Department of War

DoWSTEM

Science · Technology · Engineering · Mathematics

FY 2024

YEAR IN REVIEW

MAY 2026

FY 2024 YEAR IN REVIEW EXECUTIVE SUMMARY

The Department of War (DoW) STEM mission is to inspire, cultivate, and develop exceptional talent to tackle evolving defense technological challenges. This report summarizes the Fiscal Year 2024 (FY 2024) outcomes from 171 DoW STEM programs in the Department and demonstrates successful alignment with the strategic priorities of the Secretary of War (SecWar).

The data confirms that DoW STEM programs strategically develop a future-ready workforce by serving a substantial number of participants, including military-connected students and veterans, and focusing on critical technology areas. Through high-impact engagement methods and rigorous evaluation, these initiatives are successfully building a robust STEM talent pipeline, which is foundational to rebuilding our miliary and ensuring our Nation's technological superiority.

Analysis of the quantitative and qualitative data reveals key findings and areas of measurable progress that directly support the SecWar's three core priorities:

Reviving the Warrior Ethos and Restoring Trust.

In FY 2024, DoW STEM programs engaged 1.91 million learners and educators, representing a 13.9% increase from the prior year. These efforts support participants across the pre-K to career continuum nationwide as well as in DoWEA OCONUS regions. Engagement with military families was a key focus, with 73% (121 of 171) and 13% (23 of 171) of STEM programs engaging military-connected students and veteran spouses, respectively. While programs reported serving a total of 72,564 military-connected students and 1,219 veterans and/or veteran spouses, these numbers underestimate the true impact. Less than half of the programs that engage these communities are currently able to provide specific participant counts, signaling a much larger, unquantified reach. This presents a clear opportunity to pioneer more effective evaluation approaches, ensuring the Department can fully quantify engagement and strategically build upon current efforts. This investment in our nation's youth and military families is fundamental to reviving the warrior ethos, equipping the next generation with critical thinking and technical skills, and building a more resilient, proficient force to address DoW challenges.

DoW STEM programs build a mission-focused talent pipeline and foster public trust by connecting our science and engineering workforce directly with communities nationwide and abroad. In FY 2024, DoW STEM programs leveraged engagement approaches to include classroom visits (28% of programs) and direct interactions with DoW scientists and engineers (27%). Moreover, 22% of programs took place, at least in part, at a DoW facility or laboratory, giving participants a firsthand look at the mission. Beyond this, DoW STEM programs leverage strategic partnerships, using collaborations as a force multiplier. In FY 2024, the primary engagement method for DoW STEM programs was leveraging consortia like the Defense STEM Education Consortium (DSEC) (43% of programs). This represents an opportunity to strengthen the resilience of the defense workforce by strategically leveraging established STEM and innovation ecosystems nationwide. This unique set of approaches, from direct mentorship and engagement to strategic partnerships and consortia, fosters both foundational trust in our military and an appreciation for the service ethos that drives the DoW mission.

Rebuilding Our Military by Matching Threats to Capabilities.

To directly meet future threats, DoW STEM investments strategically ensure our military's technological edge by cultivating a STEM workforce with DoW-aligned skills. FY 2024 data confirm deliberate investments in programming that supports the most critical technology areas for future defense capabilities. While the majority of DoW STEM programs ensure broad STEM topic coverage, many intentionally incorporate topics and technologies in areas such as Trusted AI and Autonomy (26% of programs), Space Technology (23%), and Hypersonics (23%). This deliberate focus ensures a new generation of innovators equipped to develop and deploy emerging technologies. The Science, Mathematics, and Research for Transformation (SMART) scholarship-for-service program, which awarded 489 scholarships in FY 2024, is an example of the Department's approach to building a future-ready STEM workforce. The Joint Hypersonics Transition Office is also creating a specialized talent pipeline through hypersonics-focused curricula and career resources.

DoW STEM programming is further strengthening the resilience of the future defense workforce by investing in a nationwide talent pool, with emphasis on regions with significant DoW and Defense Industrial Base (DIB) infrastructure. In FY 2024, DoW STEM activities had a notable footprint in the states of California, Texas, Virginia, Maryland, and Ohio, aligning investments with key DoW laboratories and facilities to build a sustainable talent ecosystem near our nation's critical defense assets. This strategy is exemplified by FY 2024 initiatives like those led by Microelectronics (ME) Commons, a network of regional hubs that has deployed 89 workforce development initiatives, drawing over 5,000 participants, to support the growth of U.S.-based, clearable microelectonics talent. Furthermore, DoW-funded grantees like Monroe Community College (MCC), are now the nation's first community college to award associate's degrees in precision optics, a field with numerous defense applications, and issued 65 Optical Systems and Technology credentials in FY 2024 alone. These targeted initiatives demonstrate how DoW STEM programs develop talent that will advance national security capability.

Reestablishing Deterrence by Defending Our Homeland.

To ensure talent investments directly contribute to national security and deterrence, DoW STEM programs are increasingly using a variety of objective-aligned program evaluation approaches. By systematically analyzing program outcomes, DoW STEM programs can identify and scale the most effective practices, such as hands-on, project-based learning and direct engagement with real-world DoW challenges, the Department can more effectively cultivate an innovative and problem-solving workforce. This ensures that the Department's talent development efforts yield a high return in talent and technological readiness.

To measure success, DoW STEM programs leverage key performance metrics to provide concrete evidence of impact. Programs leverage pre- and post-program surveys to quantify gains in STEM knowledge and use long-term tracking to confirm that participants advance into critical STEM majors and DoW internships. This continuous, data-informed improvement cycle ensures we are efficiently cultivating the highly skilled and innovative talent required to maintain our nation's technological advantage. Ultimately, this talent pipeline is a foundational component of our nation's ability to deter aggression and defend the homeland.

Conclusion

The FY 2024 data demonstrate a significant return on investment, providing evidence that DoW STEM investments are successfully building a talent pipeline essential to our national security strategy. Through the focused cultivation of critical skills, direct engagement with the current defense enterprise workforce and infrastructure, and a commitment to data-driving program improvement, the is building the agile, innovative, and highly skilled force needed to meet future threats.

FY 2024 Year-in-Review Report Purpose

The data in this report was collected via an annual data call issued to DoD STEM programs and leadership to collect essential information about STEM education, outreach, and workforce development programs and activities performed across the Department.

DoD STEM | Acronyms List

Abbreviation	Definition
AEOP	Army Educational Outreach Program
DSEC	Defense STEM Education Consortium
DoWEA	Department of War Educational Activity
MDA	Missile Defense Agency
MEEP	Manufacturing Engineering Educational Program
MIL/LL STEM	Massachusetts Institute of Technology / Lincoln Labs STEM Programs
NDEP	National Defense Education Program
NDSEG	National Defense Science and Engineering Graduate Program
NSA	National Security Agency
OASW(M&RA)	Office of the Assistant Secretary of War (Manpower and Reserve Affairs)
OUSW(R&E)	Office of the Under Secretary of War (Research & Engineering)
RC3	Regional Community College Consortia
SMART	Science, Mathematics, and Research for Transformation Scholarship

Research supporting program activities

The Department of War (DoW) requires a **skilled, agile, and sustainable STEM talent pool** readily accessible to support the Warfighter and our national security mission.

- Preparing the future STEM workforce requires intervention at the earliest levels as well as opportunities for **continued and varied engagement across the education continuum**. Early math skills are among the strongest predictors of later academic success, college completion, earnings, and life outcomes. (Casalaspi *et al.*, 2026 https://bellwether.org)
- Elementary and secondary education in mathematics and science are **the foundation for entry** into postsecondary STEM majors and STEM-related occupations. (National Science Board, 2023)
- Research has shown that "**students are making choices in middle school that will impact their desire and ability to pursue STEM careers**. Providing middle school students with accurate information about STEM careers enables them to make more knowledgeable choices about courses of study and career paths". (Wyss *et al.*, 2012)
- In addition, middle school programs that are (1) interactive and tangible, (2) connected to their own lives and families, and (3) supportive of collaboration and creativity have **produced effective results with students developing positive STEM identities**. (Christensen *et al.*, 2015)
- Some of the **positive effects of STEM internships** for high school and college students include an increase in their professional networks, higher expectations of success, and an increase in STEM skills, identity, and self-efficacy/confidence. Internships also provide hands-on experiences and career path exploration. (Patel et al., 2021; and Coté et al., 2025)

Research supporting program activities (continued)

- Research shows that **participants in STEM competitions** like FIRST are more likely (1) to report an increase in STEM interest, (2) to major in STEM, as well as engineering or computer science, and (3) are significantly more likely to be employed in a STEM field. (Meschede et al., 2024)
- **One day or short-term STEM programs and activities add value** because they can provide immediate and impactful learning experiences.
  - An **independent evaluation of DoW's participation in the 2018 USA Science and Engineering Festival** found that approximately 42,000 people came through the DoW section over the course of the 3-day event. 55% were K-12 students; 26% were parents; and 50% were military-connected. 92% of attendees agreed that they learned interesting STEM information; 69% agreed that they learned about DoW STEM jobs; and 64% were more likely to pursue STEM education or careers. (Belanich et al., 2018)
- Two National Academies reports ("Scaling and Sustaining Pre-K-12 STEM Education Innovations: Systemic Challenges, Systemic Responses" and "K-12 STEM Education and Workforce Development in Rural Areas"), validate the **core principles of STEM ecosystems**:
  - Intentional collaboration
  - Resource alignment
  - Deep community engagement
- Research has also shown that **federal and state STEM education efforts should pair student investments with systemic supports to the ecosystem** for learning and skill-development and align investments with the evolving needs of the workforce. (Perez-Felkner et. al, 2025)

FY 2024 Data Findings and Alignment to SecWar Priorities

Goal - To demonstrate DoW STEM program alignment with Departmental priorities:

Restoring Warrior Ethos

Understanding Who's Engaged and How is Necessary to Build a Strong STEM Workforce

