statement and "About Us" Webpage

AEOP's mission statement and organization overview served as guideposts for the audit. The review assessed alignment with the three core objectives: STEM Literate Citizenry, STEM Savvy Educators, and Sustainable Infrastructure. Notably, the document analysis identified a lack of explicit mention of the objective to create STEM Savvy Educators in AEOP's mission and vision statements.

Mission: To provide an accessible pathway of STEM opportunities to attract, develop, and mentor the next generation of our nation's diverse talent through U.S. Army educational outreach programs.

Core Objectives:

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 U.S. Army research and technology resources.
3. Sustainable Infrastructure: Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure.

With these guideposts, AEOP's vision statement and organization overview were reviewed to determine if they mention, implicitly evoke, or outline the three core objectives. Notably, as shown in the table below, the document analysis identified a lack of explicit mention of the objective to create STEM Savvy Educators in AEOP's mission and vision statements.

Table 1. AEOP "About Us" Statements Alignment with Stated Core Objectives

Core Objectives	Mission Statement	Vision Statement	AEOP Overview
STEM Literate Citizenry: Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base (DIB)	☑	☑	☑
STEM Savvy Educators: Support and empower educators with unique U.S. Army research and technology resources.	☒	☒	☑
Sustainable Infrastructure: Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure.	☑	☑	☑

These documents were also reviewed to determine if the program operates with any implicit objective or focus. While the mission and vision statements were limited to the objectives to create *STEM Literate Citizenry* and a *Sustainable Infrastructure,* AEOP's overview expanded beyond the stated objectives and framed the science and engineering (S&E) mentors and research facilities as the program's "most valuable asset". Furthermore, the mission statement and the core objectives elevate diversity as an aspect of AEOP's work.

The documents were also scrutinized for implicit objectives or focuses, particularly concerning science and engineering (S&E) mentors and research facilities. Additionally, the audit considered the attention given to diversity, which, while not individually identified as "core," was viewed through the lens of mentions or activities dedicated to diversity.

The Department of Defense STEM Strategic Plan (FY2021-FY2025)

The Department of Defense STEM (DoD STEM) Strategic Plan[3] is a Department of Defense-wide strategic plan developed by the Office of the Secretary of Defense (OSD) and the Components. The plan and the included implementation strategy frames the DoD STEM mission to inspire, cultivate, and develop exceptional STEM talent to enrich the DoD workforce. The document outlines that DoD STEM is a network of academic, industrial, non-profit, and government partners working to address critical STEM challenges through talent inspiration and cultivation within all levels of schooling. The DoD STEM plan includes four goals and fifteen objectives:

Eight of these DoD STEM objectives are aligned with three of AEOP's stated goals. The alignment of DoD STEM's strategic plan goals with AEOP's core objectives is outlined in the table below:

Table 2: AEOP's Core Objectives' Alignment to DoD STEM Strategic Plan

AEOP Core Objectives (stated)	DoD STEM Strategic Plan Objectives
Objective 1: STEM Literate Citizenry: Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base (DIB)	Goal 1, Obj. 1: Amplify public awareness of DoD STEM education and career opportunities by leveraging partnerships across the Department, STEM education ecosystems, and Government agencies. Goal 1, Obj. 2: Enhance DoD STEM education program and activity experiences by leveraging DoD's unique resources. Goal 2, Obj. 2: Increase awareness of workforce development opportunities by fostering pathways to participation through a continuum of enriching DoD STEM education and workforce development programs, activities, and outreach.

[3] Department of Defense Strategic Plan: https://dodstem-assets.dodstem.us/files/DoD_STEM_Strategic_Plan_2021.pdf

Objective 2: STEM Savvy Educators: Support and empower educators with unique U.S. Army research and technology resources.	Goal 1, Obj. 3: Empower DoD STEM professionals across DoD, especially those within the defense enterprise, to participate in STEM education and outreach activities.
Objective 3: Sustainable Infrastructure: Develop and implement a cohesive, coordinated, and sustainable STEM education outreach infrastructure.	Goal 2, Obj. 1: Empower DoD STEM professionals across DoD, especially those within the defense enterprise, to participate in STEM education and outreach activities. Goal 2, Obj. 3: Increase awareness of workforce development opportunities by fostering pathways to participation through a continuum of enriching DoD STEM education and workforce development programs, activities, and outreach.

While AEOP's objectives mention diversity as within its first goal, DoD STEM's Goal 3.0 is entirely devoted to increasing the participation of "underserved and underrepresented groups". Though not aligned to AEOP's stated objectives, DoD STEM's Goal 3.0 echoes the language within the AEOP's summative program evaluations, which mentions outreach to marginalized people, not just "diverse" people. Notably, the DoD STEM strategic plan does not mention teachers and other educators in its goals or objectives. Also, DoD STEM includes empowering and engaging mentors explicitly within Goals 1.0 and 2.0. Though mentorship is discussed heavily in AEOP's documents, AEOP does not elevate mentorship to its stated objectives. In these regards, the two organizations diverge in their goals.

