

Improving Noncollege Pathways to Skills and Successful Careers



Executive Summary

Broad-based prosperity in a 21st century economy requires a skilled workforce with the cutting-edge abilities and knowledge employers require to remain globally competitive. Preparing workers for rewarding careers that meet the needs of employers is critical. Although many workers enter the workforce each year without a four-year college degree, the focus of public debate and policy is often weighted towards degree-granting post-secondary education as though it were the only pipeline to work.

Significant portions of the US working population don't have a college degree and may not ever achieve one. Roughly half of today's 30- to 34-year-olds have not achieved a college degree of any kind. Children from families with low socioeconomic status are significantly less likely than their more affluent peers to attain a college degree at the outset of their careers. Helping all children reach their educational goals should be a priority. However, a realistic approach to employment means that a college degree shouldn't represent the only path. The Committee for Economic Development (CED) believes the nation must focus on effective pathways to help students from all backgrounds and educational attainments successfully transition to careers as members of a skilled US workforce.

To further that goal, this report looks at three tools to better serve those students whose initial entry into the workforce will not necessarily include a traditional college degree.

- First, it looks at the need for and potential benefits of information for students and trainees as they navigate the initial transition from education to work. There are substantial potential returns to individuals and employers from scalable, evidence-based models that could inform students and trainees about which skills are in demand, how those skills can be obtained, and the likely return on their investment in such learning. Policymakers should consider the relative merits of alternative interventions ranging from light-touch information campaigns to more intensive counseling.
- Second, the report proposes smart investments in apprenticeships in the US, building on a history of bipartisan support. When executed well, apprenticeship programs, which help workers affordably gain in-demand skills and help employers develop and shape a pipeline of skilled workers, are one of the most promising nondegree career pathway models and promise important public benefits. After examining potential challenges and limitations, the report recommends a series of public policy actions to further evaluate, encourage, and develop the use of apprenticeships.
- Third, given the potential underutilization of existing talent among nondegree holders, the report encourages employers to rethink how they use educational attainment in evaluating and hiring potential talent, both for their own benefit and for the benefit of the large numbers of skilled students and trainees transitioning to careers without traditional degrees. With potential changes in technology and talent assessment on the horizon, forward-looking businesses should look to exploit a potential advantage in identifying more productive workers, with or without degrees.

Three Ways to Improve Noncollege Pathways to Employment

CED's recommendations for policymakers and business leaders

- 1 **Career counseling** Develop and test scalable, evidence-based models to help individuals better navigate available education and training options
- 2 **Apprenticeships** Support the smart expansion of apprenticeship programs by:
 - Educating the public on the benefits of apprenticeship programs
 - Expanding apprenticeships to more industries and occupations
 - Expanding sources of public financing for apprenticeship training
 - Aggressively piloting and evaluating different models of apprenticeship
- 3 **Competency-based hiring** Encourage employers to reexamine the use of educational attainment in their hiring processes and plan for more competency-based talent evaluation

Introduction

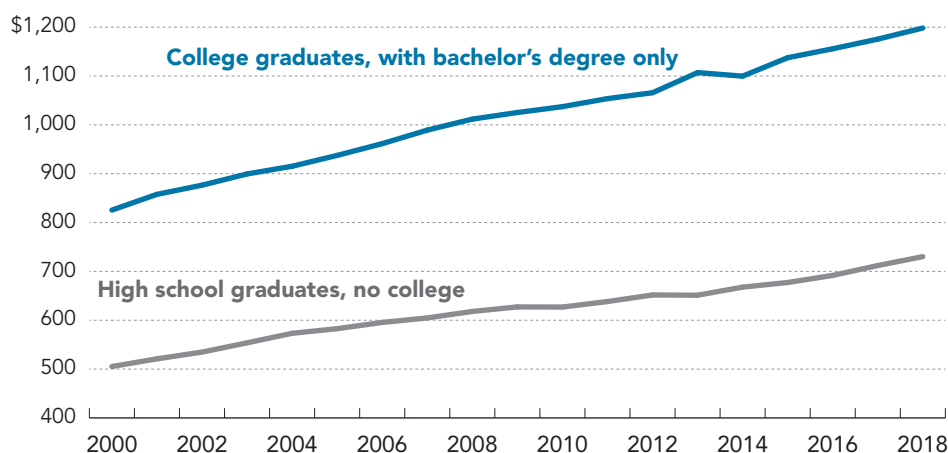
In terms of significance, public funding, and prestige in the United States, degree-granting postsecondary education institutions have dominated discussions of preparing students for rewarding careers and meeting the skill needs of employers in a 21st century economy. Yet more than thirty percent of high school graduates under the age of 24 are not enrolled in college, and roughly forty percent of students who enroll in college fail to successfully complete a degree within six years.¹² Such statistics underscore the policy failures and need for improvements in the K-12 and higher education systems in the US. But, there also appears to be an alarming lack of focus on the functioning of, support for, and concerns surrounding alternative pathways to help students who do not secure a college degree to transition to careers, thereby ensuring a skilled workforce.

Even after excluding the support provided through guaranteed student loans and tax expenditures, federal, state, and local governments are estimated to spend more than \$150 billion dollars on higher education annually.³ By comparison, the Office of Management and Budget has estimated the entire annual federal budget for workforce development programs is a fraction of that spending level: \$17 billion divided among dozens of programs serving a wide range of people and needs.⁴ The focus on traditional college education is justified, in part, by the persistently higher earnings premium for workers who graduate from college (see Figure 1).⁵ For workers aged 25 and older in 2018, the median earnings of someone with only a bachelor's degree was more than 60 percent higher than the median earnings of someone with only a high school degree.⁶

Figure 1

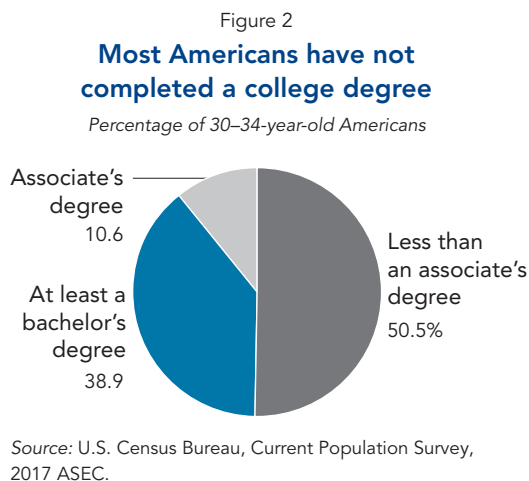
College-educated workers outearn high school graduates by a large margin