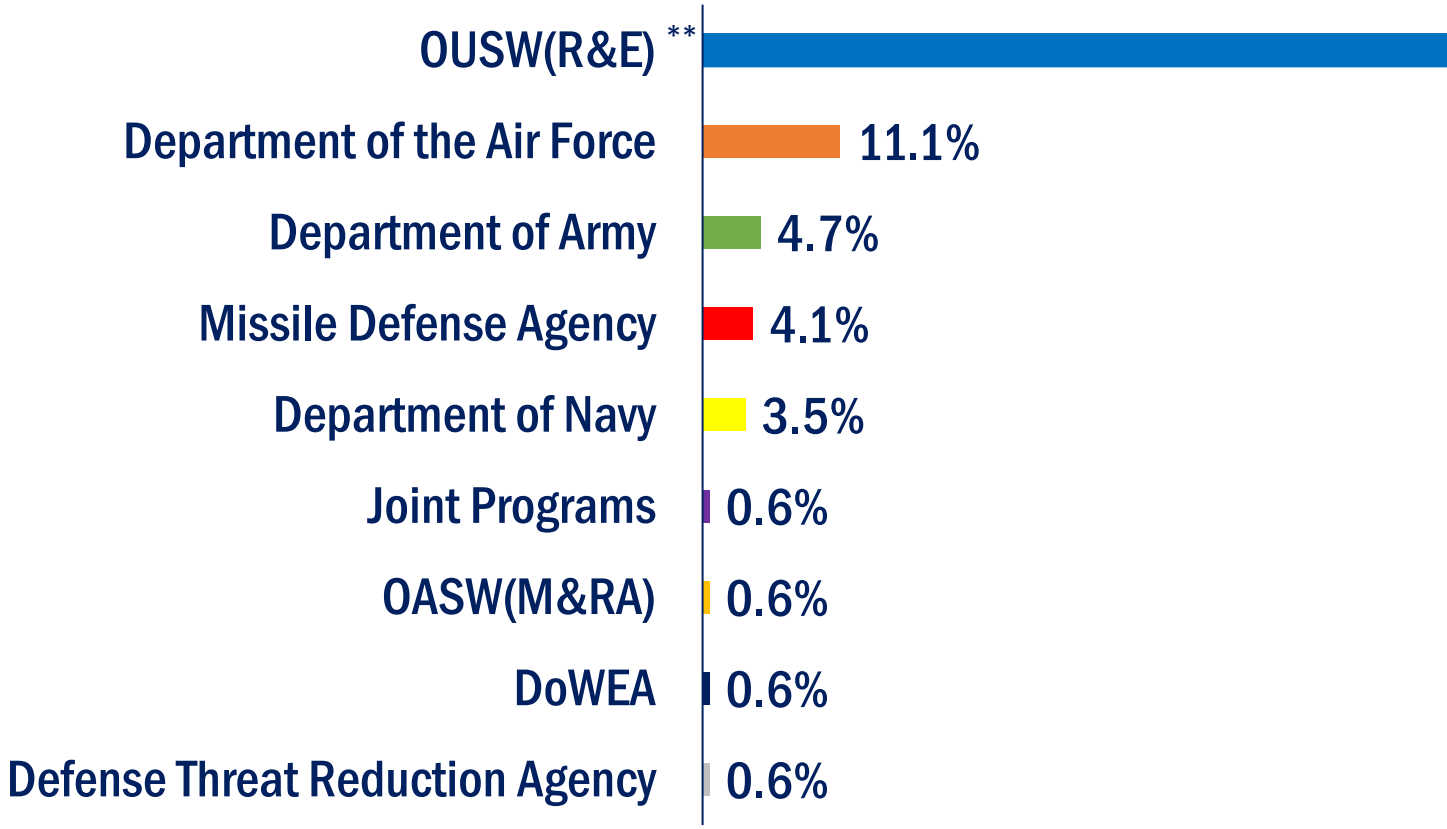
Understanding Engagement to Build a Strong STEM Workforce

Participant data enables assessment of impact and reach of STEM programs

Assess PreK-adult engagement and recruitment in defense-relevant STEM opportunities

Evaluate strategic partnerships across government, industry, academia, and nonprofits

DoW STEM FY 2024 Data Call Respondents by Component/Agency



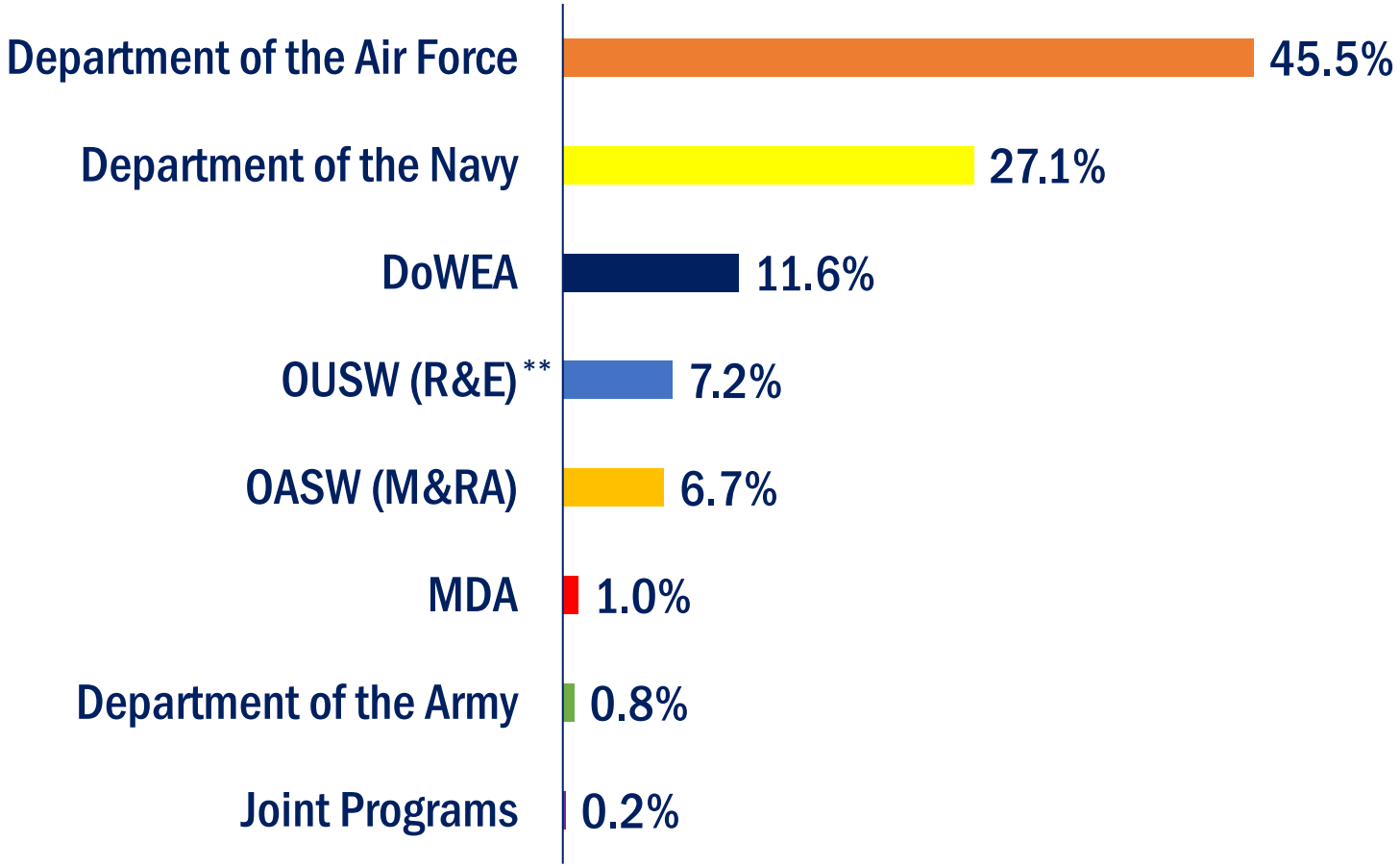
171

Total Respondents in FY 2024

44.9% increase from FY 2023

**OUSW(R&E) consists of responses gathered from JHTO, NDEP external awardees, DSEC, and other funded programs.

DoW STEM Participants Served by Component/Agency



1.91 Million

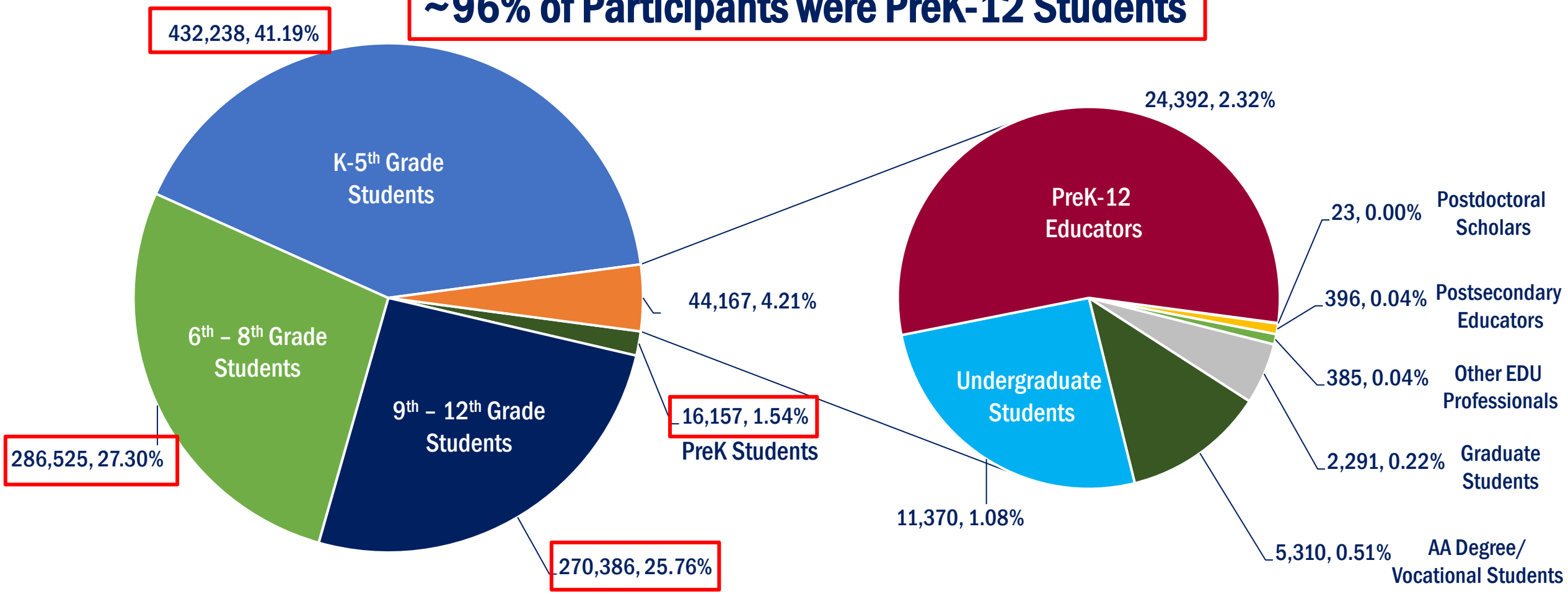
Total Participants Served in FY 2024

13.9% increase from FY 2023

**OUSW(R&E) consists of responses gathered from JHTO, NDEP external awardees, DSEC, and other funded programs.
Total participant counts were not provided for DTRA in the FY 2024 data.

