

BECOMING THE UNITED STATES OF OPPORTUNITY

A collage of diverse people and icons representing various industries, with a wooden ladder superimposed over a map of the United States. The background is a grid of small images showing people in different professions (doctor, teacher, worker, etc.) and icons (globe, car, book, DNA, etc.). A large wooden ladder is positioned in the center, spanning across a map of the United States. The text "BECOMING THE UNITED STATES OF" is in a yellow banner at the top, and "OPPORTUNITY" is in large blue letters below it.

THE ECONOMIC EQUITY AND GROWTH CASE FOR APPRENTICESHIPS

A REPORT
BY THE NEW JERSEY INSTITUTE
FOR SOCIAL JUSTICE



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The New Jersey Institute for Social Justice

The Institute's mission is to empower urban residents to realize and achieve their full potential. Established in 1999 by Alan V. and Amy Lowenstein, the Institute's dynamic and independent advocacy is aimed at toppling load-bearing walls of structural inequality to create just, vibrant, and healthy urban communities. We employ a broad range of advocacy tools to advance our ambitious urban agenda, including research, analysis and writing, public education, grassroots organizing, the development of pilot programs, and legislative strategies.

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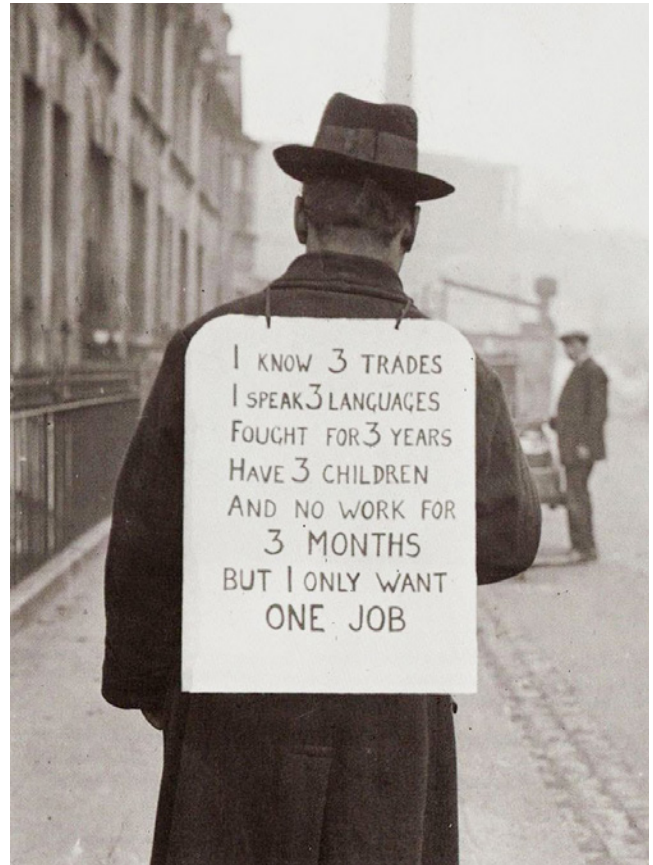
Becoming the United States of Opportunity: The Economic Equity and Growth Case for Apprenticeships

Introduction: The Challenge and the Opportunity

New Jersey, like the rest of the nation, faces significant challenges in bridging the gap between jobseekers and employers during this time of growing inequality and rapid technological change that will remake most career fields. Most jobs in the United States are middle-skills jobs, which require some type of post-high school training or education, but not a college degree.¹ Our workforce, however, is becoming more and more divided between the highly-educated, specially-trained employees, who receive an increasingly greater share of income gains, and the low-paid employees, who often work without any benefits or control over their schedule.² The middle-skill workers—like manufacturing employees—face challenging circumstances as large companies downsize, move production internationally, and increasingly rely on contractors.

This polarization of the workforce, stagnant wages, persistent structural racial and gender inequality in employment, and declining bargaining power of employees, is driving the United States towards levels of income inequality not seen since the Great Depression era of the 1920s—nearly 100 years ago.³ As economic gains increasingly go to the wealthiest, all other families become more financially precarious. Indeed, more than four in ten adults (41%) do not even have \$400 to cover an emergency expense,⁴ and 62% of Americans will live in poverty at some point in their life because they do not have enough savings to support them through losing a job, a health issue, or another unexpected loss of income or sudden expense.⁵

While the economic situation is difficult for many people in America, it is dire for people of color. Nationally, people of color have double the unemployment rate of white people, and they are twice as likely to live in poverty.⁶ Both women



Archival photo of a man seeking work during the Great Depression

Polarization of the workforce, stagnant wages, persistent structural racial and gender inequality in employment, and declining bargaining power of employees, is driving the United States towards levels of income inequality not seen since the Great Depression era of the 1920s.

In New Jersey, the median net worth for white families is **\$271,402**—the highest media net worth in the nation. The median net worth for New Jersey's Black and Latino families is just **\$5,900 and \$7,020** respectively.

Nationally, white households have a median net worth of **\$127,200**, while Black and Latino households have a median net worth of just **\$9,250 and \$12,550**, respectively.

It would take a Black family **228 years** and a Latino family **84 years** to achieve the wealth that the average white family has today.

Racial disparities reflect systemic, not individual, failures.

and people of color—and particularly women of color—are paid less and are under-represented in many lucrative career fields.⁷ Because of systemic racial discrimination and the cumulative effect of earning less over their lifetime, there is a staggering racial wealth gap.⁸ Nationally, white households have a median net worth of \$127,200, while Black and Latino households have a median net worth of just \$9,250 and \$12,550, respectively.⁹ This racial wealth gap tripled from the 1980s to the present, and was exacerbated by the substantial loss of homeownership among Black and Latino families during the 2007 to 2009 recession.¹⁰ It would take a Black family 228 years and a Latino family 84 years to achieve the wealth that the average white family has today.¹¹ In New Jersey, one of the worst states in the nation for racial wealth disparities, the median net worth for white families is \$271,402—the highest median net worth in the nation. By contrast, the median net worth for New Jersey's Black and Latino families is just \$5,900 and \$7,020, respectively.¹² These racial disparities reflect systemic, not individual, failures.

Apprenticeships are a way to advance racial and gender equity.

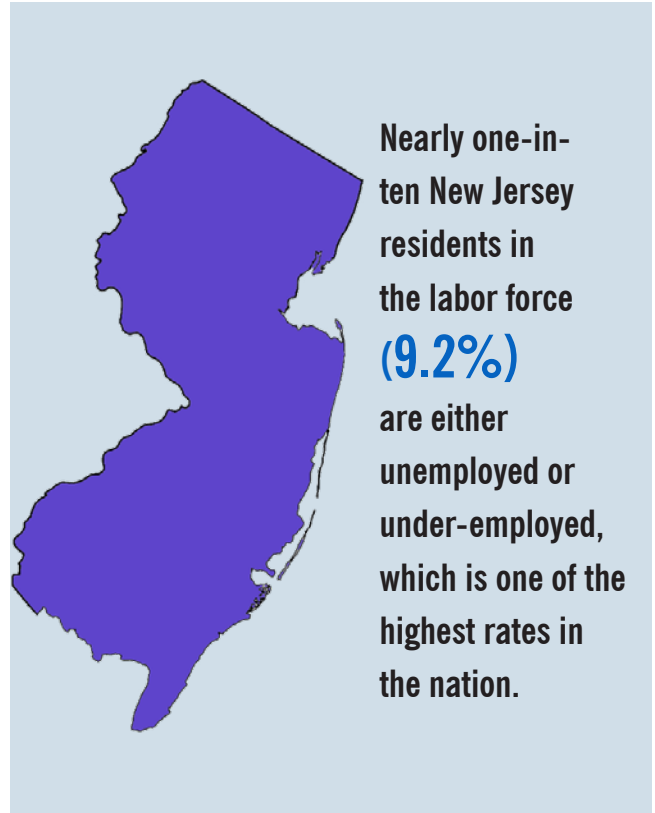
Among the many potential policy solutions to create more economic opportunity and growth in the United States, apprenticeships have been proven to consistently deliver significant financial benefits to employees, employers, the government, and society, making them one of the most productive uses of government investments. Apprenticeships are a way to advance racial and gender equity, and to counter the displacement of current and future employees

as our economy continues to undergo significant changes in what is being called the Fourth Industrial Revolution.¹³ Apprenticeships also provide incumbent workers and new entrants to the workforce with the training necessary for in-demand jobs that pay a living wage in growing career fields.

By developing and implementing a sustainable statewide apprenticeship program that meets the needs of both resident jobseekers and the state's employers, while expanding employee diversity and economic growth, New Jersey can lead the nation in creating an apprenticeship model for other states and the federal government.

The concept of an apprenticeship—a person working for reduced earnings while learning a skill or trade from another person with experience in that profession—dates back centuries to ancient craftsmen and craft guilds.¹⁴ Apprenticeships persisted through the Industrial Revolution¹⁵—when much of Europe and the United States transitioned from an agrarian society to an industrial urban society—as well as World Wars I and II, the introduction of systems of mass production, the expansion of employment opportunities to women, people of color, people with disabilities, and other people who have been marginalized, and the technological and digital revolution of the twenty-first century.

Although apprenticeships are largely associated with the skilled trades, the actual structure of an apprenticeship is used by the fields of medicine, law, finance, and journalism, as well as some of the most dynamic and successful companies in the country.¹⁶ Apprenticeship programs can be incorporated into nearly every industry, can be designed to assist dislocated and displaced workers in connecting with new career fields, and can help people who face structural and other barriers connect to employment. Importantly, as America transitions to a new global economy, apprenticeship programs can prioritize equity by enabling more women and people of color to enter career fields that have traditionally been closed to them.



Apprenticeships should align with the federal government's apprenticeship program requirements to receive funding and technical assistance, but they should be led by the states. States can tailor their apprenticeship programs to meet the needs of their growth industries and their population, providing additional support for residents who face barriers in connecting to work or who must retrain for a new career field.

New Jersey is one of the states most impacted by the challenges of this moment, and it is one of a handful of states with the greatest potential opportunity to lead the nation in developing a lifelong learning apprenticeship model that promotes a more inclusive and equitable economy, bridges the skills gap between people and industry, and integrates education and workforce training.

On the challenges side, New Jersey has one of the highest unemployment rates in the nation at 4.2%—only fourteen states and Washington, D.C. have higher unemployment rates.¹⁷ New Jersey also has one of the greatest percentages of people who are long-term unemployed in the nation.¹⁸ Nearly one-in-ten residents in the labor force (9.2%) are either unemployed or under-employed, which is one of the highest rates in the nation.¹⁹ Because of New Jersey's higher unemployment rates and one of the highest costs of living in the nation, it is experiencing an out-migration of millennial workers—who will form the bulk of the workforce in the years to come.²⁰ New Jersey is one of the worst states for income inequality, ranking 44 out of 50—meaning that 43 other states have less income inequality.²¹ This inequality results in significant income disparities for women and people of color in New Jersey,²² with women of color experiencing some of the highest pay disparities in the nation.²³

On the opportunities side, New Jersey has one of the largest and most diverse economies among the states, with a strategic location as a transportation hub on the East Coast.²⁴ New Jersey is home to several industries that are projected to grow in the state and nationally—including Trade, Transportation and Utilities, Education & Health Services, and Professional & Business Services—and it is estimated that there will be

275,300 jobs added over the course of the next six years.²⁵

New Jersey has one of the strongest public university systems in the country, several renowned private colleges and universities, and a strong network of community colleges, all of which could be potential partners in a statewide apprenticeship program.

Most of New Jersey's job growth will be in middle-skill jobs.²⁶ Prioritizing a statewide, lifelong learning model of

apprenticeships would enable New Jersey to ensure that there are sufficient middle-skill workers to meet the needs of its growing industries, while creating better employment opportunities for the nearly one-in-ten state residents who are unemployed or under-employed. In turn, this will help reduce gender and racial disparities in employment and income, and enable more young workers to remain in New Jersey, strengthening the state's future workforce.

First, this report will make the economic equity and growth case for apprenticeships. *Second*, this report will explain how apprenticeships work, and provide state policy recommendations for New Jersey. *Finally*, this report will provide a blueprint for starting a federally-registered apprenticeship program.

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The Equity and Growth Case for Apprenticeships

The United States—and the world—is in a period of rapid economic change. Innovations in computing and software, artificial intelligence, biotechnology, and nanotechnology are remaking how companies operate and the nature of work itself. Alongside these technological revolutions, there are profound social changes happening.

The United States is becoming a nation that is majority people of color, and women are achieving more parity in the workplace. Yet, our population has a declining labor force participation rate that is partially driven by legal and structural barriers to employment, like collateral consequences.²⁷ Moreover, we have rising economic inequality and less economic mobility, making it more difficult for an increasing number of people in the United States to afford a college or graduate education.²⁸

At the same time, the nation faces an increasing skills gap between jobseekers and available jobs, particularly for middle-skill jobs and jobs in new industries. In fact, several industries are unable to operate at capacity and realize their full economic potential because they cannot fill critical openings.

