

# Skill Training for Adults

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Since the late years of the Eisenhower administration, when alarms were first raised about the impact of what was then called “cybernation,” there have been cycles of interest in the role of training policy for addressing national challenges. During the Johnson administration’s War on Poverty, youth unemployment and juvenile delinquency motivated the creation of initiatives such as summer youth jobs and the Job Corps, as well as a great many others. During the Clinton years, concerns about lagging American competitiveness relative to Germany and Japan led to efforts to import elements of the German apprenticeship model as well as efforts to encourage firms to invest more in training their workforce.

If this paper had been written six months ago, it would have argued that trade shocks and disruption caused by robots and artificial intelligence have resulted in a renewed interest in public employment and training policy. Additionally, the persistence of a large low-wage labor market and unacceptable racial and ethnic disparities has pointed to the need for finding ways to help people move into better work. Today, the case is even more urgent with tens of millions unemployed due to COVID-19 and very likely facing the restructuring of industries ranging from retail to travel to manufacturing. People will need to not only obtain new skills but also find new work.

In thinking about these concerns, it would be a mistake to believe that skill training is the only answer. A broader agenda would include a wide range of economic and social welfare policies as well as efforts to strengthen employee voice. Nevertheless, training is important because many low-wage workers lack the skills needed to move into better jobs; middle-aged workers who are displaced will need assistance finding new work using new skills; and creative skill training programs can work with firms to help them improve their performance and upgrade their employment practices. When we turn to our discussion of public policy, we identify two channels through which training can play an essential role: improving access to good jobs and helping to transform low-quality jobs into better-quality jobs.

With a focus on adult training, we begin by presenting the findings from a new original survey describing how working adults obtain their job skills. The results of this survey raise important questions about equity and access. To address these challenges, we turn to a discussion of public training policy.

To preview the findings, we show that about half of adults received training from their employers in the 12 months prior to the survey, and about 20 percent undertook some form of training on their own during the same period. Whether these rates are satisfactory is an open question, but what is not acceptable is that there are large racial, ethnic, and educational differentials in access to both forms of training. This sets the stage for our discussion of public policy. We describe the major skill provision policies and institutions and emphasize a crucial observation: In many respects, we have a good understanding of what works at the level of specific programs—modern models of job training programs and community colleges—and the hard challenge is diffusing best practice at scale. Achieving scale is in part a question of resources, but at

a deeper level requires a regional social compact and a significant commitment, not just lip service, among the key actors.

That said, we argue there are some gaps in our understanding and opportunities for innovation, which we also address. Finally, we conclude with the observation that, for all the criticism regarding the limited scope of the U.S. job training system, it does have positive features, namely the multiple venues of training that are available and the flexible access to those venues. These features distinguish the American system from more rigid national models and are a source of strength.

## How Americans Get Their Skills

Skill training is available from employers, community colleges, public training programs, online programs, unions, and a disparate collection of innovative new opportunities. Given the multiple venues that are available, how do adults obtain their skills? Perhaps surprisingly, to date there has been no way to answer this question because the data is lacking. Some surveys focus on narrow age groups while others are out of date. The most recent national survey is the 2016 Adult Training and Education Survey (ATES) executed by the U.S. Department of Education (Cronen, McQuiggan, and Isenberg, 2017). However, for the purposes of understanding either the broad question of how people obtain skills or more narrow questions regarding employer training, the ATES is limited in important ways.<sup>1</sup>

An illustration of the problem is that a widely cited report on firm-based training published in 2015 relied on a 1995 survey which was simply extrapolated to 2013 (Carnevale, Strohl, and Gulish, 2015) and an Obama-era Council of Economic Advisers summary of what we know utilized a 2009 survey as did a recent scholarly article on trends in employer-provided training (Waddoups, 2016). As a result, much of the current discussion of employer training relies on anecdotes, one-off examples, or consulting firm or industry association studies whose sampling strategy and representativeness leave a good deal to be desired (Cappelli, 2015).

To fill these gaps, in January 2020 we conducted a large nationally representative survey of 3,673 working civilian adults between the ages of 24 and 64 and asked a set of detailed questions regarding employer-provided training and training they undertook on their own (see “Appendix: The Survey” for a detailed description of the survey methodology). Survey responses were weighted based on observed characteristics, including race, gender, and education, and on population estimates from the U.S. Department of Labor’s Current Population Survey. Forty-seven percent of respondents were women, 62 percent were white, and 42 percent had a college degree.

We begin by asking what skills people use at work (see Table 1). For a range of skills, we asked whether the skill was utilized every day, at least once a week, at least once a month, occasionally, or never.

**Table 1: Percentage Required to Use a Given Skill at Least Once a Week**

	ALL
Facing a complex problem that takes at least 30 minutes to find a good solution.	46.9%
Being required to read a document of more than five pages.	35.0%
Being required to perform physical labor for a 30 minute or more stretch.	40.4%
Being required to use addition, subtraction, multiplication.	75.1%
Being required to use math <b>beyond</b> addition, subtraction, multiplication.	37.9%
Being required to use a computer for tasks such as word processing, email, or web-search (but <b>not</b> including using a device such as a cash register that is connected to a computer which need not use any programs on your own).	77.6%
Being required to use a computer and work with specialized software <b>beyond</b> word-processing, web-browser, or email.	66.3%
Working as part of a team in which you and your colleagues decide how to get the work done	70.7%

Source: American Training Survey (Osterman 2020a)

As is apparent, computer skills and teamwork are widely used as is simple math. Problem-solving is important for under half the workforce and is as widely used as physical labor. On the other hand, reading moderately long documents and advanced math are important for only about a third of the workforce.

Skills are important if they have implications for compensation. We estimated a standard earning regression (reported in the Appendix) that included controls for experience, gender, education, race and ethnicity, weeks and hours of work, and the skill measures. The bad news in this equation is that after all

the controls, women, African Americans, and Hispanics are at a statistically significant earnings disadvantage. Education plays the expected role with more education being correlated with higher earnings. For the skill measures problem-solving, both simple and advanced computer skills, advanced math, and document reading are all associated with higher earnings. On the other hand, physical work and simple math are correlated with reduced earnings (presumably reflecting the nature of the jobs that emphasize these), and teamwork is insignificant.