Median usual weekly earnings, four-quarter moving average, nominal dollars



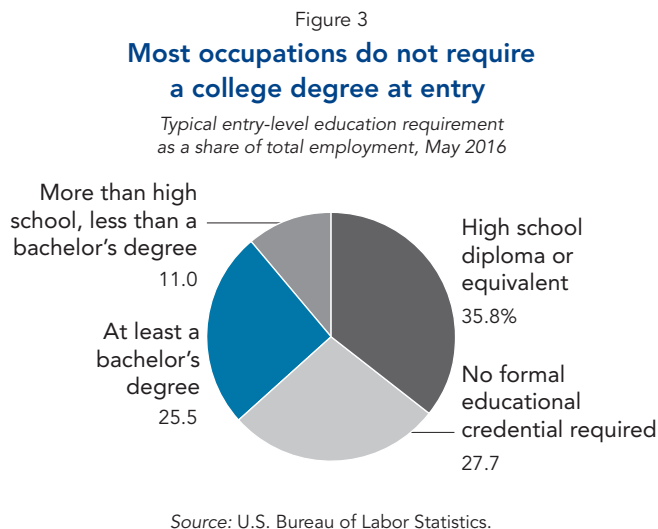
Source: U.S. Bureau of Labor Statistics.

However, even as many advocates of “college-for-all” approaches to education recognize, the goal of postsecondary education cannot be limited to four-year degrees.⁷ In part, this is because traditional degree-granting institutions, and the infrastructure of academic and career-oriented support that surround them, are failing to adequately and affordably serve the needs of most would-be workers and employers seeking talent and skills that don’t necessarily require a degree. Roughly half of current 30- to 34-year-olds have not achieved a college degree of any kind, and are unlikely to have benefited from the current approach to post-secondary education (see Figure 2).⁸ Another source of concern



is that, even as the labor market has continued to improve over recent years, many younger workers are struggling to successfully launch their careers, raising concerns about whether they could have been more adequately prepared for entry into the workplace and gainful employment. Failure to launch a career represents a possible setback in their work potential over the duration of their careers. In December of 2018, more than a million youth ages 16 to 24 were seeking a job but were neither employed nor enrolled in school.⁹

From the perspective of employers, our institutions do not seem to be preparing students to meet their employment needs. In surveys, nearly 40 percent of employers have reported that they cannot attract workers with the skills they need, even for entry-level jobs, and most employers expressed concern over a lack of preparation.¹⁰ But solely boosting college completion is unlikely to be the most direct or effective way to solve this problem. A Bureau of Labor Statistics analysis found that nearly three-fourths of employment in 2016 was in occupations that typically require no college education at entry (see Figure 3).¹¹ A December 2018 research report by The Conference Board



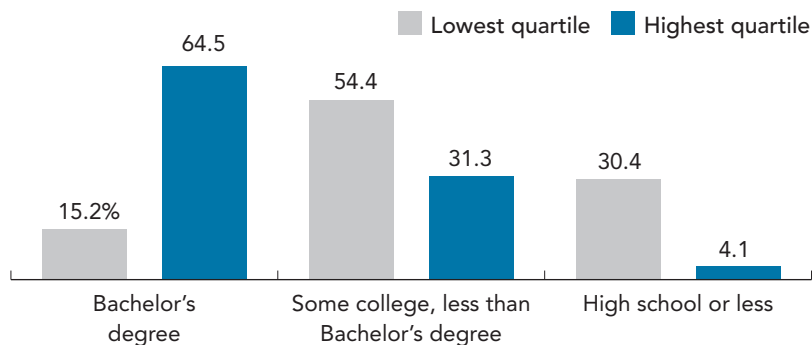
found that demand for “blue-collar” workers has grown in recent years and projected that the labor market for such workers will be “historically tight” by the end of 2019.¹² Even with faster projected growth in new jobs that require a degree, occupations that do not require a college degree at entry are expected to remain prevalent into the near future and comprise a substantial share of overall employment for some time.¹³

Even if an increasing share of students goes on to attain higher education following high school, existing college-degree focused models of skill development and training will still fail to support the full spectrum of education-to-career paths. This continued failure is disproportionately affecting the most vulnerable students. The US Department of Education's most recently completed Education Longitudinal Study found that a child in the highest quartile of socioeconomic status, based on his or her parents' education and family income, was three times more likely to have attained a college degree during the period of observation than a child from the lowest quartile (see Figure 4).¹⁴

Figure 4

Students from lower-income or less educated families are less likely to complete college

Share of cohort completing education level,* by composite socioeconomic status (SES)



* Highest level of education completed by 2013 among students who were high school sophomores in spring 2002

Source: U.S. Department of Education, NCES, Education Longitudinal Study of 2002.

The Committee for Economic Development (CED) has long recognized the need to help more Americans, from any background, develop better abilities and knowledge and ensure successful transitions into the workforce.^{15,16} In 2017, when CED undertook a "listening tour" to identify business leaders' expectations and parents' goals for their children as they tried to navigate a path toward rewarding careers, common themes emerged: the need for better school, government, and industry coordination; additional supports to help students identify and chart career paths; and more work-based learning opportunities.¹⁷ Yet all three continue to be glaring weaknesses for a higher education and workforce development system that is failing to prioritize and meet the needs of many students, especially those who will not seek a college degree directly after high school.

Ultimately, American competitiveness depends in part on capitalizing on and investing in its human talent. The US must make gains in the preparation and success of its entire workforce now and in the future. This report focuses on three opportunities to better serve students whose initial pathways to careers will not necessarily include traditional college or university degree attainment. First, it examines the potential benefits from providing more career counseling to students navigating the transition to the workforce. Second, it explores how one promising nondegree career pathway model, apprenticeship programs, could be expanded. Third, it addresses how employers can change how they utilize college degrees in the hiring process. The report closes with observations on some of the potential lessons and tough questions raised by these efforts as the global economy continues to evolve in the 21st century; and a set of recommendations for consideration by policy makers.

