



Apprenticeships and Community Colleges

DO THEY HAVE A FUTURE TOGETHER?

Jorge Klor de Alva and Mark Schneider

MAY 2018

A M E R I C A N E N T E R P R I S E I N S T I T U T E

Executive Summary

Most of today's college students view having success in the workplace, earning a decent salary, and having a fulfilling career as key reasons for pursuing higher education. This sentiment is echoed by governors, state legislators, and higher education leaders who are looking at the labor market success of graduates to evaluate how well postsecondary institutions are preparing students to join the workforce and contribute to the economy. However, there is a growing belief that colleges are not adequately preparing students for the jobs and careers needed in the 21st century and that a substantial gap exists between the training and education America's college graduates receive and the skills today's labor market demands.

Of the many options being actively discussed to bridge the divide, apprenticeship programs are attracting widespread bipartisan support. Apprenticeships are often considered the "gold standard" of workforce education. They are formal training programs during which successful applicants are paid while being trained on the job by experienced workers or mentors. Acquiring new skills in the workplace is accompanied by related training, typically provided by an educational institution such as a community college or a trade organization such as a union. In the past two years of his administration, President Barack Obama made apprenticeships a priority, directing well over \$250 million to support apprenticeship programs. In 2017, President Trump signed an executive order to increase federal funding from \$90 million per year to \$200 million.

Public two-year community colleges are already central to the nation's career and technical education system, granting hundreds of thousands of occupationally oriented certificates and technically focused associate degrees. Many community college leaders have welcomed the administration's call for apprenticeship programs, and some have already shown themselves adept at working with the Department of Labor's registered apprenticeship programs. But the overwhelming majority of community colleges have a ways to go before they can meaningfully contribute to the number of apprenticeships that so many politicians and analysts argue the nation needs.

In this report we explore how community colleges could play a more active role in growing the number of apprenticeships nationwide, a role that would contribute to resolving the current mismatch between what postsecondary institutions produce and what employers need. We begin with a brief summary of the past and current state of apprenticeships and the role apprenticeships play in other countries. We then turn to the challenges faced by community colleges interested in sponsoring apprenticeship programs and what reforms might help community colleges overcome the internal and external obstacles in their way to expansion. We conclude with the role private apprenticeship service providers may play as competitors to community colleges interested in apprenticeship programs.

Apprenticeships and Community Colleges

DO THEY HAVE A FUTURE TOGETHER?

Jorge Klor de Alva and Mark Schneider

The overwhelming majority of today's college students consider succeeding in the workplace, earning a decent salary, and enjoying a fulfilling career as the main goal of higher education.¹ Governors, state legislators, and higher education leaders are concerned about the quality of their workforce and are looking at the labor market success of graduates to evaluate how well postsecondary institutions are preparing students to achieve those objectives.² In recent years, there has been a growing belief that colleges are not adequately preparing students for the jobs and careers needed in the 21st century and that a substantial gap exists between the training and education America's college graduates receive and the skills today's labor market demands.³

Of the many options being actively discussed to bridge that divide, apprenticeship programs are attracting widespread bipartisan support. Apprenticeships are often referred to as the "gold standard" of workforce education.⁴ Part of this is because, on average, apprentices tend to outearn nonparticipants, and some apprenticeship programs have been found to yield better results than other training methods, particularly for middle-skills jobs.⁵ In the past two years of his administration, President Obama made apprenticeships a priority, directing well over \$250 million to support apprenticeship programs.⁶ In 2017, President Trump signed an executive order to further increase federal funding from \$90 million per year to \$200 million.⁷ Following that executive order, Secretary of Labor Alexander Acosta assembled the

Apprenticeship Expansion Task Force to develop recommendations to transform American apprenticeships from a system dominated by construction trades and unions to a system that fits the nation's modern, technology-based economy.⁸

In May 2018, the task force released its final report, calling for the development of a "separate, streamlined, industry-led" apprenticeship program, or "industry-recognized apprenticeships."⁹ A chief component of these industry-recognized apprenticeships would feature nationally portable, industry-recognized credentials. The task force recommended that quality and accountability requirements remain in place for these apprenticeships and that federal funding criteria be updated to ensure equal treatment of registered apprenticeships and industry-recognized apprenticeships. That the task force calls for a new and separate apprenticeship program, rather than fixing the current system, might suggest there are structural limitations in the existing apprenticeship program that inhibit it from modernizing.

Clearly, apprenticeships are attracting a great deal of attention at the federal and state levels, but they represent only a sideshow compared to the number of other postsecondary credentials awarded each year. In 2015 there were 23,578 persons who completed a civilian apprenticeship program. This is a far cry from the 961,000 one- and two-year certificates awarded in 2015. The number of certificates awarded is up 35 percent over the previous 10 years, while the number of apprenticeship completers has remained

stagnant over the same time period.¹⁰ Of the certificates awarded, research suggests that many programs in technical fields can lead to high earnings, but other certificate programs do not increase average earnings.¹¹

Similarly, over one million associate degrees were awarded in 2015, a 45.5 percent increase over the previous decade.¹² While about half of these were awarded to students who desired to transfer to traditional, four-year degree programs, the other half were primarily awarded in career and technically oriented fields. Obviously, students are voting with their feet as more of them are seeking alternative routes to enter the labor market. With students continuing to flock to technical training programs through associate degrees and certificates, should community colleges add apprenticeships to that mix as the current administration has suggested?¹³

Most of the career-oriented credentials are awarded by public two-year community colleges, making them central to America's career and technical education system.¹⁴ Not surprisingly, community colleges have officially welcomed the administration's call for apprenticeship programs, and some have shown themselves adept at working with the registered apprenticeship programs that are administered through the Department of Labor (DOL).¹⁵ But given how small the number of apprenticeships awarded each year is compared to the number of certificates and degrees they grant, community colleges, in spite of their recently expressed willingness, clearly have a ways to go before they can meaningfully contribute to the expanded number of apprenticeships that so many politicians and analysts argue the nation needs.

In this report we explore how community colleges might play a more active role in growing the number of apprenticeships nationwide, a role that would contribute to resolving the current mismatch between what postsecondary institutions produce and what employers need. We begin our analysis with a brief summary of the past and current state of apprenticeships because, despite the hype, so little is commonly known about them. Afterward we discuss the conditions under which community colleges could play a larger role in their expansion.

What Is an Apprenticeship?

While no single definition constitutes an apprenticeship, for the purpose of this report, we consider an apprenticeship to be a formal program in which successful applicants are paid while being trained on the job by experienced workers or mentors. The acquisition of new skills in the workplace is accompanied by a set of related coursework (called in-classroom instruction), usually provided by an educational institution such as a community college or a trade organization such as a union.¹⁶

Since the passage of the National Apprenticeship Act in 1937, a formal apprenticeship program is one that is registered with the federal government or a related state agency.¹⁷ The DOL, which oversees these programs at the federal level, along with participating state apprenticeship agencies, both determine the occupations that can be addressed by an official apprenticeship program and set the guidelines that need to be followed to register the program.¹⁸ Today there are 13,656 federally registered apprenticeship programs, including both civilian programs and US military apprenticeship programs. Civilian apprenticeship programs include all apprenticeships except for those offered through the US military. US military apprenticeship programs are formal military programs offered to active-duty members of the armed service to improve their job skills.¹⁹

An informal network also exists, in which many thousands of apprentices are being trained in unregistered programs. Some limited survey data suggest that the number of apprentices in unregistered programs greatly exceeds the number of registered apprentices. Some estimates by the Department of Education indicate that as many as 1.5 percent of all adults participated in some type of formal or informal apprenticeship program between 2000 and 2004. However, there is no definitive way of knowing how many informal programs are out there or what their characteristics are. Consequently, in this report we focus only on registered programs.²⁰

Although requirements for programs can vary from state to state, the standards for a registered apprenticeship program typically require at least 2,000 hours

Table 1. Virginia Requirements for a Registered Apprenticeship Program**Eligibility and Requirements:**

- As a full-fledged employee of the sponsoring company, a registered apprentice completes a minimum of 2,000 hours of supervised on-the-job training and a minimum of 144 hours of related classroom instruction for each year of apprenticeship.
- Apprenticeship terms are occupation specific, but the average term is four years.
- Successful completion of the registered apprenticeship program earns the apprentice nationally recognized state certification as a journeyperson.
- All apprentices are registered through a DOL and industry apprenticeship representative.

On-the-Job Training:

- The apprentice's sponsor provides on-the-job training through qualified journeypersons.

Related Instruction:

- Related instruction may be provided through a local community college, a vocational and technical center, electronically, or, in some instances, at the place of employment.

Source: Virginia Department of Labor and Industry, "Registered Apprenticeships," <https://www.doli.virginia.gov/apprenticeship/>.

of training and recommend an additional 144 hours of related instruction each year. This highlights one of the unique features about apprenticeship programs: Participants combine classroom learning with on-the-job training to directly prepare them for work. Of course, some programs are as short as one year or as long as six, but the majority are four years in length.²¹ As an example of how a number of states follow these federal guidelines, Table 1 displays Virginia's requirements for a registered apprenticeship program.

How Do Apprenticeships Fit with Changes in Career and Technical Education?

Apprenticeships have been around since the nation's founding (indeed, they can be traced back to the Middle Ages in Europe), but it was not until the New Deal programs were enacted to fight the Great Depression that these were formalized in the National Apprenticeship Act of 1937.²² Despite being on the books for just over 80 years, the "registered apprenticeship"

system the act established has never been widely understood or used by employers, employees, or college administrators.

Well into the middle of the 20th century, apprenticeship programs were commonly held in low esteem partly because of a long-standing assumption that apprenticeships were for high school students who were not "college material" and that they led to jobs for men primarily associated with construction trades and labor unions. By the 1980s, parents, teachers, and high school counselors began pushing high school graduates to go to college, especially four-year schools.²³ This was in part due to the pressure from advocates concerned with the potentially discriminatory effects of tracking in the nation's schools. The push for more students to attend college was also aided by the rapid growth of federal postsecondary financial aid programs, which made college accessible to a wider range of students than ever before.