2021 Summative Evaluation

AEOP provided the most recent available summative evaluation report of their program activities: *Army Educational Outreach Program: 2021 Annual Program Evaluation Report Selected Summative Findings.* This document was reviewed to determine the activities, outcomes, and evaluative efforts currently aligned to the three core objectives, well as the implicit objective of supporting S&E mentorship. A summary of this alignment is presented in the tables below.

Table 3: Summary of 2021 Evaluation Findings Aligned to STEM Literate Citizenry

Objective	Programs	Number of students served	Evaluative Efforts	Outcomes
Core Objective 1: STEM Literate Citizenry	eCYBERMISSION (eCM)	7,135	Post-surveyed 1,222 students to answer 3 research questions*	The majority of students indicated that their interest in taking STEM classes in school (66%) and participating in STEM activities outside of school requirements (72%) increased as result of AEOP. A large majority of participants reported that they designed their own research (83%), carried out investigations (84%), and analyzed data or information to draw conclusions (89%).
	Gains in the Education of Mathematics and Science (GEMS)	2,463	Post-surveyed 1,345 students to answer 3 research questions*	
	Junior Science and Humanities	2,182	Post-surveyed 414 students to answer 3 research questions*	

	Symposium (JSHS)			Most students had opportunities to work with STEM researchers, though there are some observed differences across programs. Students gained experience working on real-world STEM projects. AEOP contributed to increasing students' interest in pursuing STEM careers. AEOP contributed to increasing students' interest in pursuing STEM degrees
	Camp Invention (CI)	2,034	(Survey of current students not reported)	
	Apprenticeship & Fellowships	588	Post-surveyed 236 students to answer 3 research questions*	
	Junior Solar (JSS)	215	Post-surveyed 8 students to answer 3 research questions*	
	Unite	569	Post-surveyed 328 students to answer 3 research questions*	

Table 4: Summary of 2021 Evaluation Findings Aligned to STEM Savvy Educators

Objective	Programs	Activities	Number of educators served	Evaluative Efforts	Outcomes
Core Objective 2: STEM Savvy Educators	RESET	Provides high school and middle school educators with summer research experience at participating Army Research Laboratories	67 adults (exact number of educators unknown)	Not included in evaluation	No outcomes reported for this group
	Camp Invention (CI)	Provides professional development to teachers nation-wide	No data available in report	Not included in evaluation	

Table 5: Summary of 2021 Evaluation Findings Aligned to Sustainable Infrastructure

Objective	Programs	Activities	Evaluative Efforts	Outcomes
Core Objective 3: Sustainable Infrastructure	eCYBERMISSION (eCM)	Web-based STEM competition for students in grades 6–9	Post-surveyed 1,222 students to answer 3 research questions* 4 alumni surveyed	Across all programs, participants indicated an increased appreciation and awareness of Army/DoD STEM research. Nearly one half of all participants also reported interest in Army/DoD STEM careers. Examining interest in Army/DoD STEM careers by program revealed notable differences across programs, which was largely due students' ages.
	Gains in the Education of Mathematics and Science (GEMS)	Summer STEM enrichment program for students in grades 5–12	Post-surveyed 1,345 students to answer 3 research questions* 44 alumni surveyed	
	Junior Science and Humanities Symposium (JSHS)	STEM competition that promotes original research and experimentation in STEM at the high school level	Post-surveyed 414 students to answer 3 research questions* 15 alumni surveyed	
	Camp Invention (CI)	Summer program that engages children	(Survey of current students not reported)	

		through hands-on STEM content	10 alumni surveyed	Apprenticeships were most likely to report that their interest in Army or DoD STEM careers increased as result of their participation in AEOP, while eCYBERMISSION participants were least likely to report this. A majority of students (69%) reported that they have a greater appreciation of Army/DoD STEM research as a result of their participation in AEOP. Majority of mentors in all programs indicated that they believed students were more interested in pursuing a STEM career with the Army or DoD
	Apprenticeships & Fellowships	Provides high school, college, and graduate students with immersive STEM research opportunities	Post-surveyed 236 students to answer 3 research questions* 7 alumni surveyed	
	Junior Solar (JSS)	5th-8th grade students apply scientific understanding and race solar electric vehicles	Post-surveyed 8 students to answer 3 research questions* 1 alumnus surveyed	
	Unite	Summer program for rising 9th through rising 12th grade students from groups historically underrepresented and underserved in STEM areas	Post-surveyed 328 students to answer 3 research questions* 7 alumni surveyed	