Helping Students Better Navigate the Worlds of Education and Work

Making education and training decisions that will lead to well-paying, satisfying work is complex and difficult, and may be particularly so for students not currently on track or seeking to attain a college degree. Ideally, students and parents would be able to accurately assess the trade-offs involved in how a certain educational and vocational path matches with a student's interest and ability, how much time they will spend training, level of resources, and the future prospects down that path. But doing so requires a keen understanding and anticipation of present and future labor market demands and opportunities. The limited research available suggests many students struggle to accurately assess how their decisions, including financial choices, affect their very near-term career prospects, much less their full lifetime of work.

According to one study, faced with four broad categories of majors, fewer than 40 percent of community college students were able to correctly determine which two categories were likely to be the highest paying and which two categories were likely to be the lowest paying.¹⁸ On average, in almost all fields, students overestimated expected salaries by 13 percent and underestimated the likelihood of finding employment in those fields by 25 percent. If community college students struggle with this challenge, it is unlikely that students who do not attend college after high school enter their careers with a better understanding of the relative returns from different career paths.¹⁹

The disparate, or lack, of information sources an individual confronts when attempting to chart his or her best pathway to a rewarding career, sometimes captured within a broader "career navigation" framework, is only part of a much larger set of career-preparation challenges.²⁰ But it does play a critical role, with one survey of school counselors and career advisors rating "information about education and employment" among the top components of a successful transition to college and work.²¹ And given the potential long-run gains to students and employers from more effective education, relevant training, and smarter career choices, exploring ways to provide students with tools to make informed decisions should be a priority.

However, the degree to which counseling or other navigation efforts can initially affect education and training choices, and ultimately affect the course of a student's career, is not well defined. There is evidence that suggests receiving better information about the expected labor market outcomes of certain education and career choices could be beneficial. While the expected earnings potential of different majors does not appear to be the primary motivator of how college students choose their course of study, it does play some role in decision making. Several studies show that students at community and four-year colleges are much more likely to choose a major that would lead to higher expected earnings, all else equal.²²

A 2013 study released by the Federal Reserve Bank of New York found that presenting college freshman and sophomores with more accurate earnings information led those students to revise their own estimates of likely future earnings and prompted many of them to alter their planned choice of major.²³ Of course, for students who do not attend higher education immediately after high school, this specific intervention may be inaccessible. For this reason, many school systems have initiated the use of career and college readiness programs to help students understand career options and requirements at earlier ages.²⁴

An alternative to light touch “information campaigns” are more intensive counseling models that typically utilize a third-party organization to provide a more consistent source of guidance before and through periods of transition to new education, training, or career choices. Although the evidence from different models of career counseling is mixed, several examples of programs seem to be successful in improving college and career choices.²⁵ For example, a December 2017 study found that a Massachusetts-based intensive counseling program for college-seeking, low-income students was successful in pushing students to less expensive colleges with higher graduation rates and decreased drop-out rates through at least the second year of college.²⁶ Ensuring parents are involved could be another route to influencing student decisions.^{27,28}

Several promising efforts, such as so-called “pathways” models, utilize better career-focused counseling and goal-setting as just one aspect of deeper structural reforms to improve college and career preparation efforts prior to high school graduation. As described in a 2015 MDRC overview of some of the more prominent efforts, these programs “link career-technical education, rigorous academic coursework, and experiences that show students the relevance of education to their future, while teaching them the academic and employability skills they need to be successful in both college and career.”²⁹ In most instances, the goal of these high school pathway programs is to give students and parents choices and flexibility to pursue both college and career preparation simultaneously. Oftentimes students are provided exposure to college academics and hands-on work experience, improving entry into the workforce whenever it occurs. For example, in one popular model currently being evaluated in New York City, known as P-TECH, high schools partner with a college and at least one employer to help entering high school freshman achieve an associate’s degree in a science, math, engineering, or technology field within six years at no cost to the student while acquiring significant work-based learning.³⁰

Higher education institutions that seek to serve students from a wide variety of backgrounds and with a wide variety of educational and vocational goals also have a role to play in explaining connections to labor market outcomes. According to a brief by the Community College Research Center (CCRC), the extremely wide range of course offerings at some schools, coupled with insufficient advising and a general absence of clear paths to program finish lines, have contributed to low completion rates, especially among first-generation and low-income students.³¹ Efforts to institute “structured or guided pathways” on how to attain particular degrees or credentials as quickly as possible can be seen as complementary to counseling efforts, reducing the burden on students while they attempt to navigate education and training systems. Although popular, many guided pathway approaches are recent, and research on their effectiveness is relatively limited.³²

But first-year students at community colleges in Tennessee and Michigan who are participating in the American Association of Community Colleges' Pathways Project demonstrated an increase in credits earned, which is a promising finding.³³

Given the stakes involved—for the individuals attempting to navigate education and training systems and for future employers—the lack of quality and consistent access to information as well as counseling to help students make decisions informed by career goals and labor market realities are a clear deficiency. With the significant level of public spending that goes into educating students to prepare them for a successful postsecondary future, it merits considering the investment of additional resources to evaluate successful models of career navigation services, particularly for those who are not expected to graduate with a four-year college degree or seek one.

Expanding the Practice of Apprenticeships

Expanding the practice of apprenticeships in America has become a common, and often bipartisan, recommendation for improving skill development and employment outcomes for youth who may not complete a college degree. Expanding apprenticeships figured into President Obama's 2014 State of the Union Address³⁴ and was the subject of one of President Trump's executive orders in 2017.³⁵ Congress initiated dedicated federal funding to expand apprenticeship opportunities beginning in Fiscal Year 2016.³⁶

A December 2017 CED discussion paper, "Apprenticeship in Brief," provided a snapshot of the state of apprenticeships in the United States and the potential benefits of expansion.³⁷ When executed well, apprenticeship programs provide students with paid workplace experiences and skill-development opportunities nearly guaranteed to be of immediate value to employers within a certain field or industry. Ideally, younger apprentices are gaining not only a demonstrated competency in a specific, relatively high-wage occupation, but also employability-related skills that will be broadly valuable throughout their careers. The learning-while-earning nature of an apprenticeship also helps to make it a more affordable early career path with less reliance on student debt.³⁸