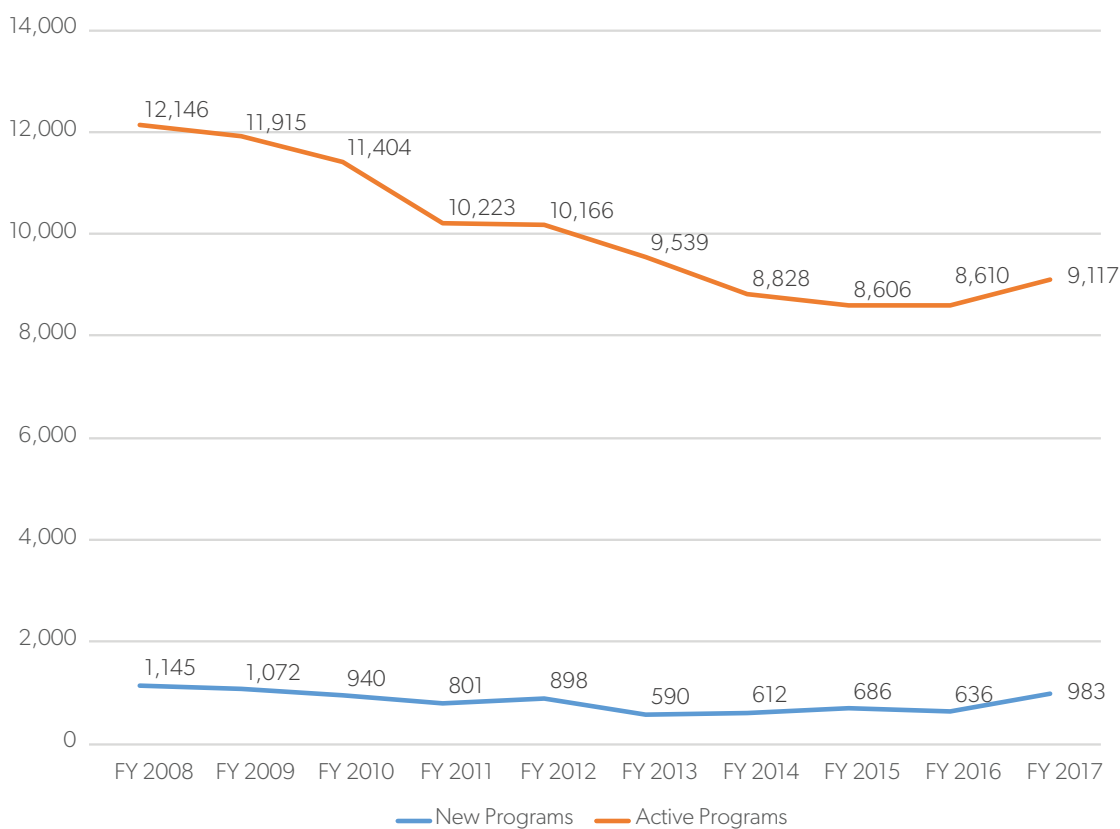
Table 2 shows the size of the mindset shift that took place during the 1980s, as the "college for all" mentality motivated more students to enroll in college rather

Table 2. Percentage of Fathers, Mothers, Counselors, and Teachers Who Advise High School Sophomores to Attend College, 1980–90

	Fathers		Mothers		Counselors		Teachers	
	1980	1990	1980	1990	1980	1990	1980	1990
Total	59%	77%	65%	83%	32%	65%	32%	66%
Men	56%	74%	62%	81%	32%	64%	32%	64%
Women	64%	80%	69%	85%	33%	66%	33%	67%
Student Test Quartile								
Lowest	40%	60%	48%	65%	26%	56%	28%	57%
Second	50%	72%	56%	79%	26%	61%	27%	61%
Third	64%	83%	69%	90%	31%	66%	30%	66%
Highest	80%	91%	85%	96%	43%	74%	42%	75%

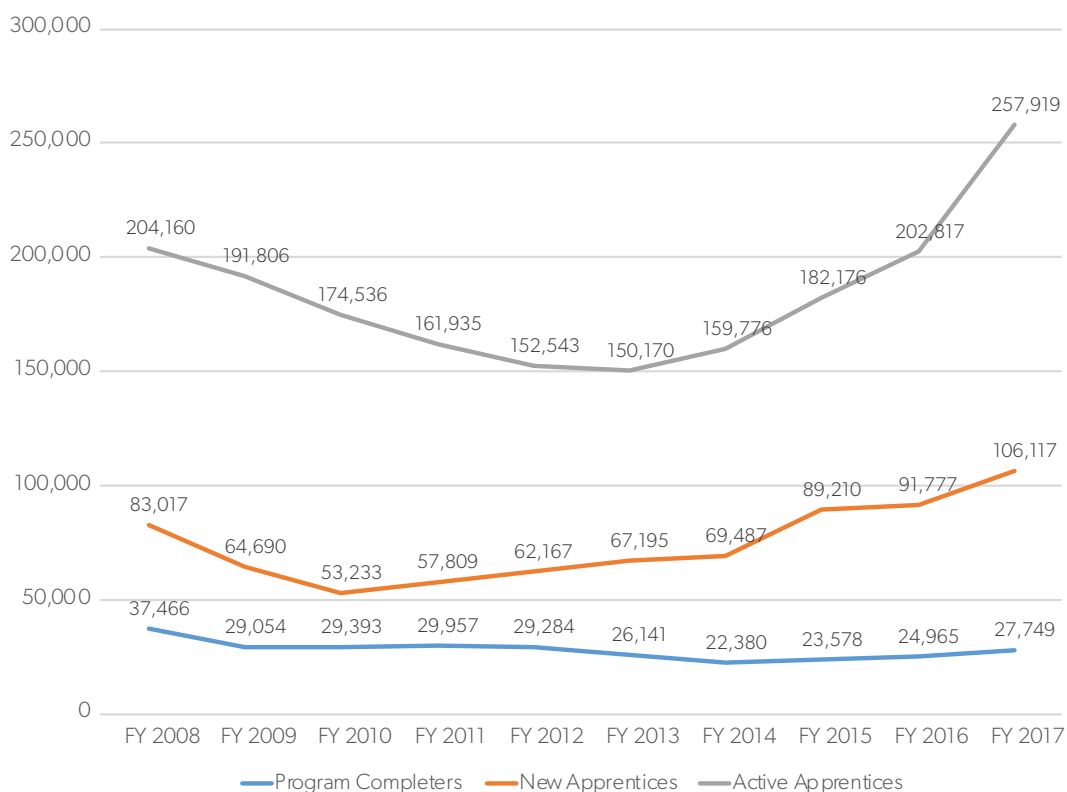
Source: National Center for Education Statistics, “High School and Beyond Base Year Student Survey,” US Department of Education, 1980; and National Center for Education Statistics, “National Educational Longitudinal Study of 1988, Follow-Up Student Survey,” US Department of Education, 1990.

Figure 1. Number of Civilian Apprenticeship Programs, 2008–17



Source: US Department of Labor, “Apprenticeship: Data and Statistics,” https://doleta.gov/oa/data_statistics.cfm.

Figure 2. Number of Active Civilian Apprentices, New Apprentices, and Completers, 2008–17



Note: “New Apprentices” are apprentices who registered during that period. (The begin date is used, not the registration date.) “Active Apprentices” includes registered, suspended, and reinstated apprentices. “Program Completers” are apprentices who have completed their apprenticeship during the period.
 Source: US Department of Labor, “Apprenticeship: Data and Statistics,” https://doleta.gov/oa/data_statistics.cfm.

than explore alternative pathways into the labor market. Across a relatively short period of time, the percentage of parents, teachers, and guidance counselors advising students—at all levels of academic ability—to attend college increased substantially. In 1980, fewer than half of teachers and counselors recommended college to the *highest-performing students*, but by 1990 more than half of them were recommending college for the *lowest-performing ones*.²⁴ The push for more students to attend college left alternative career pathways such as technical education and apprenticeship programs undersubscribed.

Fast-forwarding to the 21st century, the number of civilian apprenticeship programs fell dramatically during the Great Recession, even as college attendance, particularly in community colleges, increased (Figure 1).²⁵ Despite the emphasis on apprenticeships

by the Obama administration and President Trump, the number has still not recovered. According to the DOL, there were around 8,600 registered civilian apprenticeship programs in 2016, down 30 percent from the 2008 fiscal year.²⁶ And the number of newly registered programs fell dramatically after the Great Recession in 2008 and is only now beginning to return to prerecession levels.²⁷ The data in Figure 1 exclude military apprenticeship programs, since military programs are quite different than civilian workforce apprenticeship programs. (However, military apprenticeship programs comprise over half of US apprenticeship programs.²⁸)

Figure 2 shows a somewhat more positive picture with respect to the number of *apprentices*. Paralleling the decline in *programs* since 2008, the number of apprentices in the workforce declined precipitously

Table 3. National Averages of Completion, Cancellation, and Retention Rates Based on Federal Workload Only, Fiscal Year 2005–14

Fiscal Year	Completion Rate	Cancellation Rate	Retention Rate
2005	52%	40%	8%
2006	50%	38%	12%
2007	50%	37%	13%
2008	50%	36%	14%
2009	43%	40%	17%
2010	38%	40%	17%
2011	37%	43%	20%
2012	39%	45%	16%
2013	44%	45%	11%
2014	46%	41%	13%

Note: Fiscal year data are based on the prior year’s expected completers. “Cancellation Rate” is the percentage of apprentices who dropped out of their program in that year. “Retention Rate” is the percentage of apprentices who matriculated to the following year of their program. These national rates incorporate both civilian and military apprentices.