DoW STEM Participant Composition by Education Level

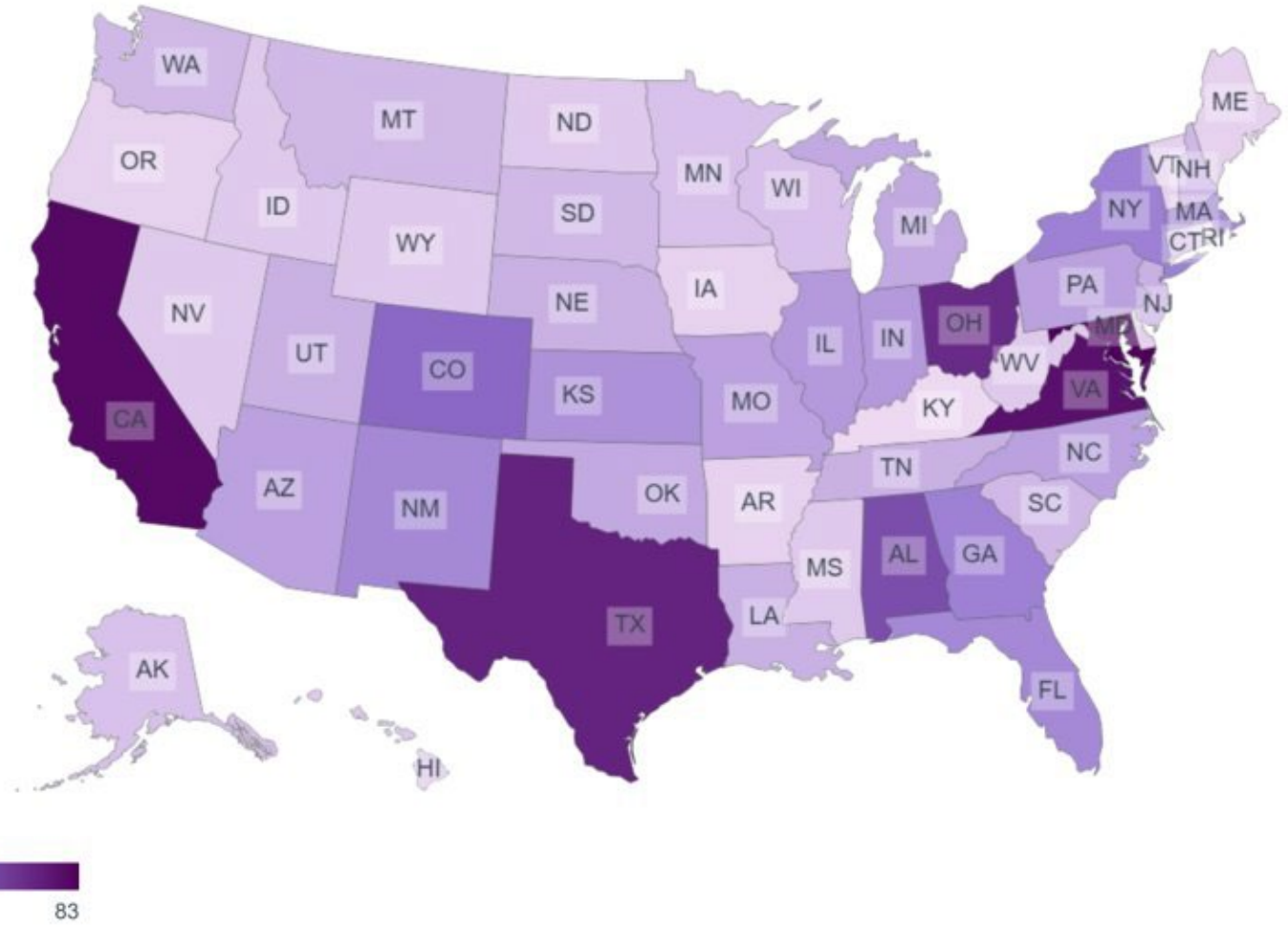
~96% of Participants were PreK-12 Students



*Participant counts by education level type were provided by 138 out of 171 program responders in FY 2024 data call.

DoW STEM Program Locations Across the Nation

The largest concentration of DoW program activities are in states with significant DoW and Federal Government presence (e.g., **California, Maryland, Ohio, Texas,** and **Virginia**).



Example: Several DoW STEM Programs are Active in Texas

Defense STEM Education Consortium

The Alamo STEM Ecosystem (Hub)
STEM Equity Ambassadors
SeaGlide
SeaPerch

Department of Air Force

DoW FIRST Robotics
Air & Space STEM Outreach
Air Force Sustainment Center
School Liaison Program

Department of Army

Camp Invention
UNITE
eCYBERMISSION

National Defense Education Program

STEMKAMP
Military City USA Consortium (MCUSA)

Note: Graphic does not highlight all DoW programs that are active in Texas.

STEM Programs Utilize 5 Key Recruitment Strategies

Direct Engagement with Educational Institutions

Social Media & Websites

Teacher & Educator Networks

Email Campaigns, Print/Digital Flyers

Military Bases, Laboratories, & Installations

Thematic Analysis is reflective of qualitative response entries.

Examining Engagement of Military-Connected Student & Veterans/Veteran Spouses

72,564

Military-connected Students Served in FY 2024

1,219

Veterans and Veteran Spouses Served in FY 2024

Analysis of Recruitment Strategies for Military-Connected Students and Veterans/Veteran Spouses

Direct Engagement with Educational Institutions

Social Media & Websites

Partner-led Strategic Communication

Engagement with Veterans Affairs Offices

Military Bases, Laboratories, & Installations

Thematic Analysis is reflective of qualitative data entries.

FY 2024 Data Findings and Alignment to SecWar Priorities

Goal: To demonstrate DoW STEM program alignment with Departmental priorities:

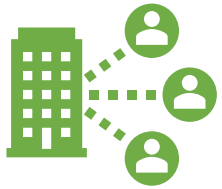
Restoring Warrior Ethos	Rebuilding our Military
Understanding Who's Engaged and How is Necessary to Build a Strong STEM Workforce	**Strengthening Military Capability through Multifaceted STEM Engagement**

Strengthening Military Capability Through Multifaceted STEM Engagement

STEM programs cultivate the talent necessary to maintain long-term national security readiness

Grow knowledge and skills in defense-relevant STEM fields

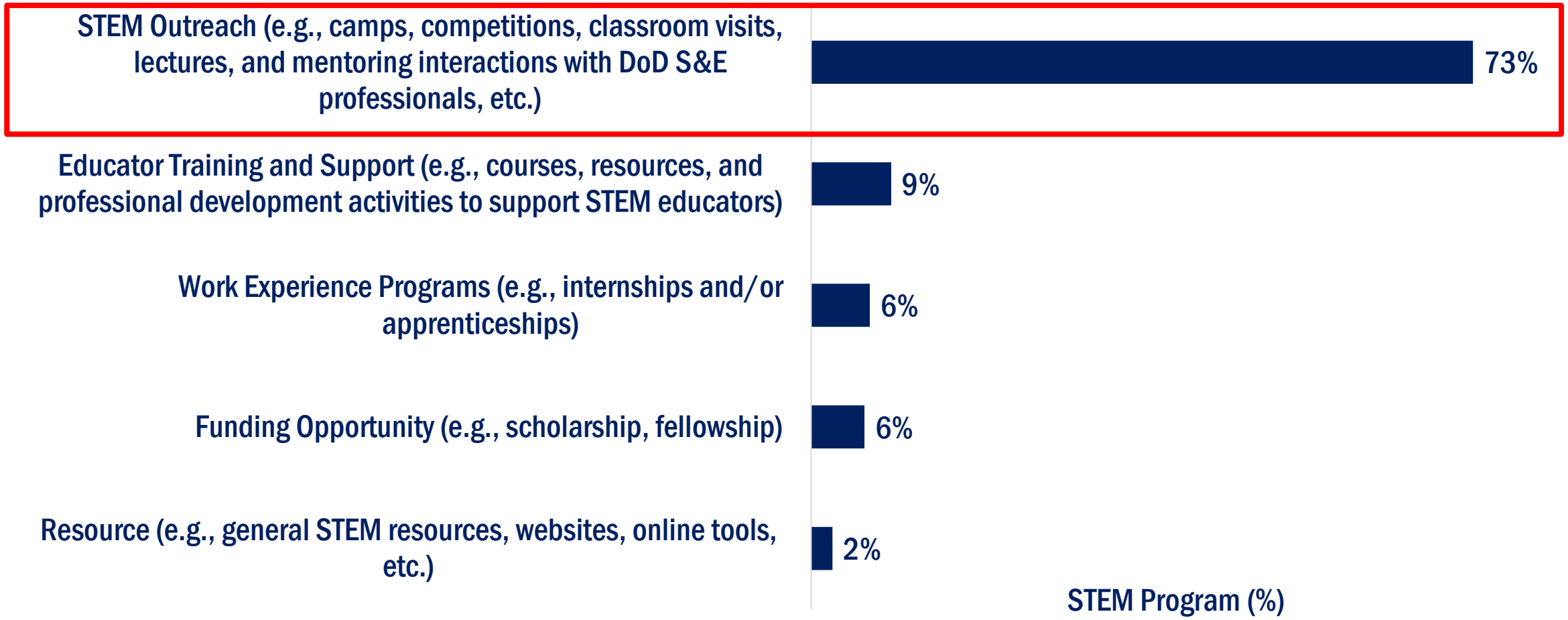
Raise awareness about the multitude of STEM careers



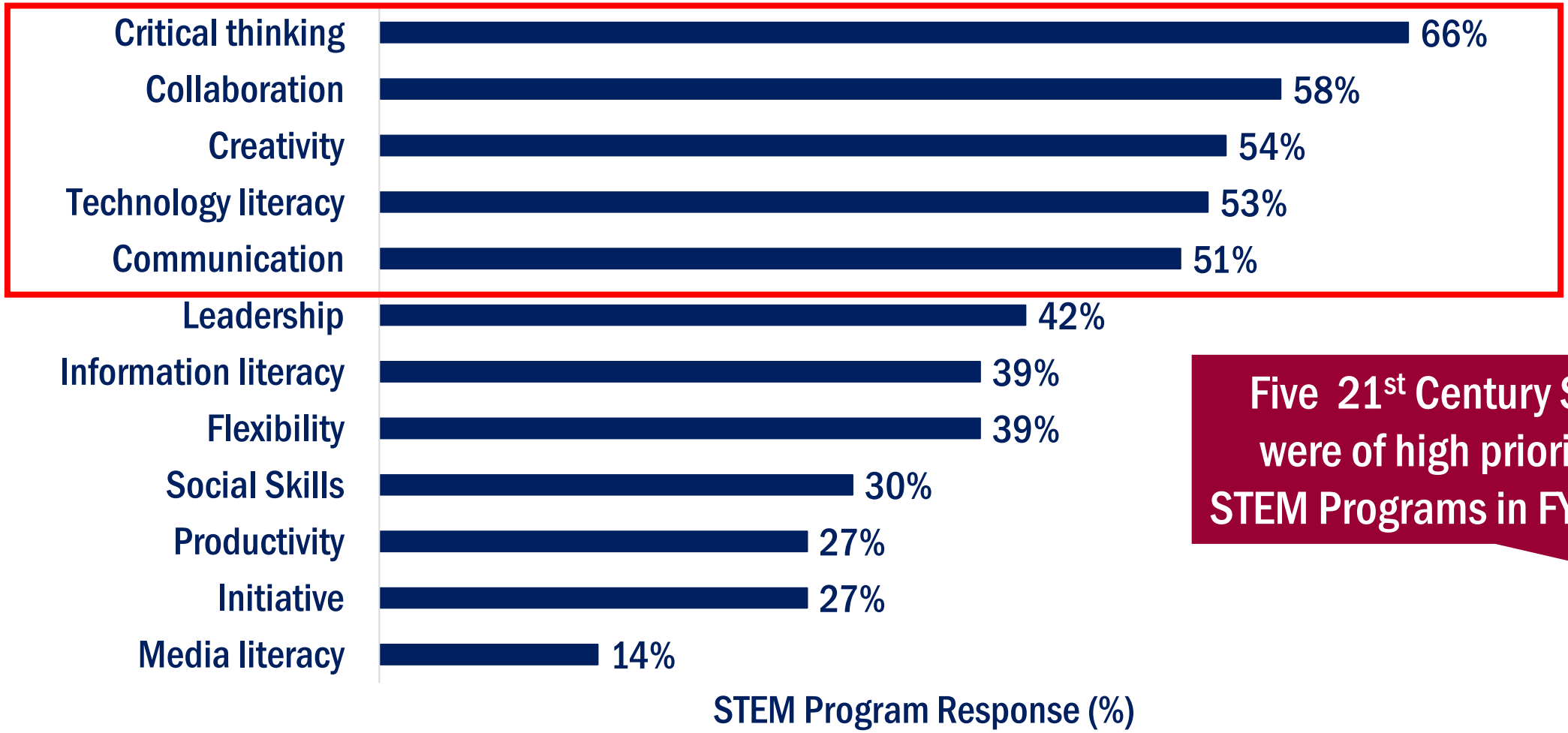
Provide real world work experiences through internships, apprenticeships, scholarships, and fellowships

What Does STEM Engagement Look Like Across DoW?