This section will provide context on the current and future challenges facing workers and companies in our national and state economy, and how apprenticeships can help bridge the gap, while creating more equity and opportunity for people, and growth for companies and our economy.

We have rising economic inequality and less economic mobility, making it more difficult for an increasing number of people in the United States to afford a college or graduate education.

Structural Mismatch Between Employers and Job-Seekers

The United States is at an eighteen-year low for unemployment (3.9%),²⁹ but there are still over six million unemployed people.³⁰ Many of these people are long-term unemployed, meaning that they have been unemployed for six months or longer.³¹ Among the unemployed, there are also



Women and people of color were largely deprived of the opportunity to participate in the largest expansion of prosperity in United States history.

persistent racial disparities, with people of color more likely to be unemployed.³² Beyond the people who are counted as unemployed because they actively searched for a job within the last four weeks, there are millions more people who have dropped out of the labor force—especially since the Great Recession of 2007 to 2009.³³ While the United States once led the world in the proportion of people in the labor force (including women), we now have one of the lowest labor force participation rates among developed economies.³⁴ This means that a smaller proportion of the adult population in America is either working or actively looking for work than during our past.

While there are millions of unemployed and under-employed people,³⁵ we have a shortage of millions of workers across several critical industries. In fact, there are more job openings than unemployed people for the first time in decades,³⁶ with some companies—and entire industries—losing business because they cannot find enough workers to fill their openings and meet their customers' demand for products.³⁷

While there may never be perfect, continuous alignment between jobseekers and job openings,³⁸ the government can significantly influence the labor force and job market by bridging the gap between the skills and education of the workforce and businesses' need for employees with certain skills.

Apprenticeships are an effective solution to address this structural mismatch between jobseekers and employers, which is both hindering economic mobility for individuals, contributing to levels of inequality last reached during the Great Depression,³⁹ and limiting the growth of businesses across several industries. Left unchecked, this trend will only get worse as our economy continues to undergo massive changes, bringing in the Fourth Industrial Revolution.⁴⁰

Rapidly Changing Global Economy & the Fourth Industrial Revolution

Currently, the global economy is undergoing a seismic shift, as developments in artificial intelligence, robotics, nanotechnology, biotechnology, and medicine are ushering in the Fourth Industrial Revolution.⁴¹ The First Industrial Revolution began in Britain around 1784, when work in key industries, like textiles, became mechanized and powered by steam and water—meaning that machines performed the work that people used to do by hand.⁴² The innovations of the Second Industrial Revolution in the late 1800s were the advent of electricity and mass production by an assembly line, characterized by Henry Ford’s assembly line production of the first affordable car—the Model T.⁴³ Then, the Third Industrial Revolution began in the 1960s, when information technology and computing gradually enabled people to access vast amounts of digital information, and to perform calculations and analyses in laboratories—and eventually home computers—that were previously impossible.⁴⁴

Now, the world is on the cusp of the Fourth Industrial Revolution, when our new technologies and innovations are “connecting the physical, digital and biological worlds” in a way that will change nearly every field and industry, and how our economies and countries function.⁴⁵ Previously separate fields—like medicine and computing—are converging and benefitting from advances in artificial intelligence and robotics, enabling advances in science, medicine, and technology that were not even conceivable a generation ago.⁴⁶

Much of this change is driven by the enormous expansion of automation of both everyday tasks and production that used to be performed by people. For instance, it is estimated that 95% of the cars sold twenty years from now will be self-driving vehicles, profoundly changing transportation and everyday life.⁴⁷ The significant expansion of automation and robotic technology could displace up to one-third of people working by 2030.⁴⁸ Even with a more conservative estimate, between 75 and 375 million people worldwide (3% to 14%

of the global workforce) will need to change careers within the next decade.⁴⁹ These profound changes to the economy and workforce will impact the next generation, as about two-thirds of children in elementary school “will ultimately end up working in completely new job types that don’t yet exist.”⁵⁰

As the world’s leading technological innovator, the United States will be one of the first nations impacted by this revolution and its effects on the workforce. Already, 46% of employers in the United States report challenges in filling job openings,⁵¹ and it is projected to become even more difficult to recruit for fields like health care, professional services, and transportation and infrastructure over the next decade.⁵²

New Jersey will be particularly impacted because the state’s largest industries—which employ most residents and generate most of the state’s economic activity—are the very industries that are undergoing the most change: (a) bio/pharmaceuticals and life sciences, (b) transportation, logistics, and distribution, (c) finance, (d) advanced manufacturing, (e) health care, and (f) energy.⁵³ Over the next five to ten years, New Jersey will need to ensure that its workforce is prepared to fill the positions in these industries, or risk losing companies and industries to other states with a better-trained workforce.⁵⁴

Returning to Investing in Employees for Growth and Global Competitiveness

A few generations ago, after the end of World War II, our nation entered a 30-year period of prosperity, where the real income of nearly all workers doubled from the late 1940s to the early 1970s.⁵⁵ As American companies thrived and expanded, and the United States government passed sweeping legislation to support the reintegration of service members into the economy, the United States emerged as the dominant global economy.⁵⁶

During this time of tremendous growth and opportunity for the United States, companies invested deeply in their employees—and employees repaid that loyalty by committing themselves to the success of their companies

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and industries. People would often spend their entire career at bedrock companies like General Electric, Coca-Cola, and Eastman-Kodak, and these companies benefitted from the stability of their workforce and the increasing productivity and innovations that come from having employees spend years learning and perfecting their area of work.⁵⁷

But women and people of color were largely excluded from these careers, and thus deprived of the opportunity to participate in the largest expansion of prosperity in United States history.⁵⁸ By the time that the Civil Rights Act of 1964 and the Fair Housing Act of 1968 were enacted—prohibiting discrimination in employment, education, places of public accommodations,⁵⁹ and in housing⁶⁰—the nation was in the final few years of robust economic mobility for workers.

By the mid-1970s, companies changed the way that they viewed their employees—from assets to liabilities.⁶¹ In response to growing international competition, companies

began shifting production and distribution to other countries, cutting their domestic workforce.⁶² At the same time, large companies began a single-minded focus on increasing shareholder profit that has continued to this day, rather than their traditional focus on employees, customers, and shareholders.⁶³ This focus on shareholder value, driven by the CEOs whose pay packages tied into this short-term stock value, led to significant reductions of the workforce and efforts to keep pay down to maximize value and share dividends for investors.

Simultaneously, union membership decreased in the United States, weakening the collective bargaining power of workers. Union membership grew post-World War II, peaking at nearly 30% (28.3%) in 1954, but it has declined for nearly the past four decades.⁶⁴ Now, unions represent only 10.7% of workers.⁶⁵ The significance of this decline extends beyond union members to non-unionized employees. Union members are typically paid higher wages and receive better fringe benefits than non-unionized employees in the same field,⁶⁶ but they also help increase the wages and benefits of non-union employees.⁶⁷ In fields with strong unions, non-union employers must track the approximate pay and benefits provided so that they can stay competitive in recruiting and retaining employees.⁶⁸

Despite low unemployment and a tight labor market, wages have barely kept pace with inflation over the past decade.⁶⁹ In fact, wage growth has not yet recovered from the Great Recession of 2007 to 2009,⁷⁰ although corporate profits recovered several years ago, and our unemployment rate is about the lowest it has been in two decades.⁷¹ Since the number of job openings (6.6 million)⁷² surpassed the official number of unemployed people (6.3 million)⁷³ in March 2018, employers will have to raise salaries to attract both employed and unemployed people to their openings—particularly if the job involves a specific or limited skill set.

However, it is also critically important for companies to invest in their current and future employees as a matter

of business necessity. During the post-World War II years, when U.S. companies dominated every industry—including manufacturing—companies invested in what were essentially apprenticeship programs for entry-level employees and in on-the-job training for people throughout the company, including middle management.⁷⁴

The decline of several major U.S. manufacturing companies over the past few decades coincided with their dramatic reduction in employee training and focus on short-term profits for shareholders. This is a foreseeable consequence, because true breakthroughs in nearly every industry require years of research and development, typically with a dedicated and cohesive team of people working steadily towards a goal—and this requires a high degree of loyalty and commitment from both the employees and the employer.

By contrast, German manufacturing companies have flourished during a time of rising innovation and increased international competition, even though they face comparable labor cost challenges to U.S. companies. Germany is home to half of the world's mid-sized manufacturing firms.⁷⁵ They have grown by 10% annually on average, created 1.5 million new jobs, and registered five times as many patents per employee as large corporations.⁷⁶ The major factor distinguishing these businesses from their counterparts in the United States is employee training and loyalty—and the German apprenticeship system is central to their business success.

As the world economy enters the Fourth Industrial Revolution, these international pressures on businesses to innovate and attract employees with very specific skill sets will only increase, and the ability of U.S. companies to maintain or grow their market share will depend on their ability to train and recruit employees—especially through apprenticeship programs.

A national study of companies currently running federally-registered apprenticeship programs by the U.S. Department of Commerce found that the companies typically began apprenticeship programs because they could not find

employees with the skills they needed, and that the program gave them a pipeline of employees with the specific skills set needed for current and future job openings.⁷⁷ In addition to the talent pipeline, companies also receive the productivity of the apprentices during their training, and reduced turnover and errors once the apprentices are fully trained.⁷⁸ Apprentices were identified by the companies as potential future managers, who learned flexibility and problem-solving, and could work more independently.⁷⁹ Further, the apprenticeship programs generated more employee engagement from both the apprentices and their mentors in the company.⁸⁰ The companies unanimously agreed that their apprenticeship program improved their overall company performance and gave them a competitive edge over others in their field.⁸¹

Higher Education Alone Cannot Bridge the Gap Between Jobseekers and Employers

Over the past few decades, jobs increasingly require some training or education beyond high school. In 1973, 72% of jobs just required a high school degree, with only 12% of jobs requiring additional education or an Associate's Degree, and 16% of jobs requiring a college degree or other advanced education.⁸² By 2020, this will have flipped, and only 36% of jobs will simply accept a high school degree, with nearly one-in-three jobs requiring some advanced education/Associates Degree (30%), and 35% requiring a college degree or other advanced education.⁸³

It is important to expand access to higher education. Generally, the more education a person has, the more likely that person will be employed and earning a higher salary.⁸⁴ However, higher education alone is not sufficient to bridge the skills gap between jobseekers and employers and expand access to economic mobility for all workers for three primary reasons: (1) not every person can afford a college or graduate degree, (2) a college degree does not provide the same benefits to workers of color and women in employment and salary, and (3) even with a college or graduate degree, workers must be prepared for lifelong learning and retraining during their career.

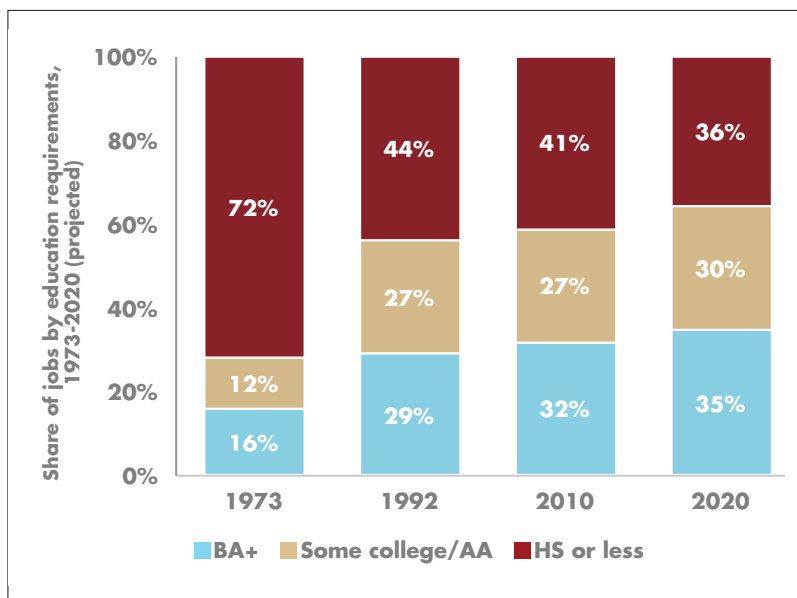


Figure 1.6. By 2020, 65 percent of jobs will require at least some education or training beyond high school.

SOURCE: GEORGETOWN UNIVERSITY CENTER ON THE WORKFORCE ANALYSIS IN RECOVERY: PROJECTIONS OF JOB OPENINGS AND EDUCATION REQUIREMENTS THROUGH 2020, 2013

NOTE: DUE TO ROUNDING, COLUMNS MAY NOT SUM TO 100 PERCENT.

Two generations ago, students could attend college for free⁸⁵ or pay for college while attending by working part-time and during summers, enabling them to graduate without any debt. But, college tuition and fees have increased 1,120% since 1978.⁸⁶ If the cost of attending college simply increased due to inflation over forty years, it would have gone up by only 275%.⁸⁷ Part of this exponential increase is attributed to states dramatically reducing their funding for state colleges and universities, causing those institutions of higher education to pass the additional costs along to students.⁸⁸

Now, students must take on a substantial debt burden to pursue an advanced education. The cumulative student loan debt is now the second highest consumer debt in the United States—behind only mortgages.⁸⁹ There are over 44 million Americans with student loan debt, and over 10% of these borrowers are delinquent or in default on their student loans.⁹⁰ Due to demographic changes and the financial consequences of college and graduate debt, college enrollment declined for a sixth straight year for this past academic year (2017 to 2018).⁹¹

For every dollar paid to a white man, Black women are paid only **63 cents**, and Latina women receive just **54 cents**.

