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ARMY EDUCATIONAL OUTREACH PROGRAM

JSHS

2020 Annual Program Evaluation Report
Executive Summary

August 2021

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ARMY EDUCATIONAL OUTREACH PROGRAM

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The Junior Science & Humanities Symposia Program (JSHS), administered by the National Science Teaching Association (NSTA) on behalf of the Services, is an AEOP pre-collegiate science, technology, engineering, and mathematics (STEM) research competition for high school students. JSHS is co-sponsored by the Army, Navy and Air Force. JSHS encourages high school students to engage in original research in preparation for future STEM career pathways. In regional (R-JSHS) and national (N-JSHS) symposia, students present their research in a forum of peer researchers and practicing researchers from government (in particular the DoD), industry, and academia.

This report documents the evaluation of the FY20 JSHS program. The evaluation addressed questions related to program strengths and challenges, benefits to participants, and overall effectiveness in meeting AEOP and program objectives. The assessment strategy for JSHS included questionnaires for participants and mentors, telephone interviews with N-JSHS students and mentors, and program information provided by NSTA.

Regional symposia were hosted by 45 university campus sites nationwide in 2020. The top five students in each region were selected to participate in N-JSHS. Of these five, the top two students were invited to present their research orally as part of the national competition; the remaining three students were invited to present a poster of their research as part of the national competition. Because of the pandemic, the N-JSHS competition was held as a virtual event, with competitors presenting their research to judges online rather than in person. In 2020, 92 students made oral presentations and 123 students made poster presentations at the virtual N-JSHS competition.

All JSHS programs are designed to meet the following objectives:

1. Promote research and experimentation in STEM at the high school level;
2. Recognize the significance of research in human affairs and the importance of humane and ethical principles in the application of research results;
3. Search out talented youth and their teachers, recognize their accomplishments at symposia, and encourage their continued interest and participation in the sciences, mathematics, and engineering;
4. Recognize innovative and independent research projects of youth in regional and national symposia;
5. Expose students to academic and career opportunities in STEM and to the skills required for successful pursuit of STEM;
6. Expose students to STEM careers in the Army and/or DoD laboratories; and

7. Increase the future pool of talent capable of contributing to the national's scientific and technological workforce.

JSHS 2020 Fast Facts	
Description	STEM Competition - Nationwide (incl. DoDEA schools), research symposium that includes 45 regional events and one national event
Participant Population	9th-12th grade students
Number of Applicants	4,511
Number of Regional Student Participants*	3,462
Number of National Student Participants	217 total 217 presenters
Number/Percentage underserved Participants**	1,372 / 44%
Placement Rate	N/A
Total Number of Adults (Mentors, Regional Directors, Volunteers – incl. Teachers and S&Es)	2,025
Number of Army and DoD S&Es	233
Number of Army/DoD Research Laboratories and Centers	20
Number of K-12 Teachers	589
Number of K-12 Schools	714
Number of K-12 Schools – Title I	441
Number of DoDEA Students	229
Number of DoDEA Teachers	7
Number College/University Personnel	774
Number of Colleges/Universities	85
Number of HBCU/MSIs	19
Number of Other Collaborating Organizations	2
Total Cost	$1,243,304
Total Travel***	$13,404
Participant Travel	$8,024
Total Awards	$407,405
Student Awards/Stipends	$387,405
Adult/Teacher/Mentor Awards	$20,000
Cost Per Student	$359

*Note: Sites used inconsistent definitions of student participation for FY20. JSHS recently updated their definition of participant as a student who submits research when applying to the program. Therefore, students who submitted research in CVENT when registering were counted as participants for each site. However, some sites reported larger participation numbers than those who registered in CVENT. For sites that reported more participants than were registered in CVENT, the site-reported number was used (see Table 1 in the Evaluation Report Findings, Part 1 of this report).

** underserved calculation based upon Cvent participation data that reflects enrollment of n=3,129

****The reported travel costs for FY20 programs are from pre-pandemic travel (October 2019-February 2020) and from non-refundable travel expenses that were booked prior to shifting to virtual programming.

Summary of Findings

The FY20 evaluation of JSHS collected data about participants; their perceptions of program processes, resources, and activities; and indicators of achievement in outcomes related to AEOP and program objectives. A summary of findings is provided below in the table below.