Source: Registered Apprenticeship Partners Information Data System as of October 31, 2014.

over the next five years. However, their number has recovered dramatically since the 2013 nadir and now exceeds prerecession levels. This uptick has been fed by a fairly rapid increase in the number of new apprentices. Nonetheless, even with this uptick, depending on how calculations are made, apprentices represent only about 0.3 percent of the nation’s total civilian workforce and around 4 percent of the annual cohort of entrants into the workforce, more or less the same percentage as in 1990.²⁹ The bottom line: Despite the heightened attention about apprenticeships, the number of individuals that complete an apprenticeship program is miniscule when compared to the over 961,000 sub-baccalaureate certificates awarded in 2014–15 and the over one million associate degrees or the nearly two million bachelor’s degrees awarded annually.³⁰

While the number of new apprentices has grown significantly since the Great Recession, as Figure 2 shows, the number of apprenticeship completers has declined since 2008. As shown in Table 3, between 2005 and 2014 the Registered Apprenticeship Partners Information Data System shows completion rates

fluctuating between 52 percent (2005) and 37 percent (2011).³¹ For fiscal year 2017 the rate was about 54 percent—substantially better than the completion rates of many certificate programs at community colleges but still lower than might be expected given the excitement surrounding the value of apprenticeships.³²

Educational Background and Demographic Characteristics of Civilian Apprentices

Examining the prior educational attainment of current apprentices clarifies the role community colleges might have as recruiters of potential apprentices. Unfortunately, finding detailed information on this is difficult. Table 4 summarizes data collected by the DOL. Over three-quarters of apprentices have a high school education or greater; however, the available data do not break out completion of high school alone versus other postsecondary educational experience. Still, given the available data, we can see that only 5 percent of apprentices entered their respective programs with either some postsecondary (community

college or university) education or prior technical training, creating a large potential pool of apprenticeship trainees for community colleges.

Table 4. Educational Attainment Level of Active Apprentices Since 2000

Education Level	Percentage
Less Than or Equal to 8th Grade	1%
9th–12th Grade	9%
General Educational Development	11%
High School or Greater	72%
Postsecondary or Technical Training	5%
Unknown	2%

Source: The data were made available to the authors by the US Department of Labor’s Office of Apprenticeship. The specific file they used is “R_APPR_PROGRAM_P,” from which all “unknowns” or blanks were removed. The database covers every apprentice registered in the federal system since approximately 2000 in nearly every program registered since then but also includes several programs that date back to older legacy systems.

Table 5 contains important, and difficult to find, demographic information on apprentices from a 2012 Mathematica study by Debbie Reed and colleagues. The data summarize information on the 2010 cohort participating in registered apprenticeship programs in 10 states.³³ As already evident in the national data shown in Table 4, the state data show that most apprentices were high school graduates (83.2 percent) or had some postsecondary education or technical training (10.3 percent). Nearly 70 percent are between 21 and 39 years old—an age group that fits the age profile of most students at community colleges. The national average age of apprentices is 28.³⁴

As could be expected, given the nation’s history of apprenticeships, most are men (91.4 percent). If the racial diversity shown is compared to that of the entire population of the 10 states where 79 percent were white, this apprentice cohort is more diverse, with 31 percent being either black or Hispanic.³⁵ Of additional importance for community college recruitment is the large number of veteran (9.2 percent) and imprisoned (11 percent) apprentices, subgroups that

can use the kind of student support that community colleges often provide.

In the 2010 enrollment cohort of apprentices, there were 19,575 men and only 1,851 women. Women in apprenticeship programs were about five years older than men on average. They were concentrated in social service professions, such as early childcare and nursing assistance.³⁶

Earnings and Employment Rates of Apprentices

Accumulating evidence shows that the wage gains for apprenticeship completers can be impressive. The Mathematica study of apprenticeships in 10 states documented significant benefits accruing to completers of registered apprenticeships, in terms of wages and employment. For example, six years after completing, the average annual earnings for apprenticeship participants were more than \$6,500 higher than the wages of demographically similar nonparticipants in the same state.³⁷ Male completers were also 15 percent more likely to be employed.³⁸

To get a better sense of how impressive the outcomes can be, consider earnings data of Florida apprenticeship participants. Florida keeps track of apprenticeship programs that are offered by the state’s community colleges and their “district technical centers,” a key component of the state’s career and technical education system.³⁹ Like the nation as a whole, Florida produces a relatively small number of apprentices compared to the large numbers of associate and bachelor’s degrees its public institutions award, but the overall median first-year wages of all apprentices, around \$48,000, compares favorably to the \$29,000 median earned by associate degree graduates and the \$35,000 median of the state’s bachelor’s degree graduates.⁴⁰

For more details, consider Table 6, which shows the first-year wages by program of students who have completed apprenticeships. Note that except for the low-paying apprenticeship in early childhood education, the median wages of every other apprenticeship program listed exceeds the median earnings of associate degree graduates and even bachelor’s degree graduates, often by tens of thousands of dollars.

Table 5. Demographic Characteristics of Apprentices in the 2010 Enrollment Cohort

	All	Men	Women
Age			
16–20 Years Old	13.4% (2,871)	13.9% (2,721)	7.9% (146)
21–39 Years Old	69.2% (14,827)	70.0% (13,703)	59.7% (1,105)
At Least 40 Years Old	17.5% (3,750)	16.1% (3,152)	32.4% (600)
Average Age (Years)	30.7	30.3	34.9
Gender			
		91.4% (17,892)	8.6% (159)
Race/Ethnicity			
White	67.6% (14,484)	68.6% (13,428)	56.7% (1,050)
Black	14.4% (3,085)	13.5% (2,643)	23.0% (426)
Hispanic	16.6% (3,557)	16.6% (3,249)	17.4% (322)
Other Race	1.4% (300)	1.3% (254)	2.9% (54)
Education			
Less Than High School	0.5% (107)	0.5% (98)	0.3% (6)
Some High School	6.1% (1,307)	6.2% (1,214)	4.3% (80)
High School Graduate	83.2% (17,826)	82.8% (16,208)	86.9% (1,609)
Postsecondary	10.3% (2,207)	10.4% (2,036)	8.5% (157)
Veteran			
	9.2% (1,971)	9.7% (1,899)	3.1% (57)
Prisoner at Enrollment			
	11.0% (2,357)	9.3% (1,820)	29.0% (537)
Sample Size	21,426	19,575	1,851

Note: The number of individuals is listed in parentheses. The 2010 apprenticeship enrollment cohort comprised 21,426 individuals (19,575 men and 1,851 women; totals from the table may not be exact due to rounding). Note that these numbers reflect a representative sample of apprentices, unlike the comprehensive tallies presented earlier in the report.

Source: Adapted from Debbie Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, Mathematica Policy Research, July 25, 2012, Table III.1, https://wdr.doleta.gov/research/fulltext_documents/etaop_2012_10.pdf. The study, prepared for the US Department of Labor Employment and Training Administration, is based on Registered Apprenticeship Partners Information Data System, which covers the registered apprenticeship program in 32 states for 2000–10.

Table 6. First-Year Wages of Students Who Have Completed an Apprenticeship Program in Florida, 2014

Program Name	Number of Completers	Median First-Year Wage
Heavy-Equipment Operation	15	\$95,000
Elevator Constructor Mechanic	16	\$88,000
Millwright	17	\$84,000
Plumbing Technology or Plumber	27	\$64,000
Firefighter	31	\$58,000
Air Conditioning, Refrigeration, and Heating Technology	113	\$55,000
Structural Steel Work—APPR	69	\$51,000
Electrician	199	\$51,000
Heavy-Equipment Mechanics	40	\$50,000
Sheet Metal Fabrication Technology	22	\$48,000
Heating, Air Conditioning, Ventilation, and Refrigeration Maintenance Technology or Technician	32	\$48,000
Plumbing Technology	120	\$47,000
Electrician	53	\$46,000
Carpentry	17	\$41,000
Pipefitting or Pipefitter and Sprinkler Fitter	18	\$41,000
Machining	13	\$37,000
Bachelor’s Graduates (Florida Universities)	63,278	\$35,000
Associate of Arts	54,954	\$29,000
Early Childhood Education	342	\$23,000

Note: Some apprenticeships are offered by Florida community colleges; others are through the district technical centers. Source: Based on data files supplied to College Measures by the Florida Department of Economic Opportunity, <https://www.air.org/center/college-measures>.

Florida also tracks apprentices who are employed in the state. Apprentices in early childhood education have the lowest percentage employed, but still over 70 percent are found in the labor market. Employment rates are over 90 percent in a dozen fields shown in Table 6 and over 80 percent in the remaining fields.⁴¹

Similarly, data from apprenticeship programs in Tennessee reveal family-sustaining wages and placement rates for apprenticeship completers that would make most community college academic programs envious, as shown in Table 7.