The primary function of most DoW STEM programs in FY 2024 was outreach to PreK-adult learners.



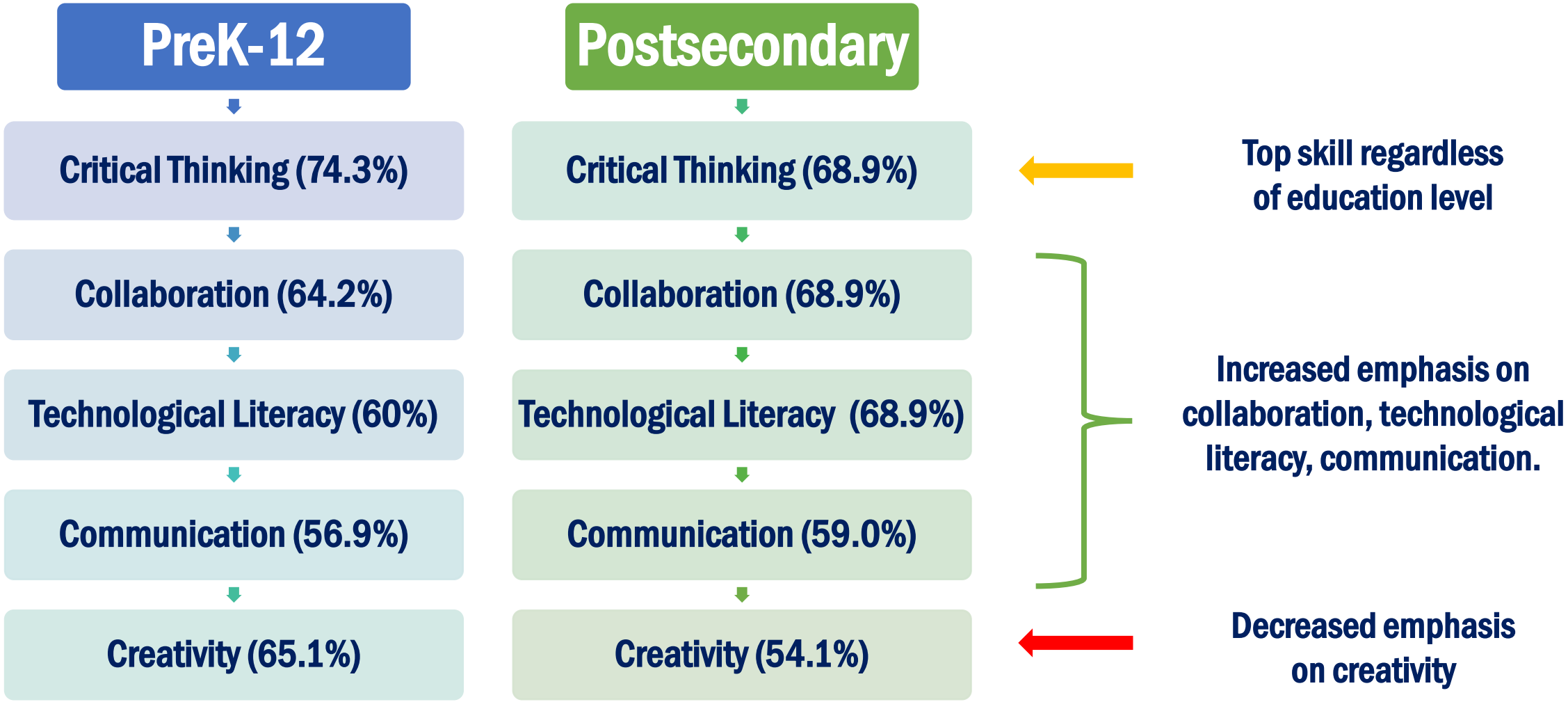
21st Century Skills are Embedded in STEM Programs



Five 21st Century Skills were of high priority in STEM Programs in FY 2024.

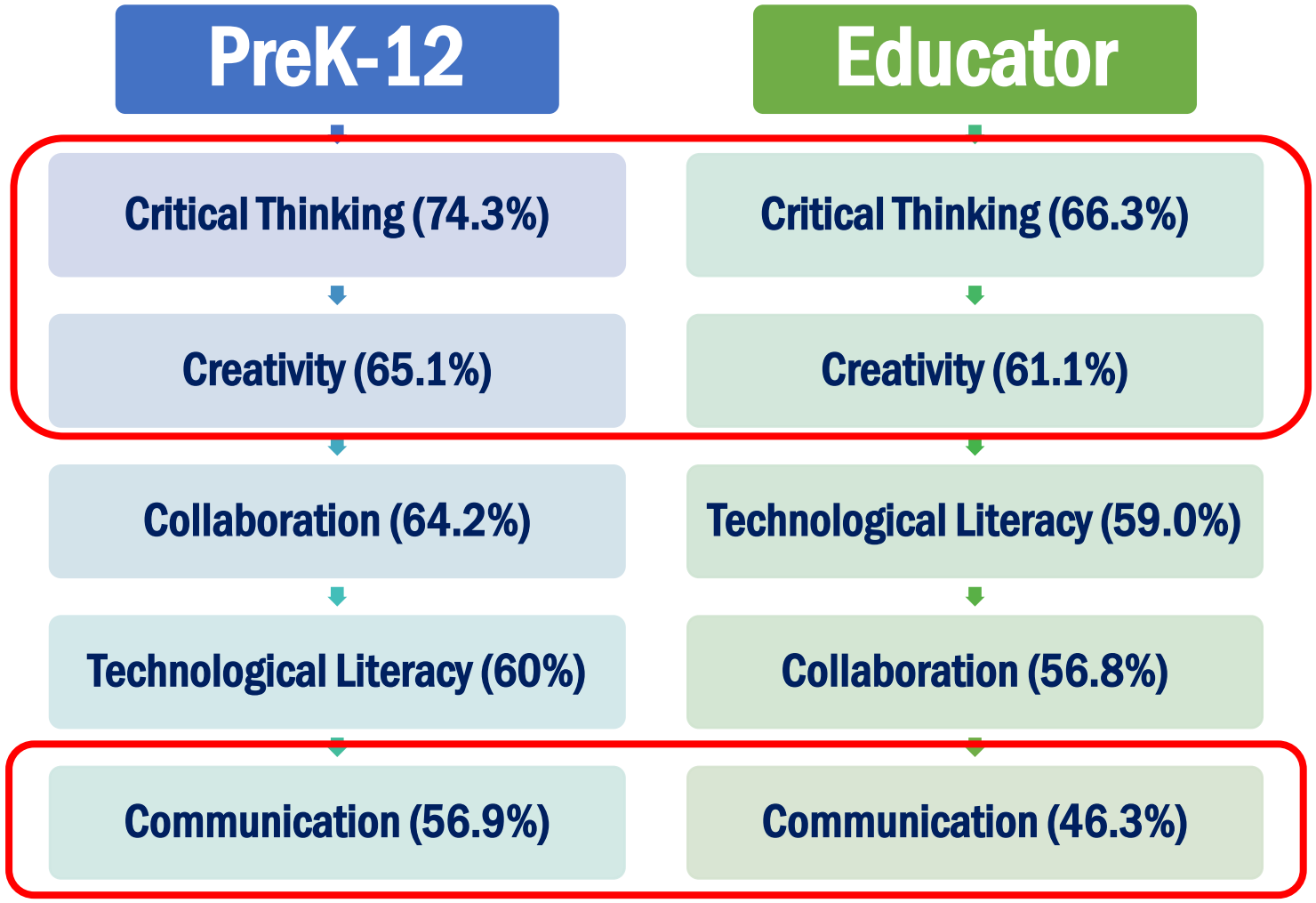
Note: Multi-select question. Percentages represent programs that selected each option.

21st Century Skills Examined by Education Level



Note: Multi-select question. Percentages represent programs that selected each option.

PreK-12 and Educator STEM Programs Show Similar trend in 21st Century Skill Incorporation



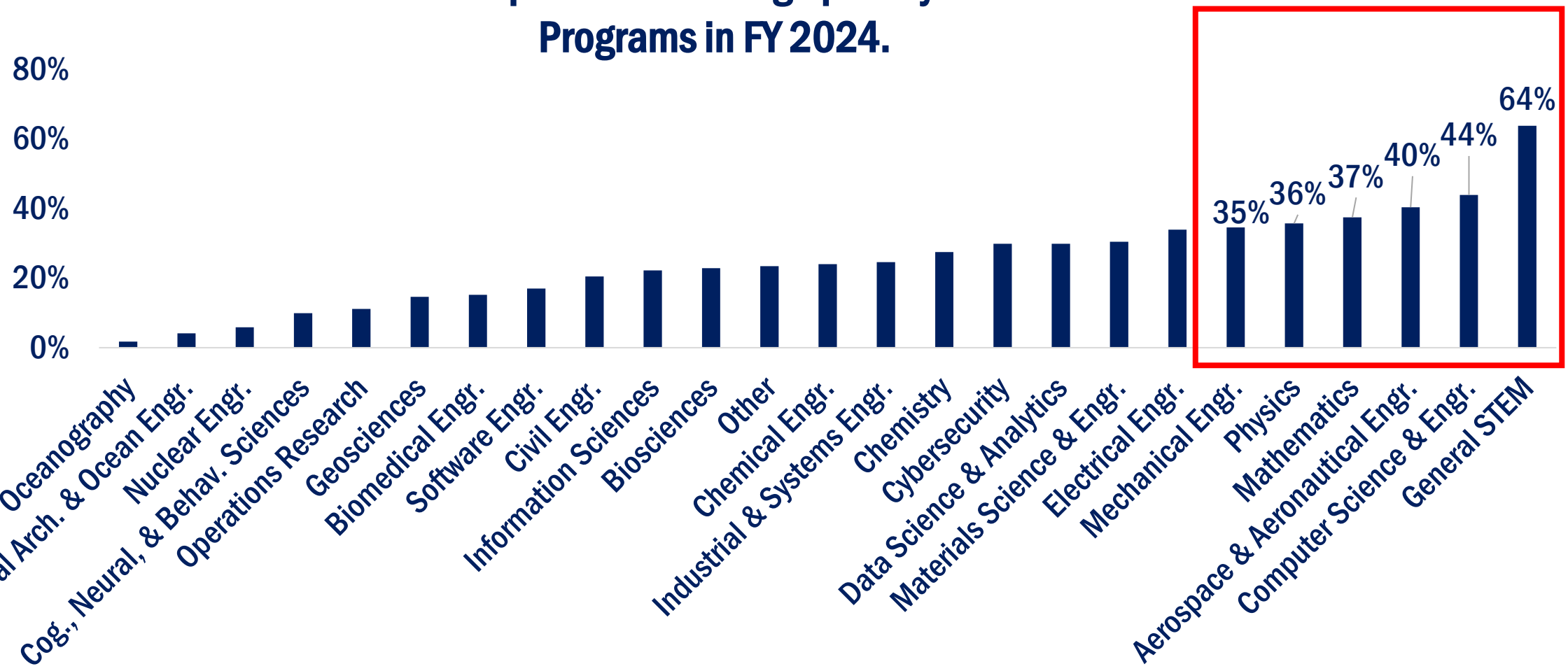
Apart from collaboration and technological literacy, a similar skills trend is observed in PreK-12 and Educator-focused programs.