2020 JSHS Evaluation Findings	
Priority #1: *Broaden, deepen, and diversify the pool of STEM talent in support of our Defense Industry Base*	
The number of JSHS applicants in FY20 remained about the same as in FY19, however there was a substantial increase in program-reported student participation, reversing a multi-year downward in participation.	This number of applicants in FY20 (4,511) was nearly the same (.4% increase) as in FY19 when 4,493 students applied; this continues the positive growth in the number of JSHS applicants in the two most recent years, reversing a previous decline experienced from FY15 to FY17 (4,279 applicants in FY18; 8,663 applicants in FY17; 8,947 in FY16; 9,347 in FY15).
	There was a substantial increase in student participation in FY20 (3,462 participants), as 31% more students participated as compared to FY19 when 2,651 students competed. This increase begins to reverse the multiyear downward trend in participation since FY15 (3,069 participants in FY18; 5,577 in FY17; 5,620 in FY16; and 5,829 in FY15).
	Program managers reported that no consistent definition for "JSHS participant" has been used by sites in reporting participation, resulting in inconsistent site reports of student participation. The program rectified this by defining a participant as any student who submits their research in Cvent when registering; this definition will be used by sites going forward.
JSHS continues a trend of enrolling a majority of female participants.	Slightly more than half (58%) of R-JSHS students were female and 41% were male, a distribution very similar to previous program years (FY19, 59% female, 40% male: FY18, 58% female, 40% male).
The ethnic/racial diversity of JSHS remains relatively constant compared to previous program years, with White and Asian being the most frequently reported races/ethnicities, however the proportion of White students	Less than half (43%) of students identified themselves as White (compared to 50% in FY19 and 57% in FY18). Slightly less than a third (31%) of R-JSHS students identified themselves as Asian (27% in FY19; 20% in FY18). Less than 10% of students identified themselves as Black or African American (5% in FY20; 5% in FY19; 6% in FY18) or Hispanic/Latino (6% in FY20; 7% in FY19; 5% in FY18).

continues a multiyear decline while the percentage of Asian students continues to increase as compared to previous years.	
The population of N-JSHS participants was similar to that of R-JSHS although more students were Asian, and fewer were other races/ethnicities as compared to the overall R-JSHS population.	The demographic make-up of students participating in N-JSHS was similar to that of the overall population of R-JSHS students substantially more students in the N-JSHS population were Asian (44%) as compared to the overall R-JSHS population (31%), and only 2% of N-JSHS students were Black or African American and only 2% were Hispanic or Latino.
The proportion of JSHS students meeting the AEOP definition of underserved increased slightly in FY20	In FY20, there was some growth in reaching underserved students by JSHS, as 44% overall met the underserved criteria for AEOP, as compared to previous years (44% in FY20; 41% in FY19; 37% in FY18).
Students reported that they actively engaged in STEM practices in JSHS but that this engagement was not significantly more frequent than in their typical school experiences.	Students reported engaging in a wide variety of STEM practices in their JSHS experiences and indicated that they performed each STEM practice more often (weekly or every day) during JSHS than in school, with the exception of working collaboratively as part of a team (30% did not do this in JSHS as compared to 11% in school). Students engaged in the following activities more frequently in JSHS than in school: analyzing data or information and drawing conclusions (65% in JSHS compared to 61% in school); solving real-world problems (56% in JSHS compared to 52% in school); designing and carrying out an investigation (56% in JSHS compared to 48% in school); using laboratory procedures and tools (53% in JSHS compared to 48% in school); and designing their own research or investigations based on their own questions (51% in JSHS compared to 42% in school).
	There was no significant difference in engagement in STEM practices by underserved status or by any individual demographic component of underserved status.
	Students participating in phone interviews noted several differences in their engagement in STEM in JSHS as compared to in school, including the opportunities JSHS provides to interact with scientists, to present research, and to receive expert feedback on their research; the broader exposure to STEM topics JSHS provides, the career information students gained, the hands-on research experience, the opportunity to see others' projects, and the opportunity to interact with like-minded peers.
Students reported gains in their STEM knowledge and STEM competencies (skills in science and engineering practices) as a result of	A majority (75% or more) of JSHS students reported medium or large gains in all areas of STEM knowledge due to their participation in JSHS. For example, approximately 80% of students reported medium to large gains in in-depth knowledge of a STEM topic (81%) and knowledge of how scientists and engineers work on real problems in STEM (77%).