### TRAINING PROVIDED BY EMPLOYERS

It is important to understand the extent of employer-provided training and, as just noted, our understanding is out of date. The survey defined further training as “training, for example, on how to run a new machine, a new administrative process, or use a new piece of software.” In the survey, 56.5 percent of respondents received formal training from their employer in the 12 months prior to the survey and 49.0 percent received informal training. The overall level of incidence reported here is broadly comparable to that of the earlier surveys (Frazis, Gittleman, and Joyce, 2000; Lerman, McKernan, and Riegg, 2004; Lynch and Black, 1998).

A central question is who receives and who does not receive employer-provided training. To address this question, we estimated regressions (logit models) with the dependent variable being the receipt of formal and of informal training in the previous 12 months.

One complication in these models concerns the nature of the employment relationship. The survey instrument utilized here was carefully designed to follow best practice with respect to the definitions and measurement of the employment categories (Abraham, Hershbein, and Houseman, 2019). The sequence of questions that made these distinctions is reported elsewhere (Osterman, 2020a). We identified three categories: standard employees who are paid and have taxes withheld by the employer at whose site they work, contract workers who are employed by one firm that withholds taxes but are assigned to work at the site of another organization, and freelancers who do not have an employer who withholds taxes. In the survey, 7.7 percent of respondents were freelancers in their main job and 10.8 percent were contractors, percentages similar to those previously attained from a federal statistical survey (U.S. Bureau of Labor Statistics, Current Population Survey supplement, May 2017). When second jobs are considered, an additional 5.7 percent were freelancers and 1.8 percent were contractors. Contractors, in principle, can receive training both from their legal employer and from the site where they are assigned; the survey collected information on both sources, and these are combined into one measure in what follows.

The regression results are provided in the Appendix. The models include controls for the full range of demographic and educational characteristics as well as controls for the degree of skill specificity, job tenure, part-time status, union status, occupation, and industry (Osterman, 2020a).

The results from this exercise are in some respects expected. Skill specificity, recent hiring, and union coverage are associated with greater employer investments in training, and part-time status is associated with reduced investments. When the model is estimated without contractors and firm size is included, training increases with firm size. People with more education also receive more employer training. All things considered, the striking feature in all models is the substantial racial and ethnic disparities. Simply put, after all the controls, being African American, Hispanic, or Asian is consistently associated with reduced employer investment in training.

Stepping back, one might be concerned that nearly half the workforce received no training from their employer over the past year. That said, there is no standard against which to judge how much training is necessary or appropriate, and perspectives may differ on this question. It is perfectly possible that a person in a good job and with marketable skills does not need any additional training. To which, to continue the dialogue, it might be replied that in an increasingly precarious labor market, ongoing skill training is an essential protection for everyone.

However, even if one takes a sanguine view on average, what is perhaps most worrying about these results is the consistent pattern of lower earnings and lower investment for people with less than a college degree and the evidence of racial and ethnic disparities. Given that employer-provided training leads to improved economic outcomes (Lynch, 1992; Bartel, 1994; Bartel, 1995; Brown, 1989; Bartel, 2000), the patterns documented here suggest that the dynamics underlying economic inequality are to an important extent perpetuated by differential access to employer-provided training. Taken as a whole, these patterns point to an important role for public policy in equalizing opportunities to improve skills.

## Moving Ahead

The disparities just documented in employer-provided training suggest that a robust training system supported with public funding has an important role to play. Of course, people could seek out training on their own, and the survey did ask about such efforts. Overall, 18.9 percent of the respondents had undertaken some form of training on their own during the year, but the great bulk of this was online (the rate of seeking out training on one's own was 4.6 percent if online is excluded). Additionally, it is not clear that self-directed training overcomes the disparities just documented, because the college-educated people were far more likely to undertake such training than those with lesser education. This then brings us to the need to understand the role of the public training system.

The persistence of a large low-wage sector in the labor market and the disruptions caused by COVID-19, technological change, and trade add to the case but also seemingly create a discouraging environment. Given these dark clouds, it is worth noting that demographic trends create a more favorable environment for training programs that could be well received by employers. The wave of baby-boom retirements will

create job openings even in occupations that are expected to experience net declines. As an example, production workers are an occupation in difficulty, with the U.S. Bureau of Labor Statistics predicting 420,000 fewer in 2028 than in 2018. However, depending on assumptions about when people retire, during the same period there will be between 600,000 and 1.6 million openings. Much the same is true for a wide range of middle-skill jobs (Osterman, 2019).

It is helpful to think of training policy as having two strategies: improving access to good jobs and helping to make bad jobs into better jobs. Training programs provide access to good jobs via provision of skills and via their job placement functions. The skill provision point is straightforward. To some extent, the skills are remedial in that many program participants lack the reading and math skills needed to hold well paying jobs. In addition, programs provide occupational skills. Beyond skill provision, training provides access because well-performing programs have relationships with employers such that these programs can become a recognized and institutionalized recruitment channel.

A critique of this line of thinking is to worry that programs are simply playing musical chairs: Moving some people into better work thereby bumps others from those jobs. Given the small scale of programs relative to labor markets, it is very difficult to test for this effect; and while there have been a few efforts in European labor markets, there are no U.S. studies. In any event, there are multiple answers to this worry.

The first point is that even if musical chairs is true overall (see response below to the contrary), there can be substantial distributional benefits from making opportunities available to those who would otherwise not get them. For example, programs may provide access to people from neighborhoods that employers have ignored or avoided. Given the substantial disparities that we (and many others) have documented, this is an important consideration and one that is sometimes overlooked by a too narrow focus on efficiency as conventionally defined.

Second, there are clear efficiency benefits to training. Improving people's skills makes them more productive and this benefits the economy as a whole. In addition, to the extent that there are mismatches in the job market, with some jobs unfilled absent intervention, training programs can ameliorate the problem and hence have an efficiency benefit. Certainly, during the very tight, pre-COVID-19 labor markets, the experience of high-performing programs was that employers were open to using them as a recruitment and training source that enabled otherwise unemployed or underemployed people to obtain good jobs. The willingness of firms to consider hiring previously incarcerated adults, who had simply been ignored, speaks to this. There is little evidence that this process resulted in others being bumped from work.

A deeper response is that training programs can increase the supply of good jobs. The evidence on this point is well established in the literature relating local economic growth to local levels of human capital (Austin, Glaeser, and Summers, 2018). This point, while important, is more likely relevant to long-run



economic growth, and the connection to short-term or even medium-term outcomes is tenuous. However, there are other channels via which training programs can improve job quality in a community.