This is reflective of most programs targeting students and educators from PreK-12 institutions.

Note: Multi-select question. Percentages represent programs that selected each option.

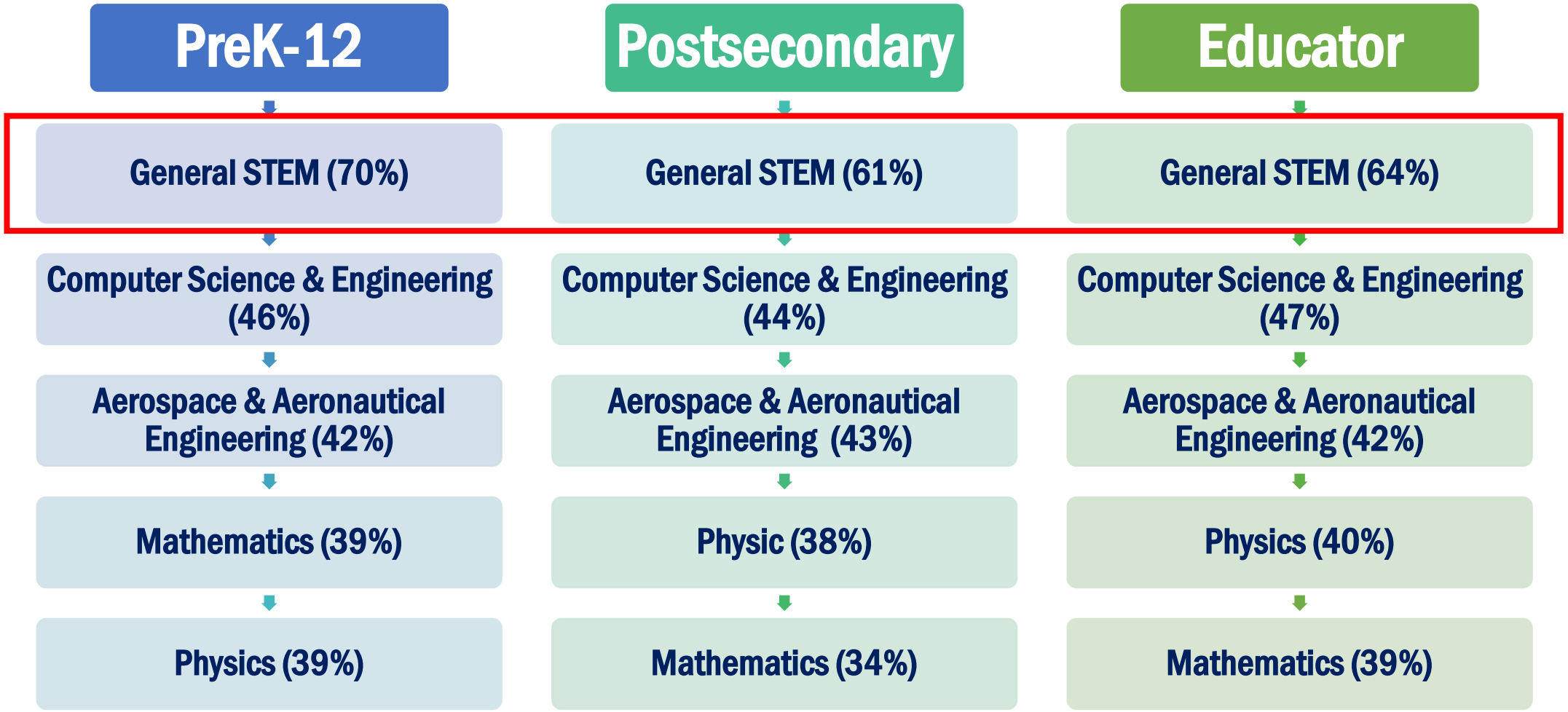
DoW-relevant STEM Disciplines are Embedded in STEM Programs

Five Disciplines were of high priority in STEM Programs in FY 2024.



Note: Multi-select question. Percentages represent programs that selected each option.

General STEM Designation Suggests Prevalence of Interdisciplinary STEM Program Designs



Note: Multi-select question. Percentages represent programs that selected each option.

General STEM in Action Across STEM Programs

SciTrek Biotech, an NDEP awardee, engages 2nd-12th grade students in immersive, hands-on STEM experiences while also offering professional development opportunities for educators.

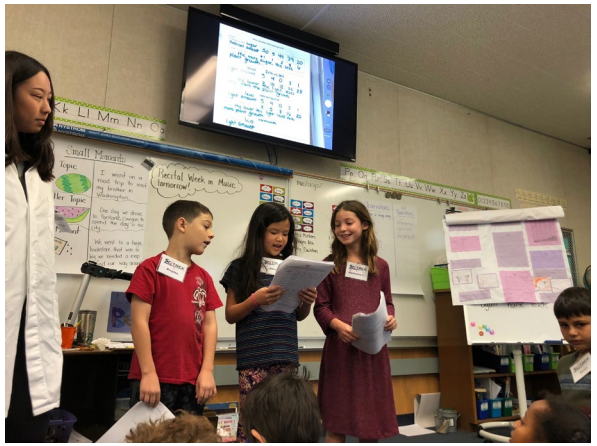


Photo credit: https://scitrek.chem.ucsb.edu/

MDA's Military Academy Internship participants conduct high-impact research in several areas from ground sensors to digital engineering to nuclear and space environmental effect to hypersonic defense weapons.

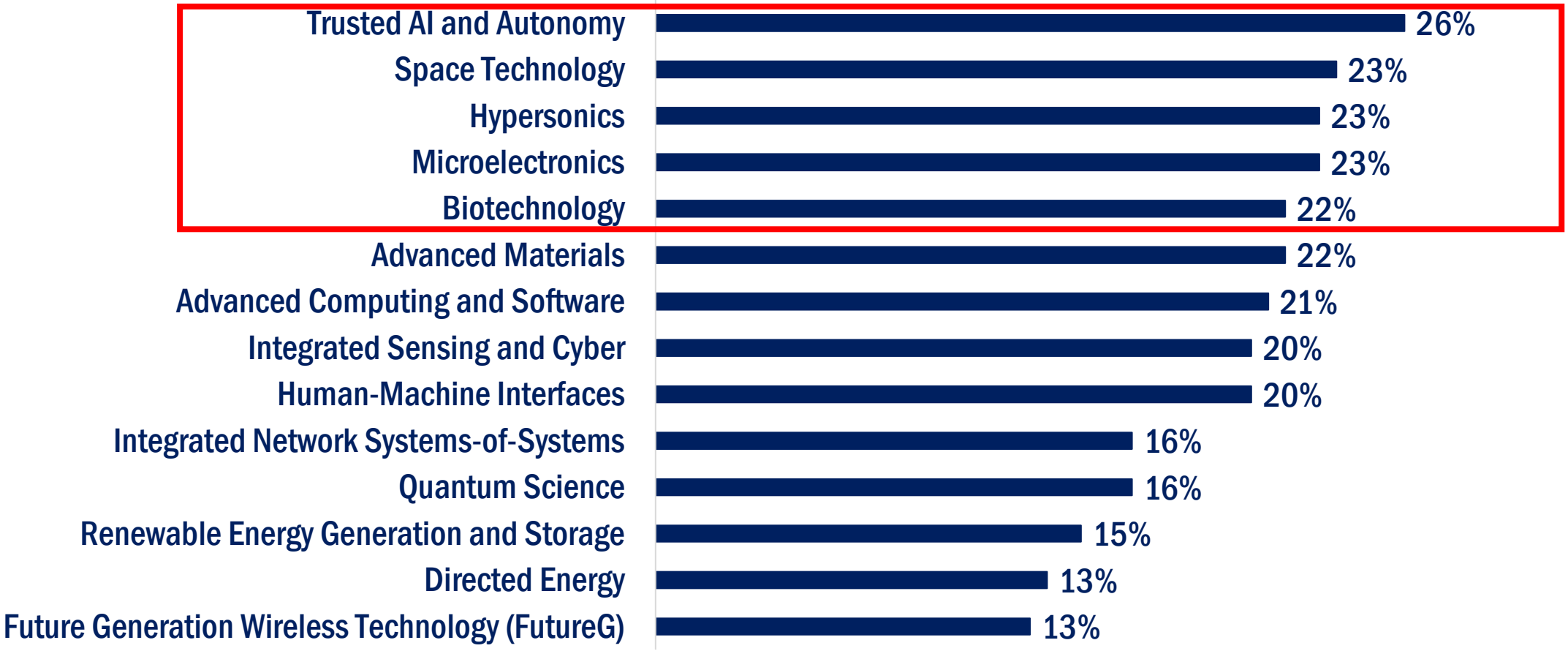
Photo credit: https://www.mda.mil/about/STEM_initiatives.html

STARBASE engages K-12 students and educators to foster interest and engagement STEM through outreach activities that include several disciplines.

Photo credit: https://dodstarbase.org/about/

Critical Technology Areas (CTAs) Incorporated in STEM Programs

Five CTAs were prevalent in DoW STEM Programs



Note: Multi-select question. Percentages represent programs that selected each option.