Evidence shows that these patterns are found across the country. In the state of Washington, for example,

94 percent of completers were employed during the third quarter after leaving the program, and their annual earnings were around \$75,000.⁴² Data from Michigan also show strong wage results. According to a recent report, the average starting wage of people who registered for apprenticeship programs was around \$14 per hour. Wages increased to over \$20 per hour among students who completed their programs.⁴³ Nationwide, according to the DOL, 87 percent of apprentices are employed after they finish their programs, with an average starting salary of over \$50,000.⁴⁴

However, two caveats are in order. First, as noted above, completion rates for apprenticeship programs

Table 7. First-Year Wages and Employment Rate of Students Who Have Completed an Apprenticeship Program at Selected Tennessee Colleges of Applied Technology, 2016

Tennessee College of Applied Technology at	Field of Apprenticeship	Placement	Average of Median 2016 Earnings
Murfreesboro	Industrial Electrical Maintenance	84%	\$54,678
McMinnville	Automotive Technology	89%	\$35,345
Memphis	Electronics Technology	70%	\$49,387
Pulaski	Industrial Maintenance Technology	86%	\$45,955
Jackson	Industrial Electricity	71%	\$63,540
Knoxville	Industrial Electricity	83%	\$52,720
Morristown	Industrial Electricity	95%	\$52,720
Newbern	Computer-Aided Design Technology	90%	\$52,197
McKenzie	Industrial Maintenance Technology	73%	\$47,295
Paris	Industrial Maintenance Technology	92%	\$49,010
Shelbyville	Industrial Electricity	84%	\$40,025
Whiteville	Industrial Maintenance Technology	N/A	\$50,040
Livingston	Automotive Technology	86%	\$35,345

Note: The table displays selected Tennessee Colleges of Applied Technology (TCAT) apprenticeship programs, though these amounts are comparable to all other TCAT programs. Placement refers to the employment rate of program completers at a job within three months after program exit.

Source: Data are derived from a review of the website of each of the TCAT. See College System of Tennessee, “Colleges of Applied Technology,” <https://www.tbr.edu/institutions/colleges-applied-technology>.

now hover around 50 percent, and the wages in Table 7 are for completers. Nonetheless, the Mathematica study found that apprenticeship *participants* (not necessarily completers) still enjoyed large earnings gains after they exited. In general, how non-completers fare is relatively unknown—but we know from other education and training programs that non-completers usually enjoy far lower earnings benefits than completers. Second, the earnings premium for apprenticeship participants tends to narrow by the ninth year after enrollment.⁴⁵ Further, according to federal data, the rate at which the wages of bachelor’s degree recipients grow is faster than the rate of wage growth for students who

completed sub-baccalaureate programs. Still, even if college graduates’ earnings catch up or surpass apprentices’ earnings, on average, the apprentices who have completed their programs are solidly in the middle class and making family-sustaining wages.

International Comparisons

International comparisons between apprenticeships in the US and other developed economies can help highlight how different and limited the nation’s approach is—and can help show what might be

Table 8. Occupations with the Most Active Apprentices in the United States, 2016–17

Occupation	Percentage of Total Apprentices
Electrician	20.5%
Plumbers, Pipefitters, and Steamfitters	11.4%
Carpenter	9.9%
Construction Laborers	6.9%
Heavy and Tractor-Trailer Truck Drivers	3.9%
Electrical Power-Line Installers and Repairers	3.5%
Sheet Metal Worker	3.3%
Structural Iron and Steel Workers	2.6%
Drywall and Ceiling Tile Installers	2.2%
Roofer	1.9%
Top 10 Occupations as a Percentage of All Apprenticeships	66.1%

Source: Employment and Training Administration, “Registered Apprenticeship National Results FY 2016,” US Department of Labor, https://doleta.gov/oa/data_statistics.cfm.

possible in the future. Indeed, to the extent that the occupations for which apprenticeships are geared expand beyond blue-collar trades, community colleges might find new areas in which they could expand. For example, many of the occupations found in other countries use apprenticeship training programs that require less expensive equipment and are more open to women than the occupations that American apprenticeships are typically geared to.

As we look at these data, a word of warning is in order: While the most avid advocates of apprenticeships often cite Switzerland and Germany as examples of what a strong national apprenticeship program could look like, international comparisons must be considered in light of different histories, economies, and cultures.

With this warning in mind, we note that apprenticeships in other advanced economies indeed attract students with a wider range of educational attainment than in the United States. For example, as we saw in

Tables 4 and 5, while most participants (between 77 percent and 83 percent) in registered apprenticeship programs in the US have graduated from high school, we do not know what percentage of them would have been qualified to enroll in a selective college. By contrast, a 2010 report for the Apprenticeship Ambassadors Network, which compared the apprenticeship system in eight European countries, found that 70 percent of English apprenticeship candidates held a General Certificate of Education Advanced Level (A Level), the highest rate of all the countries in the study.⁴⁶

This means those English apprenticeship candidates have not only graduated from a secondary school but also, more importantly, completed A-Level courses, the most rigorous classes in English high schools. In England, students who have passed A-Level courses would usually be able to enroll in fairly selective universities. In effect, this means that these students are choosing an apprenticeship over a

Table 9. Sectors with the Most Apprentices in England, 2007–08

Sector	2007–08
Customer Service	13%
Construction	13%
Business Administration	12%
Hairdressing	11%
Children’s Care Learning and Development	10%
Hospitality and Catering	9%
Engineering	9%
Vehicle Maintenance and Repair	8%
Health and Social Care	8%
Retail	8%

Source: Hilary Steedman, “The State of Apprenticeship in 2010, International Comparisons: Australia, Austria, England, France, Germany, Ireland, Sweden, Switzerland,” London Centre for Economic Performance, 2010.

university education. Indeed, some of England’s top institutions of higher education are now advising students with strong academic credentials to consider apprenticeships and other forms of technical education instead of following the usual university route.⁴⁷ This may also be due to the high fees at British universities, which in 2017 had the highest average tuition level of any developed country.⁴⁸

Another comparison we have previously noted is that apprenticeships in the US currently are concentrated in a relatively narrow band of occupations, almost all in construction or manufacturing. In fact, almost two-thirds of all active apprentices can be found in just 10 occupations (Table 8).

In contrast, in the next three tables we see that England, Germany, and Switzerland have a far broader range of occupational categories in which apprentices are being trained—many being areas of study offered at American community colleges, such as customer service, sales, and business administration. These careers, along with others in more technical fields, show up as areas in which many apprenticeships are found abroad, in sharp contrast to the narrower focus of apprenticeships in the US.

Tables 10 and 11 contain similar information but report apprenticeships by specific occupations rather than by employment sector due to data availability. Therefore, the percentages appear smaller than those found in Table 9.

These international comparisons are presented to aid policy-makers as they rethink some of the current practices that limit the expansion of apprenticeship programs to train American workers for the evolving labor market.⁴⁹ Still, given the cultural, regulatory, and historical differences limiting the transferability of practices found in other countries, it would be a fool’s errand to expect that the US could directly copy what other nations do. Germany and

Switzerland, which train a large share of their labor force through apprenticeships, have a rich culture of vocational education, which is missing in both the US and UK.⁵⁰

In addition, K–12 education systems vary remarkably by country, which naturally affects how and who decides to enroll in apprenticeship programs. In Germany, for example, “tracking” begins early (usually around the age of 10 or 12), and the courses that specific groups of students take throughout high school will typically determine what postsecondary education opportunities will be available to them.⁵¹ Since Germany’s tracking system steers many students into the apprenticeship programs, Germany’s apprenticeship sector is unsurprisingly more robust than what is found in the US, and the US could not directly replicate it without other significant changes to the US education system.

Moreover, job classifications might capture different occupations across countries, leading to inconsistent measurements. For example, nursing is a degree program in the UK but an apprenticeship program in Germany. In addition, the international data presented in these tables are nearly a decade old, and

Table 10. Occupations with the Most Apprentices in Germany, 2006–07

Occupation	Percentage of Total Apprentices
HGV Mechanic (<i>Kraftfahrzeugmechatroniker/in</i>)	4.8%
Retail Sales (<i>Kaufmann/frau im Einzelhandel</i>)	4.8%
Office Administration (<i>Bürokaufmann/frau</i>)	3.8%
Business Administration (<i>Industriekaufmann/frau</i>)	3.3%
Mechanical Engineering (<i>Industriemechaniker/in</i>)	3.3%
Cook (<i>Koch/Köchin</i>)	2.7%
Medical Administration (<i>Medizinische Fachangestellte</i>)	2.6%
Hairdressing (<i>Friseur/in</i>)	2.5%
Wholesale and Export Sales (<i>Kaufmann/frau im Gross- und Aussenhandel</i>)	2.5%
Sales (<i>Verkäufer/in</i>)	2.5%
Top 10 Occupations as a Percentage of All Apprenticeships	32.8%

Source: Hilary Steedman, “The State of Apprenticeship in 2010, International Comparisons: Australia, Austria, England, France, Germany, Ireland, Sweden, Switzerland,” London Centre for Economic Performance, 2010.

Table 11. Occupations with the Most Apprentices in Switzerland, 2009–10

Occupation	Percentage of Total Apprentices
Office Administration (<i>Kauffrau/-mann</i>)	15.4%
Retail Sales (<i>Detailhandelsfachfrau/-mann</i>)	8.3%
Electrical Installation (<i>Elektromonteur/in</i>)	3.3%
Cook (<i>Koch/Köchin</i>)	3.1%
Health Occupation (<i>Fachangestellte/r Gesundheit</i>)	3.0%
Engineering (<i>Polymechaniker/in</i>)	2.8%
Hairdressing (<i>Coiffeur/Coiffeuse</i>)	2.7%
Childcare or Care Occupations (<i>Fachfrau/-mann Betreuung</i>)	2.3%
Joiner or Woodworker (<i>Schreiner/in</i>)	2.2%
Vehicle Maintenance (<i>Automechaniker/in</i>)	2.2%
Top 10 Occupations as a Percentage of All Apprenticeships	45.3%

Source: Hilary Steedman “The State of Apprenticeship in 2010, International Comparisons: Australia, Austria, England, France, Germany, Ireland, Sweden, Switzerland,” London Centre for Economic Performance, 2010.

many new occupations, such as those in tech-related fields, have only been developed in the past few years.

As a final example, some countries might have over-licensed their economy to the point that workers need to go through apprenticeship programs for occupations that would not require apprenticeship training in other countries. In Germany, apprenticeships are required for many retail and sales occupations.⁵² In other countries, such as the US, employers do not require apprenticeship programs for these occupations and view a high school education as a sufficient qualification for a worker to be employed in those fields.