Table 7: Summary of 2021 Evaluation Findings Aligned to Implicit Objectives

Implicit Objective	Programs	Number Participating	Evaluative Efforts	Outcomes
Serving students from historically underrepresented and underserved groups	All programs	8,682	Participant ethnicity (I.e. belonging to an underrepresented group) tracked with program data	No outcome data specific to underrepresented groups reported
Engaging S&E mentors	All programs	432	Mentor questionnaire	The majority of mentors in all programs indicated that they believed students were more interested in earning a STEM degree and in higher proportions than students. Majority of mentors in all programs indicated that they believed students were more interested in pursuing a STEM career with the Army or DoD

As shown by the tables above, a considerable proportion of the programmatic efforts are targeted at addressing the objectives to build STEM Literate Citizenry and a Sustainable Infrastructure. The majority of the evaluation activities and outcomes reported in this document

focus on measuring AEOP's progress toward these priorities. Through surveys, the evaluators found that AEOP contributed to increasing students' interest in pursuing STEM careers. Furthermore, within the evaluation report, all programs were examined for diversity. This implicit priority was addressed by reviewing the demographics of the students and teachers enrolled in the programs.

However, **AEOP's second core objective of creating STEM Savvy Educators received very little attention in the evaluation.** The report specified that two programs had direct service to educators, but this group of stakeholders was not surveyed or interviewed. No outcomes were reported for educators involved in AEOP. Conversely, S&E mentors, though not included in AEOP's core objectives, were engaged at several points in the evaluation process, and their observations were used to determine the outcomes of the programs.

2020 Summative Evaluations[4]

AEOP provided multiple summative evaluation reports for their 2020 program activities. The first and primary focus of the evaluators was to assess the effectiveness for each of AEOP's elements: CQL, eCM, GEMS, HSAP, JSHS, REAP, RESET, SEAP, Unite, and URAP. Another focus of the evaluation was to study the long-term impact on alumni. The evaluation team collected data using questionnaires for all programs and individual phone interviews with selected program participants.

For this document review, the alignment of the activities, outcomes, and evaluative efforts to the three core objectives explored, well as the alignment to the implicit objectives of supporting diversity and S&E mentorship. A summary of this alignment is presented in the tables below.

Table 8: Summary of 2020 Evaluation Findings Aligned to STEM Literate Citizenry

Objective	Document(s)	Programs	Number of students served	Evaluative Efforts	Outcomes
Core Objective 1: STEM Literate Citizenry	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: eCYBERMISSION Evaluation	eCYBERMISSION (eCM)	14,245	Student questionnaire and interviews Mentor questionnaire and interviews	23,483 student participants were engaged in an AEOP. This is an 19% decrease from 2019 when 28,947 students participated, and a 22% decrease as compared to 2018 when 30,311 students participated in AEOP. The overall placement rate across AEOP for FY20 (75%) was like that of FY19 (76%) and FY18 (77%). Four programs (CQL, GEMS, SEAP, REAP) had decreases in placement rates as compared to prior years, while three programs (HSAP, Unite, URAP) increased or stayed the same. Findings from the 2020 evaluation indicated that
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Apprenticeship Programs Evaluation	College Qualified Leaders (CQL)	159	Apprentice questionnaire and interviews Mentor questionnaire and interviews	
	2020 Annual Program Evaluation Report Summative Findings	Gains in the Education of Mathematics and Science (GEMS)	2,203	Student questionnaire and interviews	

[4] Several programs from 2020 have since been rebranded including: CQL - College qualified Leaders, HSAP - High School Apprenticeship Program, URAP - Undergraduate Research Apprenticeship Program, SEAP - Science and Engineering Apprenticeship Program, and REAP - Research and Engineering Apprenticeship Program

	2020 AEOP: GEMS Program Evaluation			Mentor questionnaire and interviews	AEOP consistently provided opportunities for participants to engage in authentic STEM activities that are more intensive than those they experience in their typical school settings. With the exception of JSHS, participants across all other programs reported engaging in STEM practices to a significantly greater extent in their AEOP programs compared to their standard school experiences. Students in all FY20 AEOP reported some level of STEM identity gains which were at similar ranges to FY19 findings by program, with CQL, eCM NJ&EE, GEMS, HSAP, JSHS, REAP, SEAP, Unite, and URAP all reporting medium to large gains. Participants reported increased interest in STEM research and careers after participation in FY20 AEOP.
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Apprenticeship Programs Evaluation	High School Apprenticeship Program (HSAP)	32	Apprentice questionnaire and interviews Mentor questionnaire and interviews	
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: JSHS Evaluation Report	Junior Science and Humanities Symposium (JSHS)	3,462	Regional: Student questionnaires, mentor questionnaires National: Student interviews, mentor interviews	
	2020 Annual Program Evaluation Report Summative Findings	Camp Invention (CI)	2,771	(Evaluation efforts not reported)	
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Apprenticeship Programs Evaluation	Research & Engineering Apprenticeship Program (REAP)	86	Apprentice questionnaire and interviews Mentor questionnaire and interviews	
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Apprenticeship Programs Evaluation	Science & Engineering Apprentice Program (SEAP)	28	Apprentice questionnaire and interviews Mentor questionnaire and interviews	
	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Unite Evaluation Report	Unite	448	Student questionnaires, Mentor questionnaires	
	2020 Annual Program Evaluation Report Summative Findings	Undergraduate Research Apprenticeship Program (URAP)	49	Apprentice questionnaire and interviews	