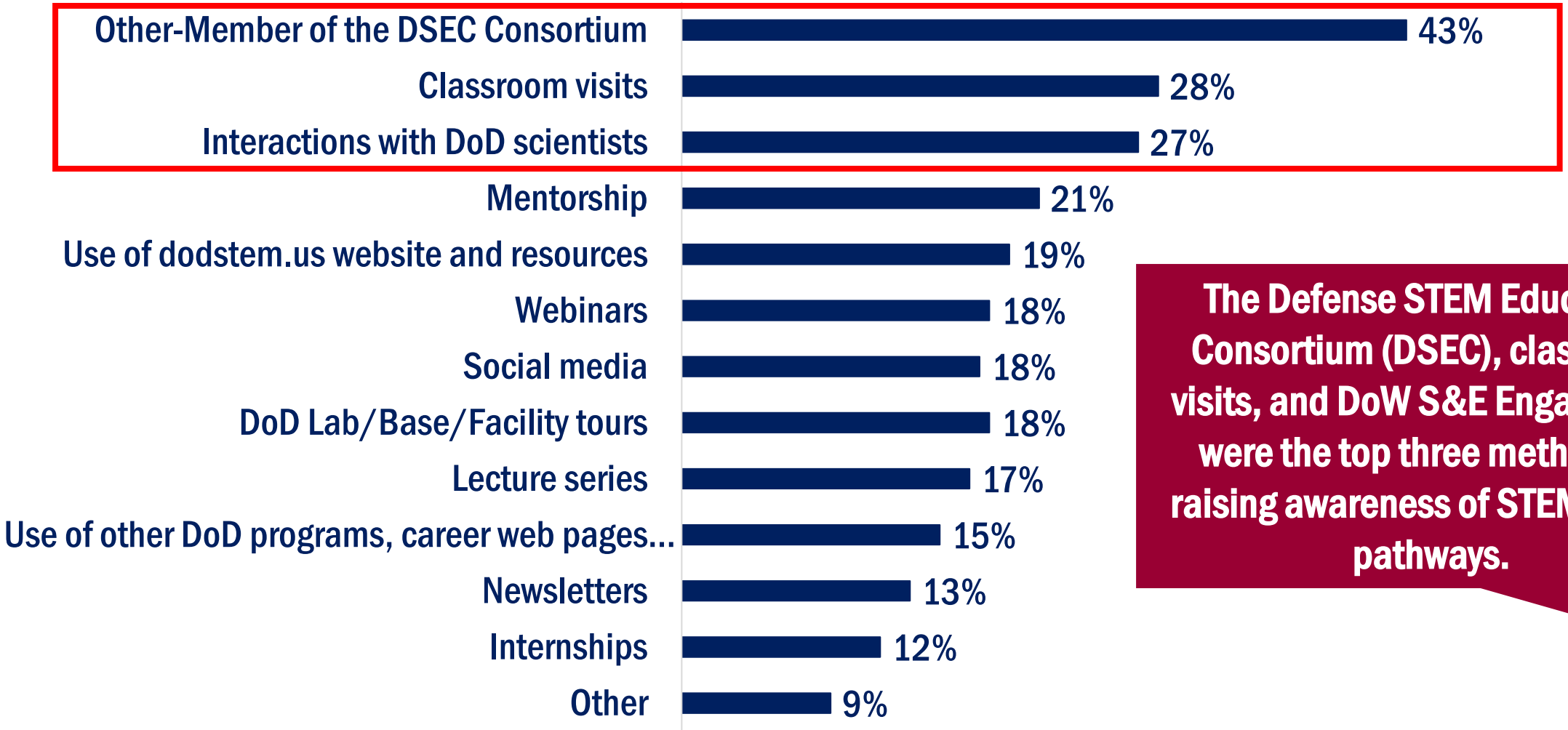
CTAs in Action Across STEM Programs

Army Apprenticeships provide high school and college students with opportunities to conduct real-world research under the guidance of Army scientists and engineers. Research topic areas may include any of the CTA areas.

The **Joint Hypersonics Transition Office (JHTO)** engages preK-12 students and educators through introduction of hypersonics-specific curriculum, outreach, and associated careers.

Microelectronics Commons (ME) engages K-adult participants to foster interest and engagement in microelectronics through hands-on trainings, curriculum, and outreach.

Programs Promote Pathways to Increase Awareness of STEM Careers



The Defense STEM Education Consortium (DSEC), classroom visits, and DoW S&E Engagement were the top three methods of raising awareness of STEM career pathways.

Note: Multi-select question. Percentages represent programs that selected each option.

FY 2024 Data Findings and Alignment to SecWar Priorities

Goal: To demonstrate DoW STEM program alignment with Departmental priorities.

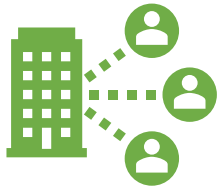
Restoring Warrior Ethos	Rebuilding our Military	Reestablishing Deterrence
Understanding Who's Engaged and How is Necessary to Build a Strong STEM Workforce	Strengthening Military Capability through Multifaceted STEM Engagement	**Identifying & Scaling Successful STEM Efforts Supports Enhanced Military Capabilities**

Identifying & Scaling Successful STEM Efforts Supports Enhanced Military Capabilities

Program Evaluation enables impact and opportunities for growth to be measured.

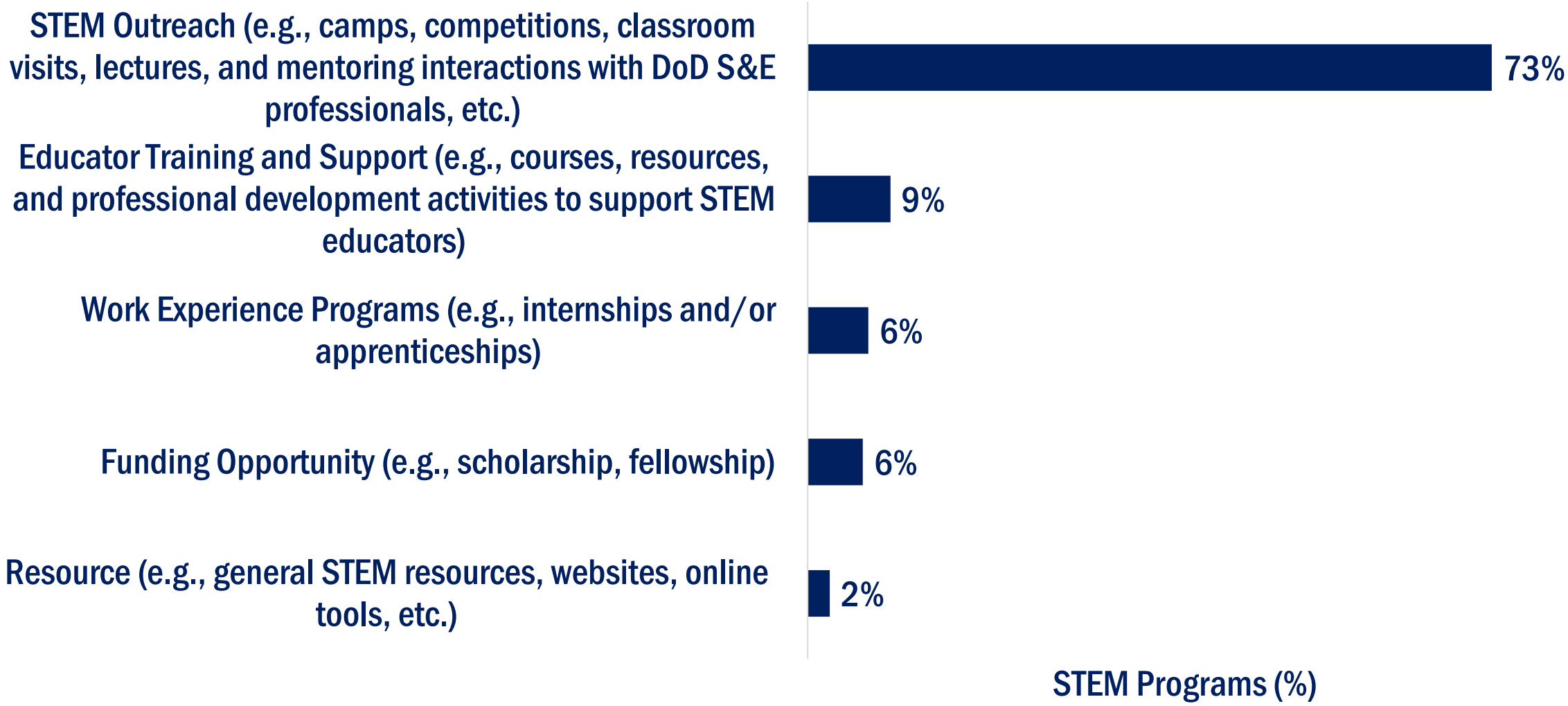
Program goals and intended outcomes detail how the program is nurturing future talent

Tracking metrics used to assess achievement of program goals



Strategic partnerships and program narratives show the impact of STEM education and workforce development investments

Building a STEM-Ready Workforce Requires Multiple Layers of Engagement



Four Themes Emerged across STEM Program Goals & Intended Outcomes

Immersive, Hands-on STEM Experiences

Educator Training & Curriculum Development

STEM-ready High School & College Students

Attract, Train, & Recruit Future STEM Workforce

Thematic Analysis is reflective of qualitative data entries.

DoW STEM Programs in Action

Immersive, Hands-on STEM Experiences

Department of Army's Junior Solar Sprint (JSS) challenges students to design, build, and race solar cars.

Education Training & Curriculum Development

The **Joint Hypersonics Transition Office** introduced hypersonics-specific content, careers, and curriculum to middle and high school teachers during the **STEM Teacher Leadership Academy**.

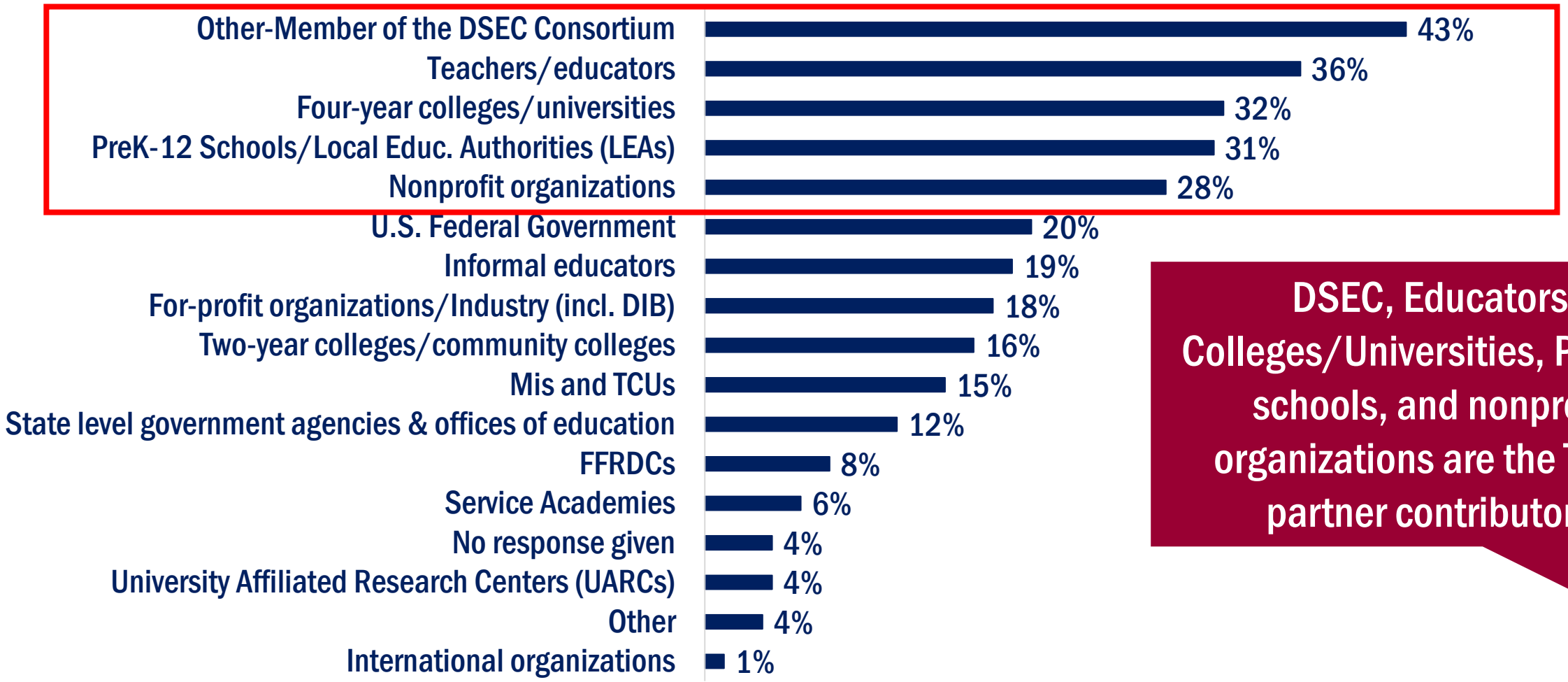
STEM-ready High School & College Students

MIT-Lincoln Labs's Beaver Works Summer Institute (BWSI) prepares high school students for advanced STEM careers through real-word, technical projects and guided mentorship.