Before the US hastily tries to adopt large apprenticeship programs, it might be worth reflecting on the economic lessons from other countries and how, in some cases, apprenticeship programs have created a potential barrier to opportunity rather than a ladder to achieving it.

Can Community Colleges Become a More Viable Option for Apprentices and Employers?

The nation's public community colleges already play a large role in providing career and technical training.⁵³ However, today they offer few apprenticeship opportunities—less than a third of community colleges nationwide have joined the network of employers, labor groups, and associations working to support registered apprenticeship programs under the DOL's Registered Apprenticeship-College Consortium (RACC).⁵⁴

Nevertheless, with the right strategies in place, community colleges may be able to provide the widest on-ramp to expanding apprenticeships. But to do so they must first figure out how they can become better suited as partners in apprenticeship programs. And the place to start is by considering how they can best address the cultural, structural, organizational, and environmental obstacles that stand in the way of even the most committed institutions.

Cultural and Structural Challenges. Although community colleges offer many courses and credentials in career and technical fields meant to train

students for immediate employment, they are primarily degree-granting institutions. Their culture frequently emphasizes general education in the liberal arts and related fields as part of their commitment to providing the first two years of a traditional college education. Both tangible rewards and public recognition come from their success at graduating students with an associate degree or facilitating their transfer to a four-year institution.

Even if this “junior college” norm is important across campuses, community colleges can be made flexible enough to run apprenticeship programs, granting academic credits to active apprentices.⁵⁵ While specific details on which institutions are offering credit for which apprenticeship programs are sparse and difficult to find, one RACC survey lists about 340 college members, generally community colleges, that have agreed to work through a recognized third-party evaluator (e.g., the American Council on Education) to facilitate the transfer of registered apprenticeship completion certificates into college credit.⁵⁶ At those schools, apprentice completers can use these credits to help complete associate or even bachelor's degree programs.⁵⁷

Community colleges can also serve apprenticeship programs in a variety of other ways, including as direct training providers (such as Honolulu Community College, Ivy Tech, and Clackamas Community College); as state apprenticeship leads (such as South Carolina's Apprenticeship Carolina and Georgia WorkSmart); or as registered apprenticeship sponsors (such as Harper College and Gaston College).⁵⁸ These community colleges have formed creative and unique partnerships with employers in their local area to offer high-quality apprenticeship programs to students.

While community colleges may state their willingness to bestow academic credit to apprentices, linkages between community colleges and apprenticeship programs are nonetheless uncommon. Of the nearly 340 member colleges of RACC, only 22 are registered apprenticeship program sponsors—that is, the institution participates as a partner in a registered apprenticeship program. The other 318 members are primarily providing apprentices an accelerated pathway to earn an associate or bachelor's degree or “strengthening relationships” among registered

apprenticeships and postsecondary institutions. And while all apprentices engage in some form of related instruction, only a small proportion fit even today's broad description of a "traditional college student."⁵⁹

The distance between colleges and employer-sponsored apprenticeships is understandable given both the history and structure of apprenticeships. Apprenticeship programs require training that primarily takes place in the workplace, not the college classroom. Formal apprenticeship programs frequently entail, as is the case in Virginia (Table 1), 2,000 hours of supervised on-the-job training and relatively minimal hours of related classroom instruction for each year of apprenticeship. Community college leaders must support apprenticeship programs with a willingness to have most of the training done by experts outside the supervisory structure of the campus.

Similarly, community colleges run headlong into another obstacle in offering apprenticeship programs: inflexible credit requirements for degree programs. With some variation across states and programs, an associate degree requires 60 total credits, usually obtained by completing 20 three-credit courses. Meanwhile, even within existing associate degree programs in career and technical fields, community colleges often require at least nine of those 60 credits to be in general education fields.

These credit requirements do not map well with apprenticeship programs. Registered apprenticeships have, on average, 144 hours of related training per year, which roughly translates into three courses worth three credits each. Yet the in-classroom component of apprenticeship programs are typically not in general education fields but in subjects directly related to the apprentice's on-the-job training. And, in most cases, apprenticeships run four years or longer, meaning the requisite in-classroom coursework totals on a per-credit basis to roughly one full year of community college coursework in an associate degree program.

Therefore, colleges willing to facilitate the successful transfer of apprenticeship training into college credits must offer flexible curricula that can recognize the on-the-job training apprentices receive during their program as part of the associate degree

program, without increasing the number of credits needed for a degree. If not, apprentices will likely be unable to take full advantage of their extensive training for college credit.

The bottom line: Integrating the core on-the-job training of apprenticeship programs with traditional course offerings is challenging, even though community colleges already conduct a substantial amount of career and technical education within existing degree and certificate programs.

Finally, in addition to reconfiguring credit and degree requirements, community colleges must recognize a more fundamental imperative: Starting an apprenticeship program requires significant institutional resources and effort. No matter how attractive it may be for students to earn real money while they learn, apprentices must be able and willing to commit themselves to multiple years of classroom instruction coupled with many hours of hands-on training, culminating with passing rigorous national certification exams.

Committed community colleges must therefore undertake significant effort in preparing students for the rigor of an apprenticeship, perhaps via pre-apprenticeship or other remedial programs. Add in the hard work involved for administrators in organizing and applying for the registration of the programs while also recruiting local industries to participate in them, which is not cheap. Plus, dedicated staff must be hired and trained in relevant classroom work and industry expertise, while classrooms must be equipped with up-to-date and expensive instructional capital. Still, as we saw earlier, when apprenticeship programs work well, the payoff for students in wages and employment security is substantial.

Organizational and Environmental Challenges.

Two of the most prominent and successful apprenticeship programs in the country, located at Central Piedmont Community College and Chattanooga State Community College, underscore another important challenge for community colleges: the corporate environment in close proximity to the college campus. In both cases, the well-known programs at these two colleges benefit from the close proximity of

large German companies with strong historical roots with the German apprenticeship system.⁶⁰ This highlights the important advantage of having large, usually European-based companies near apprenticeship providers.

At Central Piedmont Community College, the apprenticeship program leads to an associate degree in mechatronics, which is directly relevant to the needs of the nearby Siemens plant. At Chattanooga State Community College, apprentices enroll in a three-year program that includes five semesters of academic and practical training paired with four semesters of on-the-job training at Volkswagen, BMW, and Bosch plants.

However, not all community colleges with successful apprenticeship programs have nearby companies with German apprenticeship experience. For example, Michigan's Kellogg Community College has four-year apprenticeship programs in conjunction with American manufacturers with 8,000 hours of paid training and at least 576 hours of classroom courses.⁶¹ Several other examples of colleges working with local employers or sectors can be cited. But the fundamental point is that understanding the nearby corporate environment and having the capacity—and willingness—to respond quickly and entrepreneurially to employers' needs is critical to both the proper framing and operation of a successful apprenticeship program.

Community colleges located near the small number of US firms that have over 500 employees have the best opportunity to start and maintain apprenticeship programs similar to those found today at a handful of colleges.⁶² After all, only large firms can afford the \$160,000–\$170,000 that Siemens estimates it must invest per apprentice in its 42-month program.⁶³ On the other hand, 90 percent of the over 5.7 million companies in the US are much smaller in size, with fewer than 20 employees; another 9 percent (516,000 businesses) have between 20 and 100 employees. Half of the nation's workforce is thus employed by the small- and medium-sized businesses (those with fewer than 500 employees) that commonly report trouble finding trained workers for the jobs they advertise. Consequently, many of these businesses are in dire need for skilled workers who can be trained through the grants

and subsidies made possible by some states and the Obama and Trump administrations.

In effect, community colleges, whether in small towns, in rural settings, or where large businesses are few or missing, also have an opportunity to develop apprenticeship programs if focused on the specific business needs of their local communities. Clearly, apprenticeship programs cannot exist without intense and often expensive employer-college involvement—a challenge that community colleges find among the hardest challenges they face.⁶⁴

Costs, Government Subsidies, and Solutions.

The transformation of community colleges into a major offerer of apprenticeships is in part tied to the availability of government subsidies. But, as is common with many workforce programs, the flow of government money supporting apprenticeship or other training initiatives is often spotty and uncertain.

State Policy. States vary widely in their subsidies, and federal support is not well-coordinated, well-known, or sufficient.⁶⁵ Therefore, along with employers and labor groups, community college leaders must be prepared to advocate at the local, state, and federal levels for increased and continuous support for apprenticeship programs.

Successful advocacy has made subsidies available to employers in both Florida and Texas for training costs through school districts and community colleges.⁶⁶ New Jersey has provided \$8,500 per participant to train students in the Youth Transitions to Work program and subsidies to coordinators to bolster local apprenticeship programs.⁶⁷ Although the practice may be economically questionable, other states have focused their support on specific industries, such as manufacturing, plastics, and plastic-related trades in Connecticut; high technology jobs in Iowa; and childcare and the early education industry in Kansas.

One example worth emulating is Apprenticeship Carolina, a division of the South Carolina Technical College System. This is among the nation's most successful apprenticeship organizations, with nearly 920 programs and 14,500 active apprentices. Over

the past decade it has served almost 26,900 apprentices by providing apprenticeship consultants free of charge to employers and guiding them through the entire startup process, from initial development to registration with the national registered apprenticeship system.⁶⁸ With \$1 million per year from the state budget, along with annual tax credits to employers of \$1,000 per apprentice, it has grown sixfold in registered apprenticeship programs and fivefold in apprentices during its 10 years of existence. According to the Urban Institute's Robert Lerman, a specialist in apprenticeships, the annual cost to the state for each apprentice, including the tax credit, has been only about \$1,250 each calendar year.⁶⁹

In effect, interested states can leverage their community colleges and help launch apprenticeship programs for a fraction of what it costs to educate the same person as a full-time student in the same college. Put another way, apprenticeships in the US are currently funded by government sources at approximately \$100–\$400 *per apprentice*, while annual federal, state, and local taxpayer subsidies *per student at community colleges* are approximately \$11,400. Indeed, according to the study of 10 states Mathematica Policy Research completed for the DOL's registered apprenticeship program, the estimated benefit over the medium term of an apprenticeship is \$58,000 *more* in benefits per apprentice than its cost to train the apprentice.⁷⁰ As they look for a way to educate apprentices along with their other students, this is an important argument for community college leaders to make to state policymakers.

