House Committee on Natural Resources
Oversight Hearing for the Subcommittee on Energy and Mineral Resources

"American Energy Jobs: Opportunities for Education."

Presentation by

Texas State Technical College

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Background and History

Texas State Technical College (TSTC) was established in 1965 as the James Connally Technical Institute (JCTI) of Texas A&M University to meet the state's evolving workforce needs. JCTI was located in Central Texas at the former James Connally Air Force Base in Waco. In 1967, JCTI expanded to include a South Texas campus in Harlingen. Additional locations soon followed.

JCTI separated from Texas A&M University in 1969 and became an independent state institution with its own nine-member Board of Regents and the name Texas State Technical Institute (TSTI). In 1991, the Texas Legislature elevated the Institute's status as an institution of higher education and changed TSTI's name to Texas State Technical College.

Since its inception, TSTC has grown to include multiple campuses across Texas and several off-site teaching locations. TSTC is a co-educational, two-year institution offering occupationally oriented programs with supporting academic courses for certificates or associate degrees. Emphasis is on advanced and emerging technical programs not commonly offered by public junior colleges with a core focus on placement and earnings outcomes. For 49 years, TSTC has been producing top-quality graduates, who are nationally recognized for their highly specialized, technical capabilities and job-ready skills. TSTC's strong relationship with business and industry ensures that coursework focuses on the regional and statewide needs of Texas' employers and leads to success in the job market.

TSTC is Texas' only state-supported technical college system. Its statutory mission is to provide an articulated and responsive technical education system aimed at identifying and addressing industry needs. These two features make TSTC unique among institutions of higher education. TSTC currently has campuses in Waco, Harlingen, Marshall and West Texas, with locations in Abilene, Breckenridge, Brownwood and Sweetwater. The System also has off-site teaching locations in Hutto, Ingleside, Red Oak and Richmond, in addition to partnerships with many of the state's public junior colleges.

Accolades

TSTC consistently ranks as a top producer of associate degrees in Engineering Technologies & Engineering-Related Fields, Precision Production, and Computer and Information Sciences & Support Services. In *Community College Week*'s annual report titled "Top 100 Associate Degree Producers," TSTC has ranked Number 1 in Texas numerous times in one or more categories and has consistently stayed among the top 50 two-year colleges in the nation in nearly every applicable category.

TSTC offers more than 151 Associate of Applied Science (AAS) degrees and certificates and has produced more than 97,260 graduates in its nearly 50-year history. TSTC Harlingen also offers seven Associate of Science (AS) degrees in biology, computer science, engineering, mathematics, physics, nursing preparatory and health professions.

From 2009 to 2012, TSTC has generated a 32 percent increase in graduates, a 36 percent increase in job placements, and a 54 percent increase in combined annual wages. Projections indicate that the combined first-year earnings of a cohort of TSTC graduates will surpass $56 million in new salaries for Texas.

Demographics

TSTC students across the state are a diverse group demographically. They are 62.82 percent minority (53.94 percent Hispanic, 7.41 percent black, 1.47 percent other minorities) and 34.85 percent white. The student body is comprised of 39.04 percent females and 60.96 percent males. Students come from 202 of Texas' 254 counties, and nearly 64 percent are economically disadvantaged.

Instructional Programs and the Energy Sector

According to the Office of Governor Rick Perry, "the energy sector contributes more than $172 billion to the Texas economy," and that number is growing. Growth in the oil and gas industry is fueled, in part, by the use of new technologies, such as hydraulic fracturing and horizontal drilling. Activity in the Eagle Ford Shale in South Texas and the Barnett Shale in North Central Texas accounts for much of the growth in both production and available jobs in the last decade. Today, 48 percent of the nation's operational oil and gas rigs are in Texas. Although known for oil and gas exploration and production, Texas' energy sector also includes all forms of power generation. Texas is a major producer of nuclear power and has nuclear power plants in Central Texas and along the Gulf Coast. Additionally, Texas leads the nation in wind energy production with six of the nation's ten largest wind farms. Texas has more wind energy capacity, more turbines and more wind-related jobs than any other state. (Sources: Texas

Economic Development Division within the Office of the Governor and the American Wind Energy Association). TSTC has matched the state's growth in wind energy with certificate and degree programs for the industry at multiple campuses. TSTC even owns its own wind turbine and is a national leader in the development of wind energy training modules and curriculum.

