

NATIONAL SCIENCE BOARD
SKILLED TECHNICAL WORKFORCE LISTENING SESSION
ADVANCED TECHNOLOGICAL EDUCATION PRINCIPAL INVESTIGATORS' CONFERENCE
OVERVIEW OF THEMES DISCUSSED
THURSDAY, OCTOBER 25, 2018

On October 25, 2018, the National Science Board (NSB) hosted a listening session at the annual Advanced Technological Education Principal Investigators (ATE PI) Conference in Washington, D.C. to discuss the challenges and opportunities faced by the Skilled Technical Workforce (STW). The National Science Foundation's (NSF) ATE program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The ATE PI conference brings together over 800 people to focus on the critical issues related to advanced technological education. Forty-five participants joined NSB's listening session, which included community college students and faculty, and recent ATE program alums. Participants represented thirty community colleges across the country.

Below are the key themes participants discussed at the listening session.

KEY THEMES

- **Education and Training**
 - Participants identified improvement in Math education as a high-need area. There is a need to contextualize high school math to make it more practical and interesting.
 - Students expressed a strong desire to have more practical, hands-on experiences throughout their educational training. They suggested apprenticeships and internship opportunities would help, as many job opportunities require a few years of experience.
 - Students wanted to have a higher diversity of high schools that can offer different training opportunities (e.g., technical and vocational high schools, STEM high schools).

- **Exposure to STEM Career Options**
 - Exposure to STEM career fields earlier in the educational experience will help students navigate the post-secondary options better. For example, whether to pursue a 2- or 4-year degree. Exposure will also help students choose discipline-specific (e.g., Biology, Mathematics) or technical paths once they are enrolled in a post-secondary option.
 - Students often transfer to 4-year institutions from community colleges because they are not aware of the career options available to them with a 2-year degree.

- Participants proposed some solutions: Send speakers in STEM fields to middle and high schools to provide awareness and information (this type of “marketing” has contributed to the success of some of the ATE programs represented at the meeting). Send students to community colleges to explore discipline areas and technical fields. Educating high school and community college teachers about the job market and internship opportunities.
 - Partnerships between community colleges and industry can help connect students to jobs and understand what companies need in an employee.
 - Several participants feel that both high school and community college counselors are not well informed of career pathways and are advising too many students given the counselor/student ratio.
 - Students would also like to find a way to have their parents more informed of other career pathways besides immediately going to a four-year college.
 - Students wanted career options linked to data – show the evidence that skilled technical careers can be lucrative and provide opportunity. Salary and promotion data are needed for students (and parents) to make informed decisions.
- **Stigma**
 - Participants agreed that they have felt mixed acceptance from others (students, parents, teachers) when pursuing a 2-year degree.
 - Participants acknowledged that stigma still exists for Community Colleges and skilled technical careers, but more individuals are now trying to understand the myriad of options available to them.
 - Parents lack a good understanding of the opportunities and experiences that community colleges provide.
 - There is a perception that students who go to community or technical colleges are not the “good” students.
 - Many students fear going straight into the workforce after an Associate degree and as a result transfer to a 4-year institution. Some motivations behind this fear include a focus on family and building a comfortable life, and the idea that 4-year institutions are the pathway to continue to learn and explore.
 - HR offices (including within the federal government) don’t understand that job requirements can often be met with an Associate degree or people with other credentials such as certificates.
- **Value of Community & Technical Colleges**

- Several participants agreed that community colleges prepared them for a 4-year degree. Students appreciated the dedication of faculty to student success, one-on-one tutoring, and the smaller class sizes.
 - Several participants noted that their close connection to their faculty mentors also led to networking opportunities that benefited them as they looked for internship and career options.
 - Community colleges provide practical hands-on experience.
 - Students felt that community colleges helped them to grow into “what they wanted to be” in their academic and professional careers.
 - Community colleges are cheaper, and in some states, have free tuition.
 - Students highlighted some community college programs that have near 100% job placement, and how that is a huge incentive to entering and persevering through such programs to completion.
 - One obstacle: some 4-year institutions have a maximum amount of credits which can be transferred, and thus after transferring students can find themselves having to retake courses they already completed at the community college level. They noted that this is not an efficient use of their time or money.
- **Military**
 - Veterans are a potential pool of skilled technical workers.
 - There is a need to incorporate information about technical colleges and the careers offered when members of the military transition back to civilian life.
- **Economic Barriers**
 - Cost of community college is a barrier to many students from low to middle income families. Participants suggested that free, public education in K-12 be extended to include 2 years of community colleges. Students also mentioned the need for more information on grants that might be available to technical and community colleges. Dual enrollment programs between high school and community colleges were also considered important to help cover tuition costs.
 - Students struggled with time management between attending class, completing assignments, and a job.
 - Childcare is an option at some community colleges, but students mentioned that it was expensive. These wrap-around services are extremely important for this sector of the populace to participate fully in the Nation’s economy.