Federal Policy. As the above example from South Carolina makes evident, a successful apprenticeship program can be mounted at a relatively low cost. Nonetheless, an important issue for community colleges is the extent to which existing federal programs can be leveraged to support local apprenticeship programs. Community college administrators can begin to acquaint themselves with the options available by turning to the DOL primer, "The Federal Resources Playbook for Registered Apprenticeships," which briefly identifies the various programs offered by federal agencies that could be tapped to support apprenticeship programs.⁷¹

Title IV of the Higher Education Act, which provides financial aid for students attending accredited postsecondary institutions, is by far the most important potential support for community colleges that wish to sponsor or support apprenticeship programs. Many technical issues are best left to student-aid experts on college campuses. But, briefly, under existing regulations, apprentices who qualify for federal Pell Grants can receive funding to cover all or most of the cost of tuition, fees, books, and supplies for the technical, in-classroom instruction portion of an apprenticeship (as long as that instruction is part of an eligible academic program). An immediate issue that must be attended to is the extent to which the credit and contact hour requirements of Pell Grants match the typical structure of apprenticeships. In addition, if the related training component of the apprenticeship is too limited in terms of contact hours, it may not justify the costs to the community college of setting up an apprenticeship program, as the tuition and fees raised may not cover the costs involved in starting and maintaining the apprenticeship program.

Other sources of federal money exist that can support apprenticeship programs as well. For instance, the federal Workforce Investment and Opportunity Act (WIOA) provides money to subsidize job-related instruction costs. Similarly, veteran apprentices can use their GI Bill education benefits to pay for all or most of their tuition and fees if they are enrolled in credit-bearing instruction as part of the apprenticeship (i.e., the in-classroom component). While Title IV benefits are today limited to higher education institutions, both WIOA and GI Bill benefits can flow to many different types of providers of apprenticeship training, including private companies or community-based nonprofits.

The federal role in apprenticeship programs will continue to evolve during the Trump administration, as was previewed by the May 2018 final report of the White House Task Force on Apprenticeship Expansion.⁷² The report's wide-ranging policy recommendations predominantly focused on ways to encourage private businesses—not necessarily community colleges—to offer apprenticeships. As more actors begin offering apprenticeship programs, it will remain

important that appropriate accountability guidelines are in place to ensure the quality of those programs. However, it is unlikely that a one-size-fits-all federal accountability policy is the best strategy for achieving this. Private businesses may be discouraged from offering apprenticeships if requirements for doing so are too onerous. Instead, policymakers might use the market as a guide for quality apprenticeships, where unsuccessful apprenticeship programs are shuttered at the companies that go out of business. Since businesses, which are required to pay apprentices, have a large stake in ensuring their apprentices are productive and learn necessary workplace skills, there might already be necessary incentives in place to ensure that apprentice programs are optimal and efficient.

Interested and committed community college leaders are key to increasing funding for apprenticeship programs. If apprenticeships are to play a significant role in providing skills to the millions of workers needed by companies facing underqualified or poorly trained applicants, these leaders must lobby the federal government to do much more than it is doing at present. If the US were to support apprenticeships at the level Britain does, it would have to invest nearly \$8.5 billion, not the mere millions that Presidents Obama and Trump have allocated. But while much money is needed to adequately inform today's employers, students, and colleges, who are mostly unaware about internship programs and why they matter to them, their local economies, and the nation, there are cheaper and less burdensome ways to support expanding internship programs.

For example, firms could be allowed an exemption from minimum wage regulations, and employers could receive relief from certain time-consuming and costly registration requirements. In addition, more community colleges could be incentivized to come to the table by the waiving of some of the bachelor's degree requirements around credit or contact hours for Pell Grants so the students could have their 144 hours of in-classroom instruction covered. This would help ease the burden on apprentices making less than minimum wage.

Furthermore, given the lower cost apprenticeships represent for states and the federal government,

especially when compared to a community college education, interested college administrators should advocate for extending Pell Grants to permit community colleges to offer apprenticeship programs with local industries as an alternative career pathway to an accredited degree. Federal and state tax credits for companies establishing apprenticeship programs with local community colleges should likewise be pursued to help defray some of the costs participating employers must bear.⁷³

Interested and committed community college leaders are key to increasing funding for apprenticeship programs.

Perhaps most importantly, what apprenticeship programs need most to show up on the radar of employers, colleges, students, and policymakers is a broadening of the programs now available in manufacturing and blue-collar trades to include occupations in areas of high demand—such as information technology, advanced manufacturing, health care, and other specialized fields—where employers are finding it difficult to find qualified workers. As these fields open up to apprentices, we should expect employers and the states to push Congress to rationalize the registered apprenticeship system by simplifying the registration process, making it better known among students and employers, and increasing access to Pell Grants to provide additional support while apprentices are enrolled in required courses. But to the extent this last proposal begins to be implemented, community colleges could find themselves in competition with many other organizations for the available funds.

Competition from Private-Sector Providers.

Today, apprenticeships are only a small slice of the nation's career and technical training efforts. But, given policymakers' interest and improving economic conditions, the number of apprenticeships will likely grow—and the range of occupations for which apprenticeships can be created will likely also expand.⁷⁴ As community college leaders consider the role they will play in this changing landscape, they need to consider what policy changes they should advocate for among their respective states and the federal government and what actions they must take internal to their campus, in their immediate locus of control.

Whether community colleges sponsor apprenticeship programs or let external entities do it for them, interested institutions *must* become useful intermediaries between employers and potential apprentices by helping recruit, select, and prepare them for the apprenticeship, including providing, as needed, pre-apprenticeship remedial courses. This is perhaps the most integral component to fashioning successful apprenticeship partnerships. Community colleges already have access to large swaths of potential apprentices within their student bodies, and they already offer existing remedial and counseling services. And once students become active apprentices, colleges can do much more than educate them in the classroom by providing career and personal counseling and training apprentices in the soft skills necessary for success in the workplace, including communication competencies, teamwork skills, and the ability to lead and follow. Most employers are not poised as well to offer these services to apprentices.

Granted, most community colleges do not provide these services at present (though the minority of community colleges listed above with successful apprenticeship partnerships do). While the window for community colleges to expand their apprenticeship programs now seems to be wide open, if community colleges do not fill these aforementioned roles, the window could slam shut. One recent report, "Making Apprenticeships Work," details how emerging private-sector actors, called apprenticeship

service providers (ASPs), can limit and perhaps even supplant the role of community colleges as apprenticeship sponsors or intermediaries.⁷⁵

While not necessarily well-known in the United States at present,⁷⁶ ASPs have exploded in the United Kingdom, where they establish, manage, and deliver apprenticeship programs on behalf of employers. There are over 1,500 of them, and the vast majority of them are private companies. ASPs do what community colleges should be able to do well: recruit candidates, screen them, and match them to employers. In addition, they support and mentor apprentices while providing them with the related instruction—all in all, roles that should be the natural comparative advantage for community colleges. Moreover, ASPs manage contacts with government, relieving companies of that often onerous task. Given the administrative burdens of registering and managing registered apprenticeships in the US, to the extent to which private companies are prepared to take on these responsibilities, community colleges may find themselves at a disadvantage.

Despite the challenges facing them and the threat that ASPs could represent, community colleges are central to how this nation now delivers its career and technical education. In 2016 alone, they granted over 600,000 certificates—many of them designed to train students for jobs in fields such as health care, information technology, and manufacturing—and they awarded over 820,000 associate degrees, many technical and career oriented.

Nevertheless, if community colleges want to play a prominent role in the proliferation of apprenticeships, then they *must* be amenable to reforming themselves internally, so as to serve fully the needs of both apprentices and employers.

Given their central role in workforce training, many community colleges are already feeling pressure to expand their roles through apprenticeships due to the recent national attention as a better way of moving students into the workplace. With the right regulations and incentives in place and a leadership focused on students' workplace success, community colleges can keep the window of opportunity from being narrowed by private-sector firms that see opportunities

in the growing flow of dollars to support apprenticeships. But it remains to be seen whether community colleges are nimble and willing enough to keep providing value for students seeking other pathways to good careers and high wages.

About the Authors

Jorge Klor de Alva is president of Nexus Research and Policy Center and chairman of the board of the University of Advanced Technologies. **Mark Schneider** is a former visiting scholar in education policy studies at AEI, former vice president of the American Institutes for Research, and former president of College Measures.

© 2018 by the American Enterprise Institute. All rights reserved.

The American Enterprise Institute (AEI) is a nonpartisan, nonprofit, 501(c)(3) educational organization and does not take institutional positions on any issues. The views expressed here are those of the author(s).

Notes

1. Gallup and Strada Education Network, *Why Higher Ed? Strada and Gallup Examine Consumers' Top Motives for Choosing Their Educational Pathways*, January 2018, http://stradaeducation.gallup.com/reports/226457/why-higher-ed.aspx?g_source=link_usafunds&g_campaign=item_211634&g_medium=copy; and Kevin Eagan et al., *The American Freshman: National Norms Fall 2016*, Cooperative Institutional Research Program at the Higher Education Research Institute, University of California, Los Angeles, 2017, www.heri.ucla.edu/monographs/TheAmericanFreshman2016.pdf.

2. Veronica Minaya and Judith Scott-Clayton, "Labor Market Outcomes and Postsecondary Accountability: Are Imperfect Metrics Better Than None?" (working paper, National Bureau of Economic Research, Cambridge, MA, 2016), www.nber.org/papers/w22880.