Nearly 900,000 Texans are employed in the energy sector today, but Texas anticipates 26 percent growth in employment across the sector from 2010 to 2020, according to statistics released by the Texas Workforce Commission's Strategic Assessment Workforce Program. That level of growth translated into 92,776 new energy jobs between 2011 and 2013.

TSTC offers numerous instructional programs which are in high demand in Texas' booming oil and gas industries, as well as the wind, solar, and electric power industries. Although many of these programs support multiple industry sectors, they are vital to the energy sector. TSTC's degree and certificate programs which support careers in the energy sector are listed below:

- Air Conditioning / Heating / Ventilation Technology
- Drafting & Design Technology / Architectural & Civil Drafting
- Civil Engineering / Surveying Technology
- Building Construction Technology
- Welding Technology – **Welder**
- Computer Maintenance Technology
- Computer Networking & Systems Technology
- Instrumentation & Robotics Technology
- Process Operations Technology – **Process Operator**
- Diesel Equipment Technology
- Environmental Compliance Technology
- Electrical Power & Controls Technology
- Electrical Systems Technology
- Industrial Systems & Engineering Technology
- Mechanical Engineering Technology / CNC Operator – Programmer & Machinist
- Plumbing & Pipefitting Technology
- Chemical/Environmental Laboratory Technology
- Solar Energy Technology
- Wind Energy & Turbine Technology
- Applied Engineering Technology – **Downhole Tool Technician**

As stated, most of the degrees and certificates awarded through the program areas listed above support multiple industry sectors. This means that graduates have numerous options beyond the energy sector when settling upon a career path.

Welding Technology is a prime example of training where job demand exists across multiple sectors. Welders are needed in the high power semiconductor and pharmaceutical industries to handle high purity piping. Nuclear and chemical industries require welders

experienced in automation welding due to the specialized alloys and restricted access inherent in these facilities. Welders also work as high-end fabricators to repair and produce fixtures for industries requiring precision fabrication and precise tolerances. In Texas, growth in the oil and gas industry has produced a shortage of skilled welders, meaning job prospects have never been better.

While Process Operators are in heavy demand within the energy sector, their training is attractive to a variety of process industries – including chemical, food and beverage, pharmaceuticals, power generation, pulp and paper, refining and wastewater treatment. A Process Operator is part of a team of people responsible for planning, analyzing, and controlling the production of products from the acquisition of raw materials to end-product distribution to customers. Specifically, Process Operators are responsible for the efficient and safe operation of all process equipment. Salaries are in excess of $50,000, and the National Association of Manufacturers projects up to 10 million jobs in the field by 2020.

A certification which is specific to the oil and gas industry is that of a Downhole Tool Technician. In this 15-week program, a student learns to refurbish and maintain the important downhole tools which are used in oil well servicing/completions. Salaries start at $44,700 and usually include a vehicle and full medical benefits. The industry projects a 19 percent increase in the number of jobs available in this field from 2010 to 2020.

Instructional Delivery Specializations

Many TSTC students in these programs are non-traditional students with valuable work experience. They may have come to TSTC for certification of skills learned while serving in the military or while on-the-job. Others are displaced or underemployed workers who need updated or new skill sets. TSTC's objective is to develop workers who are job-ready for current, in-demand jobs. Successful placement in those jobs is the driving focus behind all we do. Accordingly, TSTC has developed certificate and specialized programs which allow students to enter the workforce quickly with marketable skills.

One such program is a competency-based educational initiative, which has the potential to shorten a student's time in actual training without sacrificing the quality of the skills learned. The learning model aligns particularly well with the needs of veterans, displaced or underemployed workers, and career-focused high school graduates.