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Moreover, the rewards of higher education are not uniform. People of color have to borrow substantially more money to finance their education, and this debt burden increases their likelihood of not completing their degree.⁹² Upon graduation from college, people of color are less likely to be employed than their white counterparts,⁹³ and they earn less than other college graduates.⁹⁴ Even Black graduates of the most elite colleges and universities do not receive the same advantage in employment opportunities and salary—their prestigious degrees only make them as competitive as white job candidates from less selective universities.⁹⁵ In 2015, Black people earned just 75% as much as white people in median hourly earnings.⁹⁶

Women also continue to earn less than men, regardless of their educational attainment. Female college graduates earn 86 cents for every dollar paid to male college graduates, despite having nearly identical levels of experience and education.⁹⁷ This pay discrimination persists throughout women's careers, increasing during their prime earning years.⁹⁸ Women of color, facing discrimination on the basis of race and gender, earn the least. For every dollar paid to a white man, Black women are paid only 63 cents, and Latina women receive just 54 cents.⁹⁹



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Finally, due to the rapidly changing global economy and the onset of the Fourth Industrial Revolution, people—even those with college and graduate degrees—must continuously upgrade and expand their skill sets to adapt to changing technology and career fields.¹⁰⁰ This means that both incumbent and new employees will need to have the flexibility to learn new skills on-the-job.¹⁰¹ The expectation of continuous learning and expansion of skills throughout one's career is common among many professions, including law, medicine, computing and information technology, and all fields of academia and research. Now, it will become the expectation for nearly all career fields.

Building and Sustaining an Inclusive Workforce

The United States is about a decade away from having a workforce that is predominantly people of color,¹⁰² a milestone that the nation's most diverse states—New Jersey, New York, California, Texas, and Hawaii—will reach sooner than that.¹⁰³ A diverse workforce leads to better company performance, with companies ranked in the top 25% for racial and ethnic diversity in management 35% more likely to have financial returns above the industry average. Similarly, companies in the top 25% for gender diversity are 15% more likely to deliver financial returns above their industry average.¹⁰⁴ Diversity is an asset for companies because diverse teams of people have been found to prioritize facts, more carefully analyze challenges, and to produce more innovative solutions to those challenges.¹⁰⁵

As the United States and New Jersey become majority people of color and women increasingly make gains in the workplace, having a diverse company will not just be an asset—it will become even more of a business necessity. Not only will most of the workforce be people of color and women, but people of color and women will collectively be the vast majority of consumers—so companies will need to provide culturally competent services, and create content and products that reflect and meet the needs of these populations.

Right now, though, women and people of color—especially women of color—face barriers in being hired, promoted, and paid fairly for their work.¹⁰⁶ This leads to an under-representation of women and people of color in management, and perpetuates gender-based occupational segregation.¹⁰⁷

In order for an apprenticeship program to be successful in expanding economic mobility for all people, it must not only create opportunities for people to learn and expand their skills set and move up the career ladder—it must also open up more opportunities for women, people of color, people with disabilities, and other under-represented groups. Historically, apprenticeships programs have failed to do this.

Ninety-one percent of apprentices find work upon completing a program at an average annual salary of about \$60,000.

In particular, women are severely under-represented in apprenticeship programs. In 2016, women were only 5.6% of active, federally-registered apprentices.¹⁰⁸ Both female apprentices and apprentices of color (Black and Latino) are also disproportionately in the lowest-paying apprenticeship occupations.¹⁰⁹ Women tend to be occupationally-segregated in caregiving apprenticeship programs, like child care and health care, and they are rarely represented in the highest earning apprenticeship programs in the skilled trades.¹¹⁰ For example, women comprise less than 5% of electrician, plumber, and carpenter apprentices.¹¹¹

Female apprentices and apprentice program directors reveal some common challenges, including that women often do not receive complete information about the range of potential apprenticeship programs in the skilled trades (including the salary and industry-recognized credential potential), that they have more caregiving responsibilities, particularly for children, and that it is a challenge not to earn money during the classroom portion of the apprenticeship program.¹¹²

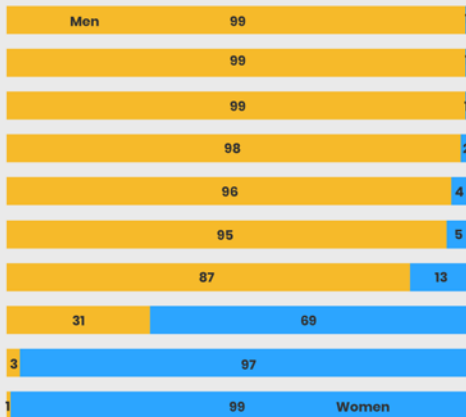


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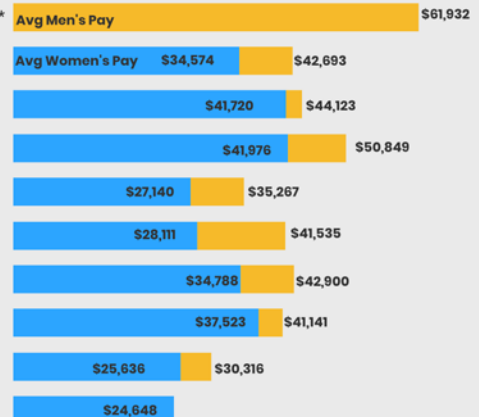
Apprenticeships tend to be gender segregated

And women pay the consequences.

Apprenticeship Enrollment by Gender Percentage



Average Occupational Yearly Wage by Gender



* No data available for women's pay

** No data available for men's pay

Women, people of color, and low-income apprentices are also more likely to report that transportation to the apprenticeship poses a challenge, and that receiving financial assistance for transportation and childcare helped them remain in—and complete—their apprenticeship program.¹¹³

In addition to these challenges, both women and people of color report experiencing discrimination and harassment in their apprenticeship programs.¹¹⁴ Gender-based harassment is common, with the Equal Employment Opportunity Commission (EEOC) reporting that anywhere from 25% to 85% of women report experiencing sexual harassment on the job.¹¹⁵ According to the EEOC, both sex-based and race-based harassment is more likely to occur in homogenous workplaces, where most of the employees are of one gender or race or ethnicity.¹¹⁶

The small number of women who apprentice in the skilled trades report experiencing more harassment and discrimination on the male-dominated work sites.¹¹⁷

Surveys of female apprentices also found that “[i]n addition to the overt harassment and hostile work environments that women sometimes confront, women’s experiences in male-dominated worksites are often characterized by more subtle forms of discrimination, such as exclusion and isolation, which can keep them from acquiring the skills they need to successfully complete an apprenticeship.”¹¹⁸



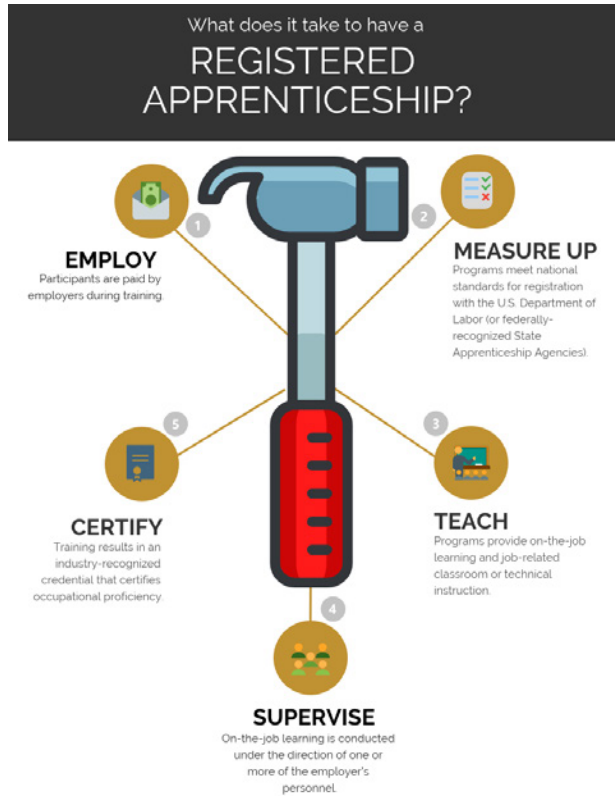


Government Investment in Apprenticeships Produces Substantial Economic Benefits

The financial return on investments in apprenticeships is substantial. With an average government investment of less than \$1,000 per apprentice in a federally-registered program, states realized an average net social benefit of \$49,427 over the career of an apprentice in the form of increased tax receipts and reduced use of public assistance.¹¹⁹ Businesses realize a significant return on their investment in apprenticeship programs through reduced turnover and improved recruitment, increased production and productivity among apprentices, improved employee engagement, and a pipeline of people to move into management positions.¹²⁰

Of course, the greatest return on investment is realized by the apprentices themselves. People who complete federally-registered apprenticeship programs earn an average of \$301,533 more over their career, while people who complete part of an apprenticeship program receive an average of \$123,906 over the life of their career.¹²¹ And, this return on investment begins immediately—91% of apprentices find work upon completing a program at an average annual salary of about \$60,000.¹²²

Because apprenticeship programs yield such significant benefits to employees and employers alike, they enjoy wide bipartisan support. President Barack Obama led an effort to double the number of registered apprentices in the United States, securing the first-ever federal budget allocation for apprenticeship programs from Congress in 2016.¹²³ Between 2015 and 2017, the federal government invested more than \$265 million in apprenticeship programs, largely in grants for states and industry partnerships to develop or expand successful programs.¹²⁴ The Obama Administration, under Secretary of Labor Thomas E. Perez, also sought to diversify apprenticeship programs, allocating approximately \$20 million to fourteen trade and intermediary organizations across the country to expand the use of apprenticeship programs in high growth industries and increase participant diversity.¹²⁵ This was a marked increase from the federal government's previous—and ongoing—investment in gender diversity in apprenticeships through the Women in Apprenticeship and Non-Traditional Occupations Act,¹²⁶ which typically provides a tiny amount of funding (around \$1 million dollars annually) to support a handful of organizations working to get more women into apprenticeships.¹²⁷ Most recently, President Donald Trump announced \$200 million in federal support for apprenticeships.¹²⁸



How Apprenticeship Programs Work

Apprenticeships in the United States and New Jersey

In the United States, apprenticeships were largely unregulated until the Great Depression era. When President Franklin D. Roosevelt came into office in 1933 after years of deep and widespread unemployment and poverty triggered by the stock market crash in October 1929,¹²⁹ he advocated for a series of significant programs and policies to create jobs and foster economic stability, known as the New Deal.¹³⁰

The National Youth Administration, established as part of the Works Progress Administration,¹³¹ was tasked with helping young people between the ages of 16 and 25 find work—including through apprenticeships. Notably, the National Youth Administration paid Black and white youth equal wages for their work and offered both young men and women employment opportunities—including in racially-integrated

workplaces.¹³² This happened a generation before the Supreme Court's 1954 decision in *Brown v. Board of Education*,¹³³ holding that segregated schools violated the Equal Protection Clause of the Fourteenth Amendment, which gradually led to a series of cases establishing racial integration throughout society—codified by federal statute in the landmark trio of civil rights laws.¹³⁴

Just a few years later, Congress passed the National Apprenticeship Act of 1937, also known as the Fitzgerald Act.¹³⁵ The Fitzgerald Act transferred the authority for overseeing apprenticeship programs from the National Youth Administration to the U.S. Department of Labor, empowering the Secretary of Labor to “formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices and to cooperate with the States in the promotion of such standards.”¹³⁶

Over time, Congress amended the Fitzgerald Act and the U.S. Department of Labor issued administrative interpretations of the law¹³⁷ to set out more specific requirements for apprenticeship programs.