Case studies of effective programs demonstrate that they can work with employers to help them improve their human resource policies and offer more opportunities to their low-wage workers (Dawson, 2016). An example is the creation of career ladders whereby employees in lower-skill jobs are provided training and then a new job ladder or career path is created that enables them to do more complex work. In effect, tasks are redistributed in a way that overall creates a higher-quality mix of work (Osterman and Shulman, 2011). This strategy has been especially effective in industries such as healthcare which have multiple levels and steps in their job hierarchy. One might argue that if these career ladders made more economic sense employers would have already implemented them, but this overlooks the weak, and ever weakening, role of human resource departments, the mindset of some employers that low-wage/low-skill workers are not able to absorb training or learn to do more complex work, and the multiple demands on employers' attention (Cappelli, 2012). Funding for these career ladder programs often comes from foundations, but some successful training intermediaries, such as [JVS](#) in Boston, have proven themselves useful enough that local employers are willing to pay a fee for the service (Rubin, 2019).

A second pathway for training to increase the supply of good jobs is extensive practitioner experience in which economic development authorities work with training programs in efforts to attract new firms and/or help existing firms grow. In this context, economic development authorities can more effectively insist that their subsidies come with a job-quality requirement if they can offer the assistance of training programs to prepare the workforce for the more complex work. An example is Project QUEST in San Antonio which has been able to do this on multiple occasions working with the city's economic development office. More generally, as a recent study of local economic development strategies noted, "Creating local jobs will be more effective in promoting local prosperity if an area's residents have the skills to fill those jobs.

Developing the skills of residents improves their access to good jobs. It also helps the entire community: Greater skill attainment often translates to a more diverse mix of jobs that spills over into greater earnings for all residents (Bartik, Hershbein, Miller-Adams, Adams, and Meyers, 2020)."

We now turn to a discussion of the components of the U.S. public training system. The United States does not have a training system if what is meant by the term "system" is a well-articulated set of programs or opportunities that fit together in a logical stepwise way and that are readily accessible to all those who are interested or need assistance. What the United States does have is a diverse and loosely connected set of opportunities.

## COMMUNITY COLLEGES

Community colleges, of which there are nearly 1,100, are America's premier training institution. They enroll 6.8 million students in credit courses of whom 46 percent are over age 22 and 64 percent are part-time. The strong majority of these older students are in vocational programs. In addition, another 5 million people take non-credit courses; and although these are poorly tracked, it is reasonable to think that most are vocational and populated by adults who attend part-time. Community college students in credit courses are disproportionately minority, first-generation college, and lower-income (American Association of Community Colleges, 2020).

Community colleges play multiple roles, a feature that is a significant strength, but that also complicates management and performance measurement. About 30 percent of students who enroll in community colleges transfer to four-year schools (Community College Research Center, 2020). The remainder of credit students receive either two-year degrees or certificates, and the majority of these are vocational and aimed directly at the labor market. In addition, as noted earlier, a large number of people enroll in short-term non-credit programs. Moreover, some community colleges play an active role in their communities working with firms to upskill their incumbent workers and cooperating with economic development efforts to attract new businesses to their region. Finally, some community colleges have established working relationships with high schools and offer early college programs or career academies.

In the Task Force's work jointly with the Community College Research Center at Teachers College, we interviewed several best practice community colleges which are active in all of these arenas. A good example is Indian River State College in the Treasure Coast region of Florida. In addition to the standard teaching and degree provision role, it works closely with regional employers. For Florida Power and Light, it has established programs in electronic engineering and nuclear technology; while for the Cleveland Clinic healthcare system (which is moving into the area), it created certificate programs in medical informatics and medical coding and is in the process of creating an anesthesia tech program.

Another example is the BioWork certificate program in North Carolina.<sup>2</sup> When employers in the growing biopharmaceuticals industry sought to expand the pool of labor for their many laboratory technician positions in the late 1990s, they relied on the North Carolina Biotechnology Center (NCBiotech) and the state's community college system. NCBiotech is a private, nonprofit corporation. The center serves as a convener for business leaders, academic experts, and policymakers to facilitate an ecosystem of biotechnology innovation. In addition to its role as a facilitator, NCBiotech provides research funding and technical expertise, and also engages in training and workforce development programs for the biotechnology sector.

BioWork is a 128-hour certificate course that provides specialized training for entry-level jobs in pharmaceutical and bioprocessing manufacturing (PBM). Created by the North Carolina Biotechnology

Center and the state's community college system in 1998 and officially launched in 2001, the program's goal was to equip workers with the skills needed to transition from declining manufacturing industries to the state's growing biopharmaceuticals industry. Program participants are only required to have a high school degree, but college-educated individuals have participated in the program as well. The BioWork program is currently offered at 10 community colleges.

The scale of community colleges and the extensive vocational components make community colleges central to any training initiatives. In some sense, the scale also implies that they add up to a "system." But in reality governance is highly decentralized—not simply in the sense that states have far more control than the federal government, but also because in many states each community college has its own governing board and in some cases its own tax base.

### FEDERAL AND STATE JOB TRAINING PROGRAMS

Publicly supported job training programs are scattered throughout the federal government, and some states also support their own interventions. In 2019, the U.S. Government Accountability Office (GAO) identified 43 distinct federal programs, but eight programs accounted for 81 percent of expenditures; and within this group, if vocational rehabilitation sponsored by the U.S. Veterans Administration and the U.S. Department of Education are omitted, then the dominant sources of support are the Workforce Innovation and Opportunity Act (WIOA), Temporary Assistance for Needy Families (TANF) training programs, funding for the Employment Service (Wagner-Peyser Act), and the Job Corps (U.S. Government Accountability Office, 2019). The administration of most of these programs is federal-state.

The nature of federal programs has evolved since the War on Poverty with changes in administrative structure at the local level, shifts in performance standards, and eligibility rules. Barnow and Smith (2016) provide a comprehensive history and description of the evolution of these programs. Nonetheless, the basic structure is that formula funds are distributed to states and localities, and governance is shared by governors, mayors, and workforce boards which are intended to represent a range of stakeholders including employers. The U.S. Department of Labor also retains some funding for national initiative and demonstration projects. Overall, the central target groups are low-income workers, youth, and dislocated workers. Funding supports training and job search assistance, but resources for actual skill training are very limited. In Program Year 2019, appropriations for WIOA Youth, Adult, and Dislocated Worker programs came to a bit over \$3 billion, a figure which is minuscule compared to education spending (Federal Register, 2019).