Students spend the bulk of their time learning through hands-on training activities leading to acquisition of skills. The unique nature of the competency-based learning model is the requirement that students demonstrate achievement of ALL competencies within the program of study, rather than earning an average grade for a course. To achieve a competency, students must master all skill sets within that competency to a pre-defined standard. This

means that competency-based programming is more rigorous in nature than traditional workforce development education.

Proven to improve retention and resolve within a chosen program of study, the learning model also offers several advantages to students. Each student is able to learn and move through the program at his or her own pace. Unnecessary "seat time" in classes reviewing information a student already knows, either through past job experience or through military service, is reduced. As a result, the time needed to earn a degree is shortened – saving money and minimizing a student's deferred wages.

TSTC began offering this competency-based approach to learning in the fall of 2013 at two locations and plans to expand the initiative to all 11 TSTC campuses by the fall of 2015.

Cooperative Efforts with Business & Industry

The strength of TSTC's instructional programs rests in the strong relationships each campus has with business and industry. Each instructional program is supported by an "Advisory Council" made up of members within the industry served by the program. In each program area, Council members direct the development, evaluation and on-going modifications of curriculum and course content so that graduates possess the knowledge and skills necessary to enter the workforce with little or no additional training.

Often, TSTC campuses develop customized partnerships with businesses to tailor curriculum specifically for the needs of that company. For example, the global corporations Fluor and Bechtel helped TSTC develop a customized curriculum in Welding Technology that includes specific skill sets and an accelerated schedule. Luminant Energy is currently working with TSTC to create a pipeline of skilled workers to meet the company's demand. The company is involved in the recruitment of potential students, selection of candidates in the program, monitoring of the students' progression, and advising on curriculum needs. Graduates leave TSTC assured of employment.

In almost every program area, similar cooperative efforts exist between TSTC and business or industry. Ron Widup, president and chief executive officer of Shermco Industries, encourages individual companies to get involved and work with technical schools as a way of ensuring graduates are job ready. Shermco – a national company which focuses on the testing, repair, maintenance, and analysis of power distribution systems – has donated an electronics lab on one of TSTC's campuses, participates in TSTC's Advisory Councils, and frequently hires TSTC graduates.

Another industry partnership involves the centerpiece of TSTC's wind energy program, a $4 million 2 MW wind turbine located near the Sweetwater campus. Several industry leaders collaborated to assist with TSTC's purchase of the turbine and to donate equipment to facilitate

a state-of-the-art program. The turbine and equipment ensure that the graduates hired by these companies train in a real-world environment.

TSTC places a high priority on training in learning labs with equipment and conditions which match those found in today's workplace. Accordingly, ongoing collaboration with business and industry is a valuable and essential part of TSTC's efforts to keep curriculum and programming reflective of current industry needs and to ensure equipment and training environments match industry standards.

Conclusion

Texas has long been a leader in the energy sector; however, recent growth in that sector has been exponential. That means skilled workers from all backgrounds will have access to a wide array of jobs. TSTC's partnerships with industry ensure that students graduate with job-ready skills which match or exceed industry standards. Additionally, TSTC is committed to finding innovative learning models, like competency-based programming, to make a student's pathway from skills training to work readiness both efficient and cost effective.

In short, TSTC has both the will and the capacity to train students to fill the growing demand for skilled workers. However, policymakers need to recognize that challenges do exist. First, despite the fact that technical jobs provide good wages and offer excellent career paths, there remains a widespread bias which pushes students away from technical fields in favor of more academic educational pathways. The result is that, today, too few students are entering technical programs, and the pipeline of students coming to technical colleges from high schools is not sufficient to meet industry's demand for trained workers. Second, in order to customize programming to meet industry needs and to accelerate a student's entry into the workforce, governmental agencies must address regulations as they deal with innovative programs like competency-based learning. This is especially true in the area of financial aid. TSTC, as an institution, has recognized these challenges and is working on several fronts to address them.

Business and industry groups across Texas well understand TSTC's commitment to hands-on training and a highly-skilled workforce. Therefore, when industry wants qualified workers, it comes to TSTC. In 2015, TSTC will mark its 50^{th} year as an institution. Its mission has remained unchanged throughout the last five decades – TSTC builds Texas' workforce.