

# Adaptation: How Educators and Employees Evolve to Meet the Needs of a Changing Landscape

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Global Interdependence Center Conference:  
The Role of Higher Education in Competitiveness and Global Productivity

Federal Reserve Bank of Philadelphia  
Philadelphia, PA

October 9, 2018

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President and Chief Executive Officer  
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The views expressed today are my own and not necessarily those of the Federal Reserve System  
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Good afternoon and thank you.

When I saw the agenda for today, I noticed that it covers a lot of what I wanted to address, which both assures me that I won't wander too far afield and runs the risk of boring you with repetition. On one thing I'm sure to be original, however, and that is in delivering the standard Fed disclaimer that the views I express today are mine alone and do not necessarily reflect those of anyone else in the Federal Reserve System.

I have the privilege — or perhaps the curse — of a number of perspectives on higher education. I spent a long time in academia, both in teaching and administration; I was a first-generation college graduate; and I am the parent of three millennial children, one of whom recently finished graduate school.

Acknowledging that I likely have some unconscious biases informed by each of these experiences — and some conscious ones that I'll keep quiet — I'm going to speak today from the monetary policymaker's perch and focus on the impact of higher education in the larger context of the American economy.

Today I'd like to address the evolving nature of the labor market, the changing realities for higher education and employers, and the implications of the sum of those parts.

Before that, however, I'd like to set some parameters for my remarks. Specifically, what I see as the fundamental purpose of higher education. I want to dispense with the debate over its aim being either preparation for work or the intellectual pursuit of a more examined life because it creates a false sense

of mutual exclusivity. Higher education should, absolutely, help prepare students for a career after graduation, and as technology advances at a more and more rapid pace, rethinking how we do that is essential. But that doesn't mean abandoning the arts and humanities. In fact, as I'll expand on later, I think it actually makes the case for their importance.

And while the phrase "higher education" tends to elicit images of brick walls and ivy, it also consists of a range of postsecondary options, from community colleges to technical schools to training programs, which are critically important and play a central role in an evolving labor market. All of these, whether they lean toward the practical or the philosophical, help students develop life skills, accumulate knowledge, and appreciate learning for its own sake.

### **The Changing Landscape of Work — Demographics**

There are two overwhelming factors influencing higher education's future: demographics and technology.

Demography has exerted force on a number of areas of the economy, including labor force participation. The current participation rate is significantly lower than it was a decade ago, and research by my staff indicates that the trend will likely continue. As the baby boomers head into retirement, they'll be the largest generation in history to do so. That will mean more people relying on Social Security and Medicare than ever before, and since they're also living longer, they'll be doing it for an extended period of time.

The millennial generation is actually a bit larger than the boomers, but even the oldest millennials are not quite in their prime earning years. So the share of that population paying into those programs is weighted toward the less affluent end of the spectrum.

We are also not seeing a great boom in population. As we all know, economics is full of equations that utilize the entirety of the Greek alphabet. But one of the most important rules is a simple sum: Growth in the labor force plus growth in productivity equals economic growth. With productivity also running low, the overall growth potential for the country is affected.

I will make a note here that we could be miscalculating productivity. One of our economists, Leonard Nakamura, has done extensive research on how technology has affected our understanding of productivity, which is notoriously difficult to measure in the first place.

What is not as difficult to measure, however, is population growth, and without more people, it will be harder for the economy to expand.

Trends in demographics affect the people who have a stake in higher education in different ways.

From the business end, we have employers who say they can't find the right skills, businesses that say a dearth of workers is affecting their ability to grow, and HR departments struggling to fill vacancies for longer and longer periods of time.

For higher education, there are fewer people in seats due to the drop-off in the birth rate in the mid-1990s. A decrease in foreign students further impacts the bottom line, because they generally pay full tuition. They also make up a substantial portion of STEM and business study, and there are entire programs that don't have enough domestic candidates to survive. If it becomes harder for foreign students to come, or if increased competition from abroad gives them incentive to stay home or go elsewhere, schools' bottom lines suffer, and our economy overall misses out on U.S.-educated students in critical fields.

### **The Changing Landscape of Work — Technology**

The other outsized force remaking the landscape of work is technology. It's changing how we work, where we work, and, most importantly, what kind of work we do.

As I delve into this conversation, I want to put it in context, because the threats and opportunities inherent to this subject are very easily, and very often, mischaracterized.

I'm an engineer by training and that lens doesn't just give me endless ways to bore people about fluid mechanics; it frames subjects as one function of a whole. In this case, it places today's technology at one point on a journey that humanity started when we first chiseled stone into tools.

From ancient Egypt to the Internet Age, each advancement has laid the groundwork for the next, creating not just more ingenious invention, but faster innovation. This isn't new; it's the natural progression of humanity's search to make life more comfortable and efficient. What *is* new is its pace.