3. Jeffrey J. Selingo, "Americans Love Higher Education, Just Not Their Universities," *Washington Post*, July 18, 2017, www.washingtonpost.com/news/grade-point/wp/2017/07/18/americans-love-higher-education-just-not-their-universities/; US Department of Labor Bureau of Labor Statistics, "The Employment Situation—February 2018," news release, March 9, 2018, www.bls.gov/news.release/pdf/empstat.pdf; and Mark Schneider and Matthew Sigelman, *Saving the Associate of Arts Degree: How an A.A. Degree Can Become a Better Path to Labor Market Success*, American Enterprise Institute, January 23, 2018, www.aei.org/publication/saving-the-associate-of-arts-degree-how-an-a-a-degree-can-become-a-better-path-to-labor-market-success/.

4. Eric M. Seleznow, "The U.S. Department of Labor's Registered Apprenticeship Program Works for Employers and Workers, Jobs for the Future," November 17, 2017, www.jff.org/blog/2017/11/17/us-department-labors%C2%A0registered-apprenticeship-program-works-employers-and-workers.

5. Debbie Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, Mathematica Policy Research, July 25, 2012, https://wdr.doleta.gov/research/fulltext_documents/etaop_2012_10.pdf; and Kevin Hollenbeck, "State Use of Workforce System Net Impact Estimates and Rates of Return," W. E. Upjohn Institute for Employment Research, November 2008, <http://research.upjohn.org/cgi/viewcontent.cgi?article=1006&context=confpapers>.

6. Paul Fain, "New Money and New Players on Apprenticeships," *Inside Higher Ed*, June 14, 2017, www.insidehighered.com/news/2017/06/14/white-house-apprenticeship-push-will-include-funding-and-focus-alternative-providers.

7. Ian Kullgren and Marianne Levine, "Trump Signs Executive Order on Apprenticeships," *Politico*, June 15, 2017, www.politico.com/story/2017/06/15/trump-apprenticeship-executive-order-239590.

8. US Department of Labor, "U.S. Secretary of Labor Acosta Announces Membership of Task Force on Apprenticeship Expansion," news release, October 16, 2017, www.dol.gov/newsroom/releases/osec/osec20171016.

9. Apprenticeship Expansion Task Force, "Task Force on Apprenticeship Expansion Final Report to the President of the United States," May 10, 2018, <https://www.dol.gov/apprenticeship/docs/20180510-task-force-meeting-final-report.pdf>.

10. National Center for Education Statistics, "Digest of Education Statistics Table 301.10," Institute of Education Sciences, 2015, https://nces.ed.gov/programs/digest/d16/tables/dt16_301.10.asp?current=yes.

11. Mark Schneider and Rooney Columbus, *Degrees of Opportunity: Lessons Learned from State-Level Data on Postsecondary Earnings Outcomes*, American Enterprise Institute, October 2017, <http://www.aei.org/publication/degrees-of-opportunity-lessons-learned-from-state-level-data-on-postsecondary-earnings-outcomes/>.

12. This is a condition of education: number of degrees and certificates conferred by postsecondary institutions and percentage change, by control of institution and level of degree, for academic years 1994–95, 2004–05, and 2014–15. See Institute of Education Sciences, "Postsecondary Certificates and Degrees Conferred," National Center for Education Statistics, January 2018, https://nces.ed.gov/programs/coe/indicator_cts.asp. In this report, we use the term "college" without regard to the tax status of the institution. As the National Center for Education Statistics publication makes clear, public community colleges are the nation's main producers of certificates and associate degrees, awarding about two-thirds of certificates and 80 percent of associate degrees. For-profit institutions produce the lion's share of the remaining credentials.

13. Consider President Trump's call for more vocational training in his 2018 State of the Union message and his subsequent

comment about renaming community colleges vocational schools, as noted in Ashley A. Smith, “Less Community, More Vocational,” *Inside Higher Ed*, February 2, 2018, www.insidehighered.com/news/2018/02/02/trump-calls-converting-community-colleges-vocational-schools.

14. Anthony P. Carnevale et al., “Certificates: Gateway to Gainful Employment and College Degrees,” Center on Education and the Workforce, Georgetown University, June 2012, <https://cew.georgetown.edu/cew-reports/certificates/>.

15. For example, Walter Bumphus, president of the American Association of Community Colleges, has “agreed to work with the Labor Department on a plan for scaling up apprenticeship programs.” See Ellie Ashford, “Acosta Calls for National Apprenticeship Programs,” *Community College Daily*, August 11, 2017, www.ccdaily.com/2017/08/labor-secretary-calls-national-apprenticeship-programs/; and WorkforceGPS, “The Role of Community Colleges in Registered Apprenticeship,” US Department of Labor, Employment and Training Administration, <https://apprenticeshipusa.workforcegps.org/resources/2017/04/10/11/14/The-Role-of-Community-Colleges-in-Registered-Apprenticeship>.

16. For a useful primer on apprenticeships, see Benjamin Collins, “Apprenticeship in the United States: Frequently Asked Questions,” Congressional Research Service, January 29, 2016, <https://fas.org/sgp/crs/misc/R44174.pdf>. See also US Department of Labor, “Frequently Asked Questions About the Apprenticeship Program,” www.dol.gov/featured/apprenticeship/faqs.

17. US Department of Labor, “History and Fitzgerald Act,” www.doleta.gov/oa/fitzact.cfm.

18. There are over 1,000 occupations recognized by the Department of Labor. See US Department of Labor, Employment and Training Administration, “Available Occupations,” www.doleta.gov/OA/occupations.cfm.

19. Credential Engine, “Counting US Secondary and Postsecondary Credentials,” April 2018, http://credentialengine.org/content/articles/Counting_US_Secondary_and_Postsecondary_Credentials_April_2018.pdf.

20. See Robert I. Lerman, “Proposal 7: Expanding Apprenticeship Opportunities in the United States,” Brookings Institution, June 19, 2014, www.brookings.edu/wp-content/uploads/2016/06/expand_apprenticeships_united_states_lerman.pdf.

21. Employment and Training Administration, “What Is Registered Apprenticeship?,” US Department of Labor, www.doleta.gov/oa/faqs.cfm; and Collins, “Apprenticeship in the United States.”

22. Washington State Department of Labor and Industries, “History of Apprenticeship,” www.lni.wa.gov/TradesLicensing/Apprenticeship/About/History/; and Employment and Training Administration, “Fitzgerald Act,” US Department of Labor, www.doleta.gov/OA/Original_fitzact_code.cfm.

23. Kenneth C. Gray and Edwin L. Herr, *Other Ways to Win: Creating Alternatives for High School Graduates* (Thousand Oaks, CA: Corwin Press, 2000).

24. Gray and Herr, *Other Ways to Win*, 27, Table 2.1.

25. For an interactive guide to the types of apprenticeship programs and sponsors that exist today, see US Department of Labor, Employment and Training Administration, “Sponsor Database,” <https://oa.doleta.gov/bat.cfm>.

26. White House, “Fact Sheet: Investing \$90 Million Through ApprenticeshipUSA to Expand Proven Pathways into the Middle Class,” news release, April 21, 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/04/21/fact-sheet-investing-90-million-through-apprenticeshipusa-expand-proven>; and Nicholas Wyman, “This New Trump Plan Could Be the Answer to Millennial Job Woes,” *Fortune*, June 18, 2017, <http://fortune.com/2017/06/18/donald-trump-apprenticeships-programs-executive-order-millennials-news/>.

27. Note that these numbers do not include the many apprenticeship programs found in the armed forces.

28. US Department of Labor, “Apprenticeship: Data and Statistics,” https://doleta.gov/oa/data_statistics.cfm.

29. Robert I. Lerman, “Expanding Apprenticeship—A Way to Enhance Skills and Careers,” Urban Institute, October 2010, www2.ed.gov/PDFDocs/college-completion/03-expanding-apprenticeship.pdf.

30. Digest of Education Statistics, “Table 320.20: Certificates Below the Associate’s Degree Level Conferred by Postsecondary Institutions, by Race/Ethnicity and Sex of the Student: 1998–99 through 2014–15,” National Center for Education Statistics, 2016, https://nces.ed.gov/programs/digest/d16/tables/dt16_320.20.asp?current=yes; Digest of Education Statistics, “Table 321.10: Associate’s Degrees Conferred by Postsecondary Institutions, by Sex of Student and Discipline Division: 2004–09 Through 2014–15,” National Center for Education Statistics, 2016, https://nces.ed.gov/programs/digest/d16/tables/dt16_321.10.asp?current=yes; and Institute of Education

Sciences, “Undergraduate Degree Fields,” National Center for Education Statistics, Figure 1, https://nces.ed.gov/programs/coe/indicator_cta.asp.

31. Office of Apprenticeship Services, “Bulletin 2015–10,” US Department of Labor, Employment and Training Administration, February 13, 2015, <https://www.doleta.gov/oa/bul15/2015-10.pdf>.

32. Data obtained from the US Department of Labor Employment and Training Administration’s Office of Apprenticeships through a Freedom of Information Act request.

33. The 10 states are Florida, Georgia, Iowa, Kentucky, Maryland, Missouri, New Jersey, Ohio, Pennsylvania, and Texas. Based on the Registered Apprenticeship Partners Information Data System. See Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis*.

34. Lisa Rabasca Roepe, “Why Apprenticeships Are Taking Off,” CityLab, February 1, 2017, <https://www.citylab.com/life/2017/02/why-apprenticeships-are-taking-off/514977/>; and Keith L. Rolland, “Apprenticeships and Their Potential in the US,” Federal Reserve Bank of Philadelphia, Winter 2016, https://www.philadelphiafed.org/community-development/publications/cascade/90/01_apprenticeships.