State programs are diverse and range from simple job search and posting efforts to training for incumbent workers in specific industries to open access job training for underemployed or unemployed people. In many cases, these programs are explicitly linked to economic development efforts to attract or retain

specific firms or industries. The programs are funded either directly from general appropriations or from small set-asides from the employer's unemployment insurance tax. There are no national efforts to track these programs either in terms of magnitude or impact, although case studies are available for a few states (Mikelson and Hecker, 2018). Utilizing a survey conducted in 2015, Wandner reported that 16 state agencies reported receiving state funding for training programs (Wandner, 2015, p. 134).

## INTERMEDIARIES

Too often, many of the programs just described are short term, connected neither to employers nor to labor market demand, and of highly variable quality. The good news is that in the past decade or so a model, often termed *intermediaries* or *sectoral programs*, has emerged (Conway, Blair, Dawson, and Dworak-Muñoz, 2007; Conway and Giloth, 2014; Kazis, 2004; Holzer, 2019).

The core best practice components of intermediaries are close relationships with employers (the so-called dual customer model), support services and counseling for clients, and substantial investments in training. Depending on the specific program, the actual training is either done by the intermediary itself or by a community college. If the training is the responsibility of the community college, the intermediary works closely with that institution around issues of scheduling and support. In order to achieve the close relationship with employers, intermediary staff become knowledgeable about the nature of the industry and the needs of employers. Intermediaries which adhere to this broad model may be sponsored by community groups, business associations, or unions. Intermediaries may receive public funds, foundation funds, or support from business organizations or unions. There are several national support organizations for intermediaries, including the Aspen Institute Economic Opportunities Program and the National Fund for Workforce Solutions.

As examples of intermediaries, consider Project QUEST in San Antonio and JVS in Boston. Project QUEST works with firms to identify future openings and to understand the requirements for those jobs. It then recruits low-wage adults and works with local community colleges to train them for those jobs. In order to help the participants succeed, it provides a rich array of support services: accelerated remedial education, weekly group meetings that focus on life skills and motivation, and financial assistance to cover issues such as transportation. In addition, QUEST counselors visit the community colleges on a regular basis to help resolve any issues the participants face and to work with the community colleges to provide as much flexibility as possible within the programs.

JVS works with employers to help construct career ladders within their organization and with employers to help fill their needs for external hiring. In both cases, it has established trust with the firms due to long-term relationships with them, and in some respects acts as a human resources consultant. Examples include working with local hospitals to train incumbent staff in low-wage positions (such as the laundry or kitchen) to move into better-paying patient-facing jobs and partnering with nursing homes to upgrade the scope of

certified nursing assistant (CNA) positions to incorporate a wider range of tasks. In these examples and others, JVS provides the basic education remediation and the skills training to enable clients to succeed in the opportunities it creates via its relationships with employers.

## What Works and What is Missing

A striking fact that is often overlooked in discussions of public employment policy is that to an important extent we know what works. Specifically, we have good evidence that community colleges pay off for students who complete certificates or degree programs and that best practice intermediaries raise the earnings of participants.

The worry about community colleges is that dropout rates are high. Nationally, 40.8 percent of community college full-time or part-time students who enrolled in 2013 earned a credential from either a two- or four-year school within six years of initial enrollment compared to 66.7 percent for public four-year schools (Shapiro, Ryu, Huie, Liu, and Zheng 2019). The rate for full-time students in community colleges was 45.3 percent (Causey, Ryu, and Shapiro, 2020).

That said, when students complete a degree or certificate at a community college, the rate of return is good. While randomized control trials are not available for standard programs, sophisticated fixed effects modeling—sometimes using survey data and sometimes using administrative data—support this conclusion. For example, an assessment using administrative data from six states found that completing an associate of arts (AA) degree improved earnings by between \$4,640 and \$7,160 compared to entering the college and not obtaining the credential (Belfield and Bailey, 2017). Smaller but positive results were also reported for completion of a certificate. A study of Career and Technical Education (CTE) in California community colleges reported earnings gains of between 14 and 28 percent, and other studies have reached similar conclusions (Stevens, Kurlaender, and Grosz, 2018; Jepsen, Troske, and Coomes, 2014).

Evaluations of WIOA programs and their predecessors are very mixed and even when positive tend to suggest small earnings gains (Barnow and Smith, 2016). By contrast, high-quality evaluations show a substantial payoff to the intermediary model (Holzer, 2019). A strong example is Project QUEST in San Antonio, which was subject to a randomized clinical trial (RCT) with a nine-year follow-up (Roder and Elliott, 2019). QUEST exemplifies the best practice elements described above in the section on intermediaries. From year three to year nine, participants earned significantly more than the control group, and by year nine the gap was over \$5,000 per year in annual earnings. These impacts are not unique to QUEST; rigorous evaluations of other best practice intermediaries also find positive results (Gasper, Henderson, and Berman, 2017; Pavetti, 2018; Hendra et al., 2016a; Hendra et al., 2016b).

Understanding that there are scalable models for effective employment policy is fundamental and should help clarify any discussion of how to move forward. That said, there are also two important missing pieces.

#### A GAP: TRAINING FOR EXPERIENCED, DISLOCATED WORKERS

We know what works for training low-wage workers who wish to move up the job ladder and training for relatively young adults who also are interested in improving their circumstances. But what about the middle-aged employee who is dislocated by trade, technological change, or COVID-19? Here, our understanding is considerably weaker. Most of our experience with retraining middle-aged and older employees comes from the WIOA Dislocated Worker Program and from training funded by the Trade Adjustment Assistance (TAA) program. The raw data from the Trade Adjustment Assistance Program (which only captures a subset of the dislocated worker population) is not encouraging: In 2017, 72.5 percent of program participants found jobs after participation in the program and of these the earnings replacement ratio for 40–49 year-olds was 83.9 percent and for 50–59 year-olds, 75.3 percent (U.S. Department of Labor, 2017). A Mathematica evaluation of the TAA program using the experience of the early 2000s found between a zero and a negative impact on earnings although younger participants did better (D’Amico and Schochet, 2012). On the other hand, a study that identified impact via random assignment to easy or tough examiners did find a substantial earnings gain from program participation over a 10-year follow-up period, although by the end of that period the relative gains dissipated (Hyman, 2018).

Additional evidence comes from the Trade Adjustment Assistance Community College and Career Training (TAACCCT) program, which between 2011 and 2018 awarded nearly \$2 billion in grants to several hundred community colleges to train dislocated workers. The goal was to develop innovative curricular approaches for this group. According to the Department of Labor Inspector General, only about 40 percent of participants completed their program and under 50 percent of these completers subsequently found employment (U.S. Department of Labor, 2018). However, a critique of this assessment is that it mixed together well designed and managed programs with ones that were less so, and a meta-analysis of a subset of 36 program evaluations (selected on the basis of rigor) reported a significantly positive employment gain for participants (Bragg, 2020; New America, 2020). Finally, an assessment of dislocated workers training in Washington State Community College did find positive impacts that varied in expected directions with the length of the training investment (Jacobson, LaLonde, and Sullivan, 2011).