participating in JSHS; FARMS and underserved racial/ethnic minority students reported larger STEM competency gains than their peers.	There was no significant difference in gains in STEM knowledge by underserved status or by any individual demographic component of underserved status.
	Approximately two-thirds or more of students (64%-81%) reported medium or large gains in their STEM competencies as a result of participating in JSHS. More than three-quarters of students reported medium to large gains in multiple STEM competencies, including using knowledge and creativity to suggest a solution to a problem (78%); carrying out an experiment and recording data accurately (79%); and presenting an argument that uses data and/or findings from an experiment (81%).
	There was no significant difference in gains in STEM competencies by overall underserved status, however students who received free or reduced-price lunch (FARMS) reported a significantly greater impact on their STEM competencies compared to their peers who did not receive free or reduced-price lunch (small effect size). Significant differences were also identified by race/ethnicity, with underserved minority students reporting significantly greater JSHS impact on their STEM competencies compared to their peers (small effect size).
Students reported gains in their 21st Century skills as a result of participating in JSHS.	With the exception of one of the 21st Century Skills (creating media products, for which 36% reported no gain), more than half of students (54%-85%) reported at least medium gains in all 21st Century skills. Areas with largest reported 21st Century skills gains (approximately 80% or more reporting medium to large gains) included: taking initiative and doing work without being told to (79%); incorporating feedback on work effectively (79%); adapting to change when things do not go as planned (80%); and communicating clearly with others (85%).
	There was no significant difference in gains in 21st Century skills by overall underserved status or by any individual demographic component of underserved status.
Students reported gains in their STEM identities as a result of participating in JSHS; FARMS students, students from underserved racial/ethnic minority groups, and female students reported larger gains than their peers.	Three-quarters or more of students (74%-81%) reported medium or large gains across all STEM identity items. Areas of the greatest reported gains (80% or higher in medium/large) were: confidence to try out new ideas or procedures on STEM projects (81%); desire to build relationships with mentors who work in STEM (81%); and being better prepared for more challenging STEM activities (80%).
	There was no significant difference in gains in STEM identity by overall underserved status, however FARMS students, students from underserved racial/ethnic minority groups, and female students reported larger gains than their peers (small effect sizes).
Priority #2: *Support and empower educators with unique Army research and technology resources.*	

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 students indicated their mentor was either a STEM researcher (47%) or teacher (31%). A large proportion of students reported their mentor was available at least half of the time (70%).
Most students participated in the design of their research projects either independently or with their mentors.	Nearly all students (86%) reported having some degree of participation in designing their research projects. Specifically, 38% independently designed their entire project, while another 24% reported working with their mentor to design their project, and 19% designed their project with their mentor and members of a research team.
Most mentors used a variety of effective mentoring strategies with their students, however few discussed AEOP other than JSHS with their students.	Most responding mentors (54%-84%) reported using strategies associated with establishing the relevance of learning activities to students, supporting the diverse needs of learners, supporting students' development of collaboration and interpersonal skills, and supporting students' engagement in "authentic" STEM activities.
	Although over two-thirds (70%) of mentors discussed JSHS with students and 22% discussed Unite, relatively few mentors (11%-17%) reported speaking with students about other AEOP specifically or about AEOP generally.
Students reported high levels of satisfaction with JSHS program components.	More than half of students (54%-93%) reported being at least somewhat satisfied with all event features except for team building activities (40% somewhat or very much satisfied, 52% did not experience). Event features with high frequencies of satisfaction (somewhat/very much satisfied reported by approximately 75% or more of students) were student oral presentations (93%), judging process (78%), and feedback from judges (76%).
	Few students expressed dissatisfaction with any JSHS features on the questionnaire although, similar to FY19, 10% expressed dissatisfaction with the judging process and 8% with feedback from judges. As in FY19, about half of students had not experienced team-building activities, however a slightly larger proportion of students (8%) expressed dissatisfaction with this element as compared to FY19 (6%).
	Qualitative data from students suggest that students particularly valued meeting new people and networking, the opportunity to present their research, the opportunity to learn about other students' research, the opportunity to learn research and other STEM skills, the judges and the feedback they received.
	Students who commented on judging during the interviews noted that the judging at the N-JSHS level was more tailored to their project's topic, that N-JSHS judges asked more detailed questions, and that the N-JSHS judges represented more specialized fields. Some students commented that they did not receive feedback from judges at their

