

Testimony before the Senate Appropriations Committee
Subcommittee on Labor, Health and Human Services, and Education

STEM Education: Preparing Students for the Careers of Today and the Future

Sarah A. Tucker, Ph.D., Chancellor

West Virginia Community and Technical College System

March 15, 2017

Thank you, Chairman Blunt, Ranking Member Murray, and Subcommittee members for the opportunity to speak about the need for STEM education and partnerships between business and industry. I would like to extend a special thanks to Senator Shelley Moore Capito for reaching out to me to speak here today and also, Senator Manchin. Both are strong allies for community colleges in West Virginia. It is not often that a small state like West Virginia has the opportunity to have both Senators on such a prestigious committee and I am certainly thankful that we do.

My name is Sarah Tucker. I am the Chancellor for the West Virginia Community and Technical College System. As you are all well aware, West Virginia has seen a significant downturn in its coal mining industry, leaving thousands of able workers unemployed. It is the goal and mission of the Community College System to offer these, and indeed all, West Virginians with workforce programs that will lead to gainful employment. Most of these programs are science, technology, engineering, and math or STEM programs, which I am here to talk with you about today.

First, let me tell you a little bit about who we are. The Community College System of West Virginia is comprised of nine public community colleges at 27 different locations across the Mountain State. Our

annual headcount enrollment is nearly 28,000 students, 55 percent of whom attend college on a part-time basis. Our average student age is twenty-eight years old and the vast majority of our students, about ninety-two percent, are West Virginia residents. As you can imagine, given these demographics, our students have a whole host of challenges that many traditional students do not have to face. In fact, these challenges largely face students in community colleges in your state too. They typically have families to feed, mortgage and car payments, childcare issues, and sometimes parents for whom to care. Many of them are either out of work, or are under employed - working a job that does not let them make ends meet or get ahead. These circumstances often cause our students to need to get into and out of a program that will lead them to a high wage career as quickly as possible. In West Virginia, nearly all of those careers are in the STEM fields. Namely, the four largest growth industry sectors in West Virginia are: manufacturing, health care, IT, and energy – all STEM areas.

While the STEM fields have historically been thought of as the purview of highly accomplished baccalaureate students, it is becoming increasingly clear that community and technical colleges are critical to providing STEM education and training for much of tomorrow's workforce. In West Virginia, and indeed across the nation, business and industry are turning to their community college partners to provide them with the technical workforce they need. This change has been a welcome challenge in West Virginia. I say it is a challenge, because our community college students often come to us unprepared for college-level work. With upwards of 65 percent of our students requiring developmental coursework in mathematics, teaching these students to become proficient in a STEM field, that is necessarily reliant on mathematical understanding, poses a significant challenge for our colleges, but it is a challenge that we are successfully meeting.

West Virginia's community colleges are nationally recognized as being leaders in developmental education reform. Each of our colleges has moved to a co-requisite design for math and English instruction for unprepared students, which means that students are taking the college level coursework they need to be successful in their field, while simultaneously receiving support to help them master the content. We have seen students in math courses improve their success rates from 13 percent to 64 percent. This change is having a significant effect on the retention rates of our STEM majors, for whom, mathematics is often a stumbling block.

Another major stumbling block for our students is how they view themselves and the role of higher education in their lives. If you asked our students whether their mechatronics or electrical lineman program was a STEM program, they would probably tell you "no." Many of our students choose their major based on the availability of a job. They honestly do not care and probably do not even think about whether or not they are in a STEM major. They care about whether or not they will be employed when they graduate and what their wages will be. Moreover, students are particularly interested in going to school while simultaneously earning a wage. Having the opportunity to work in their field while going to college increases students' retention and graduation rates, and makes them more marketable when they enter the workplace. This is one of the reasons that partnerships with business and industry, particularly in STEM fields, are so vital to our community colleges and our students.

By their very nature, STEM majors are technical, often equipment intensive, and require highly trained faculty members. In other words, these majors are expensive. Faculty salaries are typically higher in STEM fields than they are in others, the cost of state-of-the-art equipment and keeping curricula and training up to date can be cost prohibitive. Through our industry partnerships, we have been able to overcome

many of these obstacles. The community college system relies on our partners to help us validate curriculum, provide equipment, and loan us skilled employees to work as adjunct faculty at our colleges. In return, the colleges ensure that they recruit, train, and graduate students who are qualified to meet workforce demands.