Given the considerable disparity in the evidence, a fair conclusion is that more work remains to understand how to best serve experienced dislocated workers, and investing in demonstration programs would be appropriate.

## A MISSING CONTRIBUTOR: THE U.S. EMPLOYMENT SERVICE

It is striking that in most policy discussions of the training system and labor market adjustment, little attention is paid to the U.S. Employment Service. With tens of millions of people unemployed, the need for services that assist people in finding new work is apparent. This is particularly urgent given that the COVID-19 crisis seems likely to permanently damage some industries as well as lead employers to automate work in others. Training programs do play a role in labor reallocation via the training they provide and the efforts of the placement staff and job developers who are part of their operations. Nonetheless, a public job matching service is needed, and this is the role of the U.S. Employment Service.

Founded in 1933 by the Wagner-Peyser Act, the mission of the Employment Service (ES) is to be available to anyone who walks in looking for work and, at the same time, to offer employers a venue in which they can list jobs. Over the years, the ES has evolved and taken on a range of responsibilities, including open access to anyone seeking help, enforcing the Unemployment Insurance (UI) job search requirement, providing some enhanced services to UI recipients, and co-locating its Job Centers with the One-Stops operated by the federal WIOA training program and hence becoming the access point for training services. There are over 2,400 Job Centers and these provide services, depending on the business cycle, to between 15 million and 20 million people (Wandner, 2015; Balducci and O'Leary, 2017).

The ES has been controversial since its founding. In the South, it long was a labor recruitment instrument that maintained and enforced a segregated and discriminatory labor market regime. During the years of the War on Poverty and subsequent reorganizations of federal job training programs, it was often an obstacle to efforts to create a seamless system and in some locations an obstacle to shifting the system's mission in the direction of the economically disadvantaged (Weir, 1992). Despite these blemishes, its potential importance is apparent. The issues lie in performance and funding.

Assessing performance is complicated since the universal access mission precludes an RCT for the system as a whole. That said, evaluations of components of the system, most notably job search assistance provided to UI recipients, do show that receipt of services shortens unemployment spells (Jacobson, Petta, Shimshak, and Yudd, 2004). A recent effort, the Reemployment and Eligibility Assessment (REA) program, provided light-touch assistance and reduced the receipt of UI by between half a week and 1.5 weeks, about half of which was due to more rapid job acquisition (Klerman, Saunders, Dastrup, Epstein, Walton, Adam, and Barnow, 2019). Because ES services are low cost (consisting of job search workshops and light counseling), the cost-benefit ratio is positive; and given this ratio, the case is there for public support.

That said, reducing unemployment spells, while laudable, does not necessarily represent success in moving people up the economic ladder. The REA program just cited increased annual earnings only by about \$500. By all accounts, the ES job listings are biased to low-paying and low-quality work, and the ES is not the venue of choice for employers looking for skilled employees. For good jobs, the ES competes with

modern alternatives such as Indeed.com. The question then is whether the ES can play a larger role, and this implies a reconsideration of its activities as well as more generous funding.

In thinking about a more ambitious agenda for the Employment Service, it is important to acknowledge its limitations. Obviously, the Employment Service does not create jobs nor does it provide training and the benefits that come with it. However, the ES, and the One-Stops that are typically part of ES Job Centers could be an effective gateway to training and a useful resource for employers. This potential is illustrated by the role of the One-Stops and the Job Centers in filling good jobs at Fiat Chrysler Automobiles (FCA) in Detroit.

As part of building a new assembly plant in Detroit, FCA agreed to give hiring priority for 5,000 production workers to Detroit residents. The city's workforce leaders spent a year working with FCA to understand what they were looking for in their workforce and what had been their experience with employees who had succeeded in these jobs and those who had turned over quickly. Based on this understanding and working with the One-Stops and the ES, the city aggressively advertised the opportunity and ran job fairs that screened potential applicants for eligibility on several dimensions and 15,900 applicants met the criteria. For these people, the ES/One-Stops trained them in how to complete the online application and assessment, and provided some light tutoring in math and mechanical skills. As of this writing, the hiring process is underway and 1,000 offers have been made.

The lessons for the ES is that if it is taken seriously as a recruitment resource by employers and if it can deliver value to firms, then there is a substantial role it can play in the job market. The challenge, of course, is how to up the game of the ES so that what it was able to achieve in Detroit can be replicated elsewhere. That said, it is also notable that the Detroit success was not due to the ES operating on its own but rather to a partnership between the city's political leadership and the employer community. Put differently, an effective workforce system that operates at scale needs to be embedded in a regional commitment among the social partners, a topic we return to below.

## How to Proceed

Given what is known about training programs, we can conclude that: there are significant inequalities and disparities in the job market that an effective training policy can address, that we have models that are effective, and that there are nonetheless important gaps in both our understanding and in the structure of the system. In thinking about how to move forward, we focus on three topics: resources, building a shared regional commitment to an effective system, and innovation.



## RESOURCES

To start with a predictable point, without adequate resources it is simply not possible to build an adequate system. Training programs, community colleges, and the Employment Service have faced declining support, exactly the opposite of what is needed.

Government funding accounts for just under 65 percent of community college revenue, yet between 2000 and 2018 total funding per full-time equivalent (FTE) student from state, local, and federal sources for community colleges was flat in real (inflation-adjusted) terms, while demands on and expectations for the system increased considerably (Community College Research Center, 2019).<sup>3</sup>

In addition, the actual level of funding—not just the rate of change—matters. There is good evidence that investment in support services improves retention and success rates (Bailey, Jaggars, and Jenkins, 2015; Evans, Kearney, Perry, and Sullivan, 2017; Klempin, Kalamkarian, Pellegrino, and Barnett, 2019; Roder and Elliott, 2019; Weiss, Ratledge, Sommo, and Gupta, 2019). An example of this is the aggressive coaching incorporated as part of the Detroit Promise Program that provides last dollar financial support to community college students (Ratledge, O'Donoghue, Cullinan, and Camo-Biogradlija, 2019).

Current levels are inadequate. Per-pupil operating expenditures for community colleges are less than half that of four-year bachelor's (not master's and not research) private colleges (Kahlenberg, Shireman, Quick, and Habash, 2018). Even modest trend increases would be inadequate to enable community colleges to meet the needs of their students by increasing support services and other necessary steps to improve retention and outcomes.