Along this journey, jobs and industries have morphed and transformed, and they will continue to do so. Our challenge — and our opportunity — is how to train people to change with them. To do that, we have to understand how and where those changes are taking place.

The Philadelphia Fed just published research that shows the likely effect of automation in our District and in the U.S. In addition to identifying jobs that are in danger of automation, we assigned degrees of likelihood to it happening. We also looked at the people doing those jobs, who would be hardest hit, and where new jobs would likely be created.

We found that almost one in five jobs in our District had a 95 percent or better chance of becoming automated. We also found that the people most likely to be displaced are some of the economy's most vulnerable workers — women, people of color, younger people, and workers in lower-skilled positions.

Some people will be absorbed into new jobs, but there's a risk that others will not. Armed with this knowledge, we can think about how to connect those workers to training and new job opportunities.

The underpinning of this and other research is that, while we haven't seen this exact kind of innovation before, we've seen the pattern. Throughout history, as jobs change, they've produced other jobs. With information on how and where that will happen, we can create systems that help workers, employers, and educators adapt.

### **The Intersection of Employers' and Higher Education's Needs**

The changing landscape of the labor market offers an opportunity to assess how we're preparing today's students for tomorrow's jobs.

Again, I am looking through that big-picture lens, because while technological fluency is important, I would caution against an overcorrection that disregards everything but the coding.

As we think about what skills will be necessary for the future, particularly in the context of technological advancements, we shouldn't forget the value of the skills honed by the arts and humanities.

Communication, critical thinking, interpretation of intent; the wide range of subjects in a classical liberal arts education forces the mind to shift gears, and that adaptability is crucial in a time of constant change.

As automation continues its march, it also lays bare the human capabilities that cannot be artificially reproduced. Much of what automation has already displaced — and the industries in which its impact will continue to grow — are repetitive actions and rote knowledge that robots do better and more efficiently than us. Artificial intelligence in its current form is not akin to a self-aware Hal in 2001; its output is limited to the things we input. Our comparative human advantages of creativity and individuality cannot be duplicated. At least not yet. If that happens, disregard everything I just said ...

I was preceded on the agenda by a panel on what higher education needs and wants from business and government, and I'm followed by its counterpart, what business and government ask of higher ed.

I actually think those wants and needs intersect.

The inevitability of continued technological evolution will necessitate two things: a core set of skills that can evolve with the market and a shift to constant training and continuing education.

Professions will need continual upskilling, whether it's to keep up with industry standards or just learn the office's new software, while those preparing for the workforce will need both proficiency in current programs and to develop skills that will help them adapt with the technology as it evolves.

From the employers' end, that means investing in the workforce and committing to lifelong learning. Simply replacing outdated skills with new ones just isn't efficient or cost-effective, and it may not even be enough — they'll need workers who can adapt to a dynamic and regularly changing environment, and that takes investment in people.

Educators will also need to consider new models, not just because technology is forcing it, but because they'll be in a position to offer the lifelong learning that workers need.

### **Rethinking Models and Mindsets**

In rethinking models, we should also rethink mindsets because there are some entrenched beliefs that we need to change if we're going to successfully adapt.

I just made the case for the importance of the humanities, and I believe in their value. But I also think that we place too great an emphasis on traditional, four-year education, particularly when it comes to employment.

The other components of higher education I mentioned earlier — community colleges, technical schools, training programs — are equally valid sources of skilled workers and, in some instances, better suited to employers' needs. A bachelor's is not the only educational path to the skills employers want, though it's too often a requirement.

When my staff was researching "opportunity occupations" — jobs that pay at or above the median wage that don't require a four-year degree — they found something interesting. Despite not requiring a degree, employers started asking for one during the slow recovery, when higher unemployment created more competition. We've seen that in a lot of sectors, and, while it's retreated to a large extent, the

degree inflation still exists in some places. I've been shown website galleries of some of the more egregious job ads: degree required, master's preferred, previous experience ... \$7.50 an hour, no benefits.

That misalignment of requirements and the actual needs of the job perpetuates the veneration of pedigrees over skills, which is a mindset I think we need to change. But it also risks employers missing out on the right candidate.

This reconsideration of skills and degrees is more important than ever. We have a labor market with very little slack left, and the most common refrain I hear from employers is that they can't fill the jobs they have. Those demographic and technological pressures are unlikely to recede.

I was recently in Lancaster, PA, where a business owner told me they can't get enough workers for assembly line work. It's a straightforward job, just taking pretzels off the belt and putting them in boxes. They're paying \$17 an hour. And those are the jobs that don't require training.