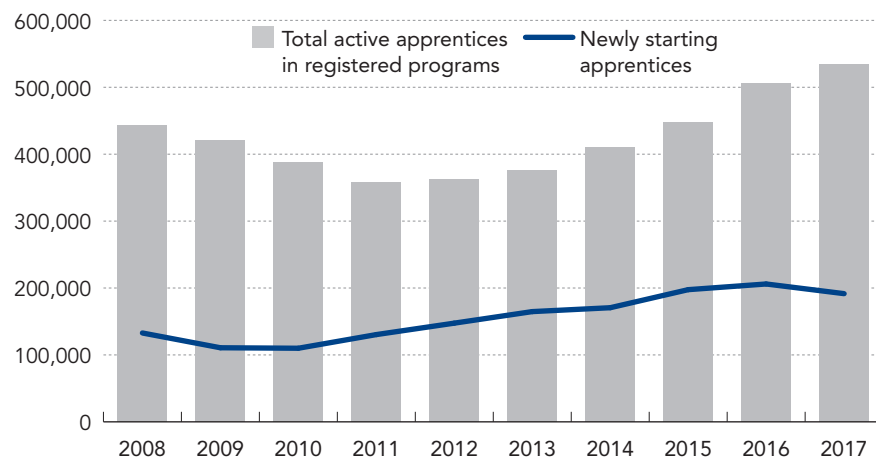
For employers, apprenticeships are an opportunity to shape the skills and experiences of a pipeline of potential employees to fit their workplace needs and evaluate those workers on the job. In a 2018 survey conducted by The Conference Board, CEOs identified a failure to attract or retain top talent as their single most critical concern among 30 hot-button issues.³⁹ For employers committed to strategic talent planning, apprenticeships can be one route to address perceived shortfalls in the supply of skilled employees or challenges in recruiting and retaining quality talent.⁴⁰

To be eligible for most federal funding in the United States, federally-recognized, registered apprenticeship programs must meet regulatory criteria that distinguish them from other forms of on-the-job training. To be registered, apprenticeship sponsors must demonstrate that their programs meet certain standards to protect the apprentice during the period of their training, including having a defined, progressively increasing wage scale and a limited probationary period. Programs must transfer skills and knowledge that would require at least 2,000 hours of on-the-job learning to obtain and also provide significant job-related technical instruction beyond the on-the-job training.⁴¹ Registered apprentices receive an industry-issued certificate of completion at the end of the training program, which is intended to be a nationally-recognized credential should the apprentice seek employment with someone other than the employer who sponsored the apprenticeship.⁴² Apprenticeships typically last between one and six years, with the majority lasting four years.⁴³

While apprenticeships are common in some parts of Europe, they remain relatively rare in the United States. According to the Department of Labor, there were roughly 530,000 active apprentices participating in one of the 22,000 registered apprenticeship programs in the US in 2017 (see Figure 5).⁴⁴ By comparison, more than 12 million students under the age of 25 attended an American college or university in 2017.⁴⁵ As a share of its labor force, apprenticeships in America (0.2 percent) are significantly less common than in Canada (2.2 percent), Britain (2.7 percent), or Germany (3.7 percent).⁴⁶ Similarly, a 2018 analysis found that, among OECD countries that reported data, the US was ahead of only Japan and Italy in terms of its utilization of apprenticeships relative to the size of its college-attending population.⁴⁷

Figure 5

Though they have grown in number, apprenticeships remain rare



Source: U.S. Department of Labor.

Though there have been efforts to expand apprenticeship in America beyond traditional building and construction trades, most US apprenticeships are still concentrated in a relatively limited number of fields. Roughly half of current apprentices are either in the construction industry or the US Military Apprentice Program (see Table 1).⁴⁸ By comparison, Europe, and especially the United Kingdom, use apprenticeships for a much broader range of careers, including finance and health care. Nearly three-quarters of new apprenticeships in England are in business, administration, and law; health, public service, and care; or retail and commercial sectors.⁴⁹

Table 1

Most US apprenticeships are in the construction industry or the US military

Active apprentices, 2017

Industry classification	Number	Share of total	Industry classification	Number	Share of total
Construction	175,200	51%	Utilities	9,000	3
Military (USMAP)	89,300	26	Health care and social assistance	2,500	1
Public administration	23,000	7	Retail trade	2,400	1
Manufacturing	17,600	5	Education	2,300	1
Transportation	15,900	5	Others	9,300	3

Source: Department of Labor

In part because of its relative rarity and the need to examine effects over a long period of time, evidence on the positive impacts of apprenticeships in the US is suggestive rather than conclusive,⁵⁰ and an evaluation of recent federal grants to create or expand apprenticeship programs is ongoing.⁵¹ However, a 2012 assessment and cost-benefit analysis of registered apprenticeship programs in ten states found that apprentices had significantly higher earnings than similar nonparticipants nine years after enrollment and that the social benefits of apprenticeship programs were likely to outweigh their costs.⁵² Those results were consistent with positive benefits found in studies of apprenticeship programs in Washington State, as well as with the findings of many studies of programs in Europe.⁵³

For employers in the US, evidence on the relative return of investment from sponsoring apprenticeships, compared to other strategies for recruiting a sufficiently skilled workforce, remains mostly anecdotal.⁵⁴ For instance, a 2007 survey of American apprenticeship sponsors found that ninety-seven percent would recommend the program to other employers, and at least two-thirds of sponsors identified at least one of the following as a very important benefit: meeting their demand for skilled workers; reliably assessing worker skill levels; raising productivity; strengthening worker morale and pride; and improving worker safety.⁵⁵ A review of data from Europe suggests that a large minority of firms providing apprenticeship training recoup the cost of their investment by the time an apprentice completes the training program.⁵⁶ For other firms, a positive private benefit-cost trade-off requires retaining some portion of their trainees for some duration after training ends. The high degree of variability in immediate profitability and retention rates in contexts that differ from each other and differ in significant ways from the American labor market makes it hard to generalize the results to an American context.