	2020 AEOP: Apprenticeship Programs Evaluation			Mentor questionnaire and interviews	
	2020 AEOP: Apprenticeship Programs Evaluation	AEOP Summer Course	104		

Table 9: Summary of 2020 Evaluation Findings Aligned to STEM Savvy Educators

Objective	Document(s)	Programs	Number of educators served	Number of Educators from Title I schools	Evaluative Efforts	Outcomes
Core Objective 2: STEM Savvy Educators	2020 Annual Program Evaluation Report Summative Findings	RESET	27	18	Participant interviews	AEOP adult participants (i.e., mentors, S&E's, Team Advisors, teachers) reported use of effective mentoring strategies across the AEOP in FY20. AEOP participants continued to be satisfied with the support received from their mentors/S&Es/Team Advisors/teachers.
	2020 Annual Program Evaluation Report Summative Findings	Camp Invention (CI)	No data available in report	No data available in report	Not included in evaluation	

Table 10: Summary of 2020 Evaluation Findings Aligned to Sustainable Infrastructure

Objective	Document(s)	Programs	Evaluative Efforts	Outcomes
Core Objective 3: Sustainable Infrastructure	2020 Annual Program Evaluation Report Summative Findings 2020 AEOP: Apprenticeship Programs Evaluation 2020 AEOP: eCYBERMISSION Evaluation 2020 AEOP: GEMS Program Evaluation 2020 AEOP: JSHS Evaluation Report	All student-focused programs	Questionnaire of participating students and apprentices. Survey of alumni	In general, nearly 90% of alumni were interested in pursuing a STEM career (88%). Approximately two-thirds indicated they were aware of Army/DoD STEM careers (65%), and 73% of alumni indicated they would be interested in learning more about Army/DoD STEM careers. More than half (59%) of alumni indicated that they were currently interested in pursuing an Army/DoD STEM career. Participants reported positive attitudes toward Army/DoD STEM Research. AEOP increased participants' interest in pursuing STEM careers.

Table 11: Summary of 2020 Evaluation Findings Aligned to Serving Historically Underrepresented

Implicit Objective	Program	Diversity/Serving Underserved Populations Included in Program Objectives	Percentage of Underserved participants	Evaluative Efforts	Outcomes
Diversity/Serving Historically Underrepresented groups	ECYBERMISSION (eCM)	No	56%	Demographic information of enrolled participants was tracked	AEOP continued to engage a strong pool of diverse future STEM talent – over 23,000 participants, including 53% underserved students. Most students reported engaging in all STEM practices during GEMS and reported being more engaged in STEM practices in GEMS than in school. Students experienced gains in STEM
	Camp Invention (CI)	No	77%		
	College Qualified Leaders (CQL)	Yes	26%		
	Gains in the Education of Mathematics and Science (GEMS)	Yes	40%		
	High School Apprenticeship Program	No	47%		
	Junior Science and Humanities Symposium (JSHS)	No	44%		

	Research & Engineering Apprenticeship Program (REAP)	Yes	94%		knowledge during GEMS. Students meeting the AEOP definition of Underserved, female students, students who would-be first-generation college attenders, and low-income students, ELL students, and minority students reported greater gains than their peers Students reported gains in their STEM knowledge and STEM competencies (skills in science and engineering practices) as a result of participating in JSHS; FARMS and underserved racial/ethnic minority students reported larger STEM competency gains than their peers. Unite continues to serve students from groups historically underserved and underrepresented in STEM, although the proportions of participants representing some racial/ethnic minority groups declined in 2020.
	Science & Engineering Apprentice Program (SEAP)	Yes	21%		
	Unite	Yes	95%		
	Undergraduate Research Apprenticeship Program (URAP)	No	29%		
	AEOP Summer Course	No	73%		

Table 12: Summary of 2020 Evaluation Findings Aligned to Engaging S&E Mentors

Implicit Objective	Program	Number of S&E Mentors	Mentor Outcomes
Engaging S&E mentors	CQL	89	A majority of URAP mentors reported using strategies associated with each of the five areas of effective mentoring. The two most commonly selected responses for how mentors learned about AEOP were their supervisor/superior (30%) and someone who works with the DoD (30%).
	SEAP	22	