Attract, Train, & Recruit Future STEM Workforce

Department of Air Force's Premier College Intern Program (PCIP) provides defense-relevant internship opportunities that serve as a gateway to Air Force Civilian Service.

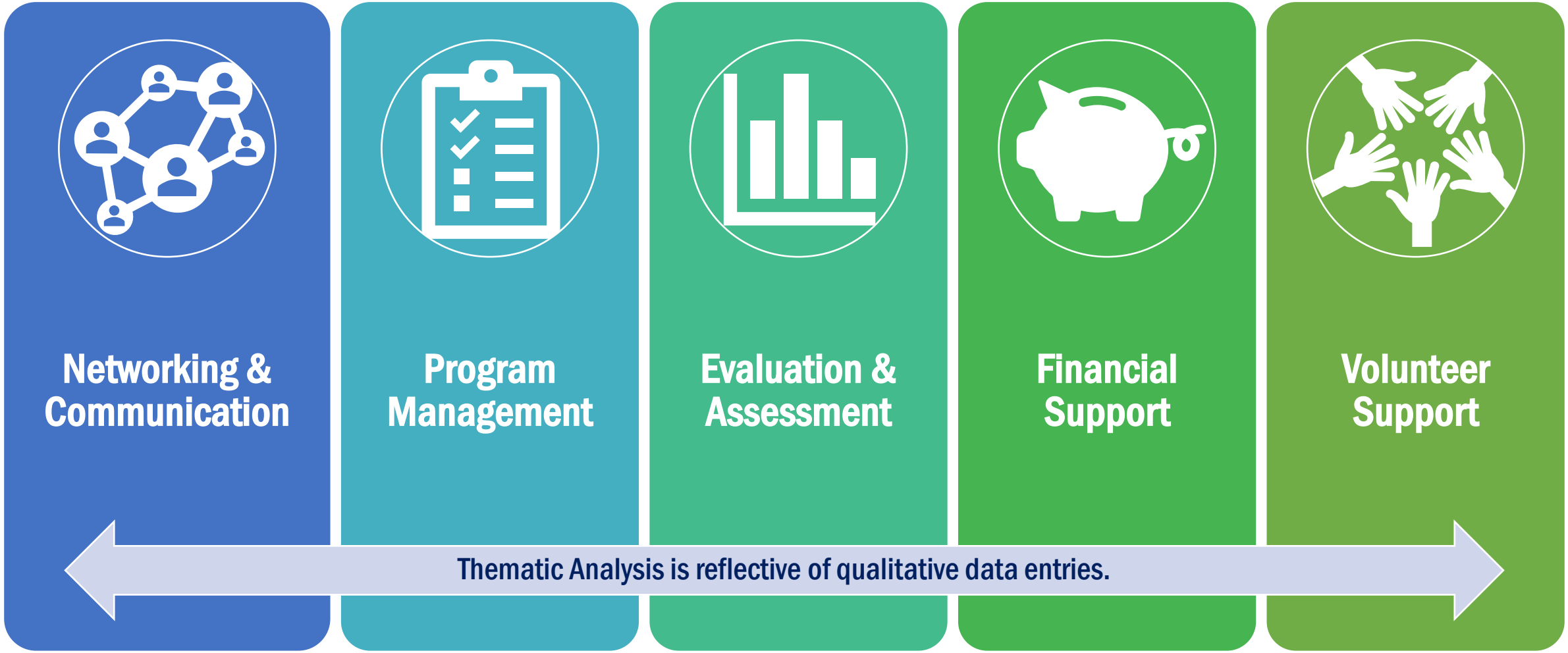
Collaborative, Cross-sector Partnerships are Vital for DoW STEM Program Success



DSEC, Educators, Colleges/Universities, PreK-12 schools, and nonprofit organizations are the Top-5 partner contributors.

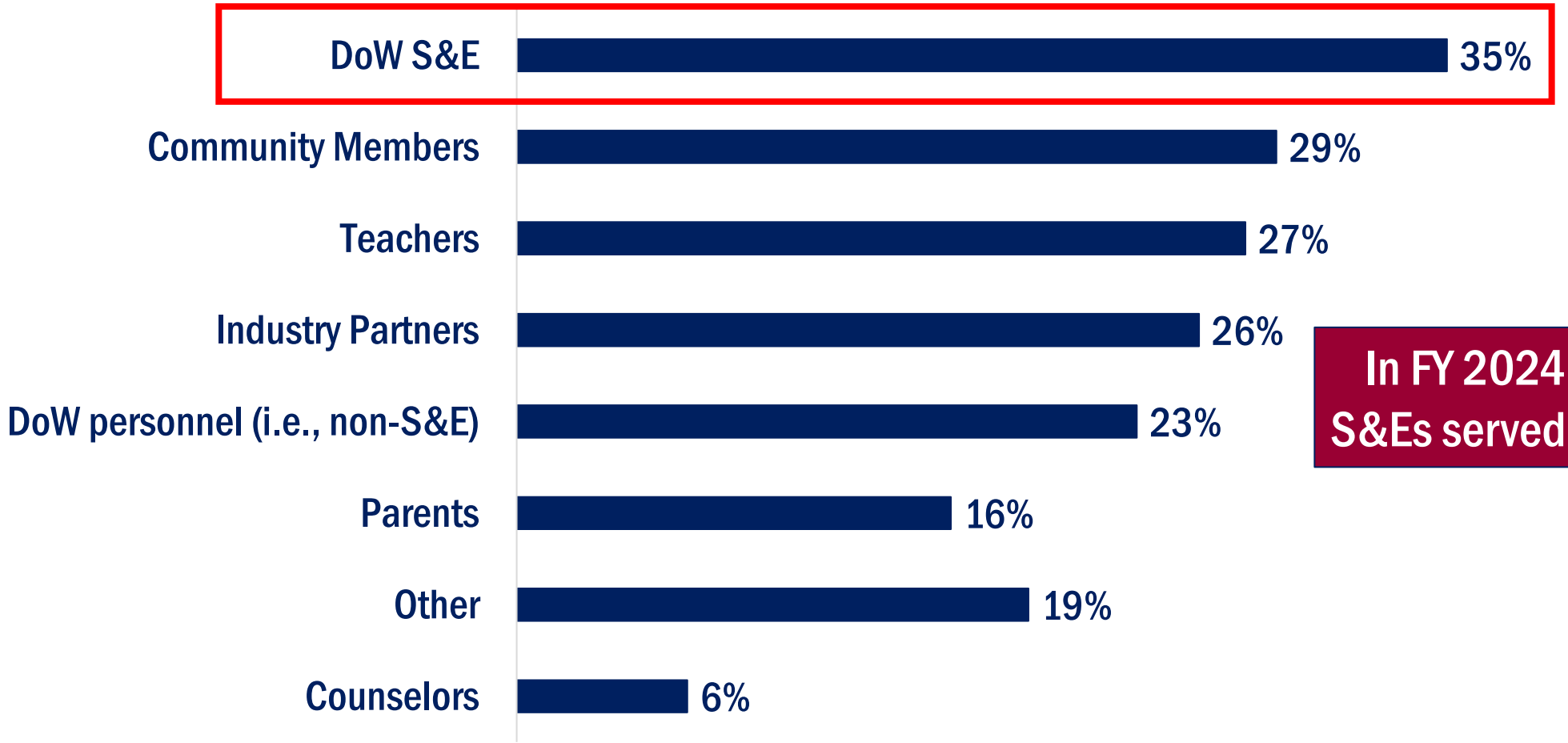
Note: Multi-select question. Percentages represent programs that selected each option.

STEM Program Partners Offer a Wide Variety of Support



STEM Program Volunteer Representation

DoW S&Es provide the most support to STEM education and workforce development programs.



In FY 2024, 7,252 DoW S&Es served as volunteers.

Note: Multi-select question. Percentages represent programs that selected each option.

Opportunity Area: Leveraging STEM Learning Ecosystems

In FY2024, 26% of respondents* partnered with STEM Learning Ecosystems or Consortia.

The **Teaching Institute for Excellence in STEM (TIES)**, a DSEC partner, fosters cross-sector collaboration to build STEM literacy and a future ready workforce. Notable initiatives include **STEM on the Go Van** and the **STEM Coordinators Community of Practice**.

Photo credit: https://www.tiesteach.org/stem-on-the-go-experience/

Junior Sciences and Humanities Symposium (JSHS) is jointly sponsored across the Department to support research experiences for high school students. The **National Science Teachers Association** is a key partner in JSHS's administration.

Photo credit: Ms. Ericka Rojas, DoD SMART Program Analyst

* Respondents included NDEP awardees, MDA, and Army

Four Themes in STEM Program Goals & Intended Outcomes

Immersive, Hands-on STEM Experiences

Educator Training & Curriculum Development

STEM-ready High School & College Students

Attract, Train, & Recruit Future STEM Workforce

Thematic Analysis is reflective of qualitative data entries.

Measurements of Success in STEM Programs

Commonly Assessed Metrics by STEM Programs

Quantitative Participation & Engagement

- # of Participants
- # of Engagements
- # S&E Volunteers
- Scholastic Achievements

STEM Readiness

- STEM Interest, Attitude, Behaviors
- Awareness of STEM Careers
- STEM Skill Development
- Pre- and/or Post Assessments

Program Effectiveness

- Participant** Feedback
- Curriculum Feedback
- Mentor Feedback

Least Used Metric

Longitudinal Impact

- Alumni Participant Tracking
- Retention Rates
- Degrees and/or Certifications Earned

**Participant Feedback may include educators, PreK-adult learners, and volunteers.

Our Collective Impact

FY 2024 DoW STEM Program Success Stories

Growing the Microelectronics Innovation Workforce

Workforce Development	• 89 WFD initiatives launched • 5256 enrollees in WFD initiatives • 260 internship placements
Curriculum Development	32 new courses designed
Partnerships	120 ME Commons funded partners

Department of Air Force: Premier College Intern Program (PCIP)

PCIP Intern, Zachary Gioppo's extraordinary research and scholarly achievements culminates into future career opportunity with Department of Air Force.