Although there are some real potential benefits of apprenticeships, there are also potentially significant challenges to consider for program expansion. Apprenticeships can be expensive upfront investments for sponsoring employers. A Department of Commerce survey found that sponsor costs ranged from less than \$25,000 to \$250,000 per apprentice, in part because of differences in program duration.⁵⁷ And relative to Europe, the American labor market has typically had higher worker mobility.⁵⁸ If trained apprentices in America are more likely to switch jobs (compared with their European counterparts), American employers benefit less from the initial probationary structure of apprenticeship programs, and apprenticeships may be less attractive. This would depend on the worker loyalty by-product of apprenticeships, plus the room in the firm for upward mobility if apprentice employees do in fact prove and improve their work. Policies around how apprenticeship programs are developed, regulated, and funded should take account of the public, as well as private, benefits of apprenticeship and seek to find an appropriate balance between public and private costs. If apprenticeships add significant skills and value to workers but workers use that benefit to move on quickly from their training firms, then some might recoil from the notion of public subsidies to create apprenticeships, but if apprenticeships do as much good as, for example, public high school shop classes, then public funding makes perfect sense.

A second concern is that apprenticeships, while broadly popular, are perhaps equally broadly viewed as a less prestigious alternative to a college education. In a New America survey on apprenticeships, despite the fact that nearly four in ten respondents had identified apprenticeship programs as the best way to prepare for a job and career, only roughly a quarter of respondents said they would be the most willing to recommend apprenticeships to their own child or a child they knew who was considering education after high school.⁵⁹ The drop-off between what respondents identified as “best” and what they would recommend to children in their own lives suggests that apprenticeships, similar to career and technical education programs or perhaps any career path outside of college, may face a degree of stigma. Advocates including business leaders and public officials who are interested in the expansion of apprenticeships will need to find ways to explain to parents, students, and industry the relative benefits, risks, and trade-offs of pursuing apprenticeship as a path to a rewarding career or a skilled pipeline of workers.

A third concern is that, in the long run, the apprenticeship approach may be less well-suited to an environment of rapid change, where technical skills can become obsolete quickly and adaptation is a critical component of a worker’s success. In that environment, the concern is that apprenticeships, which can be more narrowly tailored to specific industries and occupations, may be less beneficial than the more generalized education typical of college. A 2015 analysis comparing employment outcomes at different ages for people with a vocational versus general education background in eleven countries found that people who completed vocational education had better employment rates earlier in their careers but worse employment rates later in life.⁶⁰ This pattern was particularly strong in countries with strong traditions of apprenticeship. In the case of Denmark and Germany, the study’s authors estimated that otherwise similar people who had vocational, rather than general, education had lower lifetime earnings.

The degree to which that pattern might develop in the US as apprenticeships expand in reach is questionable given a very different government and education system as well as labor market. If the alternative to apprenticeships is a struggle to find a job that doesn’t require a degree or beginning an expensive and ultimately unsuccessful college career, apprenticeships are likely preferable. Apprenticeships can also build general work habits and skills, while providing some general education. The finding in some European countries that workers who completed apprenticeships have lower lifetime earnings on average is a strong reminder to maintain a focus on the portability of skills and ensure that the instruction and training acquired under a successful apprenticeship program does not become overly narrow or specific to a limited set of employers. Ultimately, to be successful, American apprenticeships need to be designed to be broadly beneficial to both sponsors and apprentices in the long run compared with plausible alternatives.

Given the potential benefits of expanding apprenticeship, both for employers looking to develop a skilled pipeline of future workers and for students whose preferences and career needs are not being well served by the higher education system as it currently exists, business leaders and policymakers should be taking steps to encourage and further develop apprenticeship strategies.

Educate the public on the benefits of apprenticeships

The expansion of apprenticeships has garnered high-level attention, including the formation in July, 2018, of a Presidential Council with that explicit goal.⁶¹ However, it is unsurprising that many advocates for apprenticeship see branding, marketing, and education as necessary prerequisites for expansion. The potential stigma around apprenticeships as a less selective option to more traditional classroom-based higher education and the fact that apprenticeships have limited exposure because they currently touch a limited number of workers and a small share of businesses primarily clustered in a few industries may make expansion challenging without that support.

The Trump Administration's Task Force on Apprenticeship Expansion proposed that the federal government invest in a "campaign of awareness to multiple stakeholders such as industries, employers, educators, counselors, workforce development practitioners, and potential apprentices."⁶² Economist Robert Lerman, the founder of the American Institute for Innovative Apprenticeship, has highlighted the potential role for state governments in marketing apprenticeships to firms based on success achieved in South Carolina.⁶³ South Carolina was able to use a combination of strong branding, sales, and marketing, plus a relatively modest tax credit incentive, to rapidly increase the number of companies that participated in its apprenticeship initiative.⁶⁴

In addition to directly marketing the benefits of apprenticeship, it is necessary for individuals to have quality information that will support decision making, and that can advance a more robust program of research about apprenticeships in America. For this reason, it is important that there are reliable and easily accessible data on apprenticeship programs, including outcome assessments, to help potential apprentices make informed choices and assist sponsors to determine their relative or expected return on investment.⁶⁵ The federal government can also play a significant role by funding and publicizing the results of evaluations of different apprenticeship strategies.

Parents and students could learn about the potential benefits of apprenticeship with coordination among high schools, community colleges, or other community-based organizations and apprenticeship programs. Both the Center for American Progress and the National Skills Coalition have advocated the expansion of so-called "pre-apprenticeship" programs, which provide academic knowledge and skills training that help serve as on-ramps for participation in apprenticeships.^{66,67} Pre-apprenticeship programs can also grow and diversify the pipeline of apprentices by reaching out to groups that might not otherwise be familiar with apprenticeship opportunities.