We have several partnerships with business and industry in the STEM fields that I would like to highlight for you today. Perhaps one of our most successful is between BridgeValley Community and Technical College and Toyota Motor Corporation. In 2012, Toyota West Virginia and BridgeValley launched the Advanced Manufacturing Technician Program. This is a two-year Associate's degree program that combines cutting-edge STEM curriculum with paid work experience through a world-class manufacturer. Students attend two full days of classes each week, and work in Toyota's plant three days each week. They must maintain a "C" or higher in each of their classes to remain eligible for the program. By the time students have graduated from the program, they can be hired into Toyota at a base salary of \$61,000 per year plus benefits. Adam, one of the first graduates of the program said, "I couldn't afford to go to college. So this was the only route I had that I could afford to do. The fact that you get a two-year degree, and all the hands on experiences you've got here, it doesn't match anything else anywhere."

Toyota has been a tireless partner with BridgeValley. They continually work with the college to make sure that students are learning what Toyota needs them to know to be successful in automotive manufacturing. BridgeValley designed a laboratory in its Advanced Technology Center that mimics the production line students will see in Toyota. The equipment BridgeValley uses to train students in this lab is the same equipment they will see in Toyota's Buffalo, WV plant. After receiving feedback from students, BridgeValley even went so far as to mark the location of each piece of equipment, on the floor with the

same red tape used by Toyota. Again, the purpose of this exercise is to replicate employee workspace in the student learning space.

As a result of this successful partnership, Toyota Motor Corporation generously donated robots to BridgeValley, so that students could be trained on the most state of the art equipment. Toyota also donated \$1 million for the ongoing maintenance and care of their Advanced Technology Center, appropriately named "Toyota Hall." The fourth cohort of students is scheduled to graduate this spring. Graduates have either gone to work for Toyota, NGK, Honda or Gestamp, or they have decided to continue their education.

A second STEM partnership that I would like to highlight for you is with New River Community and Technical College. New River's notable partnership has been made possible by the National Emergency Dislocated Worker Training Grants provided by this body to the U.S. Department of Labor. New River has developed an Electric Distribution Engineering Technology program that has been widely utilized by our dislocated coal miners. Companies like Pike Electric, Sowers Electric, and American Electrical Equipment Inc. have provided work-based learning opportunities for dislocated coal miners enrolled in this program. The National Emergency Dislocated Worker Training Grants have provided students with tuition dollars so that they can enroll in training with New River. This program has become popular among coal miners because it is accelerated, taking only fourteen weeks to complete, it provides a high-wage job opportunity \$15.50 per hour with a \$1 per hour raise every six months, and it allows a laid off coal miner the opportunity to remain in their community while they earn a living. In fact, these employees can top out at pay anywhere from \$37 to \$39 per hour or \$76,960 to \$81,120 per year.

Electrical lineman work is mobile by its very nature. Employees travel to the site of storm damage, or to towns and cities undergoing upgrades to electrical systems. Typically, linemen work four days on and three days off. This allows a dislocated coal miner to earn wages similar to or higher than he or she was earning in the mines, and remain in their home community. In August 2016, thirty-two dislocated miners, oil and gas workers and other dislocated workers graduated from the Electrical Distribution program. Each had their tuition paid for through funds allocated through National Emergency Dislocated Worker Training Grants. One such student, Mark, a laid-off coal miner said of New River's program: "It's been great. I got a job right out of the program. I got on the job training and now I can help get my family back to where we need to be. It just feels good to be able to provide for my family again and not be dependent on coal." In total, three cohorts of students have completed training and a fourth is set to graduate soon. All students have gotten jobs after graduation.

We have also had terrific success in our partnerships between the oil and gas industry and two of our community colleges, West Virginia Northern Community College and Pierpont Community and Technical College. Similar to the other partnerships I have outlined, several oil and gas companies have helped us validate our curriculum, donated equipment, and provided significant scholarship opportunities for our students in the petroleum technology and mechatronics programs. Industry partners in this endeavor have included: First Energy, Noble Energy, Columbia Pipeline, MarkWest, Dominion Energy, Southwest Energy, Chevron and Chesapeake. Many students have entered positions starting at a wage of \$26.50 an hour. First Energy and Pierpont have formed a particularly strong alliance. The President of West Virginia for FirstEnergy, Holly Kaufmann recently spoke at the dedication of Pierpont's North Advanced Technology Center saying that their partnership is a great example of, "how business and education can work together to create opportunities for our next generation to be successful right here in West Virginia." The North Central Advanced Technology Center is a shining example of the intersection of STEM fields

and partnerships between community colleges and business and industry. Housing laboratories for Applied Process Technology, Petroleum Technology, Electrical Utility Technology, and a wide variety of Health Care fields, this facility, along with its counterpart Toyota Hall, has truly solidified our community colleges' role in training West Virginia's STEM workforce.

