# Preparing for the Future of Work and Learning: the Role of Community Colleges

By Lee D. Lambert, J.D. Chancellor, Pima Community College March 2019

Who is more skilled – the brain surgeon or the automotive technician?

I posed this question at the beginning of my recent presentation to the Arizona House of Representatives' Education Committee. My topic was "Preparing for the Future of Work and Learning: The Role of Community Colleges." The query actually was meant to illuminate the point of my talk: Transformative change is taking place in every occupation, and will profoundly affect all workers, from those who wield a scalpel to those who turn a wrench.

Behind the disruption are the dizzying advances being made in mobile technology, cloud computing, artificial intelligence (AI) and the Internet of Things. It would not be a stretch to think of these forces as "superpowers" in that, in the words of Pat Gelsinger, Chief Executive Officer of VMWare, a global firm specializing in digital infrastructure, they are on a par with "major nations, shaping the course of history." Taken together, these forces amount to a Fourth Industrial Revolution that is "fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human," according to Klaus Schwab, Klaus Schwab, founder and executive chairman of the World Economic Forum.

## Needed: new skills

These forces will have a profound impact on work. The World Economic Forum estimates that 65 percent of today's first graders will work in jobs that do not currently exist. And the timeframe for these seismic shifts are a little more than a decade away. In some cases, the shifts have already occurred. By 2030, 1 in 3 U.S. workers – including the surgeon and the mechanic -- will need to learn new skills and find work in new occupations, according to a 2017 McKinsey Global Insights forecast.

What does this mean for Pima Community College, a large comprehensive higher education institution in Tucson, Arizona, about 65 miles from the Mexico border? Pima and its fellow Arizona community colleges, uniquely positioned to provide the human capital that helps determine the economic success of our region, must possess the nimbleness to train Arizonans to thrive in the brutally competitive global marketplace of the 21st century. There is no time to waste: The Brookings Institution calculates that 44 percent of job tasks in Tucson and Phoenix already are susceptible to automation.

#### Deepening relationships with industry

"Shift Happens 2," a February 2019 report by INNOVATE + EDUCATE, a national workforce development nonprofit, stresses the importance of learners pursing a myriad of credentials. "Today, it is no longer a pathway from primary to secondary to postsecondary education leading to a job. That staid formula is no longer working . . . . Today, a learner's most pressing need is a greater connect between education and employment outcomes." Pima recognizes the need to shift teaching and learning to emphasize applied learning, lifelong learning and earn-to-learn models. The success of these endeavors depends on strong partnerships with business.

For example, through our Applied Technology Academy, we are training engineers from Caterpillar, the global heavy-equipment manufacturer, which recently opened a facility in Tucson. Caterpillar has identified a gap in its engineers' skill set: they lack realworld, factory-floor fabrication experience. Pima's remedy is to offer six-week lab-lecture classes, Welding for Non-Welders and Machining for Non-Machinists, that lets the engineers get their hands dirty. So far, 48 CAT employees have completed the classes, and another cohort is scheduled. We also are developing a new class, Prototyping using Nonmetal Materials.

Meeting the needs of industry is also the goal of our collaboration with TuSimple, an autonomous vehicle manufacturer with a production facility in Tucson. With autonomous trucks delivering groceries in Phoenix, it's clear that the future of truck transportation will mean drivers will need to learn a special set of new skills. We are working with TuSimple to build an Autonomous Vehicle Driver and Operations Specialist certificate that will build competencies in multiple areas – from logistics to information technology to automated industrial technology – that will be needed for the drivers of the future to interact with their autonomous vehicles.

### **Centers of Excellence**

A Center of Excellence (CoE) is an academic hub, a collection of programs strategically aligned to pursue excellence in a particular field of study. Pima is planning CoEs in six disciplines; the first to be brought online will be one focused on Applied Technology. We are investing more than \$56 million, with additional funding to come from a capital campaign, to expand existing programs and start new ones across three areas: Transportation Technology (e.g., Automotive Technology, Diesel Technology, Autonomous and Connected Vehicles), Manufacturing/Advanced Manufacturing (Machine Technology, Welding/Fabrication, Automated Industrial Technology, Process Control Optics, Quality and Design), and Infrastructure (Construction, Utility Technology, Mining and HVAC). Our CoEs are founded on meeting the workforce needs of today while forecasting and responding to changes beyond the horizon.

## **Aviation Technology**

Everyone benefits when education and private industry collaborate. In Arizona, we are fortunate to have leaders who recognize the role government can play in propelling the Page **3** of **4** 

state's economy. Gov. Doug Ducey has included in his 2019 budget proposal a \$20 million one-time allocation to expand and improve our Aviation Technology Center (ATC). If approved by the State Legislature, the funding will potentially double, to 250, the students the ATC can serve. The extra capacity is necessary, as the program currently has a waitlist stretching more than a year.

Why Pima's Aviation Tech Center? Our ATC has a national reputation built on rigor – 2,000 hours of training, more than 100 exams, nearly 300 hands-on projects. We are one of a handful of schools offering sought-after advanced structural repair and modification, and commercial jet transport and Avionics training, thanks to the 727 on site.

The state's investment in Pima would solidify Arizona's pre-eminent position in aerospace manufacturing while helping fill an education gap that could threaten our lofty standing. Arizona ranks No. 1 in overall aerospace manufacturing, according to the global consulting firm PricewaterhouseCoopers (PwC), but is only 20<sup>th</sup> in the U.S. in the education subcomponent of the rankings. PwC notes that our northern neighbor Utah has engaged seven aerospace companies in the expansion of a program that provides high school seniors with training for an aerospace manufacturing certification. It is imperative Arizona does not fall behind in providing the "educated, technology-savvy and diversified workforce" needed to maintain competitiveness in this sector.

The bottom line, according to an analysis by Sun Corridor Inc., a regional economic development entity: The expansion would produce 75 new Aviation Tech graduates a year in jobs with an average salary of \$52,000. The total economic impact from 2019-2023 from the \$20 million investment: \$225.6 million – a better than 11-to-1 return. In aviation, as in other economic sectors, one need not be a brain surgeon to recognize the wisdom of preparing our workforce for the future.