Expand apprenticeships to more industries and occupations

The United States has utilized apprenticeships for far fewer jobs than European countries like Britain and Germany. In Switzerland, nearly a fifth of apprentices are in "white-collar" business jobs.⁶⁸ A necessary route to significantly expanding apprenticeships in America will be engaging a greater variety of employers to take advantage of apprenticeship programs as an opportunity for attracting and retaining a skilled workforce. There are numerous examples of employers utilizing apprenticeship programs as a pathway to white collar jobs in the US, including Amazon Web Services, Accenture, JPMorgan, and Mercy Health, but significant opportunities to expand the scope and scale of apprenticeship programs remain.^{69,70}

A 2017 Harvard Business School analysis looked at the outer bounds of occupations potentially suitable to apprenticeship and identified 3.2 million job openings in 2016 that could have been filled through apprenticeship, including many in 47 additional occupations where apprenticeship is not commonly used.⁷¹

One potential barrier to expansion is the challenge for smaller and mid-sized employers without an existing apprenticeship infrastructure to design, register, and execute a program that suits their needs. In Europe, and in some industries with traditions of apprenticeships in the US, unions or industry associations play key roles in organizing or providing necessary components of education and training.⁷² The federal government has a role to play in facilitating industry, union, or employer partnerships to come together to support apprenticeship programs, but business leaders will also have to be creative and farsighted in undertaking collaborative efforts that are mutually beneficial. For example, the Washington Technology Industry Association, a nonprofit trade group, launched a tech-centered apprenticeship initiative called Apprenti which is now being exported to other states.⁷³

Another route to expansion is reducing the burdens associated with registration and program design. So long as the registration process ensures standards of quality and basic protections for apprentices, any improvements that streamline registration or standardize the process across state lines should be welcome.⁷⁴ The development of voluntary national competency-based occupational standards, which sponsors can draw from in designing their own apprenticeship programs, is a useful step in this direction.⁷⁵

Policymakers and business leaders should also look for ways to utilize existing higher education infrastructure to help support apprenticeships and reduce the burden on employers. More community colleges could be encouraged to form partnerships with employers wishing to sponsor apprenticeships, utilizing their facilities and redirecting resources to help design and provide related classroom instruction. An American Enterprise Institute analysis found that less than one-third of community colleges nationwide had joined the network of organizations working to support registered apprenticeship programs under the US Department of Labor's Registered Apprenticeship-College Consortium.⁷⁶ Similarly, New America has called for connecting apprenticeship more closely to the higher education system, including empowering state education agencies that demonstrated the necessary capacity to register apprenticeship programs tied to higher education programs.⁷⁷ In addition to helping make expansion of apprenticeships easier, greater involvement of higher education entities in the apprenticeship process may help signal the valid footing of apprenticeship as an education-to-career pathway to otherwise hesitant parents or students. Furthermore, higher education providers stand to benefit, given that the relevance of their program offerings is likely to benefit from closer coordination with sponsors looking to hire.

Another approach for federal, state, or local policymakers to consider in expanding apprenticeship to more occupations would be to increase the utilization of the apprenticeship model as a pathway to public service. The most visible use of apprenticeships within the US government is in the armed forces. In 2017, roughly 90,000 US Navy, Marine Corps, and Coast Guard personnel participated in a registered apprenticeship program to help advance their occupational specialties.⁷⁸

But significantly more government agencies could benefit from utilizing an apprenticeship model to recruit and train skilled civil servants, as is common in the United Kingdom.⁷⁹ The British government sets a target that at least two percent of staff at any public sector agency with more than 250 employees should be apprentices.⁸⁰

Expand sources of public financing for apprentices

Oren Cass, the former policy director for Mitt Romney's 2012 Presidential campaign, has posited that the education system should be willing to look as favorably on supporting "a fifteen-year-old whose next seven years will be spent in a combination of school, apprenticeship, and employment as...one headed to a four-year public university."⁸¹ In addition to equity arguments in support of students pursuing a more vocational-oriented education-to-career path, successful apprenticeship programs offer public benefits including higher lifetime earnings and tax contributions and lower social service utilization, much as with higher education generally. These benefits offer a clear incentive for the government to cover some of the upfront training costs, reducing the risks and increasing the returns, and thereby encouraging participation by apprentices and sponsors. Particularly to the extent that both the apprentice and the public have an interest in imparting skills and experience that might be "portable" to potential employers other than the sponsor, public subsidy is justifiable.

Each stakeholder has a role to play. Employers largely bear the management, disruption, and financial costs of on-site training and apprentice wages and benefits, while recouping the training-period productivity of the apprentice. For their part, apprentices accept somewhat lower wages which will be offset by the expected value of the training. Government actors could help finance the instruction component of training. In practice, businesses that employ college graduates who received government support in pursuit of their degrees already benefit from a similar arrangement. Although this oversimplifies the way potential costs, benefits, and risks involved in an apprenticeship program are shared, it is a useful perspective for considering appropriate funding roles. Strong government financial support for the "tuition" portion of an apprenticeship, particularly during the early years of apprenticeship expansion, was also the recommendation of Tom Bewick, president of the Transatlantic Apprenticeship Exchange Forum, based on the United Kingdom's experience.⁸²

From the federal perspective, policymakers should revisit how existing sources of financial support could be utilized when the underlying goals of education and career advancement in those programs would essentially be satisfied by apprenticeship. For example, annual Pell Grants of up to \$6,095 are currently awarded to full-time undergraduate students with exceptional financial need and typically do not need to be repaid. But Pell Grants cannot currently be used toward the instruction component of all registered apprenticeship programs.⁸³ However, that could be adjusted to make the "tuition" expenses from related instruction in a registered apprenticeship program eligible for Pell grant support for otherwise Pell-eligible students. Because of the low means-testing eligibility threshold, combined with the fact that apprentices draw wages during their employment, Pell Grants as currently targeted may not fully meet the needs of many potential apprentices.⁸⁴ Some structural variation on Pell Grants may be needed.

Many states have sought ways to support better vocational training, often through improvements in the quality and affordability of community college programs. Florida, North Carolina, and Washington waive all or some tuition for apprentices who get related instruction from community colleges.⁸⁵ More states could follow their lead or adapt existing aid programs targeted at community college students to ensure that related instruction in registered apprentice programs is eligible for waivers or subsidies.

Aggressively pilot and evaluate different models of apprenticeship

Different approaches and variations on an apprenticeship framework could yield improved returns on investment for apprentices, businesses, and the public. Given the relative rarity of apprenticeships in the US today, the need for more effective vocational pathways, and the somewhat sparse evidence-base for what may work best in an American labor market context, proponents of apprenticeships should be willing to embrace experimentation in allowable arrangements and regulation on the path to expanding apprenticeships. While it is important to ensure that, at a minimum, apprentices are protected from fraud or abuse, Congress should encourage, enable, and potentially fund the testing and evaluation of many different approaches on a pilot basis.