First, an organization or group of organizations must apply for registration of an apprenticeship program to either the U.S. Department of Labor's Office of Apprenticeship in their state or a recognized State Apprenticeship Agency.¹³⁸ The



National Archives photo from the National Youth Administration Integrated Sewing Project



apprenticeship program must be in an “apprenticeable occupation,” which is broadly defined to be a job in an industry, which must:

- (a) Involve skills that are customarily learned in a practical way through a structured, systematic program of on-the-job supervised learning;
- (b) Be clearly identified and commonly recognized throughout an industry;
- (c) Involve the progressive attainment of manual, mechanical or technical skills and knowledge which, in accordance with the industry standard for the occupation, would require the completion of at least 2,000 hours of on-the-job learning to attain; and
- (d) Require related instruction to supplement the on-the-job learning.¹³⁹

Second, the sponsor of a federally-registered apprenticeship program must have a written plan—called “program standards”—that describes the “terms and conditions of employment, training, and supervision” of the apprentices, including whether the apprenticeship will be completed under a time-based, competency-based, or hybrid approach.¹⁴⁰

Under a time-based approach, the apprenticeship term is equal to the industry-standard for on-the-job learning, which

is typically “at least 2,000 hours” (50 work weeks).¹⁴¹ The competency-based approach requires the apprentice to attain a certain level of skills-based competency before graduating from the apprenticeship program, which means that the completion time may vary among individual apprentices.¹⁴² The hybrid approach incorporates elements of both the time-based and competency-based methods, measuring the “apprentice’s skill acquisition through a combination of specified minimum number of hours of on-the-job learning and the successful demonstration of competency.”¹⁴³

In addition to the on-the-job learning, the apprenticeship program standards provide for instruction in the technical aspects of the job and occupation, whether in a traditional education class, an occupational or workforce training course, through electronic media (like online learning), or in another approved format.¹⁴⁴ Although it is not required, a minimum of 144 hours of instruction annually is recommended.¹⁴⁵

The program standards for a federally-registered apprenticeship also include specific labor protections for the apprentices, including regular performance evaluations and the maintenance of records of their progress in the apprenticeship program, payment of at least minimum wage at the beginning of the program and a “progressively increasing schedule of wages to be paid to the apprentice

consistent with the skill acquired,” and a ratio of apprentices to experienced workers to enable proper supervision, training, and safety.¹⁴⁶ The probationary period of the apprenticeship—during which the employer can cancel the agreement without stated cause—cannot exceed 25% of the program length or one year, whichever is shorter.¹⁴⁷

Further, the employer and sponsors of an apprenticeship program are required to comply with anti-discrimination and equal opportunity laws, and to incorporate their plan for compliance into their program standards. This includes filing a written equal opportunity pledge as part of the program standards,¹⁴⁸ creating an affirmative action program within the apprenticeship program,¹⁴⁹ and devising a selection

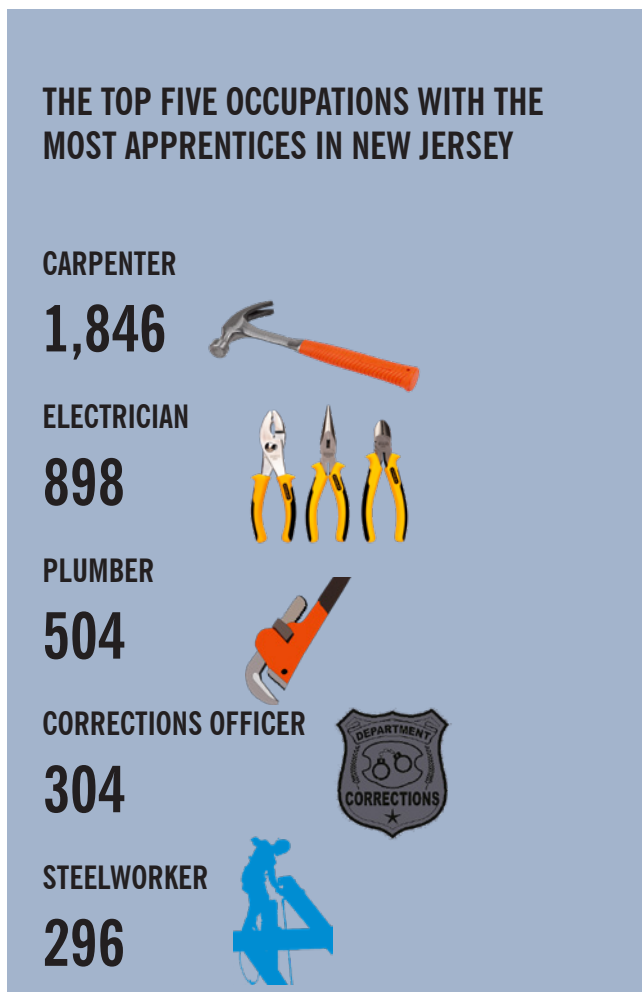
process for apprentices that is facially neutral and non-discriminatory in terms of race, color, religion, national origin, sex, sexual orientation, age (40 or older), genetic information, and disability.¹⁵⁰

Beyond following the requirements for registering an apprenticeship program and adhering to minimal program standards, there is a lot of flexibility for employers and other organizations to start and run apprenticeship programs to meet the needs of their business or industry—including anticipating future workforce needs.

Apprenticeships are decentralized in the United States, meaning that most of the support and coordination happens at the state level through the federal Office of Apprenticeship or a federally-recognized State Apprenticeship Agency. The states that have significant and successful apprenticeship programs often provide additional support for businesses, industry association, and community colleges and workforce training providers, through both state law and policy.

New Jersey has a federal Office of Apprenticeship,¹⁵¹ which registers and oversees federally-registered apprenticeships in the state, and a newly-created Office of Apprenticeships in the New Jersey Department of Labor and Workforce Development. Earlier this year, Governor Murphy announced the New Jersey Apprenticeship Network (NJAN), under which is the state’s Office of Apprenticeships and an inter-agency initiative to integrate apprenticeships into the state’s education system, led by the Department of Labor and Workforce Development, the Department of Education, and the Office of the Secretary of Higher Education.¹⁵² The new state Office of Apprenticeships is charged with developing programs through a state Apprenticeship Innovation Fund, and with supporting apprenticeship registration and expansion with industries, key stakeholders, and the federal Department of Labor.¹⁵³

These initiatives build upon the state’s established federally-registered apprenticeship programs. As of the most recent data available, there are currently 7,299 active apprentices





in New Jersey, participating in 727 different programs.¹⁵⁴ As in most states, the bulk of the apprentices in New Jersey are in the skilled trades. The top five occupations with the most apprentices in New Jersey include the following: (1) carpenter (1,846), (2) electrician (898), (3) plumber (504), (4) corrections officer (304), and (5) steelworker (296).¹⁵⁵

Best Practices in Apprenticeships

While apprenticeships are largely decentralized in the United States, with individual employers and industry sectors taking the lead on developing and obtaining approval for their apprenticeship programs, other nations have a unified strategy for creating, standardizing, and supporting apprenticeship programs.¹⁵⁶ These countries are notable for the integration of apprenticeship programs into their education system, as well as their labor and workforce system, and for the ongoing collaboration between their government, business and industry, and their education and training providers—from their public school system to their colleges and universities.

In 2015, the U.S. Departments of Commerce, Labor, and Education signed a Declaration of Intent (or Memorandum of Understanding) with both Germany and Switzerland

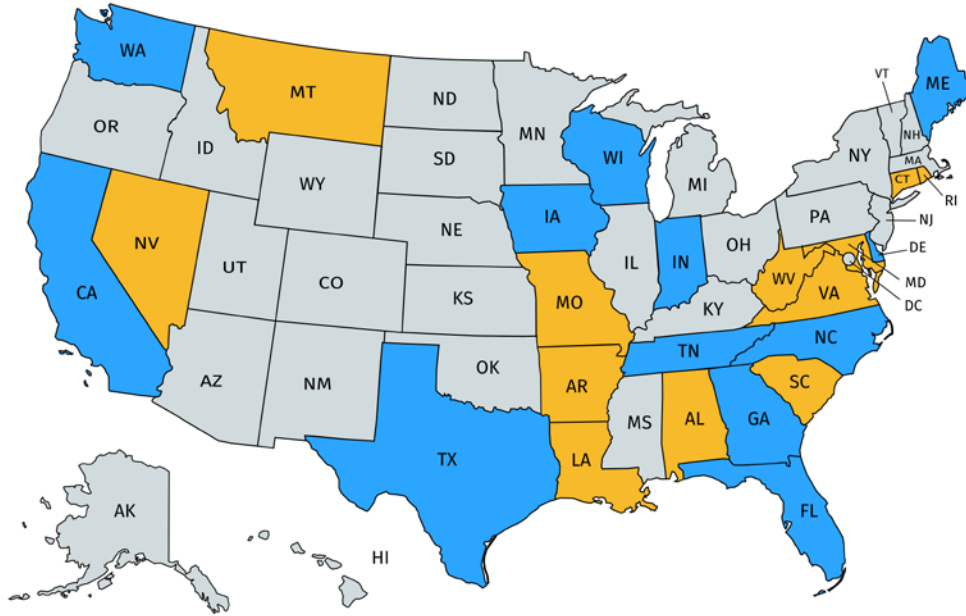
to facilitate greater international exchange of ideas on apprenticeships and workforce training.¹⁵⁷ Similarly, some states have partnered with German and Swiss companies on apprenticeship programs for their employees in the United States. The following is a summary of best practices in apprenticeships, drawing from these existing international programs and successful programs in the United States.

First, apprenticeship programs should be fully integrated into the public education system, as is the case in countries like Austria, Germany, Switzerland, and Great Britain.

In these countries, young people have the option to begin an apprenticeship program while still receiving their mandatory education (equivalent to high school in the United States). During this process, students receive significant counseling and advising about the advantages of pursuing either an apprenticeship or more traditional formal education (college or university),¹⁵⁸ and they have the option of earning a degree—in addition to an industry certificate—while completing a more advanced apprenticeship program.¹⁵⁹ The benefit of this approach is that it enables the government to cover the education-related costs of training, rather than those costs falling on the apprentice. In addition, this integration of apprenticeships into the education system enables young people to immediately begin working and earning money, which may be a financial necessity for some students and their families.

In North Carolina, Apprenticeship 2000 is an example of an apprenticeship program that is integrated into the public school system. Since its founding in 1995, Apprenticeship 2000 provides opportunities for high school juniors and seniors in the Charlotte region to complete a four-year, 8000-hour program, during which participants learn a trade like CNC Machinist, Tool & Die Maker, Mechatronics and Injection Molding Technician.¹⁶⁰ The apprentices are paid an increasing wage for their on-the-job training, and they take courses at Central Piedmont Community College.¹⁶¹ Upon completion of the program, the apprentices receive an AAS degree in Mechatronics Engineering Technology from Central Piedmont Community College, a Journeyman's Card and Certificate from

Support for Apprenticeship Programs by State



Created with mapchart.net ©

- States Which Offer Tax Credits to Employers for Hiring Apprentices
- States Which Offer Tuition Support for Registered Apprentices

States Which Offer Tax Credits to Employers for Hiring Apprentices

	\$/ Apprentice	% Wages	% Property/ Equipment	% Training costs
Alabama**	\$1,000			
Arkansas*	\$2,000	10%		
Connecticut*	\$4,800	50%		
Louisiana**	\$1,000	\$1/hr wage		
Maryland	\$1,000			
Missouri***		50%	30%	
Montana	\$750; \$1,500 (veteran)			
Nevada			100%	
Rhode Island*	\$4,800 (only manufacturing)	50%		
South Carolina	\$1,000			
Virginia				30% @ community college or \$100/credit @ private
West Virginia*	\$1,000	50%		

* Whichever amount is less; **Yearly Cap; ***Youth only

States Which Offer Tuition Support for Registered Apprentices

	Funds to community colleges	Funds for most instruction	Job Assistance Training	Coverage of Student Costs
California	✓	✓		
Delaware	✓	✓		
Florida	✓	✓		✓
Georgia				70%
Indiana	✓	✓		
Iowa			✓	
Maine	50% tuition costs			50%
North Carolina				100% (must be HS student when entering)
Tennessee				Up to \$11,600 (State employees only)
Texas		✓		
Washington	50% tuition costs			50%



the State of North Carolina, and a certificate from the U.S. Department of Labor.¹⁶²

Since these apprentices often begin the program as teenagers, and it is typically their first work experience, it is also important that there is flexibility in the program to allow the apprentices to change course or return to a more traditional formal education route. Switzerland is particularly successful at providing this flexibility for apprentices.¹⁶³ Apprentices can elect to switch to an academic course of study, gaining entrance into the top universities in Switzerland,¹⁶⁴ and students in academic study can pursue vocational training later on.¹⁶⁵

Zurich North America, a Switzerland-based insurance company, started a similarly-flexible apprenticeship program in the Chicago, Illinois area in 2016. Participants in this program can choose either the claims or underwriting track, splitting their time between training on-the-job at Zurich's North American headquarters in Schaumburg, Illinois and taking courses at William Rainey Harper College.¹⁶⁶ Upon completion of the program, participants receive an Associate in Applied Sciences Degree in Business Administration, a certificate from the U.S. Department of Labor, and they become eligible to earn national insurance credentials.¹⁶⁷ The credits from William Rainey Harper College can be transferred to several four-year colleges, enabling participants to also pursue a Bachelor's Degree in a related or different field.

Second, apprenticeship programs should engage the entire industry in the development of the curriculum and training, so that apprentices in each occupation receive

a standardized and universal training that is portable.

In Germany, for example, the industry associations and trade unions work together to develop and continuously update the training curriculum, and all training, testing, and certificates are standardized by industry throughout the country.¹⁶⁸ Not only does this create more mobility across companies for the apprentices, but it also addresses the employer concern of not receiving the benefit of their investment in apprenticeship programs—all industries and employers collectively pay for and eventually benefit from their standardized national apprenticeship training.