PCIP Internship

- 11-Weeks at Environmental Element at Joint Base Andrews
- Developed a GIS-based tracking tool that streamlined stormwater outfall monitoring

Post-PCIP Achievements

- Opportunity to continue research remotely during academic year
- Student lead for NSF –funded Materials-Based Innovations for Sustainable Water Treatment and Reuse Program in France

Future Career Pursuits

- Set to return as a full-time Environmental Engineer through the Palace Acquire (PAQ) program after graduation

National Defense Science and Engineering Graduate (NDSEG) Program is Building STEM Leaders of the Future

Alumni Spotlight	Dr. Joseph Jewell is the current DoW Assistant Secretary for Science and Technology
Scholastic Achievements (2023-2024)	• 910 Publications • 38 Patents
STEM Career Pathways (2023-2024)	• 29 Government Internships Secured • 5 DoW Civilian Roles Obtained

OASW(M&RA): DoD STARBASE

DoD STARBASE
A Department of Defense Youth Program

Post-Program Student Performance	•**36%** improvement in Physics •**32%** improvement in Chemistry •**36%** improvement in Math
STEM Attitudes	**80%** of student participants showed improved attitudes towards military careers
STEM Career Awareness	**81%** of first-time STARBASE educator participants are more aware of DoW STEM career opportunities

MIT - Lincoln Laboratory Radar Introduction for Student Engineers Program (LLRISE)

Montserrat Diaz's, a MIT-LLRISE Alumnus, journey to STEM demonstrates the importance of early and continued exposure.

Early Exposure to STEM

- Empower Yourself STEM Program
- Aerospace Robotics Competition (ARC) team

LLRISE Engagement & Leadership

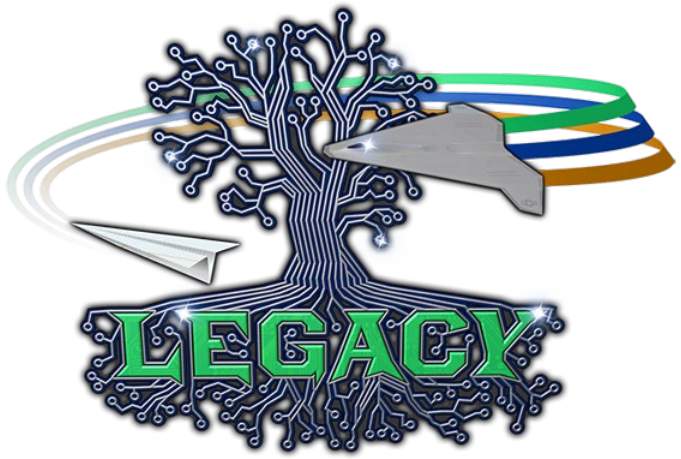
- LLRISE Participant in Spring & Summer (2024)
- Teaching Assistant for LLRISE Spring Program (2025)
- Teaching Assistant for Beaver Works Summer Institute (2025)

Current Scholastic Achievements

- MIT Class of 2029 Electrical Engineering Major
- Armed Forces Communications & Electronics Association International (AFCEA) High School Internship Program Participant
- 2x AFCEA Young Social Innovator Awardee

Department of Air Force: Leadership Experience Growing Apprenticeships Committed to Youth (LEGACY) Program

Innovative STEM Projects with Real-World Applications



A DAF LEGACY student participated in a groundbreaking experiment that investigated the effects of fungus, magnets, and radiation on genetically-modified mustard seeds grown in microgravity by deploying the seeds on a five-day space mission on board Polaris Dawn.

A DAF LEGACY internship project resulted in a portable charging station design, approved by the JBA SparkX Cell, capable of jump-starting a UH-1N Huey helicopter and powering 120 VAC devices. Her design, using non-Chinese components, is being built and tested by the Air Force, potentially leading to widespread adoption and improved operational resilience.

NDEP – SMART Scholarship Program

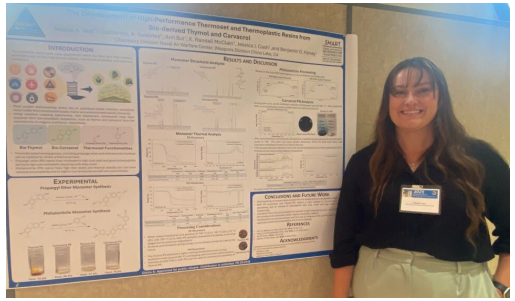


Photo credit: SMART Scholarship Program (2026)

SMART Scholar Achievements

- Collaborations with international researchers resulted in 5 Publications
- Positive internship experiences yielded new DoD projects for some scholars

Scholars forged New International Partnerships

- UK Defense Science and Technology Laboratory (DSTL)
- Disruptive Capabilities and Technologies Office
- UK Quantum Roadmap

Scholars continue to foster technical collaborations

- NATO's Center for Maritime Research and Experimentation visited Naval Surface Warfare Center (NSWC) at Carderock and Panama City

NDEP Congressional Initiative – Regional Community College Consortium (RC3)

Lorian County Community College (LCCC): Ohio Manufacturing Talent Expansion for the Defense Industrial Supply Chain

Educator Development

- Redesigned **Industry 4.0 Automation & Robotics Teacher Certification Program**
- **17 Educators** participated in the pilot

Student Engagement

Ohio NextFlex partners **engaged 2,720 K-12 students**

OhioTechNet

Photo credit: LCCC Ohio TechNet DIB Consortia

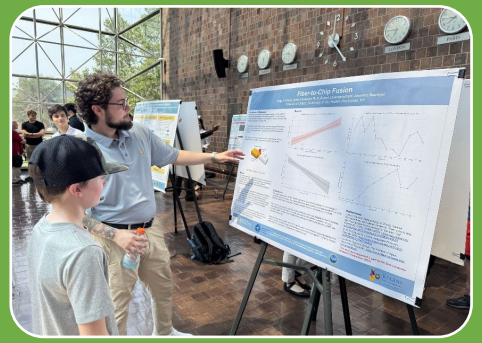
NDEP Congressional Initiative – Manufacturing Engineering Education Program (MEEP)

Monroe County Community College (MCC):
Defense Engineering Education Program - Enhancing Results in Optics (DEEPER Ops)

Scholastic Achievements

65 Optical Systems Technology Credentials awarded:

- **24** Certificates
- **41** Associates of Applied Science Degrees



Student Success

- **40%** of students completed programs with GPAs of 3.5 or above
- 2 students awarded Certificates of Achievement at MCC Honors Convocation
- 2 students presented research at MCC Scholars Day & won scholarship awards

NDEP Congressional Initiative – STEM Awards

Barry Goldwater Scholarship & Excellence in Education Foundation (BGSF)

"As a female in STEM fields, the Goldwater Scholarship has significantly impacted my educational and research opportunities, career path, and job prospects. Specifically, the financial support provided by the Goldwater Scholarship has allowed me to focus on my academics, further my research, gain confidence in my abilities, and discover my passion." - Lindsay M.

"The Goldwater Scholarship has opened the door for many opportunities in my academic career. When interviewing for graduate schools…I was able to discuss the undergraduate research projects that I conducted and discussed in my Goldwater application. I received multiple offers from various PhD programs…I am honored to be a Goldwater Scholar and represent this community in the marine sciences." - Bethany W.

Photo credit: Barry Goldwater Scholarship & Excellence in Education Foundation

NDEP Congressional Initiative – STEM Awards

Mobile County Public School System(MCC):
Scaling Up the JROTC STEM Academy: Leveraging the JROTC Network to Increase the STEM Pipeline

JROTC STEM LEADERSHIP ACADEMY

Photo credit: MCC JROTC STEM Leadership Academy

Academy Preparation

- **168 Instructors trained** to teach STEM-in-the-Air curriculum.
- Instructors ranged from high school teachers to JROTC instructors to college students.

Academy Implementation

- Inaugural JROTC STEM Academy hosted 9th cohort
- **Launched 3 new Academy Locations**
- Published 2024 Program Wide Cadet Impact Report

References

- Belanich, James, Dobbins, Christian, Moses, Franklin, Srinivasan, Ruhi, Cummings, Melissa, DeMaio, William, O'Connor, Kelly, Parrish, Emily, Ana and Waruhiu, Steven. (2018). Evaluation of DoD's Participation in the USA Science and Engineering Festival. IDA Product D-10339. Institute for Defense Analyses https://www.ida.org/research-and-publications/publications/all/e/ev/evaluation-of-dods-participation-in-the-usa-science-and-engineering-festival.

- Casalaspi, Davis, Robinson, Brian, Squire, Juliet, Baxter, Mark and Jackson, Anson. (2026). Solving for X: A Primer on the Research, Practices, and Policies That Shape Math Education. https://bellwether.org

- Christensen, R., Knezek, G., & Tyler-Wood, T. (2015). Alignment of hands-on STEM engagement activities with positive STEM dispositions in secondary school students. Journal of Science Education and Technology, 24(6), 898-909. https://doi.org/10.1007/s10956-015-9572-6

- Coté, L. E., Van Doren, S., Zamora, A. N., Jaramillo Salcido, J., Law, E. W., Munoz, G. O., ... & Baranger, A. M. (2025). "When I talk about it, my eyes light up!" Impacts of a national laboratory internship on community college student success. Plos one, 20(1), e0317403.

- Massey, C. M., & Stephens, A. (2025). Scaling and Sustaining Pre-K-12 STEM Education Innovations: Systemic Challenges, Systemic Responses. Consensus Study Report. National Academies Press. https://eric.ed.gov/?id=ED672766

References

- Meschede, T., Warfield, M., Hoover, M., Haque, Z., Zhang, M., Melchior, A., & Burack, C. (2024). The FIRST® Longitudinal Study's 10 Years of Follow-up Data. https://www.firstinspires.org/sites/default/files/2024-2025-FIRST/FIRST-Longitudinal-Study-10-Year-Cumulative-Report.pdf.

- National Academies of Sciences, Engineering, and Medicine. (2024). *K-12 STEM education and workforce development in rural areas*. K-12 STEM Education and Workforce Development in Rural Areas report

- National Science Board, National Science Foundation. 2023. Elementary and Secondary STEM Education. *Science and Engineering Indicators 2024.* NSB-2023-31. Alexandria, VA. Available at https://ncses.nsf.gov/pubs/nsb202331/.

- Patel, A., Bulger, A., Jarrett, K., Ginwright, S., Chandran, K. B., & Wyss, J. M. (2021). Summer research internships prepare high school students for 21st century biomedical careers. *Journal of STEM outreach*, *4*(1), 10-15695.

- Perez-Felkner, L., Gholami, Z., & Wu, X. (2025). Public financing of STEM education: Research evidence and policy recommendations. *Policy Insights from the Behavioral and Brain Sciences, 12*(2), 177–185. https://doi.org/10.1177/23727322251360330

- Wyss, V. L., Heulskamp, D., & Siebert, C. J. (2012). Increasing middle school student interest in STEM careers with videos of scientists. *International journal of environmental and science education*, *7*(4), 501-522. https://eric.ed.gov/?id=EJ997137

Backup Information for Supporting Research

- The U.S Bureau of Labor Statistics (2025) projects growth in U.S. STEM jobs from 10.78 million in 2024 to 11.65 million by 2034, an 8.1% increase, outstripping the growth rates for all occupations (3.1%) and non-STEM occupations (2.7%) (https://www.bls.gov/emp/tables/stem-employment.htm).
- DoW is the largest employer of STEM professionals in the federal government (https://data.opm.gov)

STEM Certificates and Degrees 2021-2022

Education Level	Number of Certificates/Degrees
Certificates	96,637
Associate's degrees	84,856
Bachelor's degrees	435,506
Master's degrees	139,944
Doctor's degrees	32,321
Total	**789,264**

https://nces.ed.gov/fastfacts/display.asp?id=899

- According to the National Science Foundation (NSF,) only 37% of those with their highest degree in an S&E field worked in S&E occupations. (The State of U.S. Science and Engineering 2024. Washington, D.C.: National Science Board.)