	regional events. Other students commented that there was less time for judging at N-JSHS as opposed to at their regional event and that they were not able to see their judges at the N-JSHS event.
Students and mentors made positive comments about the virtual N-JSHS event.	Many N-JSHS students and adults participating in phone interviews commented positively on the virtual format of the N-JSHS competition. The tone of the comments was gratitude that the event was not canceled and appreciation for the hard work of the event organizers to arrange the virtual event. Most comments about the virtual event were also positive. The only somewhat negative comments about the virtual format of the event were that students were not able to watch other students' presentations and that they were unable to see the judges.
JSHS students made various suggestions for program improvement.	JSHS students suggested a range of improvements in survey responses, including the following: • Improvements to event logistics, including the scheduling and length of presentations (allowing a longer time), time management at events, and improving tours, event activities, and speakers • Improvements to judging and awards such as providing more judge feedback, more topically diverse judges, and more awards or prizes • Improvements to communication • Providing more or different categories for projects • Providing examples and/or clearer presentation guidelines • Improving the registration or submission process.
	Most N-JSHS students participating in phone interviews had no suggestions for improvement. The five who made suggestions recommended making the website easier to navigate, holding in-person events (rather than virtual), ensuring that regional events provide sufficient space for poster presentations, rescheduling N-JSHS to the summer so that it does not coincide with AP exams, and providing assistance in identifying mentors.
Mentors reported high levels of satisfaction with JSHS and suggested various program improvements.	More than half (61%-91%) of mentors indicated they were at least somewhat satisfied with all program features except for communicating with NSTA (37% somewhat/very much satisfied; 58% had not experienced). Additionally, 30% of mentors reported having not experienced support for instruction or mentorship during JSHS activities. Very few mentors (1%-4%) expressed dissatisfaction with any feature of JSHS.
	Qualitative data from mentors indicate that mentors particularly valued students' opportunity to see others' research, students' learning, the quality of the judging and judges' feedback, the speakers and activities at events, students' opportunities to network with professionals and peers, and the organization of the JSHS program and events.
	Mentors suggested that JSHS could be improved by the following:

	• Improving event logistics and scheduling, including providing more or different activities, more opportunities for students to interact with one another, and teacher sessions or workshops • Increasing the diversity of speakers at events • Improving judging, including more feedback from judges, more or better judges, providing training for judges, and providing more judges from the DoD • Providing additional supports for teachers and incentives for teachers to participate as mentors • Increasing publicity for or improving program outreach, and disseminating JSHS information to preservice teacher programs • Improving communication between the national and regional levels.
	Mentors participating in interviews suggested ways to broaden the reach of JSHS, including the following: • Focusing on outreach to and supports for teachers, including providing funding for participating teachers, disseminating program information to preservice teacher education programs, and engaging middle school teachers to encourage them to start research programs. • Devising ways to account for or equalize resource disparities between students, including matching students with mentors, pairing students with graduate students at local universities, and/or providing funding to meet the unique needs of underserved and underrepresented students such as stipends • Partnering with programs such as TRIO and Upward Bound • Expanding the categories of competition to include, for example, academic writing, in order to allow a greater diversity of students to participate.
Priority #3: *Develop and implement a cohesive, coordinated and sustainable STEM education outreach infrastructure across the Army*	
Students' primary source of Information about AEOP is communication through their schools; students were motivated to participate by their interest in STEM and their desire to learn. Mentors learned about AEOP primarily through personal or professional contacts.	The most frequently selected sources of information for JSHS students were school/university newsletter, email, or website (32%) and someone who works at the school/university the student attended (42%).
	The top two factors motivating students to participate in JSHS were interest in STEM (78%) and the desire to learn something new (72%). These were followed by teacher encouragement (58%), having fun (56%), and a desire to expand laboratory or research skills (54%).
	The most common ways mentors learned about AEOP related to some form of personal contact including past participation in JSHS (36%), a colleague (28%), a JSHS site host or director (18%), or a student (15%).