In Southeast Michigan, the Advance Michigan Center for Apprenticeship Innovation (AMCAI) provides a similar model of using the same apprenticeship training program for more than forty employers in the automotive and transportation advanced manufacturing fields.¹⁶⁹ AMCAI is comprised of four community colleges that offer education and on-the-job training with employers in partnership with the Southeast Michigan Community Alliance and Workforce Intelligence Network for Southeast Michigan.¹⁷⁰ Because of the large number of employer and educational partners, AMCAI can reduce the cost of training people in specialized advanced manufacturing, and offer additional resources to apprentices who need additional support or services.¹⁷¹

LaunchCode, a national computer programmer apprenticeship program, also provides industry-standardized training and screening for technology firms. Apprentices receive a 20-week training from LaunchCode before being placed with an employer, and employers cover the cost of on-the-

job training and the apprentices' wages, with LaunchCode receiving a set fee if the apprentice is converted to a permanent employee.¹⁷² Thus far, LaunchCode has placed nearly 1,000 apprentices with employers of various sizes across ten states, with 90% of the apprentices converted to permanent employees.¹⁷³



Photo by the Apprentice School
Newport News Shipbuilding

Third, apprenticeship programs should pay participants for their on-the-job training and cover the costs of their educational component, so that cost is not a barrier to any potential participant. This is standard practice among the European countries, with the government typically paying for the educational component and the employers bearing the cost of paying the apprentices and providing on-the-job training.¹⁷⁴

In Hanover, New Hampshire, Hypertherm runs a two-year apprenticeship program for CNC machine operators, during which the company not only covers the costs of the nine weeks of classroom instruction—it also pays apprentices for their classroom learning time. Hypertherm reported that paying the apprentices for the classroom time generates loyalty to the company, and incentivizes keeping the training program “short and rigorous.”¹⁷⁵ Hypertherm developed the apprenticeship program with Vermont HITEC¹⁷⁶ to ensure a sufficient workforce of machine operators, and after the apprentices began out-performing incumbent workers, it expanded the program to re-train its incumbent workforce of machinists.¹⁷⁷

Fourth, apprenticeship programs should offer participants a career pathway, and should be elevated to the same level as higher education alternatives. In countries like Germany and Switzerland, apprenticeship programs are an integral part of the dual education system, considered an alternative to the higher education path—not a lesser choice.

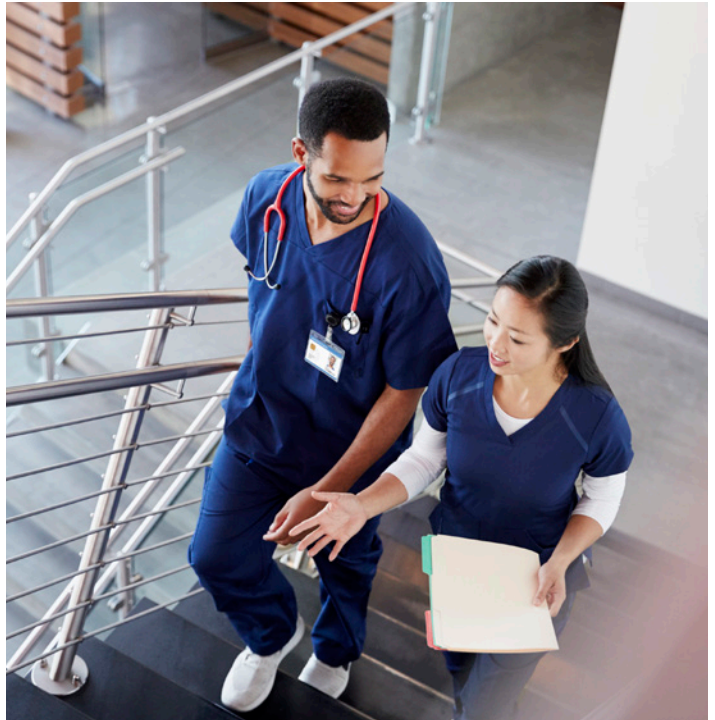
Similarly, the Apprentice School at Newport News Shipbuilding in Newport News, Virginia, offers nearly 800 apprentices the opportunity to learn highly-technical shipbuilding at its parent company Huntington Ingalls Industries while attending college for free.¹⁷⁸ The Apprentice School provides four, five, and eight-year apprenticeships in nineteen shipbuilding disciplines and eight advanced programs of study, and apprentices can earn a Bachelor's degree at Old Dominion University in five to eight years, paid for by Huntington Ingalls.¹⁷⁹ Each year, the Apprentice School receives more than 4,000 applicants for about 230 spots, making it as competitive as top universities, like Harvard University.¹⁸⁰

POLICY RECOMMENDATIONS

Building upon best practices in apprenticeship programs internationally and from around the country, the following are policy recommendations for New Jersey to adopt to lead the country in building out a lifelong learning apprenticeship model. In line with other states around the nation, these recommendations include tax credits for apprenticeship programs and tuition support for apprentice training. Based on research into best practices in workforce development and education, these recommendations also include policies to support the development and expansion of apprenticeship programs, particularly in high growth industries.

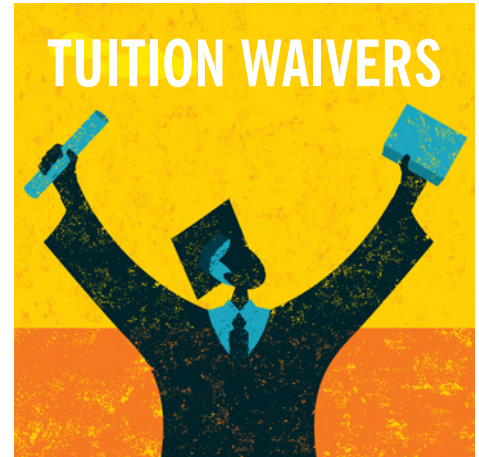
New Jersey should expand the use of apprenticeships that are federally-registered, so that the programs could potentially receive complementary support from both the federal and state government, enabling more businesses to afford the start-up costs of an apprenticeship program—ultimately opening the doors to additional future apprentices in New Jersey.

- **Develop a Statewide Plan to Diversify Apprenticeships:** Although individual apprenticeship sponsors and businesses are required under federal law to implement affirmative action programs and commit to equal opportunity throughout their apprenticeship program,¹⁸¹ the State of New Jersey should develop its own affirmative action plan to increase diversity in its apprenticeship programs. This plan could be developed in partnership between New Jersey’s Office of Apprenticeships, the Department of Labor and Workforce Development, the Department of Education, and the State’s Chief Diversity Officer, consulting with and receiving input from the Governor, the Legislature, community and advocacy groups that work with and on behalf of impacted communities of people, and the public. Ideally, the plan should provide industry-specific recommendations for increasing diversity—particularly by gender, race, and disability status—and should be tailored to the industries, businesses, colleges and universities, workforce development providers, and resident population of New Jersey.
- **Create a Statewide Youth Apprenticeship Pilot Program in New Jersey High Schools and State Colleges:** In the other countries with the most developed and successful national apprenticeship programs, students are given the opportunity to begin an apprenticeship program during their teenage years. While the United States used to have more trade instruction during middle and high school, those programs were significantly cut back as graduation requirements were increased and a college preparation track was emphasized.¹⁸² Unfortunately, this inadvertently resulted in the elevation of a college track over vocational training, without empowering students to learn about the skilled trades and other alternatives to college.



New Jersey could pioneer a statewide apprenticeship program in high schools and state colleges, perhaps building upon the existing curriculum of high schools and colleges that specialize or have large math, science, and computing programs in partnership with the New Jersey Department of Education. Building off lessons learned from other nations, this pilot program should provide students with intensive career counseling on various career paths and options in middle school, high school, and college. For high school students, it should provide them with the flexibility in their curriculum to either pursue their apprenticeship career field or college post-high school graduation.

It should also mandate that the participating employers pay the student-apprentices, including providing them with gradually increasing wages and an industry-recognized credential upon completion. This type of program would expand the opportunities available to young people, including students who are unable to afford to attend college or who want some work experience before entering college. Further, this type of program could incentivize additional employers to begin apprenticeship programs in New Jersey, since they would receive a dedicated number of apprentices annually, enabling the employers to recoup their upfront investment in training faster.



- **Support the Development of Three Statewide Adult Apprenticeship Pilot Programs in South, Central, and North New Jersey in High Growth Industries:** Like the rest of the country, most of New Jersey’s current apprenticeships are in the skilled trades. In order to provide state support to expand the industries using apprenticeships and advance economic development, the State should create a pilot grant program through the Department of Labor and Workforce Development’s Talent Networks¹⁸³ to fund three new adult apprenticeship programs in each part of the State (South, Central, North) in a high growth industry, like (a) bio/pharmaceuticals and life sciences, (b) transportation, logistics, and distribution, (c) finance, (d) advanced manufacturing, (e) health care, and (f) energy. These grants could be awarded to any type of organizational sponsor of an apprenticeship program, including businesses, labor unions, colleges, workforce training providers, and non-profit organizations, but they should be awarded in three different high growth industries.
- **Create a Pilot Pre-Apprenticeship Program for New Jersey:** While New Jersey should prioritize getting people into apprenticeships, some people with limited or no work experience may need a pre-apprenticeship program that prepares them to succeed in what is essentially a full-time job (including the instruction). Thus, New Jersey should create a uniform, statewide pre-apprenticeship program that is based on the U.S. Department of Labor’s quality framework for pre-apprenticeship programs¹⁸⁴ and best practices nationally on preparing people—especially people with barriers to employment—on how to navigate a job, including communicating, working with teams, and meeting employer expectations. This program should also provide one-on-one tutoring to ensure that program participants have basic literacy and math skills, and it should provide supportive services for participants as needed.

This program would receive referrals for participants from apprenticeship program directors around the state of applicants who they believe would benefit from this training prior to entering the apprenticeship program. This program should be developed in consultation with the New Jersey Department of Labor & Workforce Development, as well as the Department of Education, and it should be entirely state-funded since most participants would be unable to afford tuition costs, and they would not be receiving a salary during the pre-apprenticeship program.

- **Tuition Fee Waiver for Apprenticeship Courses:** In addition to on-the-job training, every apprentice must complete a course of instruction and earn an industry-recognized credential during their program. While it is best practice for employers to cover these educational costs for their apprentices, it is not a federal requirement. To ensure that the instruction-related costs of an apprenticeship do not pose a financial barrier to participation for residents, the State should provide a tuition fee

waiver for residents earning below the state’s median annual income. Not only will this tuition fee waiver support the growth of apprenticeships in the state and foster economic mobility, it will also provide additional state support for the educational partners of an apprenticeship program—primarily community colleges and high-quality workforce training providers.

- **Provide An Annual Appropriation for New Jersey Pathways Leading Apprentices to a College Education (NJ PLACE):** The NJ PLACE program was created to help facilitate agreements between “[s]tate agencies, employer organizations, labor organizations, schools, and two-year and four-year institutions of higher education to enter into agreements to provide college credit in connection with apprenticeship programs and permit the work of apprentices in those programs to be credited towards two-year and four-year college degrees.”¹⁸⁵ In addition to enabling apprentices to transfer their program work into college credits, the NJ PLACE program is also intended to support the development of apprenticeship programs beyond the construction industry, and to link those programs to college degree programs.

The NJ PLACE program is designed to support the “Youth Transitions to Work Partnership Act” by connecting apprenticeship programs with high schools and colleges to enable successful transitions of high school graduates into apprenticeship and college degree programs. However, there is not a designated funding source for the NJ PLACE program to ensure that the State Employment and Training Commission of the Department of Labor and Workforce Development can provide the staff and resources necessary to facilitate these partnerships on an ongoing basis.¹⁸⁶ New Jersey should provide for an annual appropriation to ensure the NJ PLACE program is adequately funded.

- **Pass Stackable Credential Legislation:** Building on state laws like the NJ PLACE Act,¹⁸⁷ New Jersey should adopt a law requiring that community colleges and workforce training providers receiving government funds exclusively provide stackable credentials—certifications or course credits that can lead to a more advanced certification or a degree—that would be accepted by certificate or associate degree programs in the same field. Stackable credentials are a critical tool for people to advance in their career field over time, particularly while working full-time. They are also usually portable among employers within the same industry, which promotes career mobility for residents. Additional funds should also be appropriated to provide technical assistance and support to colleges and training providers to implement this stackable credential requirement.
- **Tax Credits for Organizational Sponsors of Apprenticeship Programs to Partially Cover Start-Up Costs:** Apprenticeship programs can involve significant start-up costs, including staff time, the renting or purchase of equipment and training space, the payment of education and training costs, and allocating a gradually-increasing salary for apprentices. In order to incentivize the establishment of new apprenticeship programs, the State should provide a \$5,000 business tax credit for businesses and a \$5,000 state grant to non-profits, labor unions, and other tax-exempt organizations that began a federally-registered apprenticeship program during the prior year. Since it is particularly important to expand the state’s workforce in high growth industries, businesses in the state’s high growth industries should receive an additional \$5,000 business tax credit for beginning a federally-registered apprenticeship program—entitling them to a total tax credit of \$10,000. These tax credits are larger than the typical \$1,000 to \$2,000 that most states offer, because New Jersey is a high-cost state and smaller tax credits do not offer as much of a meaningful incentive to incur the start-up and salary costs for a new apprenticeship program. The tax credits should either be gradually increased over time, or indexed to inflation, so that they remain strong incentives for businesses—particularly in high growth industries—to start federally-registered apprenticeship programs in New Jersey.