35. See population estimates at US Census Bureau, “National Population by Characteristics: 2010–2017,” <https://www.census.gov/data/tables/2017/demo/popest/nation-detail.html>.

36. US Department of Labor, “Apprenticeship Benefits,” www.doleta.gov/oa/apprentices.cfm; and Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis*.

37. Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis*, Table IV.6.

38. Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis*, Table IV.4.

39. Florida Department of Education, “District Postsecondary Institutions,” www.fldoe.org/academics/career-adult-edu/dist-ps-instit.stml.

40. Mark Schneider, *Measuring the Economic Success of Florida’s Graduates: Economic Security Report 2017*, College Measures at the American Institutes for Research, December 2017, Figure 1, www.beyondeducation.org/temp/ER_Report.pdf.

41. Based on data provided to the authors by the Florida Department of Education.

42. Michelle Wein, “An Analysis of Registered Apprenticeships in Michigan,” State of Michigan Department of Technology, Management, and Budget, November 2016, http://milmi.org/Portals/137/publications/Apprenticeship_Report_2016.pdf.

43. Public Sector Consultants Inc., *Benefits of Michigan Apprenticeship Programs*, April 2017, www.michiganbuildingtrades.org/PDFs/Benefits%20of%20Apprenticeships%20FINAL%20April%202017-final.pdf.

44. White House, “Fact Sheet—American Job Training Investments: Skills and Jobs to Build a Stronger Middle Class,” news release, April 16, 2014, <https://obamawhitehouse.archives.gov/the-press-office/2014/04/16/fact-sheet-american-job-training-investments-skills-and-jobs-build-strong>.

45. Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis*, Tables IV.1, 3, 4, 5, and 6.

46. Hilary Steedman, “The State of Apprenticeship in 2010, International Comparisons: Australia, Austria, England, France, Germany, Ireland, Sweden, Switzerland,” London School of Economics and Political Science, 2010, <http://cep.lse.ac.uk/pubs/download/special/cepsp22.pdf>.

47. Nicola Woolcock, “Top Schools Push Pupils away from Universities,” *Times*, August 26, 2017, www.thetimes.co.uk/edition/news/top-schools-push-pupils-away-from-universities-wellington-college-sedbergh-school-queen-ethelburga-s-college-stamford-school-lincolnshire-l7rvg3czd.

48. Jon Stone, “Government Sneaks Out £250 Tuition Fee Rise for Existing Students,” *Independent*, December 22, 2016, www.independent.co.uk/news/uk/politics/tuition-fees-rise-pounds-250-9000-9250-existing-students-all-a7491351.html.

49. We expect more internship programs to be developed in areas that can address the workforce needs of the nation’s technology-based economy after the release of the expected guidelines on new “industry-recognized apprenticeships” by the Trump administration. See Skills Blog, “NSC Announces Work-Based Learning Academy State Teams,” National Skills Coalition, April 23, 2018, www.nationalskillscoalition.org/news/blog.

50. Lerman, “Expanding Apprenticeship.”

51. Sylke V. Schnepf, “Inequalities in Secondary School Attendance in Germany,” S3RI Applications; and Christian Dustmann,

Patrick A. Puhani, and Uta Schönberg, “The Long-Term Effects of Early Track Choice,” Institute for the Study of Labor, 2014, <http://ftp.iza.org/dp7897.pdf>.

52. *Financial Times*, “Germany’s Apprenticeship Scheme Success May Be Hard to Replicate,” April 20, 2017, www.ft.com/content/1a82e8e0-04cf-11e7-aa5b-6bbo7f5c8e12.

53. While community colleges have been the subject of far more research and analysis, two-year for-profit institutions have also played an important, though smaller, role in career and technical training.

54. US Department of Labor, “RACC: College Members,” https://doleta.gov/oa/RACC/College_Members.cfm. RACC is made up of employers, labor-management groups, and associations that have Registered Apprenticeship programs and two- and four-year post-secondary institutions designed to build stronger links between registered apprenticeship programs and institutions of higher education. See US Department of Labor, “Registered Apprenticeship-College Consortium Frequently Asked Questions (FAQs),” https://doleta.gov/oa/pdf/RACC_FAQs1.pdf; and US Department of Labor, Employment and Training Administration, “RACC College Members,” https://doleta.gov/oa/RACC/College_Members.cfm.

55. One recent Jobs for the Future report explains how community colleges are well positioned to deliver both academic credit and associate degrees earned through apprenticeship programs. See Bill Browning and Rebecca Nickoli, “Supporting Community College Delivery of Apprenticeships,” Jobs for the Future, www.jff.org/sites/default/files/CC-Survey-Report-091917.pdf.

56. According to personal communication with Louis Soares, who runs the credit evaluation services at the American Council on Education (ACE), ACE has had few apprenticeship programs come through the CREDIT Registry and Transcript System used by learners who have successfully completed courses or examinations through ACE CREDIT evaluated organizations. And the majority of programs that have gone through the CREDIT system have used the credit recommendations to help build direct articulation agreements with one or two local colleges rather than to expand apprenticeship opportunities.

57. US Department of Labor, “RACC Factsheet for Colleges,” https://doleta.gov/oa/pdf/RACC_One_Pager_for_Colleges.pdf.

58. WorkforceGPS, “The Role of Community Colleges in Registered Apprenticeship,” February 2018, <https://apprenticeshipusa.workforcegps.org/resources/2017/04/10/11/14/The-Role-of-Community-Colleges-in-Registered-Apprenticeship>.

59. For instance, see Mary Alice McCarthy, Iris Palmer, and Michael Prebil, “Connecting Apprenticeship and Higher Education: Eight Recommendations,” *New America*, December 2017, <https://na-production.s3.amazonaws.com/documents/Connecting-Apprenticeship-HigherEd.pdf>.

60. Tom Snyder, “Apprenticeship Programs at Community Colleges,” *Huffington Post*, January 6, 2016, http://www.huffingtonpost.com/tom-snyder/apprenticeship-programs-at-community-colleges_b_8918366.html.

61. Snyder, “Apprenticeship Programs at Community Colleges.”

62. Andy Kiersz, “The Impact of Small Business on the US Economy in 2 Extreme Charts,” *Business Insider*, June 16, 2015, <http://www.businessinsider.com/us-employment-by-firm-size-has-a-fat-tailed-distribution-2015-6>.

63. Katherine Peralta, “Apprenticeships Could Be Gateway to Middle Class,” *US News & World Report*, January 12, 2015, <https://www.usnews.com/news/articles/2015/01/12/apprenticeships-could-provide-a-pathway-to-the-middle-class>.

64. Bill Browning and Rebecca Nickoli, “Supporting Community College Delivery of Apprenticeships,” Jobs for the Future, www.jff.org/sites/default/files/CC-Survey-Report-091917.pdf.

65. Robert I. Lerman, “Proposal 7: Expanding Apprenticeship Opportunities in the United States,” Hamilton Project at Brookings Institution, www.brookings.edu/wp-content/uploads/2016/06/expand_apprenticeships_united_states_lerman.pdf.

66. Florida Department of Education, “What Is Registered Apprenticeship?,” <http://www.fl DOE.org/academics/career-adult-edu/apprenticeship-programs/what-is-apprenticeship.shtml>; and Texas Workforce Commission, “Apprenticeship—Program Overview,” www.twc.state.tx.us/programs/apprenticeship-program-overview#authorityFunding.

67. State of New Jersey Department of Labor and Workforce Development, “Youth Transitions to Work Program,” http://www.nj.gov/labor/forms_pdfs/Programs/NGO/FY18/YTTWNGOFY2017-FY2018.pdf; and State of New Jersey Department of Labor and Workforce Development, “Incentives for Hiring WorkFirst New Jersey Participants,” http://careerconnections.nj.gov/careerconnections/hire/hiring/workfirst/incentives_for_hiring_workfirst_new_jersey_participants.shtml.

68. Apprenticeship Carolina, www.apprenticeshipcarolina.com/.

69. Lerman, "Proposal 7," www.brookings.edu/wp-content/uploads/2016/06/expand_apprenticeships_united_states_lerman.pdf.
70. Reed et al., *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, Table V.7.
71. US Department of Labor, "The Federal Resources Playbook for Registered Apprenticeship," www.doleta.gov/oa/federalresources/playbook.pdf.
72. Apprenticeship Expansion Task Force, "Task Force on Apprenticeship Expansion Final Report to the President of the United States."
73. See, for example, the Leveraging and Energizing America's Apprenticeship Programs Act, S. 574, introduced in 2015 by Sens. Cory Booker (D-NJ) and Tim Scott (R-SC), as noted by Office of Sen. Cory Booker, "Senators Booker and Scott Team Up to Tackle Skills Gap and Address Youth Unemployment," news release, February 26, 2015, www.booker.senate.gov/?p=press_release&id=206. See also the relevant proposals in Andrew P. Kelly and Kevin J. James, "Promoting Innovation in Higher Education," in *Unleashing Opportunity: Policy Reforms to Strengthen Higher Education*, ed. Andrew P. Kelly et al. (Washington, DC: National Affairs, 2017), https://nationalaffairs.com/storage/app/uploads/public/doelib/HigherEd_Ch5_JamesKelly.pdf.
74. See Public Sector Consultants Inc., "Benefits of Michigan Apprenticeship Programs," April 2017, www.michiganbuildingtrades.org/PDFs/Benefits%20of%20Apprenticeships%20FINAL%20April%202017-final.pdf.
75. Ryan Craig and Tom Bewick, "Making Apprenticeships Work: Five Policy Recommendations," University Ventures, http://universityventures.com/images/Making_Apprenticeships_Work_-_UV_Whitepaper.pdf.
76. One such apprenticeship served provider has emerged in the United States in the past year, called Franklin Apprenticeships. See Franklin Apprenticeships, <https://www.franklinapprenticeships.com/>.