	REAP	66	Mentors who participated in phone interviews responded positively about the virtual format of HSAP for 2020 but noted that creating connections between students was particularly challenging. A majority of mentors reported using strategies to establish the relevance of learning activities (62%-95%), support the diverse needs of students as learners (57%-94%), support students' development of collaboration and interpersonal skills (68%-95%), and support students' engagement in authentic STEM activities (77%-98%). Most mentors also used several strategies to support students' STEM educational and career pathways (34%-73%) Mentors reported satisfaction with GEMS features and noted a number of strengths of GEMS. Mentors also made suggestions for program improvement. Most JSHS students had worked with mentors who were either teachers or STEM researchers; most mentors were available to students at least half of the time. Most mentors used a variety of effective mentoring strategies with their students, however few discussed AEOP other than JSHS with their students. Unite mentors were satisfied with program features that they had experienced and identified a number of strengths of the Unite program. Mentors also offered various suggestions for program improvements.
	HSAP	26	
	URAP	39	
	eCYBERMISSION	316	
	GEMS	40	
	JSHS	233	
	Unite	25	

For the first core objective of creating STEM Literate Citizenry, **nearly all the programs enacted by AEOP's branches work to increase students' STEM literacy** (with the exception of RESET, the educator-focused program). The vast majority of the AEOP stakeholders are students. Students were also the group most engaged during the evaluations, as the program distributed surveys and interviewed current participants and alumni. Many of the outcomes evaluated and reported were focused on students' outcomes, including their proclivity toward pursuing STEM careers. Most of the results reported in the 2020 evaluation reports, as well as the 2021 report, were related to students' enrollment, engagement, and gains related to STEM learning. This finding within the documents shows that building students' STEM literacy is a key priority for AEOP as much has been invested in these areas of programming.

Similarly, in 2020, AEOP reached out to current and former student participants to find out how likely they were to pursue careers with DoD or serve AEOP as mentors in the future. This was done across the student-centered programs to assess progress toward the third core objective (Sustainable Infrastructure). The results showed that the participants were more interested in Army/DoD careers after AEOP, but not as much as they were for STEM careers in general.

In 2020, the teacher-focused RESET program was evaluated, and the participating teachers were interviewed to determine the outcomes of this program. Twenty-seven educators

participated in the program. These teachers learned effective mentoring skills and were pleased with their interactions with S&E mentors. An interesting finding of reviewing the FY2020 Evaluations is that, aside from the evaluation of RESET, no other evaluation engaged teachers. When assessing progress toward core objective 2 (Savvy Educators), the educators discussed and evaluated for the student-focused programs are the S&E mentors, not the students' classroom educators. For eCYBERMISSION, CQL, SEAP, REAP, HSAP, and other programs, the results of the mentor questionnaires and interviews are reported in the sections associated with educator outcomes. Although teachers are included in many of these programs within the general group of "adults" who help facilitate the program activities, **the teachers were not surveyed or interviewed for the evaluations outside of RESET.**

AEOP's attention on the diversity of its programs continued in the 2020 reports. For all programs, the ethnicity of participants was tracked, and the percentage of underrepresented individuals was calculated. This was done even for programs that did not include diversity and/or reaching out to the underserved as part of its programmatic objectives. For programs that exclusively serve underrepresented groups, such as GEMS, the result of students from underrepresented populations was compared to the results of the general population of participants. The evaluation reports show that students from underrepresented backgrounds have positive outcomes following AEOP programs. However, the diverse of the programs has been decreasing in recent years.

Mentors also continue to be a group of interest in the 2020 evaluation reports, more so than classroom teachers. Like the 2021 evaluation report, mentors were included in the stakeholder engagement for the student-centered programs, but teachers were not. The report found that mentors had generally positive views of the programs and the students, as well as some suggestions for improvement. With the exception of RESET, the reports referred to mentors when assessing progress toward educator-related goals. **Again, mentors appear to have a larger share of AEOP's attention compared to teachers.**

Summation

Given the documents provided for review by AEOP, four programmatic priorities were apparent in the mission statement, reports, and other primary documents. Based on the number of activities and evaluative efforts described, AEOP mainly works to:

- Build STEM literate students,
- Provide STEM opportunities to students from underrepresented/underserved groups, and
- Build a sustainable infrastructure involving former participants seeking careers with Army/DoD.

The programs are also very interested in the experiences of their S&E mentors and have spent considerable time investigating how mentors feel about the outcomes of the students. However, the documents share little about what outcomes, if any, they hope mentors will experience.

The documents show little attention to the educators (i.e., classroom teachers), despite the second stated core objective is to create STEM Savvy Educators. The only program specifically targeted toward teachers is RESET, which only matriculated 27 participants in 2020. Furthermore, though teachers are involved in other programs to support students, they were not engaged in the evaluation of the student-centered programs. The programs would have to either include more programming or more evaluation activities focused on teachers to match the attention paid to students and mentors.