Most students had not heard of most AEOP other than JSHS although many expressed interest in participating in other AEOP in the future. Program staff and event presentations were the most impactful resources for both mentors and students to learn about other AEOP.	Few students expressed they were "not at all" interested in participating in AEOP in the future (4%-5%), however, more than half of students (58%-76%) reported they had not heard of programs other than JSHS.
	Between 20% and 39% of students expressed at least some future interest in all programs. For example, 48% were at least somewhat interested in the SMART scholarship and 33% were at least somewhat interested in REAP. A large majority of JSHS students (91%) expressed interest in participating again.
	Resources that more than half of students indicated had at least somewhat of an impact on their awareness of AEOP were: JSHS program staff or site coordinators (64%); presentations or information shared at the competition (60%); and invited speakers (55%). JSHS mentors had less of an impact, with less than half of JSHS students (42%) reporting that mentors helped them learn about AEOP; another 11% indicated that AEOP information from mentors was not helpful. Around two-thirds of students had not experienced the AEOP website (65%) and AEOP printed materials (68%).
	Mentors reported that the most useful resources of AEOP information were: JSHS program staff of site coordinator (75%), presentations or information shared at the JSHS competitions (68%) and invited speakers or "career" events (46%). Around two-thirds of mentors had not experienced the AEOP website (67%) and AEOP printed materials (64%).
JSHS participants learned about STEM careers in JSHS, although they learned about more STEM careers generally than about STEM careers in the DoD was limited; students had positive perceptions of DoD research and researchers.	A large proportion (85%) of JSHS students reported learning about at least one STEM job/career during JSHS, and 28% indicated they had learned about five or more. Students, however, had learned about far fewer DoD STEM jobs/careers, with approximately half (52%) reporting having heard of at least one, and only 15% having learned about five or more during JSHS.
	N-JSHS students noted in interviews that their exposure to DoD STEM career opportunities was primarily from interacting with judges during the N-JSHS event or from previous participation at N-JSHS events rather than from regional competitions.
	JSHS students were asked to identify which resources were most impactful on their awareness of DoD STEM careers. Resources rated by more than half of students as having at least somewhat of an impact on their learning about DoD STEM careers were presentations or information shared at the competition (54%); invited speakers (51%); and JSHS program staff or site coordinators (53%). JSHS mentors had less of an impact with 37% of R-JSHS students reporting that mentors impacted their learning about DoD STEM careers (52% said that they did not experience this).

	Resources mentors reported as most useful (somewhat or very much) for exposing students to DoD STEM careers were JSHS program staff of site coordinators (67%), presentations or information shared at the JSHS competitions (57%) and invited speakers or "career" events (51%).
	JSHS students had positive opinions about DoD research and researchers. Nearly all students (96%-97%) selected "strongly agree" or "agree" for each survey item they responded to, including that DoD researchers solve real-world problems (96%) and develop new cutting-edge technologies (97%).
JSHS students reported being more likely to engage in STEM activities outside of required school courses in the future; students who would be first-generation college attendees and those who attended suburban schools were more likely to report intentions to engage in STEM in the future than their peers.	More than 80% of R-JSHS students reported they were more likely or much more likely to participate in all STEM activities after JSHS. STEM activities in which nearly all students (95% or more) indicated an increased likelihood of participation were: participate in a STEM camp, club, or competition (95%); take an elective STEM class (95%); and work on a STEM project or experiment in a university or professional setting (97%).
	While there were no differences in likelihood of future engagement in STEM by overall underserved status, students who would be first-generation college attendees and those who attended suburban or non-urban/non-rural schools were more likely to report intentions to engage in STEM in the future than their peers (small effect sizes).
Nearly all JSHS participants had educational aspirations beyond earning an undergraduate degree after participating in JSHS.	Nearly all students (97%) reported planning to earn at least a bachelor's degree. Further, 85% of students reported they intend to earn a master's degree or higher, and 72% said that they plan to earn a terminal degree (doctorate, medical degree, professional law or business degree).
JSHS students reported positive impacts from their JSHS participation and experienced a variety of benefits from participating.	Half or more of R-JSHS students (50%-81%) agreed that JSHS contributed to or was primarily responsible for their growth in all areas associated with their interest in STEM opportunities; their STEM skills, confidence, and knowledge; and their knowledge of and appreciation for STEM research and careers in the DoD. Students reported particularly great impacts in the areas of their STEM knowledge, skills, and abilities (81%); interest in participating in STEM activities outside of school requirements (77%); and interest in earning a STEM degree (70%).
	More than a third of JSHS students (37%) reported that JSHS had not increased their interest in pursuing a STEM career with the DoD.
	There was no significant difference in impact of JSHS by overall underserved status or any individual demographic component of underserved status.