Federal funding for adult job training, adult basic education, and high school career and technical education have all declined. The Workforce Investment Act (WIA)/WIOA formula spending between FY 2001 and FY 2019 fell from \$4.62 billion to \$2.82 billion, respectively (National Skills Coalition, 2020). This decline is substantial, but even this underestimates the limited funds for training. Because WIOA funds are used along with Wagner-Peyser funding to support the Job Centers, estimates are that under 30 percent of WIOA funding is expended on training (Mikelson and Nightingale, 2005). The lack of resources for training is particularly troubling because the successful intermediaries described above require nontrivial investments. According to one review, per-participant costs of high-performing programs ranged from between \$7,500 and \$14,000 (Pavetti, 2018).

Adult basic education funding between 2001 and 2019 fell from \$770 million to \$643 million and Perkins Student Support for Career and Technical Education fell from \$1.74 billion to \$1.28 billion (National Skills Coalition, 2020). The Employment Service is also starved of support, and the system spends on average about \$45 per person who walks in the door (Balducchi and O'Leary, 2017). Wagner-Peyser funding levels have sharply declined in the past several decades, falling from \$839 million in 1995 to \$702 million

in 2011, and to \$668 million this fiscal year (Wandner, 2015; National Skills Coalition, 2020). Taking inflation into account, the decline is even more dramatic.

### MAKING IT HAPPEN

We know what works, and it is naïve to avoid the hard fact that more resources are needed. However, funding is only the beginning. There is considerable on-the-ground work to be done in institution building. In part, the challenge is organizational—for example, some community colleges need to improve practices and ineffective intermediaries need to be weeded out. But more generally, the problem is political and regional: developing a broadly shared commitment to pull together and support an effective system (Bartik, Hershbein, Miller-Adams, Adams, and Meyers, 2020).

A focus on a regional commitment makes sense managerially because labor markets are regional and because public labor market programs, adult education, community colleges, and school systems are all best managed by governors who can coordinate at the state level and operate at the regional level in the state. Nonetheless, there is a deeper requirement than good management: a shared commitment by employers, community groups and unions, and governmental and educational leaders to build and support a system. Too often, such a commitment is represented in a pale way by Workforce Boards that do not include the power players in a region and by a planning process that is really about producing a required document and little more.

In practical terms, one might ask: Do employers utilize the employment and training system to recruit their workforce? Do they respect the system as a source of advice for improving their human resource practices? Do governors force a process for rewarding success and weeding out weak players? Do governors force coordination across bureaucracies that otherwise would be stovepipes isolated from one another? Are community groups and unions treated as full participants? Within regions, do local governments cooperate with one another in planning and delivering services?

Too often, the employer community either simply ignores the employment and training system or regards it as an extension of welfare programs and assigns interaction to the community relations function. Additionally, it is too often the case that the K-12 system, the community colleges, and the training systems have only pro forma interactions and that key constituencies are isolated from decision-making around these issues. The exceptions to these concerns—states such as Massachusetts, North Carolina, and Tennessee—are those with widely admired and creative workforce development systems (though even in these best practice states, limited resources constrain scale).

An example of concerted action can be found in Boston. In the late 1970s, state government and the hightech business community came together to form the Bay State Skills Corporation (BSSC), which provided public and private dollars for job training. During the same period, the Boston business

community more broadly supported The Boston Compact, an early example of current “Promise Programs” that provided financial support for post-secondary education to all Boston high school graduates. Over time, the BSSC and another state economic development agency were merged to form the Commonwealth Corporation, which is funded by a state appropriation and which manages, among other training programs, an incumbent worker upskilling initiative financed by a portion of the state unemployment insurance tax. The state investments support a wide range of training efforts and cooperate with two large union programs, Local 1199’s health training program and the Hotel and Restaurant Employees Union BEST job training program. Another important player is the Boston Private Industry Council (PIC), the oversight agency for WIOA funding. The Boston PIC membership includes high-level corporate leadership and hence is effective in helping to link training programs with jobs. Additionally, two of the most innovative intermediaries in the country, JVS and YearUp, are based in Boston. A final observation is that over this entire period, the state’s political leadership has been committed to skill training issues.

All the above represents an exemplary regional commitment to skill training and to linking together some of the key actors in a common effort. But it must also be recognized that the effort falls short. Community colleges interact with these initiatives on a program-by-program basis but are not well integrated into the overall effort. Funding levels are well below what is needed to reach the large numbers of people who need skill training. It remains difficult for community colleges and training programs to capture the attention of human resource staff in firms. Some of the poorer immigrant satellite cities to Boston receive less attention and resources than does Boston proper. In short, the Boston efforts represent a creative set of first steps toward developing a regional compact, but much remains to be done.

The bottom line is that until the key actors in a region take the system seriously, work together, and provide resources, we will never achieve more than scattershot successes and isolated examples of best practice. Although not easy, it is within the power of political leaders to force the relevant bureaucracies and local jurisdictions to cooperate, and it is broadly the experience that community groups and unions are willing participants. The puzzle is how to bring employers into the system and encourage them to take it seriously, treat it as a source of employees, and support funding. Achieving this has been an ongoing challenge and is the topic of much discussion among providers and relevant policymakers. The first step is certainly the bully pulpit. Political leadership, in Washington and in state capitals, needs to make it clear that they need and want the business community to support and utilize the system. Similarly, business associations, national and industry based, need to push their membership. Beyond this is a mixture of carrots and sticks. The carrots include tax incentives and subsidies for training (Negoita and Goger, 2020); the sticks include deploying the purchasing power of federal, state, and local governments; and stronger employee voice would also help. However, none of this will work until the employment and training system makes the case that what it has to offer in the way of recruitment, training new and incumbent workers, and assistance with career ladders and other human resource challenges will help employers meet their own goals.

## INNOVATION

A central theme of the foregoing is that in many respects we know what works, and the challenge is getting from here to there. This challenge requires money, institutional reforms, and a regional commitment by the full range of social actors. That said, there are gaps in our knowledge, there are important new ideas, and the system needs to be open to innovation.

Demonstrations: As noted above, our understanding of how best to help older, experienced, dislocated workers move into new quality work is uncertain. There are some successful examples, but they are scattered, and there are also a considerable number of less successful efforts. The case here is strong for demonstration programs and serious evaluations.