In practice, the audit suggested that AEOP's strategic priorities appeared more aligned with the Department of Defense STEM Strategic Plan than with its own stated goals outlined in the mission statement. Notably, AEOP's attention to diversity and mentors closely mirrored the priorities outlined in the DoD STEM plan.

Appendix B – Stakeholder Engagement Analysis

The AEOP Consortium and its members participated in a stakeholder engagement process to provide highly valued input and help TPMA identify key goals and objectives for the AEOP Strategic Plan. TPMA orchestrated a comprehensive Design Sprint, harnessing the expertise of AEOP's leadership team and key stakeholders in focused discussions that focused on critical aspects of AEOP's operations that will lead to success including AEOP's mission, vision, and values; strengths, weaknesses, challenges, and opportunities related to the past and upcoming strategy; emerging trends and the organization's adaptability; local and regional student support resources and gaps; opportunities for collaboration; and changes and expectations for AEOP's programs.

This Design Sprint comprised four integral components:

- **Framing:** Through extensive consultations with leadership and key stakeholders, realistic objectives were identified and defined to understand, prioritize, and address challenges during the Design Sprint Process.
- **Custom Designed Session:** TPMA meticulously designed and facilitated a dynamic, highly engaging planning session. This session served as a platform to unearth innovative solutions in an inclusive environment that valued every participant's contribution.
- **Comprehensive Summary:** Post the Designed Session, TPMA provided a comprehensive summary that encapsulated central themes, key findings, and outcomes as recommended by the diverse group of stakeholders.
- **Strategic Action:** Leveraging insights from the Design Sprint and combining them with industry practices, TPMA formulated a strategic action plan. This plan laid out concrete steps essential for maintaining momentum and ensuring continual progress.

To carry out the Design Sprint, TPMA worked with AEOP Consortium members to identify current successes and challenges; identify various solutions to the outlined challenges; worked to understand how the solutions would impact various stakeholders across AEOP; and set aside time to set a vision, identify strategies and tactics to accomplish the identified goals. This two-hour session leveraged the perspectives of AEOP Consortium members to inform a strategic plan that would work best for stakeholders.

Following the Design Sprint process, TPMA examined the information shared by the Consortium, strategically extracting key insights to lay the foundation for the initial iteration of the strategic plan. This preliminary version of the strategic plan underwent a comprehensive presentation at one of the bi-annual consortium meetings, during which TPMA not only shared the proposed iteration but also facilitated an additional engagement process. This focused session took a deeper look into the intricacies of the AEOP's current strategies, fostering collaborative discussions with Consortium members to pinpoint actionable strategies tailored to optimize AEOP programs. Consortium members were asked to work in groups and identify strategies and tactics to execute the identified goals. The resulting strategies, along with

valuable feedback from participants, were captured and integrated into subsequent iterations of the strategic plan.

The resulting strategies and feedback from the Consortium led to a restructuring of the strategic plan where four key goals were identified:

- **Goal 1:** Establish AEOP as a Premier Program for STEM Education in the Nation.
- **Goal 2:** Expand and Facilitate Greater Access to AEOP Programs for Underserved Students
- **Goal 3:** Strengthen AEOP Alumni Engagement
- **Goal 4:** Enhance Organizational Collaboration and Clarity within AEOP

Each of the four goals identified in the strategic planning process were paired with a set of objectives, forming a strategic roadmap for AEOP to navigate towards these overarching goals. Notably, these goals are closely aligned with Department of Defense's STEM education objectives. The second version of the strategic plan was circulated to Consortium members for review. Following their review, TPMA conducted a series of interviews with 14 different Consortium member groups including Individual Program Administrators, the Army, and the lead organization which served as a platform for delving deeper into the strategic landscape, extracting invaluable insights, and identifying key actionable steps that AEOP could undertake to effectively attain of these strategic goals. These interviews asked Consortium members to identify a range of assets, barriers, gaps, and needs, and to assess how these factors could either support or impede AEOP in its pursuit of the identified goals. This iterative process supports the strategic framework, ensuring that actions are closely aligned with the aspirations of the AEOP community.

Key Findings from Interviews

TPMA facilitated a holistic interview process with members of the AEOP Consortium to further inform how AEOP could execute strategies to accomplish the goals outlined in the strategic plan. Below are several graphics that highlight assets, barriers, gaps, and needs as identified by AEOP Consortium members. Key findings from these engagements are outlined below:

Goal 1.0 – Establish AEOP as a Premier Program for STEM Education in the Nation.