- **Tax Credits for Businesses to Partially Cover Apprentice Wages:**

New Jersey should incentivize businesses to employ apprentices by providing tax credits to partially offset their wages. For each apprentice that a business employs for at least six months of the prior year, the business should receive a \$1,000 tax credit against their New Jersey state taxes.

To encourage businesses to employ apprentices that face barriers to employment, the business should receive an additional \$2,000 tax credit for each apprentice who was employed for at least six months of the prior year if they are a veteran; eligible to receive Temporary Assistance for Needy Families (TANF)/Work First New Jersey and/or the Supplemental Nutrition Assistance Program (SNAP); a dislocated or displaced worker; if they were previously long-term unemployed; or previously incarcerated. Further, to encourage businesses and industry associations to diversify their career field and implement a robust—and federally required—affirmative action plan for their apprenticeship program, the business should receive an additional \$2,000 tax credit for each apprentice who is employed for at least six months of the prior year and who is under-represented in that career field based on their race, color, religion, national origin, sex, sexual orientation, disability, or age. These tax credits are additive, meaning that a business could claim more than one tax credit for a single apprentice. For example, a technology-based business could claim a total of \$5,000 in tax credits for a female coding apprentice who was previously long-term unemployed, since women are under-represented as coders in the technology industry.¹⁸⁸ These tax credits should either be gradually increased over time, or indexed to inflation, so that they remain strong incentives for businesses to employ and train apprentices in New Jersey.

For each apprentice that a business employs for at least six months of the prior year, the business should receive a \$1,000 tax credit against their New Jersey state taxes.

- **Create a Pilot Transportation and Childcare Assistance Program for Apprentices:** Multiple state and national studies of apprenticeship programs have consistently identified two main barriers to completion of apprenticeship programs: a lack of affordable and reliable transportation and a lack of affordable, high-quality childcare. While these two issues impact many apprentices, they disproportionately affect women, people of color, and low-income apprentices—and are often the reason that these groups of people decide to leave apprenticeship programs before completion. In order to retain more people who are traditionally under-represented in apprenticeship programs, the State should create a pilot transportation and childcare assistance program for federally-registered apprentices earning below the state median annual income.¹⁸⁹ This program would provide direct financial assistance or vouchers to eligible participants, as well as help the apprentices identify existing transportation or childcare programs that they or their children may be eligible for, like pre-kindergarten programs. Further, this pilot program should include state support for apprentices to earn their drivers' license or receive reinstatement of a previously-suspended drivers' license, because a drivers' license is often a requirement for participation in apprenticeship programs in the skilled trades.



- **Create Employee Resource Groups and Peer-to-Peer Mentor Programs for Under-Represented Groups in Apprenticeship Programs:** Women, people of color, and people with disabilities are significantly under-represented in apprenticeship programs, despite the fact that these groups comprise a large and growing segment of the workforce. While it is necessary to increase recruitment of these groups to apprenticeship programs, it is crucial to ensure their retention and completion of the apprenticeship once they enter.

All participants in federally-registered apprenticeship programs receive a mentor, but it would be unlikely that most of these under-represented people receive a mentor who is also from an under-represented group. These under-represented apprentices may not know how to navigate their new workplace, or how to handle harassment or discrimination, ultimately leading many to leave their program before completion. Eventually, when there is a critical mass of women, people of color, and people with disabilities in apprenticeship programs, this mentoring will arise organically, and instances of harassment, discrimination, and alienation will naturally decrease.

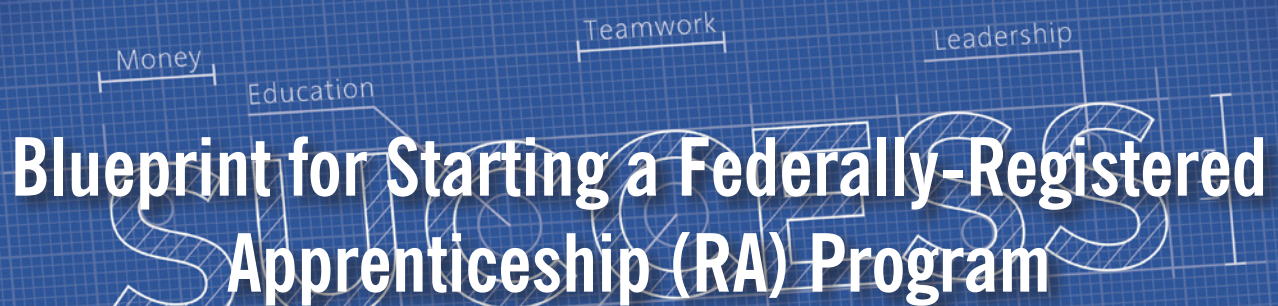
However, in the intervening years, the New Jersey Apprenticeship Network and New Jersey's Department of Labor and Workforce Development, working in partnership with New Jersey's Office of Apprenticeships, New Jersey's Department of Education, and the State's Chief Diversity Officer, should begin a peer-to-peer statewide apprenticeship mentoring program for women, people of color, and people with disabilities. In addition, there should be an analysis of what groups of people are under-represented in which industries, and then the State should form employee resource groups for those apprentices. For instance, women are severely under-represented in the construction trades, so the State could form an employee resource group for women in the skilled trades.



Conclusion: Becoming the United States of Opportunity

In the United States right now, a child born into a family at the bottom of the economic ladder has less of a chance to rise to the top than a child born in other post-industrial nations like Canada and Great Britain.¹⁹⁰ This lack of economic opportunity—particularly for people of color and low-income people—is driving the United States towards dangerous levels of inequality not seen since the Great Depression era. At the same time, our economy is undergoing rapid and substantial changes that will require additional training and government support for the workforce to adapt and flourish. These challenges will ultimately require several broad-based systemic reforms, including changing the nature of workforce training and education and substantially expanding apprenticeship programs, increasing the minimum wage and strengthening legal protections for workers, and reducing the costs of high education and better debt forgiveness programs for borrowers.

As a state embodying both the challenges and opportunities presented by this moment, New Jersey can lead the nation in adopting a lifelong learning model of apprenticeships that reignites economic opportunity and mobility for all residents. This holistic model of apprenticeship programs rooted in expanding equity and access to opportunity for women, people of color, people with disabilities, and low-income people through the “learn and earn” model of training, while supporting the growth of industries in the state, will position New Jersey as a leading state for opportunity. As this model is adopted by more states, the nation will come closer to embodying its promise of being the United States of opportunity—for all.



Blueprint for Starting a Federally-Registered Apprenticeship (RA) Program

APPENDIX

The following is a ten-step plan for businesses or other organizations to start a Federally-Registered Apprenticeship (RA) program based on federal law, recommendations from the U.S. Department of Labor and U.S. Department of Commerce, a review of successful and established apprenticeship programs from around the country and in different industries, and research into best practices in apprenticeships and workforce training.

This blueprint applies nationally, though some states may impose additional requirements to take advantage of state-specific tax incentives and other benefits. Every state has either a federal Office of Apprenticeships or a State Apprentice Agency that is federally-recognized, which is often the best source of up-to-date information and technical advising on starting or maintaining a federally-registered apprenticeship program.

STEP 1

Hold meetings within your company, industry sector, or organization to decide how apprenticeships fit into your company culture, recruitment strategies, and short, medium, and long-term goals and work plans.

For an apprenticeship program to be successful, it must bring value to the company or organization, and there must be buy-in or support throughout the organization. The first step in creating an apprenticeship program is to consult with people in all relevant parts of the organization on how they currently

operate, and how apprentices could support their work and be integrated into their department's plans. For instance, the human resources department could share their current talent recruitment and development strategy—meaning how they hire new employees and support the professional development of current employees—and share what jobs the company has trouble filling.¹⁹¹

Based on the collective input into these meetings, there should be a general consensus on the value of an apprenticeship program, and a clear concept of how it supports the organization's strategy and work plans.



STEP 2

Decide what types of job(s) you want to fill with apprentices, and what types of industry-recognized credentials and education those employees will need.

The second step in developing an apprenticeship program is to determine what job—or jobs—will be filled by the apprentices. Typically, companies realize the greatest return on their investment in apprenticeship programs when they are trying to fill middle-skill positions that require some specialized training or technical skill. These positions can be the most challenging for companies to fill, because they require a specific set of skills, unlike entry-level positions, and because they do not pay as well as high-skill positions, which limits the pool of interested applicants.

After determining what jobs in the company or organization will be at least partially filled by apprentices, it is necessary to identify the minimal education and industry-recognized credentials required for each of those jobs. In addition, since RA programs require mentors for the apprentices to help supervise their on-the-job training and integrate them into the company, planning for internal recruitment and training of mentors should begin.

STEP 3

Contact your state office of apprenticeships to begin applying for a Federally-Registered Apprenticeship program, and to receive technical assistance and advising.

After determining how apprenticeships fit into your organization and what jobs you will seek to fill, the next step is to contact your state's U.S. Department of Labor Office of Apprenticeship or a state agency that is recognized by the U.S. Department of Labor.¹⁹² These agencies can provide technical assistance as a company creates its apprenticeship program, including helping to structure the apprenticeship program, preparing the on-the-job training outline, and identifying educational partners to help coordinate the program.¹⁹³

If the application is for an apprenticeship program for which the Department of Labor previously approved the Standards of Apprenticeship, it can receive expedited approval. However, if the occupation for the apprenticeship has not been previously approved by the Department of Labor, the application must include documentation on the need for an apprenticeship program and the curriculum for the program (proposed Standard of Apprenticeship).¹⁹⁴



STEP 4

Form partnerships for your apprenticeship program to minimize costs and allow for a continuous cohort model of apprenticeship training.

Many different types of organizations can sponsor an RA program, including businesses, industry associations, labor organizations, community or four-year colleges, and community-based organizations. Since apprenticeship programs must include both on-the-job training and job-related classroom instruction leading to an industry-recognized credential, it is essential that at least one employer and at least one education provider (a college or workforce training provider) is a partner.

Employers, industry associations, and labor organizations also benefit from economies of scale by partnering together to train cohorts of apprentices for the same types of jobs across an industry in a region.¹⁹⁵ For example, organizations could partner on a regional apprenticeship program for skilled electricians to work in the construction industry, medical technicians to work in the health care industry, and coders to work in the technology departments of companies.

By forming these partnerships, the cost to each employer for the training of each apprentice goes down, as they can share

the fixed costs of classroom instruction, like the instructor or professor's salary. Further, forming partnerships can enable a group of employers to continuously train cohorts of apprentices, even if each individual employer only needs to hire a handful of people for that position. The cohort training model is more effective because it facilitates group learning and provides the apprentices with a built-in peer support network that helps ensure retention and program completion.¹⁹⁶

STEP 5

Design and obtain federal and state approval for the apprenticeship program, as well as approval from the Registered Apprenticeship College Consortium and any other relevant government or industry organization.

The next step is to submit a plan and documentation on the proposed apprenticeship program for a specific occupation to either the Department of Labor¹⁹⁷ or your State Apprenticeship Agency—depending on your state—for their review and approval.

To obtain approval, the standards documentation must “demonstrate that an apprenticeship meets the five-part definition. . . by listing the occupational competencies,

curriculum, wages and hours of work, applicant qualifications, and duties and responsibilities of the apprentices, sponsor, and mentors.”¹⁹⁸ The application must also list the industry-recognized credential that the apprentices will receive upon program completion, and it must demonstrate that the program meets the Equal Employment Opportunity requirements for recruitment and selection and other regulatory requirements related to that particular apprenticeship field.¹⁹⁹

The key elements of RA programs are:²⁰⁰

1. Participants are paid by employers during training.
2. Programs meet national standards for registration with the U.S. Department of Labor (or federally-recognized State Apprenticeship Agencies).
3. Programs provide on-the-job learning and job-related classroom or technical instruction.
4. On-the-job learning is conducted under the direction of one or more of the employer’s personnel.
5. Training results in an industry-recognized credential that certifies occupational proficiency.

After obtaining approval from the U.S. Department of Labor or your state apprenticeship agency for an RA program, the next step is to submit your program information to the Department of Labor and the U.S. Department of Education’s Registered Apprenticeship College Consortium (RACC).²⁰¹ The RACC is a national consortium of two and four-year colleges and educational associations, employers, and labor groups that have collectively agreed to accept a completion certificate from a RA program for college credit at any of the partner colleges and universities.²⁰² In order to participate, the apprenticeship program must be evaluated by an independent third party organization, like the American Council on Education or the National College Credit Recommendation Service, which assesses the college-level equivalency of the program.²⁰³ By providing the apprentices with college credit, this consortium reduces the financial cost and time investment of earning a two or four-year college degree in the future, which encourages lifelong learning and career mobility.