New Pedagogies: There has been considerable energy in the national discussion around new ideas concerning pedagogy. Examples are certificate programs such as those provided for Oracle and Microsoft, boot camps, and online courses. We do not have a full accounting of the number and scope of these new models although efforts, such as Credential Engine (<https://credentialengine.org/>), are underway that aim to classify and track them.

Some of these innovations, such as online courses, hold potential promise with respect to both pedagogy and scale and may, as an example, enable community college students to more easily combine working with education and training. Indeed, the proportion of students studying fully online who are enrolled within 50 miles of their homes is increasing (Lederman, 2019). However, recent research on online learning at community colleges suggests it has not been successful to date, particularly for low-income and underprepared students (Jaggers, 2019). For now, it seems best to think of this group taken as a whole as experiments from which we can learn, but it is certainly possible that they may become more central over time.

System Infrastructure: Two ideas in wide currency—skills standards and information transparency—aim to improve the efficiency with which the training system operates. Additionally, proposals for individual training accounts seek to facilitate access to training.

Skill standards, modeled on those in Germany, were introduced into the American discussion during the Clinton administration. The rationale is that standardization of credentials would enable people to be more mobile across employers, and even geographies, while at the same time providing reassurance to employers about what they get when they hire someone. Widespread adoption would in some sense create a national skill training system albeit without any particular institutional innovations beyond adoption of a standard curriculum structure across training organizations.

While attractive in the abstract, important questions remain about this idea. The deepest problem is that employers do not seem to pay attention except in tightly defined circumstances (e.g., some IT

certifications), a limitation that has been demonstrated in two large-scale surveys.<sup>4</sup> Employers simply do not seem to find the credentials useful or necessary. At the deepest level, this reluctance is inherent on the open flexible nature of the American labor market which was noted above. Employers prefer to adjust their hiring criteria as well as their internal investment in training based on the state of labor market demand and other factors (Modestino, Shoag, and Balance, 2016; Hershbein and Kahn, 2018). Whether continued advocacy around standards will move the needle is an open question, and it is too soon to reach a positive or negative answer.

Related to the idea of uniform industry credentials are efforts to better diffuse labor market information regarding trends in occupational openings, compensation, and other features of jobs, as well as the payoff to different credentials and the track record of different training providers. The argument is that greater transparency will lead to better decision-making by all parties. It is important to understand that information per se is not a substitute for investment in the reach or quality of institutions. Furthermore, the impact of data on the quality of the system requires a faith in the ability of markets to weed out weak players based on information about their deficiencies. At the same time, while information alone does not create a system, better information would certainly be useful, and it is hard to argue against improved transparency.

As already noted, adequate funding is a major problem for all components of the public job training and readjustment system and, added to the challenge, only a minority of adults are able to seek out training on their own. Individual Training Accounts (ITAs) aim to address these challenges by providing opportunities for adults to save for education and training using pre-taxed dollars which would be matched by public contributions (Fitzpayne and Pollack, 2018). One issue here is how to structure the accounts so that low wage workers, who may very well find contributions difficult, can benefit. The deeper issue is the same as that already identified: Absent a strong underlying system with buy-in from important stakeholders, the ITAs run the risk of being money badly spent. That said, lifelong learning accounts are an idea worth exploring provided that they are structured to ensure equitable access for the low-wage workforce.

The foregoing ideas are all worth exploring. But a central point merits repetition: Improving information and providing people with resources only will reap benefits if there is a strong system that can provide quality training at scale. There is no substitute for investing in the institutions themselves and for building a regional commitment to an effective system.

Youth: While adult training is the focus of this brief, it is important to acknowledge that high schools and immediate post-secondary education play an important role in training job skills. High school Career and Technical Education (CTE) is supported at the federal level via the Perkins Act and by the states via education appropriations. CTE may be integrated into comprehensive high schools or in dedicated vocational high school facilities, as it is in Massachusetts, Tennessee, and other states. And new models for

CTE programs have proliferated in recent years. Their core characteristic is to better integrate work experience with the traditional classroom. Examples include the Pathways to Prosperity Network and the IBM P-TECH schools. Another strategy has been to work within existing schools and update the apprenticeship idea by linking high school classes with work experience (Lerman, 2019). Examples include CareerWise Colorado and the Toyota FAME model. There is ample scope, and need, for careful assessment of the performance of these models.

## Conclusion

The findings from the American Training Survey make the case for an effective public employment and training system. In the face of this challenge, critics often point to the much more orderly systems of Germany and Switzerland with their well-developed apprenticeship programs and national credentials that lead into employment. All observers are impressed with the high quality of these systems. But the U.S. system is more flexible and open. It is possible at almost any point in life to enter into training, change fields, and learn new skills. This flexibility aligns with the fact that occupations in the United States have multiple entry points and the training system reflects this. The seeming disorganization of the U.S. system is, from another perspective, a strength—and it is a strength that helps many individuals, even now with our inadequate investment. Any effort to introduce systematic rigidities seems likely to fail, and to fail for good reason. The solution is more about investing in what we know works, experimenting with new ideas, and providing adequate resources.

There is, though, a deeper and more highly relevant lesson from these other systems: the commitment of the social partners—firms, unions, and the government—to cooperate in delivering skill. The broad national consensus is important because it underwrites the long-term viability and scope and quality of the systems. To date, no comparable social contract exists in the United States. We have argued that if we want to move past isolated examples of best practice and address labor market challenges at both the national and regional levels, it is necessary to achieve a compact among employers, communities, and governments to build a real system. The good news is that we understand many of the elements of such a system and we also have a firm grasp on what we need to learn. Hopefully, the striking juncture in which we find ourselves—a job market crisis and a renewed awakening to racial and ethnic disparities—will provide the impetus to move forward on building such a compact.

## Appendix: The Survey

This paper draws from a survey that was conducted in January 2020 by NORC using their standing AmeriSpeak panel (<https://amerispeak.norc.org/about-amerispeak/Pages/default.asp%0>). The panel is a nationally representative pool, and our survey is limited to people between the ages of 24 and 64 who were working in non-agricultural civilian jobs. The survey was conducted in English and Spanish.