Assets

The key findings related to Goal 1 highlight several crucial aspects. Effective communication with educators was the most mentioned asset to executing effective programs. A few programs mentioned that they have the privilege of leveraging the expertise of state advisors from the Department of Education and that has helped them identify priority schools across states and identify and incorporate emerging practices in STEM education. Other individuals discussed how important support from Army labs and researchers was in delivering quality educational programming. When discussing assets with one administrator, they mentioned that the overarching goal is to cultivate interest in STEM rather than creating STEM content per se. Therefore, developing STEM programming should be a priority; however, efforts should also be

made to generate excitement around STEM careers through effective program delivery, rather than developing subject expertise.

Other key assets that were mentioned throughout the stakeholder engagement process include the positive impact of a new evaluation team is noted, emphasizing their attentiveness to the specific needs of AEOP programs; and the feedback one program is able to receive through working with adult populations; and the long history of well-established programs that gives them some recognition.

Barriers

The findings related to the alignment and duties of existing staff at the lead organization for Goal 1 reveal a mixed scenario. While commendable efforts are being made, the current structure is deemed less than fully optimal. Several stakeholders discussed that AEOP should consider the staff capacity and/or duties assigned to leadership roles. Additionally, many administrators noted disparity in program standards and evaluation practices, varying from one program to another. They called for a more standardized and equitable approach to program evaluation and resource deployment.

Other key barriers that were mentioned include understanding what goals AEOP and the Army have in delivering the STEM programs; oversaturation of content and programs in the education space; and hesitancy to embrace new processes and procedures among AEOP administrators.

Gaps

Developing a program pipeline for students has been a recurring theme throughout engagements with AEOP. Navigating and creating a student pathway poses challenges because not all programs are executed similarly, and some programs lead better to a pipeline than others. Compounding this is an absence of consistent touchpoints from early programs to programs for college students and adults. Administrators mentioned it would be worth defining which programs best fit into this initiative. Furthermore, efforts should be made to identify students along their “AEOP Journey” and streamline their eligibility for future AEOP programs.

Other gaps that were mentioned include understanding the criteria for a program to become part of AEOP consortium; the delivery of evaluation efforts, particularly among youth populations faces challenges like complex language and internet accessibility issues; the quality of data captured should be enhanced to better communicate the impact of AEOP programs; and there was an identified need for a strategic plan to address gaps and build collective efforts among AEOP programs.

Needs
Improvement of data collection and program evaluation processes was the most mentioned need among program administrators. Administrators used words such as fairness and standardization to describe needed efforts to improve program evaluation processes and malleable was the word that individuals used to describe efforts needed to improve data collection. A more specific examples included the use of a longitudinal study to track students through AEOP programs or deploying a collective impact model. Improvement of these areas will help AEOP communicate the impact of programming.

Another common need that was elevated focused on the need for more resources. One specific example includes securing or allocating more funding toward educators and team leads to acquire essential resources to implement programs and to continue supporting students to keep them in the AEOP pipeline once they exit a program.

Other needs that were highlighted include emphasizing the uniqueness of each program; leveraging the Army's expertise in identifying emerging trends in the STEM field; creating a more efficient data collection process; and AEOP acknowledging STEM efforts that occur outside of AEOP programs, for example, discovering and highlighting new trends in STEM education.

Goal 2.0 – Expand and Facilitate Greater Access to AEOP Programs for Underserved Students

Assets
To accomplish Goal 2, many program administrators highlighted their criteria for student participation and intentionality around outreach. Specific examples that were mentioned include outreach to Title I schools, programs' ability to offer free programming, and their specific definitions of underserved student populations. In other words, programs have been intentional about reaching out to underserved student populations and their requirements encourage participation from these populations.

Barriers
While many programs mentioned that they have strong definitions of underserved student populations, others underscored that there does not seem to be a consistent definition among all AEOP programs. They further mentioned that creating a common definition would help programs strive toward a common goal.

Connecting with military families was mentioned as another barrier. Program administrators mentioned that connecting with these families was a priority; however, they felt that they did not have the expertise to execute these efforts effectively and advocated for more support in doing this.

Other barriers to enhancing services for underserved and military family students included using a more intuitive registration platform; allocating funding to support participants who are overseas; and developing wrap around services for program participants.

Gap
Administrators did not reach consensus on many gaps as they relate to Goal 2. A few examples that were mentioned include creating a direct initiative focused on connecting with military families; a lack of a common definition for underserved students; collaboration with other military (Airforce, Navy, etc.) outreach programs; administrators' ability to validate data given that much of it is self-reported; and the fact that programs might not relate to individuals from certain demographics.

Needs
To enhance services, several administrators placed an emphasis on working closely with identifying targeted school districts and engaging parent groups to promote team leader opportunities. Connecting with parents was often seen as a key opportunity to reach more students.

Facilitating collaborative outreach efforts was the second most mentioned need to connect with more students. To maximize this effort, one administrator explained that a strong process might look like discovering which programs pipeline well together, then having them combine resources to coordinate outreach efforts.