STEP 6

Establish a system to collect and analyze data on the costs and benefits of the apprenticeship program to each partner and the collective group, and to allow for streamlining and improvements to the program as it launches and unfolds.

Studies of apprenticeship programs consistently demonstrate that their value significantly exceeds their cost to the individual employee, the business, and the government. However, since each organization or company must spend significant resources to establish and run an apprenticeship program, and it is a multi-year commitment, it is optimal to collect data to track outcomes and justify the ongoing expenditure to the company’s leadership and board. The following steps are adopted from *The Benefits and Costs of Apprenticeships: A Business Perspective*.²⁰⁴

First, it is necessary to keep track of the costs of the apprenticeship program, as compared to the current costs of recruiting and training for that job position(s). There will be certain fixed costs to running an apprenticeship program, which are also known as sunk costs,²⁰⁵ because they are the minimal expenditures to running the program regardless of the number of participants. These include the following: (a) curriculum development or purchase, (b) equipment purchases, if any, (c) staff time spent on setting up the program, (d) overhead and management costs, (e) use of classroom space, if outside of the company, and (f) recruitment costs.²⁰⁶ Then, there are variable costs, which will vary depending on the number of apprentices in your program.²⁰⁷ These include the following: (a) the wages and benefits paid to each apprentice, (b) the time each mentor spends with their apprentice-mentee, (c) any supplies and uniforms, if applicable, and (d) the tuition paid for each apprentice, and any costs and fees for their books and materials.²⁰⁸

Second, assess and measure the benefits of the apprenticeship program to the entire company. Some potential benefits of an apprenticeship program could occur in production and

operations, while other benefits could accrue on the human resources and personnel side. The potential benefits of an apprenticeship program on the program or operations side could include: (a) “output during the apprenticeship at a reduced wage,” (b) “higher post-apprenticeship productivity relative to similarly-tenured employees,” and (c) “reduction in mistakes or errors).²⁰⁹ On the human resources and personnel side, potential benefits could include: (a) greater “employee engagement and loyalty,” (b) “reduced turnover,” (c) dedicated “pipeline of skilled employees,” (d) “better matching of employee skills,” (e) pipeline of future managers, and (f) “lower recruiting costs.” Keep in mind that some benefits will only appear in the long-term, so it is important to track the baseline data prior to beginning the apprenticeship program and during the ensuing years.²¹⁰

Third, once the apprenticeship program is operational and it is possible to collect data on both its costs and benefits, share this data with people throughout the company and program partners to identify opportunities for improvements to the apprenticeship program and to minimize program costs while maximizing the program value.²¹¹ The U.S. Department of Commerce created a beta version of a tool to calculate the “return on investment”—or cost-benefit analysis—of internship programs, which can help with this calculation: <http://www.esa.doc.gov/content/new-tool-help-firms-calculate-their-return-investment-apprenticeship>.

STEP 7

Recruit a diverse talent pool for the apprenticeship program from both incumbent workers and new jobseekers. Assess your employee onboarding process to ensure that your workplace is designed to support and integrate people of different races, colors, religions, gender and gender identity, sexual orientation, national origin, and veteran status.

Once the apprenticeship program is designed and approved, it is necessary to recruit a diverse talent pool of applicants, and to ensure that the employee onboarding process reflects the



needs of a diverse workforce. A critical component of this part of the work is to assemble a diverse team of current employees within your organization to lead the recruitment strategy development and the design of the process to successfully integrate these new apprentices into your company.

When designing the recruitment strategy, it is essential to have deliberate, targeted outreach to under-represented groups within the job type and career field. For instance, if you recruit apprentices for a job type that is predominantly filled by men, then you may have to create different messaging materials to recruit women. Part of recruiting under-represented groups of people for a specific job or career field is communicating that the organization is welcoming to a diverse workforce, and that there will be support once they are on the job.

It is essential to examine your organization’s policies and procedures for all employees to ensure that the workplace is equitably designed and that no unnecessary barriers are created. For example, do the company leave policies provide flexibility for employees with caregiving responsibilities—who are predominantly women²¹²—so that they are not penalized if they must take a day off to care for a sick child or ailing parent?

STEP 8

Launch the pilot apprenticeship program, while continuing to recruit for subsequent cohorts of apprentices.

When the apprenticeship program launches, allow for some flexibility to adapt the program based on lessons learned from the apprentices and other partners, while still adhering to the minimal program standards. During this time, continue to recruit for subsequent classes of apprentices, including asking for referrals from current apprentices.

STEP 9

Conduct regularly-scheduled in-person check-ins with the apprentices, their mentors and other supervisors, and the training/education providers to ensure that the program is running smoothly and that individual apprentices are successfully progressing through the program.

Although there is not national data available, a multi-year study of apprenticeship programs in ten states found that only about half of apprentices complete their program.²¹³ While research shows that apprentices receive value in the form of higher lifetime earnings from participating, even if they do not complete the program,²¹⁴ the company does lose a skilled employee that they have invested anywhere from \$25,000 to \$250,000 in training.²¹⁵

Some of this attrition may be due to the long length of apprenticeship programs, which generally run between one and four years. Over the course of years, peoples' personal and professional lives and goals may change significantly. However, some of these apprentices left their programs because of challenges that were within the purview of the employer, with former female apprentices reporting harassment, hostile work environments, and discrimination.²¹⁶ Apprentices may also face barriers to working full-time that confront many people, such as unreliable and inadequate public transportation, chronic health conditions, and insufficient and unaffordable help with child care or elder care.

Thus, there should be regularly-scheduled in-person check-ins with the apprentices, their mentors and supervisors, and the training/education providers to identify and remedy any issues. As part of these conversations, efforts should be made by the employer(s), mentor, education/training provider, and other partners to assist apprentices who encounter challenges in the workplace or in completing their training.

STEP 10

On an ongoing basis, assess how the apprenticeship program can be improved, and implement those changes.

Finally, there should be a regular assessment of the apprenticeship program to determine how it can be improved and updated, as new developments occur in the career field or company. The cost-benefit data collected and the one-on-one check-ins with the apprentices, their mentors and other supervisors, and the training/education providers will help to identify areas for growth and improvement. For example, Dartmouth-Hitchcock changed the shift scheduling for its pharmacy technician apprenticeship program after receiving input from the apprentices that they found it difficult to be productive when working both a late night and an early morning shift.²¹⁷



[Endnotes]

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³⁷ Danielle Paquette, *2017’s Challenge: Too Many Jobs, Not Enough Workers*, WASH. POST: WONKBLOG (Dec. 28, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/12/28/2018s-challenge-too-many-jobs-not-enough-workers/?noredirect=on&utm_term=.dbfb2b056cc9.

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⁵⁸ *Id.* at 161-190; ROSABETH MOSS KANTER, MEN AND WOMEN OF THE CORPORATION (1977).

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⁶³ HOFFMAN ET AL., *supra* note 16, at 29-31 ("In the 1980s, a Conference Board survey found that 56 percent of executives believed 'employees who are loyal to the company and further its business goals deserve an assurance of continued employment.' Just a decade later, that figure had plummeted to 6 percent. Remember GE's focus on maximizing employee security? By the 1990s, GE CEO Jack Welch was quoted as saying, 'Loyalty to a company? It's nonsense.'").

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¹³⁶ The original statute can be found on the U.S. Department of Labor website. *Fitzgerald Act*, U.S. DEP'T OF LABOR, https://www.doleta.gov/OA/Original_fitfact_code.cfm (last visited Aug. 13, 2018).

¹³⁷ To access the administrative interpretations of the Fitzgerald Act and other employment-related laws issued by the U.S. Department of Labor, see *Federal Register Documents*, U.S. DEP'T OF LABOR, <https://federalregister.dol.gov/> (last visited Aug. 17, 2018).

¹³⁸ 29 C.F.R. § 29.3(a); State contacts are listed here: *State Offices of Apprenticeship*, EMP. & TRAINING ADMIN., U.S. DEP'T OF LABOR, [HTTPS://WWW.DOLETA.GOV/OA/STATEOFFICES.CFM](https://www.doleta.gov/OA/STATEOFFICES.CFM) (last updated Apr. 3, 2018). For states with federal Office of Apprenticeship administration, there is a process to have a State Apprenticeship Agency formally approved, or recognized, and derecognized. 29 C.F.R. §§ 29.13, 29.14.

¹³⁹ 29 C.F.R. § 29.4.

¹⁴⁰ 29 C.F.R. § 29.5 (a-b).

¹⁴¹ 29 C.F.R. § 29.5 (b(2)(i)).

¹⁴² 29 C.F.R. § 29.5 (b(2)(ii)).

¹⁴³ 29 C.F.R. § 29.5 (b(2)(iii)). *See also* 29 C.F.R. § 29.5 (b(16)) (“Program standards that utilize the competency-based or hybrid approach for progression through an apprenticeship and that choose to issue interim credentials must clearly identify the interim credentials, demonstrate how these credentials link to the components of the apprenticeable occupation, and establish the process for assessing an individual apprentice's demonstration of competency associated with the particular interim credential. Further, interim credentials must only be issued for recognized components of an apprenticeable occupation, thereby linking interim credentials specifically to the knowledge, skills, and abilities associated with those components of the apprenticeable occupation.”).

¹⁴⁴ 29 C.F.R. § 29.5 (b(4)).

¹⁴⁵ 29 C.F.R. § 29.5 (b(4)). Note that there are minimal standards for the classroom instructors. 29 C.F.R. § 29.5 (b(4)(i-ii)). (The instructors must “[m]eet the State Department of Education's requirements for a vocational-technical instructor in the State of registration, or be a subject matter expert, which is an individual, such as a journeyworker, who is recognized within an industry as having expertise in a specific occupation; and [h]ave training in teaching techniques and adult learning styles, which may occur before or after the apprenticeship instructor has started to provide the related technical instruction.”)

¹⁴⁶ 29 C.F.R. § 29.5 (b(5-7)).

¹⁴⁷ 29 C.F.R. § 29.5 (b(8,20)).

¹⁴⁸ The Equal Opportunity pledge is “[Name of sponsor] will not discriminate against apprenticeship applicants or apprentices based on race, color, religion, national origin, sex (including pregnancy and gender identity), sexual orientation, genetic information, or because they are an individual with a disability or a person 40 years old or older. [Name of sponsor] will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required under Title 29 of the Code of Federal Regulations, part 30.” 29 C.F.R. § 30.3(c)(1). Note that the categories of protected groups included in the pledge can be expanded if state or local law provides additional protections. 29 C.F.R. § 30.3(c)(2) (“The nondiscrimination bases listed in this pledge may be broadened to conform to consistent State and local requirements. Sponsors may include additional protected bases but may not exclude any of the bases protected by this part.”).

¹⁴⁹ This requirement became effective on January 18, 2017, and programs are required to file their proposed affirmative action plan within two years—by January 2019. New apprenticeship programs have two years to file their affirmative action program from their program registration date. 29 C.F.R. § 30.4.

¹⁵⁰ 29 C.F.R. § 30.10. In addition to requiring the selection procedure to be facially neutral, it must also “(1) . . . comply with the Uniform Guidelines on Employee Selection Procedures (UGESP) (41 CFR part 60–3), including the requirements to evaluate the impact of the selection procedure on race, sex, and ethnic groups (Hispanic or Latino/non-Hispanic or Latino) and to demonstrate job-relatedness and business necessity for those procedures that result in adverse impact in accordance with the requirements of UGESP,” “(2) . . . be uniformly and consistently applied to all applicants and apprentices within each selection procedure utilized,” and “(3) . . . comply with title I of the ADA and EEOC's implementing regulations at part 1630. This procedure(s) must not screen out or tend to screen out an individual with a disability or a class of individuals with disabilities, on the basis of disability, unless the standard, test or other selection criteria, as used by the program sponsor, is shown to be job-related for the position in question and is consistent with business necessity.” 29 C.F.R. § 30.10(b)(1-3); 29 C.F.R. § 30.10

¹⁵¹ *State Offices of Apprenticeship*, EMP. & TRAINING ADMIN., U.S. DEP'T OF LABOR, <https://www.doleta.gov/OA/stateoffices.cfm> (last updated Apr. 3, 2018).

¹⁵² Press Release, State of N.J., Governor Murphy Advances Plans for New Jersey Apprenticeship Network to Spur Economic Development & Educational Attainment for New Jerseyans (June 8, 2018), https://nj.gov/governor/news/news/562018/approved/20180608_apprenticeship.shtml.

¹⁵³ Press Release, State of N.J., Governor Murphy Advances Plans for New Jersey Apprenticeship Network to Spur Economic Development & Educational Attainment for New Jerseyans (June 8, 2018), https://nj.gov/governor/news/news/562018/approved/20180608_apprenticeship.shtml.

¹⁵⁴ *Registered Apprenticeship National Results: Fiscal Year (FY) 2017 (10/01/2016 to 9/30/2017)*, EMP. & TRAINING ADMIN., U.S. DEP'T OF LABOR, https://doleta.gov/oa/data_statistics.cfm (last updated Apr. 4, 2018).