For higher education, there is an opportunity to rethink new partnerships and models that could also bring in more revenue while, at the same time, better responding to the needs of business and industry.

This is important for many institutions as demographic forces are likely to shift an increasing share of local, state, and federal budgets toward retirement benefits, pensions, and health care. States' proposed budgets are generally calling for increased spending in fiscal 2019 and there is attention to higher education. However, the overall growth is smaller than historical averages, and there are many competing interests.<sup>1</sup>

As higher education institutions of all types look at their balance sheets and as consolidations and mergers increase across the sector, there are both opportunities and risks.

I know from experience that change can be a daunting proposal, especially at institutions that are historically or culturally resistant to it. And the suspicion is understandable, particularly if there's a fear that quality of education is being sacrificed for revenue streams, and when too much of the debate frames education's focus as an either-or proposition.

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<sup>1</sup> The National Association of State Budget Officers, ["Summaries of Fiscal Year 2019 Proposed & Enacted Budgets,"](#) Washington, D.C. (August 31, 2018).

There are, however, new and creative ways to adapt to the needs of a changing landscape without surrendering the essential characteristics that make all of our postsecondary paths of study exceptional.

There are great models that both employers and educators can consider. Some of the most innovative have come out of community colleges. They range from working with individual businesses to give credit for on-site work to competency-based bachelor's degrees for experienced professionals.

Our research on apprenticeships has also highlighted some exceptional models; we visited the Philly Shipyard last year, and the participants we met ranged from a woman with an M.F.A. who's become their star welder to a man in his 40s whose Facebook page is overwhelmed by friends angling for the next opening. But just as importantly, we've seen apprenticeships emerge in finance, IT, and health care, areas we don't traditionally associate with a model that dates back to the Code of Hammurabi.

Peter Cappelli, who heads up the Center for Human Resources at Wharton, has done research on the most important lines on a recent graduate's résumé; number one is internships. Employers are looking for experience. There are any number of partnerships that could occur both across and within sectors that could benefit everyone involved. This is especially important when a good portion of internships are still unpaid, which puts lower-income students at a disadvantage. While the share of paid internships has been rising steadily over the past several years, in 2017, the unpaid ones still accounted for more than 43 percent.<sup>2</sup>

### **Education's Impact on the Economy**

The pull of demographic forces doesn't just affect labor force participation; it plays a role in dynamism as well. The U.S. economy has historically been dynamic. By that I mean the standard economics definition of turnover in businesses, jobs, and worker mobility, rather than innovative and energetic, though that's certainly apropos. Dynamism has been on the decline for the past 30 years or so. If we want to keep the economy from stagnating, we need as many participants in the workforce as possible.<sup>3</sup> We also need a workforce that is trained and adaptive to change.

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<sup>2</sup> National Association of Colleges and Employers, "[Trend Is Toward Paid Internships](#)," (February 15, 2018).

<sup>3</sup> Ryan A. Decker, John Haltiwanger, Ron S. Jarmin, and Javier Miranda, "Declining Business Dynamism: Implications for Productivity?" Hutchins Center Working Paper 23 (September 2016).

There are real consequences to the skills and labor shortage. We often talk about it in broad terms — the economic reality that businesses can't expand and overall dynamism falls. That, in itself, is obviously a pressing issue, but zeroing in on specific sectors highlights the potential for ripple effects.

Take health care as an example. I was recently in Wellsboro, in the far northeastern corner of Pennsylvania, meeting with business and community leaders to discuss their approaches to economic growth. One of them runs a hospital, and despite offering higher salaries than Philadelphia does for doctors and health-care workers, they're struggling to recruit.

Multiply that by cities and towns across the country facing similar skills shortages and add to that the retirement of the boomers that I mentioned earlier. Roughly 10,000 people turn 65 each day in the U.S., a trend that started in 2011 and is likely to continue for another decade.<sup>4</sup> Consider additionally that health care currently accounts for almost 18 percent of the economy and is on track to make up 20 percent by 2025.<sup>5</sup> It puts the need for skilled workers in perspective.

### **The Opportunity (of a Lifetime)**

I actually think we have an incredible opportunity, one that doesn't come around often. We have a labor force with very little slack left, and there is a confluence of discussions about the future of higher education, the importance of skills, and the impact of technology on our lives. It's the perfect time to see these all in the frame of the bigger picture and consider what it means for the next five, 10, 20 years. That can help us to structure our education, training, and workforce to adapt and evolve as the landscape does.

Thank you.

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<sup>4</sup> Russell Heimlich, "[Baby Boomers Retire](#)," Pew Research Center (December 29, 2010).

<sup>5</sup> Centers for Medicare & Medicaid Services, "[Historical](#)," CMS.gov (last modified January 8, 2018).