For example, in the United Kingdom, private third-party intermediaries, known as Apprenticeship Service Providers (ASPs), help design, market, and implement apprenticeship programs.⁸⁶ Some supporters have pushed for their use to become more common here in the United States. ASPs are typically responsible for recruiting, screening, matching, and supporting apprentices and are funded through a combination of government reimbursement and employer-matching fees for successful placement outcomes.

Other advocates have pushed for apprenticeship models that would be more squarely integrated with higher-education institutions to facilitate apprenticeships in conjunction with a more generalized college degree.⁸⁷ So-called “degree apprenticeship” programs are intended to reduce the financial burdens of typical college programs while providing a greater degree of generalized, broad instruction and more flexible credentials than a typical apprenticeship.⁸⁸

The Trump Administration has proposed a new Industry-Recognized Apprenticeship Program (IRAP), intended to create a less burdensome system of apprenticeship registration that would be overseen by certified third parties like business associations or other nongovernmental intermediaries.⁸⁹ So long as appropriate safeguards are maintained for apprentices, and excessive variation does not threaten to paralyze businesses from exploring current options, more refined and targeted experimentation and learning about different approaches should be welcomed.

Planning for Competency-based Hiring

Acquiring a four-year college degree is a difficult path, and one seemingly out of reach for many students. As a result, companies that look exclusively to such college graduates to fill their demand for a skilled workforce may be making a costly mistake by ignoring a significant pool of talent without formal degrees. Particularly in a world with stiff competition for a skilled workforce and changing employer needs for specific skills, many businesses should reassess whether they can successfully hire skilled workers without college degrees.

If companies could accurately understand applicants' acquired skills, knowledge, and underlying employability traits, a degree would be an unnecessary requisite for workplace success. Yet, a 2017 Harvard Business School review found that employers were increasing the educational requirements of many existing jobs and that some automated hiring tools were set to exclude otherwise qualified candidates who did not possess a specified degree.⁹⁰

Particularly in an age of online applications, where the barriers to applying may be lower and the volume of applicants for a job posting may be very high, employers may struggle to assess which applicants have the full range of skills required. An efficient tool to identify which of a large number of applicants have the right skills could be crucial, especially for entry-level openings. Many employers use educational attainment, and in some cases, the prestige of school attended, as a convenient proxy in the initial stages of a hiring process.⁹¹

Dialing up educational requirements could reflect the objectively increasing complexity in a job over time, or it could be increasing selectivity made possible by a weak labor market with many candidates competing for the same job.⁹² One analysis of 26 million job postings from 2015 found roughly 8 million jobs where more than 25 percent and less than 75 percent of otherwise similar job postings specified a bachelor's degree, suggesting that the necessity of the degree requirement was at least questionable.⁹³ Similarly, in many instances, a large share of job postings required degrees for occupations where the majority of incumbent workers did not have them, a phenomenon sometimes described as "degree inflation." For example, a 2014 study found that 65 percent of job postings for executive secretaries and executive administrative assistants required a bachelor's degree, while only 19 percent of currently employed people in that occupation had such degrees.⁹⁴ Considering that there are over 650,000 employees who fall into that occupational category alone illustrates increasing education requirements could cost job opportunities for workers without four-year college degrees.⁹⁵

However, educational attainment is not particularly effective as a filter or measure of job-relevant skills. Educational attainment is positively, but not perfectly, correlated with many measures of job-relevant characteristics, including general skills.⁹⁶ Relevant skills and aptitudes can be gained through military service, running a business, or many life experiences other than formal educational attainment. Conversely, employers also find that not everyone with a degree from a prestigious school is highly skilled and well-suited for every job.

In one survey of employers, 68 percent reported that nondegree workers with experience were either more or equally likely to have high levels of productivity compared to recent college graduates, and 63 percent expected nondegree workers with experience to reach full productivity as fast as or faster than college graduates.⁹⁷

Employers who successfully identify underlying job competencies without college degrees as a filtering mechanism can tap into a larger pool of talent and thereby gain an additional advantage over competitors. Competency-based hiring approaches have been much discussed but are not being executed widely. Barriers to identifying such competencies accurately and cost-effectively clearly remain.

One potential remedy is competency-based education that emphasizes particular skills and deemphasizes a particular volume of credit hour accumulation. But to meet employer needs, such programs must delineate the discrete skills achieved so that businesses can recruit for, and students can advertise their proficiency in, particular competencies. Rather than spending the time to aggregate a series of different competencies into a degree-conferring “bundle” over an extended period of dedicated study, some students could focus on achieving only the competencies they need to achieve their initial career goals. In this model, the education pathway for those workers is re-imagined as the accumulation of “stackable credentials.”⁹⁸ Rather than one period of study with a terminal degree, workers could acquire a series of industry recognized credentials in shorter time periods that build toward higher-level certificates or degrees within their chosen occupation. Although this approach has typically been associated with middle-skill vocational career paths, such as those offered at community and technical colleges, a similar disaggregated, cascading skill-development approach could be applied to many occupations that require a four-year degree or even advanced graduate studies.

However, this vision of de-bundled degrees and stackable credentials faces the practical reality that efforts at nondegree credentialing have tended to lead to a sharp proliferation in credentials. One study found almost 2,500 distinct certifications listed in the nine percent of online job postings that asked for some type of certification in 2015.⁹⁹ To value a credential, an employer would need to know that it is legitimate, be confident that it measures skills relevant to his or her needs, and trust that it signifies a sufficient level of proficiency in those skills. Without those elements, an employer may as well directly assess individual applicants’ competencies. A potential student considering the pursuit of a credential faces similar challenges. How can he or she be confident that a credential would be valuable to employers and, in the case of stackable credentials, that it would convey the skills needed to pursue further learning?

Meaningful credentialing would require standardized measures of the needs of occupations, which could be rapidly updated to reflect changing skill requirements, and uniform assessment of underlying job competencies. Technology may allow reliable assessments of cognitive aptitudes, skills, and knowledge, as well as many behavioral skills, traits, and propensities. However, employers would still need to determine which competencies to recruit for and then measure job performance and contributions to organizational success after a new employee begins work, if they are to close the circle and make the competency system work for the long haul. Except in jobs that have clear output measures, like sales positions and call-center workers, employers may have to

rely on less quantifiable or “weak signals” of relative performance to determine which competencies matter most for success in which jobs.