¹⁵⁵ KEITH ROLLAND, FED. RES. BANK OF PHILA., APPRENTICESHIP GUIDE 2017 11 (Angela Martello ed., 2017), https://www.philadelphiafed.org/-/media/community-development/publications/special-reports/apprenticeship-guide/apprentguide_web_full.pdf?la=en.

¹⁵⁶ *Programmes & Pathways under the Apprenticeship Toolbox*, EUROPEAN ALLIANCE FOR APPRENTICESHIP, <https://www.apprenticeship-toolbox.eu/programmes-pathways> (last visited Aug. 15, 2018).

¹⁵⁷ *Spotlight: Commerce Signs Agreement with Germany to Coordinate Workforce Development and Apprenticeship Opportunities*, NEWSROOM: U.S. ECON. DEV. ADMIN., U.S. DEP'T OF COMMERCE (July 2015), <https://www.eda.gov/archives/2016/news/blogs/2015/07/01/spotlight.htm>; Penny Pritzker, U.S. Sec'y of Com., Remarks at Swiss MOU Signing (July 9, 2015), <https://www.commerce.gov/news/secretary-speeches/2015/07/us-secretary-commerce-penny-pritzker-delivers-remarks-swiss-mou>.

¹⁵⁸ *Vocational Education & Training*, SWISS EDUCATION, <https://swisseducation.educa.ch/en/vocational-education-and-training-0> (last visited Aug. 16, 2018); *The German Vocational Training System*, FED. MINISTRY OF EDUC. & RES., <https://www.bmbf.de/en/the-german-vocational-training-system-2129.html> (last visited Aug. 17, 2018); *Apprenticeship Training in Austria – A Best-Practice-Case in Europe*, AUSTRIAN INFO.: THE ZINE, <http://www.austrianinformation.org/current-issue-spring-2014/education-in-austria-the-dual-system>

(last visited Aug. 17, 2018); *Apprenticeships Guide*, NAT'L APPRENTICESHIP SERV. OF THE UNITED KINGDOM, <https://www.gov.uk/apprenticeships-guide> (last visited Aug. 17, 2018).

¹⁵⁹ NAT'L APPRENTICESHIP SERV. OF THE UNITED KINGDOM, A GUIDE TO HIGHER AND DEGREE APPRENTICESHIPS (2018), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699399/Higher_and_degree_apprenticeship_fact_sheet-090418.pdf.

¹⁶⁰ APPRENTICESHIP 2000, *About the Program*, <http://apprenticeship2000.com/zwp/about/> (last visited August 15, 2018).

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ Heather Singmaster, *Swiss Education: No Dead Ends for Students*, EDUC. WEEK: GLOB. LEARNING (Mar. 24, 2015, 10:30 AM), http://blogs.edweek.org/edweek/global_learning/2015/03/cte_in_switzerland_supporting_students_for_success_with_no_dead_ends.html?print=1 (“We have built in a high degree of permeability in the system, which allows for a multitude of career pathways for young people. There are no dead ends. With every degree there comes further education options, thus VET is a very solid foundation for lifelong learning.”).

¹⁶⁴ Ralph Atkins, *Switzerland Thrives on Apprenticeship Tradition*, SWISSINFO.CH, https://www.swissinfo.ch/eng/training-for-success_switzerland-thrives-on-apprenticeship-tradition/43769858 (“Even if adolescents start in vocational training, they can switch to academic courses later and even study at the country’s top universities. ‘You could work on the till in a shop — or rise to become a professor,’ says Tim Hodel, another SBB apprentice.”) (last visited Aug. 16, 2018).

¹⁶⁵ *The Swiss Apprenticeship System: A Model for the World*, NEWLY SWISSED, <https://www.newlyswissed.com/swiss-apprenticeship-system-model-world/> (“[A] great deal of students in gymnasiums realize a few years into their studies that they do not wish to follow an academic path but would prefer to move into industry. In these cases, the cantons will work out a fast track apprenticeship curriculum to account for knowledge gained during studies at a gymnasium. This flexibility is exactly what other cantons need to accommodate the youth and prevent them from feeling trapped.”) (last visited Aug. 17, 2018).

¹⁶⁶ Stephanie K. Jones, *Zurich Shares Lessons from First Earn-and-Learn U.S. Apprenticeship Class*, INSURANCE JOURNAL (Jan. 22, 2018), <https://www.insurancejournal.com/magazines/mag-features/2018/01/22/477521.htm>.

¹⁶⁷ *Insurance apprentices graduate from Zurich*, DAILY HERALD (Dec. 7, 2017, 1:10 PM), <http://www.dailyherald.com/business/20171207/insurance-apprentices-graduate-from-zurich>.

¹⁶⁸ *The German Vocational Training System*, FED. MINISTRY OF EDUC. & RES., <https://www.bmbf.de/en/the-german-vocational-training-system-2129.html> (last visited Aug. 17, 2018).

¹⁶⁹ *About AMCAI*, ADVANCE MICH. CTR. FOR APPRENTICESHIP INNOVATION, <https://miapprenticeship.org/about/> (last visited Aug. 13, 2018).

¹⁷⁰ The four community colleges are Henry Ford College, Oakland Community College, Schoolcraft College, and St. Clair County Community College. *Id.*

¹⁷¹ *Id.*

¹⁷² OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 55-56.

¹⁷³ *Id.* at 55; *About*, LAUNCHCODE, <https://www.launchcode.org/about> (last visited Aug. 13, 2018).

¹⁷⁴ *Financing under the Apprenticeship Toolbox*, EUROPEAN ALLIANCE FOR APPRENTICESHIP, <https://www.apprenticeship-toolbox.eu/financing> (last visited Aug. 15, 2018).

¹⁷⁵ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 54.

¹⁷⁶ *Institute for American Apprenticeships*, VT. HITEC, <http://www.vthitec.org/> (last visited Aug. 14, 2018).

¹⁷⁷ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 53.

¹⁷⁸ *About*, THE APPRENTICE SCHOOL OF NEWPORT NEWS SHIPBUILDING, <http://www.as.edu/about/index.html> (last visited Aug. 15, 2018).

¹⁷⁹ *Id*; Nelson D. Schwartz, *A New Look at Apprenticeships as a Path to the Middle Class*, N.Y. TIMES (July 13, 2015), <https://www.nytimes.com/2015/07/14/business/economy/a-new-look-at-apprenticeships-as-a-path-to-the-middle-class.html>.

¹⁸⁰ Schwartz, *supra* note 179.

¹⁸¹ This requirement became effective on January 18, 2017, and programs are required to file their proposed affirmative action plan within two years—by January 2019. New apprenticeship programs have two years to file their affirmative action program from their program registration date. 29 C.F.R. § 30.4.

¹⁸² KAREN LEVESQUE ET AL., NAT'L CTR. FOR EDUC. STAT., U.S. DEP'T OF EDUC., VOCATIONAL EDUCATION IN THE UNITED STATES: THE EARLY 1990s 7 (1995), <https://nces.ed.gov/pubs/web/95024-2.asp> (“The National Assessment of Vocational Education (NAVE) found that this declining vocational enrollment might be attributed to several factors, such as increasing high school graduation requirements . . . and the vulnerability of secondary vocational programs to local economic conditions.”).

¹⁸³ The New Jersey Talent Networks were launched in 2011 to align training and education with employers’ in-demand skills, and they include these industry clusters: (a) Construction & Utilities, (b) Life Sciences, (c) Advanced Manufacturing, (d) Technology, (e) Financial Services, (f) Transportation, Logistics, & Distribution, (g) Food Industry, (h) Retail, Hospitality, & Tourism, and (i) Health Care. N.J. DEP’T OF LABOR & WORKFORCE DEV., *Talent Networks*, http://careerconnections.nj.gov/careerconnections/partners/talent/talent_networks.shtml (last visited Aug. 13, 2018).

¹⁸⁴ Keith L. Rolland, *Apprenticeships and Their Potential in the U.S.*, CASCADE: FED. RES. BANK OF PHILA. (Winter 2016), https://www.philadelphiafed.org/community-development/publications/cascade/90/01_apprenticeships.

¹⁸⁵ N.J. STAT. ANN. § 34:15D-24.

¹⁸⁶ N.J. STAT. ANN. § 34:15D-24(c) (West) (“The State Employment and Training Commission is authorized to obtain, accept and utilize resources for the NJ PLACE program as may be, or may become, available from appropriate State, federal and non-governmental sources of funding for employment, training and educational purposes, including the Workforce Development Partnership Fund created pursuant to section 9 of P.L.1992, c. 43 (C.34:15D-9), the “Supplemental Workforce Fund for Basic Skills” established pursuant to section 1 of P.L.2001, c. 152 (C.34:15D-21), or funds available pursuant to the Workforce Investment Act of 1998, Pub.L. 105-220 (29 U.S.C. s.2801 et seq.).”).

¹⁸⁷ N.J. STAT. ANN. § 34:15D-24 (West 2010).

¹⁸⁸ NAT’L SCI. FOUND., NEW FORMULAS FOR AMERICA’S WORKFORCE: GIRLS IN SCIENCE AND ENGINEERING (2003), <https://www.energy.gov/sites/prod/files/2013/04/f0/New%20Formulas%20for%20America%27s%20Workforce%20Girls%20in%20Science%20and%20Engineering%20National%20Science%20Foundation%202003.pdf>.

¹⁸⁹ *See, e.g.* WILKINSON & KELLY, *supra* note 113, at 2-3.

¹⁹⁰ Raj Chetty et al., *Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility*, 104(5) AM. ECON. REV. 141 (2014).

¹⁹¹ *See, e.g.* OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 11 (“Siemens developed a precision product and the technology needed for production. This requires a highly-skilled workforce. . . leading to the North Carolina plant’s apprenticeship program.”).

¹⁹² State contacts are listed here: *State Offices of Apprenticeship*, EMP. & TRAINING ADMIN., U.S. DEP’T OF LABOR, [HTTPS://WWW.DOLETA.GOV/OA/STATEOFFICES.CFM](https://www.doleta.gov/OA/STATEOFFICES.CFM) (last updated Apr. 3, 2018).

¹⁹³ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 9.

¹⁹⁴ ROLLAND, *supra* note 155, at 17.

¹⁹⁵ *See, e.g.* NORTH CAROLINA TRIANGLE APPRENTICESHIP PROGRAM (NCTAP), <http://nctap.org/> (last visited Aug. 15, 2018); APPRENTICESHIP 2000, <http://apprenticeship2000.com/zwp/> (last visited Aug. 15, 2018).

¹⁹⁶ U.S. DEP’T OF LABOR ET AL., WHAT WORKS IN JOB TRAINING: A SYNTHESIS OF THE EVIDENCE 6 (2014), <https://www.dol.gov/asp/evaluation/jdt/jdt.pdf>; NAT’L RES. COUNCIL, LEARNING, REMEMBERING, BELIEVING 143 (Daniel Druckman & Robert A. Bjork eds., 1994), <https://www.nap.edu/read/2303/chapter/11#143> (“Training intact teams seems to. . . provid[e] a mutual redefinition of role responsibilities and job procedures and social support for implementing and maintaining the procedures learned in the training program.”).

¹⁹⁷ DOL online registration tool: *Welcome to the Apprenticeship Registration Page*, U.S. DEP’T OF LABOR, <https://doleta.gov/oa/registration/> (last visited Aug. 14, 2018).

¹⁹⁸ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 9.

¹⁹⁹ *Id.*

²⁰⁰ U.S. DEP'T OF LABOR, A QUICK-START TOOLKIT: BUILDING REGISTERED APPRENTICESHIP PROGRAMS 9-10, https://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf.

²⁰¹ *Registered Apprenticeship-College Consortium*, U.S. DEP'T OF LABOR, <https://doleta.gov/oa/racc.cfm> (last visited Aug. 13, 2018).

²⁰² U.S. DEP'T OF LABOR, REGISTERED APPRENTICESHIP-COLLEGE CONSORTIUM: FREQUENTLY ASKED QUESTIONS (FAQs), https://doleta.gov/oa/pdf/RACC_FAQs1.pdf.

²⁰³ *Id.*

²⁰⁴ OFF. OF THE CHIEF ECONOMIST, *supra* note 77.

²⁰⁵ Peter Bondarenko, *Sunk Cost*, BRITANNICA, <https://www.britannica.com/topic/sunk-cost> (last visited Aug. 16, 2018).

²⁰⁶ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 20.

²⁰⁷ MERRIAM-WEBSTER, *Variable Cost*, <https://www.merriam-webster.com/dictionary/variable%20cost> (last visited Aug. 16, 2018).

²⁰⁸ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 20.

²⁰⁹ *Id.* at 23.

²¹⁰ *Id.*

²¹¹ *Id.* at 26-27.

²¹² FAMILY CAREGIVER ALL., WOMEN AND CAREGIVING: FACTS & FIGURES (2003), <https://www.caregiver.org/women-and-caregiving-facts-and-figures>.

²¹³ REED ET AL., *supra* note 110, at xvi.

²¹⁴ *Id.*

²¹⁵ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 1.

²¹⁶ REED ET AL., *supra* note 110, at 53.

²¹⁷ OFF. OF THE CHIEF ECONOMIST, *supra* note 77, at 27.



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