Other needs that were mentioned include creating more precise and compelling data to communicate the value of programs; collaborating with other national and regional nonprofits who are also providing services to underserved and military family students; and strengthening relationships at Army research labs.

Goal 3.0 – Strengthen AEOP Alumni Engagement

Assets
There are a few assets already in place to support Goal 3, the main one being the alumni council who is responsible for carrying out alumni engagement initiatives. Another asset that one program mentioned specifically was using "near peer" mentors which may include individuals who have recently completed an AEOP program.

Other assets that were mentioned include staying connected through various mediums including LinkedIn and other social media platforms; connecting with one another at conferences; and leveraging active alumni associations and affiliate chapters.

Barriers
The biggest barrier that individuals mentioned related to Goal 3 was the lack of crossover among AEOP programs. Administrators felt that students were not made aware of other AEOP

programs, for various reasons, and some students may not have even known that they were participating in an AEOP program. Therefore, their connectedness to AEOP was thin.

Other barriers that administrators mentioned was staying connected with students is difficult because they generally use student emails and will lose access to those emails as they age; mentors, particularly adult mentors are only available during select times throughout the day.

Gaps
Administrators elevated numerous gaps to achieving this goal; however, the most frequently mentioned gap was the lack of structure around how to build the network. Individuals mentioned that there needs to be more consistent definitions for the terms AEOP programs are using; there is a lack of understanding of how toolkit partners are supposed to work with IPAs; the working groups that exist are good in theory, but they would benefit from clarified parameters, expectations, and accountability; more structure for alumni affiliate chapters as opposed to allowing them to happen organically; and creating cross program subject matter experts who can communicate the value of all AEOP programs.

Other gaps that individuals mentioned include a need to define who alumni are, just college students and adults or all individuals who complete an AEOP program and the need to identify ways to stand out in an oversaturated market.

Needs
The needs that were elevated were consistent with the gaps identified in the previous sections. Administrators outlined a need to clarify how the alumni organizations should operate; focus on connecting with parents and families; and identifying which programs pathway together well to establish a pipeline that can be leveraged to strengthen the network.

A new concept proposed by one administrator includes a consortium-wide training for peer mentors. This training would consist of a badge or certificate and ideally strengthen the peer mentor's affiliation with AEOP.

Goal 4.0 – Enhance Organizational Collaboration and Clarity within AEOP

Assets
Administrators spoke highly about the current efforts to facilitate Goal 4. Many of these efforts are focused on facilitating internal communication including the monthly IPA calls and bi-annual meetings; working groups that allow administrators to collaborate around niche topics; collaborative efforts with other programs who conduct outreach to students from similar age groups and demographics. Another asset that was mentioned was the number of subject matter experts that exist within AEOP from various individual programs to individuals at the Army and the lead organization

Many other efforts were focused on external collaboration including partnerships with national organizations such as the National Science and Teaching Association (NTSA); connections with

national advisors and state advisors who are connected with the states' departments of education; and working with adult populations who are able to help programs build more connections at the local and regional level. It is worth noting that the items that are mentioned do not apply across all programs. Many of the assets that administrators identified were specific to their own programs.

Barriers

The barriers to enhancing collaborative efforts varied throughout the interviews. Some were focused on AEOP in general, whereas others were focused more on specific programs barriers to collaborating. Items that applied to AEOP included not being sure who has authority to approve recommendations from program administrators, in other words, who has the final say; a lack of formalized process to foster collaboration and carryout collaborative initiatives; the capacity of program administrators and the lead organization to carryout additional/new initiatives; connecting with other Department of Defense outreach programs.

Other barriers that were more specific to certain programs were that the program sponsor, in this case the university sponsoring the program, was disconnected from AEOP and prevented the program administrator from increasing their budget, hindering collaborative efforts.

Gaps

Administrators presented varying responses for gaps in enhancing collaboration, but many were focused on gaining clarity on certain aspects of AEOP operations. Examples that were mentioned include gaining more of an understanding of what everyone does and their program timelines; creating a stronger purpose for the internal working groups; understanding which member of leadership is responsible for carrying out which activities; and understanding that not all programs are meant to be connected.

Other gaps that were mentioned include using Basecamp, and/or other internal collaborative platforms, to their full capacity; focusing more on building relationships with agencies as opposed to advertising and spending funding accordingly; and the fact that some programs are not located in the same areas and it is difficult to collaborate because they are not connecting with the same populations.

Needs

Administrators elevated varying needs to execute Goal 4 including clarification of the Army's role withing AEOP and how to work with them; additional support staff from AEOP and the lead organization; consistently utilizing resources, such as Basecamp, to their full potential; building and maintaining strategies around conferences, working groups, and other internal initiatives; and identifying which programs fit best together to support the AEOP pipeline and directing time, energy, and resources to this work, in turn creating more sustainable partnerships among AEOP programs.

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