	Student responses to an open-ended questionnaire item indicate that students experienced a number of benefits from participating in JSHS, including the following: • The opportunity to present their research and develop presentation and communication skills • Networking, either in general, with peers, or with professionals • STEM learning • Developing research or STEM skills • Exposure to others' research • Feedback on research and judging • Career information • Confidence • Increasing interest in or motivation for STEM.

Recommendations for FY21 Program Improvement/Growth

The primary purpose of the AEOP program evaluation is to serve as a vehicle to inform future programming and continuous improvement efforts with the goal of making progress toward the AEOP priorities. FY20 JSHS evaluation findings indicate that JSHS experienced success as in previous years, including continuing a two-year trend of growing participation in the program overall. Regarding underserved student participation, JSHS increased this percentage to 44% in FY20. Participants were overwhelmingly positive about the delivery of JSHS through the virtual format – as many commented about being pleased that this opportunity was made available to them during the pandemic when so many other things were being cancelled.

Other notable successes for the year include continual impacts on STEM knowledge, STEM identity, and 21st Century skills. While these successes are commendable, there are some areas that remain with the potential for growth and/or improvement. The evaluation team, therefore, offers the following recommendations for FY21 and beyond:

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

JSHS continued to make progress in growing both the number and diversity of participants (44% underserved) in the program in FY20. It is recommended that JSHS continue to explore growing the geographical reach of engagement in the program – as findings from the evaluation this year indicate JSHS has the greatest impact (statistically significant differences) on students from lower socio-economic status groups and those coming from rural and urban areas. Growing participation across these target groups will continue to increase the percentage of underserved students in JSHS each year.

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

Empowering educators and mentors with Army resources and support is something JSHS has been actively working to improve each year. However, in FY20 mentors reported two persistent concerns that continue to be a challenge for JSHS to address. First, most mentors (83%) reported they had not discussed any other AEOP specifically or in general with students. There appears to be some disconnect between JSHS and AEOP overall for the educators and other adults participating in the program, as 67% shared they were not familiar with the AEOP website. Second, only 52% of JSHS participants reported learning about one more DoD STEM jobs/careers. Findings for FY20 in this area indicate a need for NSTA/JSHS to revisit current resources/strategies for supporting educators with AEOP information, materials, and AEOP pipeline program details. Educators should be well equipped to introduce, discuss, and promote AEOP and DoD programs, as well as jobs/careers with JSHS participants. NSTA/JSHS should revisit current resources/strategies for supporting educators with DoD information, materials, etc, to include jobs/careers within in the DoD, not just AEOP.

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

Related to findings for educators in FY20 under the second priority, participants in JSHS overwhelmingly (58% to 76%) had not heard about other AEOP besides JSHS. This is not surprising given that few educators/adults reported discussing AEOP with participants. Despite not hearing about other programs, 91% indicated interest in participating in JSHS again. Between 20-39% of participants expressed some interest in future AEOP program (other than JSHS) participation. This finding has been prevalent across evaluations from FY15 to present without much improvement despite some efforts to encourage regional sites to promote AEOP. Due to the significance and importance of making participants aware of the other AEOP and resources in the pipeline, we strongly encourage NSTA to implement a plan of how to better grow mentor and participant awareness of other AEOP in FY21. A recommendation is to consider adding a section to the JSHS website that advertises various AEOP, Air Force, Navy STEM programs and career opportunities.

Other feedback specific to JSHS improvements that were suggested by both mentors and participants that warrant attention by NSTA include: improving event logistics and scheduling (allowing more time for presentation), more feedback from judges (multiple years this has been requested), and more diversity in judges and speakers. It is recommended that NSTA develop a plan for addressing these areas as well.