Although the current barriers to competency-based approaches seem steep, continued improvements in data collection and performance assessment technologies could quickly make them more of a reality. Forward-looking business leaders should link demonstrated competencies and job performance in their hiring to assess and cultivate the talent of skilled workers without college degrees.

Lessons for the Future of Work

Predictions about how work will change in the future often include rapid changes in skill requirements such that workers will require continual education and new training to prosper and form a highly skilled workforce. This view is shared by large numbers of employers and employees. In a 2016 World Economic Forum survey, employers predicted that roughly a third of what were considered the most desired core skills for a given job will have changed by 2020.¹⁰⁰ In a Pew research survey, roughly two-thirds of workers said the need to improve skills was greater than in the past 20 to 30 years, and more than 70 percent expected that need to grow over the next 20 to 30 years.¹⁰¹ The formal education that precedes a worker's career may become more of a first step toward acquiring career-enhancing skills than a completion of formal training needs—for students not served by four-year institutions as well as for a vast majority of American workers.

Students today, particularly those outside of four-year degree institutions, are challenged to extract the most benefit from the training or education options available to them. Potential workers need an infrastructure of information and counseling, informed by labor market realities, to evaluate alternatives and choose the best and quickest path toward their goals. Today's arrangement is not only failing students, but also employers, who need the valuable supply of skilled workers that an easier-to-navigate system would produce. The need for evidence-based models to help find training and mid-career reskilling options will only increase. Those trends should motivate policy-makers to act rapidly.

Most midcareer workers find themselves in a situation similar to students seeking nondegree pathways to a career: they cannot afford extended breaks from employment to pursue dedicated education. But the need for retraining is growing, and policymakers and business leaders must develop and fund an affordable ecosystem of frequent retraining and skill development that workers will need over the course of their careers to build the high-skilled workforce that a cutting-edge 21st century economy demands.

Apprenticeship may provide learning, on-the-job training, and a steady source of income. But such models typically require apprentices to accept low wages for relatively long periods of training, and so may not attract mid-career professionals. Thus, training may need to achieve discrete, employer-valued skills in short, stackable bursts, as in more credential-focused hiring and promotion. Workers could move from employment to training to new opportunities, perhaps several times over the course of a career, as the demand for their skill sets and competencies evolves. But, however they do so, policy-makers and business leaders must grapple with how the cost of training is divided among businesses, employees, and the government outside of today's degree-centric postsecondary education model.

Conclusion

Fielding a world-leading, highly skilled workforce is essential to American prosperity and economic leadership. Maintaining our global edge will require that American workers of all backgrounds are effectively and efficiently prepared and achieve success throughout their careers.

Given the large share of America's students who are transitioning to the workforce through routes outside of traditional degree-granting institutions, policymakers and business leaders interested in American economic competitiveness in the 21st century must help these future workers and the employers who need their talents and skills.

In this report, CED has identified several ways to smooth career pathways for students who do not pursue or require a bachelor's degree for postsecondary learning.

First, students need better information to navigate the education and training system. The nation must develop and test scalable, evidence-based models to inform students and trainees about which skills are in demand, how those skills can be obtained, and the likely return on their investment in learning. The more Americans seek out mid-career education and training opportunities to obtain or upgrade marketable skills, the more important such infrastructure will become.

Second, apprenticeships could help students to gain marketable skills and connect to the labor market at the onset of their careers without the debt risk from many degree programs. Policy makers and business leaders should support smart investments to further examine and expand the model; educate more students, parents, and employers of the potential benefits of apprenticeship programs; encourage the expansion of apprenticeships to more occupations and industries; and provide additional public funding to maximize the public benefits from apprenticeships. Rigorous experimentation and evaluation should be critical aspects of this expansion.

Finally, employers should re-envision how they use educational attainment in evaluating and hiring potential talent, for their own benefit and that of large swaths of the American workforce. Nondegree students will suffer if degree attainment thresholds remain and unnecessarily constrain employers. Resourceful employers should seek creative ways to identify underlying skills and competencies and more accurately evaluate their own needs.

Three Recommendations for Business Leaders and Policymakers

To improve the preparation and success of the entire workforce, CED recommends several steps that will better support Americans without college degrees who are transitioning to careers. We believe that the foregoing analysis justifies the following steps by employers and public policymakers:

- 1 **Develop and test scalable, evidence-based models to help individuals better navigate available education and training options.** In too many circumstances, students and trainees are making decisions without reliable access to important information about which skills are in demand, how those skills can be obtained, how long those skills can be expected to remain in demand, and the likely return on their investment choices. Given the potential long-run gains for both individuals and their future employers, exploring ways to provide tools for better-informed education, training, and career decision making should be a priority.
- 2 **Support the smart expansion of apprenticeship programs.**
 - **Educate the public on the benefits of apprenticeship programs.** Given the potential stigma around apprenticeships as second-best alternatives to college career paths and the limited number of workers and employers with first-hand or second-hand apprenticeship program experience, branding, marketing, and education will play important roles in any expansion effort. Additionally, more data on apprenticeship programs, including outcome assessments, should be made easily available to help inform the choices of potential apprentices and sponsoring employers.
 - **Expand apprenticeships to more industries and occupations.** A successful expansion of the apprenticeship model will need to engage a more diverse group of employers and potential apprentices. To facilitate that expansion, public and business policy should seek to reduce the burdens associated with registration, program design, and implementation, including use of existing public sector assets.
 - **Expand sources of public financing for apprenticeship training.** Given the potential public benefits from successful apprenticeships, exploring options for greater public financial support for the training costs or related instruction portion of apprenticeships is justified.
 - **Aggressively pilot and evaluate different models of apprenticeship.** Apprenticeship programs are a promising component of efforts to improve vocational pathways, particularly for nondegree students. Although it is important to maintain protections for apprentices, a wide range of different apprenticeship models should be aggressively tested to find the models that work best for meeting the needs of American workers and their potential employers.
- 3 **Plan for more competency-based hiring.** Given possible changes in technology and talent evaluation that could be on the horizon, forward-looking business leaders should re-examine how they currently use educational attainment as an unbendable criterion for hiring in circumstances where skills obtained in other ways could equip successful employees. Both students transitioning to work without attaining a college degree and employers hoping to make use of an underutilized talent pool could benefit from a talent evaluation process that more directly assesses relevant competencies.

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