Respondents had the option of answering via telephone; but of the 3,648 in the dataset, only 89 availed themselves of this option. Because the entire standing panel represents a larger population than the subset that we draw, NORC provided weights to match the observed characteristics of the March 2019 Current Population Survey. Appendix Table 1 below provides the relevant data for our sample:

**Appendix Table 1: Sample and Benchmark**

	2019 CENSUS ORG AGE 24-64, EMPLOYED	SURVEY UNWEIGHTED	SURVEY WEIGHTED
Percent Women	46.9%	43.2%	47.4%
Mean Age	42.7	42.4	42.8
Percent White	61.5%	61.4%	61.7%
Percent African-American	11.7%	11.8%	11.6%
Percent Hispanic	17.6%	17.7%	17.5%
Percent Asian	7.0%	4.5%	3.8%
Percent Less Than High School	5.6%	2.9%	5.1%
Percent High School Only	26.1%	22.7%	31.7%
Percent Some College	26.5%	25.5%	21.3%
Percent College Degree	41.6%	48.9%	41.9%

As is apparent, the weighted survey is a close match to the benchmark. It is worth noting that both recent academic research (Kochan, Yang, Kimball, and Kelley, 2019; Pedulla and Mueller-Gastell, 2019) and high-quality government research reports (Board of Governors Federal Reserve System, 2016, 2017, 2018; Robles and McGee, 2016) have used standing panels like the one used here.

A second issue regarding the survey concerns the fact that it was done largely online. As noted, the survey did provide a telephone option, but the take-up was very low. Research on possible biases in online surveys is reassuring. In 2015, Pew examined the question by running parallel surveys and searching for differences in responses between those who were in the mail survey arm and those in the online arm (Keeter and McGeeney, 2015). At the time, Pew reported that 89 percent of the population had access to

the internet, a figure that has likely increased since then (and the figure was likely higher because the survey could be completed on a cell phone).

Pew reported that out of 406 survey items, two-thirds had a difference in response between the two arms of 1 percentage point or less, and only nine items had a difference of 5 percentage points or more. When they examined differences by sub-group, the most important consideration was age: Those 65 and over showed more differences between the two arms because a lower fraction of this age group is on the internet and hence those who are more likely a biased sample. This is not a concern for the present research since our age range tops out at 64. The central conclusion of the Pew Report was that “most survey estimates produced by Web surveys will be a little different from those produced by surveys that cover the entire public.” These results are reinforced by a separate study comparing probability sampling and interviewing via Random Digit Dialing (RDD) versus via the internet. Chang and Krosnick (2009) concluded that the internet methodology was equivalent with respect to representativeness and superior with respect to self-reporting accuracy (largely due to the lower rate of social desirability response bias).



## Regressions

### Earnings Regression

Gender (1=Woman)	-.2400317** (.0226575)
High School or Less	-.054848 * (.0327785)
College Degree	.2672858** (.0301006)
Potential Experience (Age-Years of Education-6)	.0225023** (.0041029)
African-American	-.1650548 ** (.0342089)
Hispanic	-.1009406 ** (.02878)
Asian	.130527 ** (.0520148)
Usual Hours Worked	.0268487 ** (.001275)
Weeks Worked Past Year	.0173871 ** (.0008615)
Union Covered	.1956018 ** (.0284996)
Weekly: Solve Problems	.1413915 ** (.0247691)
Weekly: Documents	.0755042 ** (.0247553)
Weekly: Physical Labor	-.1359131 ** (.0240813)
Weekly: Simple Math	-.0619906 ** (.0284084)
Weekly: Advanced Math	.1114695 ** (.0239291)
Weekly: Simple Computer	.149739 ** (.0357793)
Weekly: Advanced Computer	.0931679 ** (.0295855)
Weekly: Work In Teams	.0382257 (.0270184)
Constant	8.266726 (.0768701)
R-Square	.525

Source: American training survey. The dependent Variable is ln(annual earnings)  
 \* = significant at 10% level \*\* = significant at 5% level

### Training Regressions (logits)

	FORMAL TRAINING	INFORMAL TRAINING
Age	.0003692 (.0035799)	-.0050135 (.0035515)
Gender (1=woman)	-.0925049 (.0866877)	-.0359271 (.0856949)
High School or Less	-.0710119 (.1068285)	-.362712** (.1064372)
College Degree	.1785645* (.0976076)	.3664778** (.0954976)
African-American	-.1948107* (.1195936)	-.2525899** (.119166)
Hispanic	-.4099023** (.1021803)	-.3755669** (.1021875)
Asian	-.2681762 (.1874304)	-.421781** (.1849957)
Skills mostly or totally transferable to firm in same industry	.6254742** (.0978959)	.6426036** (.0991046)
Skills mostly or totally transferable to firm in different industry	-.0678859 (.0841674)	.0547899 (.083298)
Part-time	-.3403409** (.0960368)	-.119675 (.0960875)
Union Covered	.4691068** (.1122327)	.0628079 (.1084286)
Recent Hire	.4388523** (.0976459)	.5741865** (.096668)

Source: American training survey. Freelancers and traditional self-employed excluded. Formal and informal training for contractors includes both training provided by their employer and training provided by their work site. Regressions also include occupation and industry fixed effects.

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## Endnotes

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- 1 This was a large survey of people aged 16 to 65 who were not currently in high school. The survey focused on obtaining estimates of the extent to which Americans hold formal work-related licenses and certificates and succeed in providing detailed information on these and their incidence. However, from the perspective of understanding employer-based training, or the broader question of overall how skills are obtained, the survey is limited. While it asks about whether respondents have credentials and whether they are useful on their current job, the survey does not enable one to know whether the credentials were obtained at the current employer, and this is the only employer about whom information is collected. Additionally, data on the current employer is limited to the main employer even if people hold multiple jobs and information regarding the firm and the nature of the work is limited to occupation and industry; information is not collected on informal on-the-job training or on formal training that does not lead to certification.
- 2 I am grateful to Allison Forbes for her research on the North Carolina programs and for drafting the paragraphs that follow. The underlying material is based in large part on Lowe (2010).
- 3 Total revenue (in 2018 dollars) per FTE from federal, state, local, and tuition in 2000–2001 was \$15,072 and in 2017–2018, \$17,265. Excluding tuition and fees, the figures were \$12,343 and \$12,495, respectively.
- 4 A 2018 survey by NIST National Manufacturing Extension Partnership, utilizing an on-line survey of the MEP national network as well as focus groups, concluded that credentials are “not routinely required or used” by firms, that firms do not know what credentials are available, that firms are unaware of any value added from credentials, and that firms report that they would want to train new employees regardless of what credentials they hold (WorkCred, 2018). These results are consistent with a nationally representative survey conducted in 2012 and 2013 that found that only 7.4% of manufacturing firms responded affirmatively to the question, “Do you use any formal industry skill credentials system, such as those provided by industry associations or national testing services, for hiring core employees?” (Weaver and Osterman, 2014).