I would be remiss if I did not mention the wonderful opportunity that Procter and Gamble's recent move to West Virginia has afforded our residents and Blue Ridge Community and Technical College. Over the next three years, Procter and Gamble will need to hire more than 700 employees at their West Virginia facility. Each of these employees needs education and training in STEM fields, primarily Mechatronics, Instrumentation Process Controls, and Applied Laboratory Technicians. Blue Ridge is currently poised to become one of Procter and Gamble's national training centers. However, Blue Ridge will not be able to supply this workforce alone. They are working closely with area high schools to provide a strong STEM education pipeline for potential Procter and Gamble employees. These pipelines are desperately needed between K-12 and community colleges to help ensure that students come to us well prepared for the coursework in front of them.

The final program that I would like to share with you today is our successful partnership with West Virginia's Department of Health and Human Resources (WVDHHR). Through this partnership WVDHHR has made federal funding available to encourage and support Temporary Assistance for Needy Families (TANF) recipients interested in enrolling in training programs at our community and technical colleges. Initiated for the first time statewide in the fall of 2016, we have a total of 155 TANF recipients enrolled in our community colleges and we expect this number to grow in future semesters. Most of these recipients are single mothers under the age of 40. Typically, these students are intimidated about going to college

and lack many of the academic skills associated with success in college. Interestingly, the majority of these students enter STEM fields, particularly fields related to health care. Brandy, a single mother, who earned two associate degrees through this program told others interested in participating, “Don’t ever give up. There are agencies and people out there who will help you and will do everything they can to get you where you need to be.” Brandy, is now employed, working with foster youth, and able to support her family.

Through this partnership, again funded through federal dollars, WVDHHR and our community colleges are able to get students the help they need to be successful in college, as well as troubleshoot any impediments, like childcare and transportation needs, they may have that would prohibit them from going to school. Our initial pilot of students saw more than ninety percent of students in program passing their fall semester and more than seventy percent with a GPA above a 2.0. We are hopeful that we will continue to see this success as the program matures and are encouraged that so many of our students entered STEM fields. Similar to the nation, West Virginia is not only facing a nursing shortage, but is generally facing a shortage in trained health care professionals. Federal-state program outcomes like these provide hope that we may be able to change the life course of a family while also meeting a significant workforce need.

I would like to take a moment to thank this subcommittee for voting for year round Pell Grants. For those of us at community colleges, particularly those that are trying to retrain dislocated workers and TANF and Supplemental Nutrition Assistance Program (SNAP) recipients, summer Pell is vital to our success. Students receiving workforce retaining dollars are often required to attend continuous training, which becomes difficult if they are unable to receive Pell in the summer. Business and industry push our colleges

to provide accelerated programs, which we have been able to design through Trade Adjustment Assistance Community College and Career Training (TAACCT) funding. However, without summer Pell, many of our students cannot afford to take advantage of these accelerated programs designed to get them into the workforce more quickly. Indeed, it seems that by eliminating summer Pell, we may have inadvertently hurt the very students Pell is designed to help. So I thank you for your support of that change and I sincerely hope that you will continue to support it in the coming months.

Federal support and collaboration on our STEM- focused training opportunities is invaluable for West Virginia's community colleges and for community colleges in states nationwide. On behalf of myself and my colleagues at community colleges across the nation, I encourage the Appropriations Committee to enhance and support programs that are working across the country, including:

- National Emergency Dislocated Worker Training Grants
- Year-round Pell
- GEAR UP
- Tech Hire
- Career and Technical Education
- Internships, Apprenticeships, and Workplace Training

I cannot emphasize enough the value that these programs provide across our nation. Students, employers, schools, and communities have benefited significantly from these programs. Youth who never thought they could attend college are doing so because of the work of our GEAR UP programs and career technical education. Adults who have lost their jobs or are struggling with under-employment and never believed they would get an opportunity to better their lives and the lives of their families, are getting that

second chance through the National Emergency Dislocated Worker Training Grants, and workplace training opportunities.

I would also encourage you to expand the definition of “training” and “apprenticeships.” Training is often defined as a one-year certificate or two-year associate degree, but there are several short term training programs that can lead to well-paying careers. Similarly, apprenticeships can take on many forms, including but not limited to, registered apprenticeships. Workplace training opportunities, like short term, flexible internships also provide students with experience in their field and are often more desirable to employers. Broadening definitions to include short term training opportunities and workplace internships could go a long way to enhancing retraining efforts that are already underway.

Our public community and technical colleges provide students with incredible opportunities. I am proud of the work that we do and proud of the work that is yet to come. On behalf of our students, I thank you for the work you have done and the work you will continue to do to move our country’s workforce forward. As Chancellor for the West Virginia Community and Technical College System, I know our community colleges change people’s lives. But I also know that change would not be possible without strong partnerships and support from people like you. Thank you for this opportunity.