



RESEARCH REPORT

Inclusive Apprenticeship

A Summary of What We Know about Apprentices with Disabilities

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Inclusive Apprenticeship

Inclusive apprenticeship programs, or those that support apprentices with disabilities, hold promise for improving long-term employment outcomes. But little is known about the prevalence and operations of inclusive apprenticeship programs. This report summarizes current information on experiences of people with disabilities in apprenticeship, drawing on the research literature, interviews with experts on inclusive apprenticeship, and administrative and survey data. This report’s goal is to synthesize information about inclusive apprenticeship and provide insights about best practices to deepen both researchers’ and practitioners’ understanding.

This report provides insights on several key inclusive apprenticeship themes that have implications for the Partnership on Inclusive Apprenticeship (PIA) and its formative evaluation. First, it describes the essential components of an inclusive apprenticeship as documented in the literature, including policies, practices, tools, technologies, and supports provided to apprentices with disabilities. It then describes the benefits and costs of inclusive apprenticeship for apprentices and employers. Next, it examines the federal and state government support for inclusive apprenticeships and follows with a review of the available administrative data on apprentices with disabilities. The report concludes with lessons for inclusive apprenticeship based on recent experience.

Introduction

The US Department of Labor’s (DOL) Office of Disability Employment Policy (ODEP) launched the Partnership on Inclusive Apprenticeship (PIA) initiative in 2020 to build on the efforts of the Apprenticeship Inclusion Model (AIM) pilot to make apprenticeship more inclusive for people with disabilities. PIA engages a wide community of stakeholders to enhance awareness of policies and practices that improve recruitment, participation, supports, and outcomes for apprentices with disabilities. PIA works with apprenticeship intermediary organizations, state and local workforce agencies and boards, American Job Centers (AJCs), Vocational Rehabilitation (VR) agencies, employers, advocates, and other stakeholders. PIA is focusing its efforts on high-growth, high-demand (HGHD) occupations and emerging industries including information technology (IT), health care, and advanced manufacturing.

The Urban Institute, sponsored by ODEP, is providing research to support the PIA initiative, including developing a baseline of knowledge on inclusive apprenticeship, technical assistance on data and outcomes to measure progress and success in inclusive apprenticeship, and a formative implementation evaluation of PIA, all of which are integrated with and inform each other.

The purpose of this report is to synthesize information that can be useful for PIA implementation by providing insights on several key inclusive apprenticeship themes. Section 1 describes the essential components of an inclusive apprenticeship as documented in the literature, including policies, practices, tools, technologies, and supports provided to apprentices with disabilities. Section 2 describes the benefits and costs of inclusive apprenticeship for apprentices and employers. Section 3 examines the federal and state government support for inclusive apprenticeships. Section 4 then reviews the available administrative data on apprentices with disabilities and describes the characteristics of currently registered apprentices with disabilities. Section 5 concludes with lessons for inclusive apprenticeship based on recent experience. Data sources and the approach to the literature review are described in the Methods and Data Appendix.

What Is Apprenticeship Training?

Apprenticeship combines classroom-based learning with structured on-the-job training and provides a credential upon completion. Apprenticeship can take several forms, including unregistered apprenticeships, industry-recognized apprenticeship programs (IRAPs), and registered apprenticeships:

1. Registered apprenticeship programs are operated by a “sponsor” (often, but not always, an employer) who is responsible for coordinating with partners and implementing the apprenticeship standards:
 - » DOL or an approved state apprenticeship agency (SAA) periodically reviews registered apprenticeship programs to ensure they are compliant with their apprenticeship standards and all health, safety, and equal employment opportunity regulations. Consequently, reporting requirements associated with registered apprenticeships facilitate auditing of who is served by these programs.
 - » Registered apprenticeship programs meet federal and state standards and are registered either with DOL’s Office of Apprenticeship (OA) or an approved SAA.
 - » Registered apprenticeship programs must include at least 2,000 hours of paid on-the-job training and 144 hours of related technical instruction. Registered apprenticeships must also include a structured wage progression and result in an industry recognized credential.

2. Unregistered apprenticeships are not registered with federal or state apprenticeship agencies and can therefore vary more substantially in their length and content:
 - » Unregistered programs are difficult to define precisely because they operate outside the registered apprenticeship system, but researchers and practitioners typically identify a training program as an unregistered apprenticeship if it combines paid, structured, on-the-job occupational skills training with more general theoretical instruction in a classroom or other setting.
 - » Shorter-term, unpaid, or unstructured work-based learning opportunities such as internships are not considered unregistered apprenticeships.
 - » IRAPs are a particular type of unregistered apprenticeship that receives additional oversight and approval from Standards Recognition Entities (SREs) approved by DOL.
 - » The first IRAPs were approved in 2020, so we know little about their impact on apprentices compared with registered apprenticeship programs, although many apprenticeship intermediary organizations active in the registered apprenticeship system serve as SREs.¹

Equal employment opportunity regulations are particularly important for ensuring that apprenticeship programs are offering an inclusive workplace for apprentices with disabilities. In 2016, DOL announced a final rule prohibiting discrimination based on disability status in registered apprenticeship programs. That rule went into effect in 2017 and requires employers to invite apprentices to self-identify as people with disabilities both before hiring and during the apprenticeship.² People with disabilities do not always self-identify, and employers of apprentices with disabilities may not always update the data they report to the federal government, so self-reported disability status leads to an underestimate of apprentices with disabilities.

How Was This Research Conducted?

This study uses three data sources to understand the experiences of apprentices with disabilities in the United States and the content and experiences of inclusive apprenticeship:

- A **comprehensive literature review** using predetermined search terms and databases to understand existing research studies and other documentation of inclusive apprenticeship programs on the experiences of apprentices with disabilities. The literature review was restricted to papers and reports published in the past 20 years. The reason for this limitation is that people's perceptions and attitudes about disability have changed over time, including the

perceptions and attitudes of people with disabilities themselves. These changes affect the way the topic is studied.

- **Semi-structured background interviews** with eight experts on inclusive apprenticeship, including two employers, two representatives of apprenticeship intermediary organizations, three state government officials, and one advocate for people with disabilities. These background interviews complement the literature review to ensure the report reflects recent developments in inclusive apprenticeship that may not be sufficiently documented.
- **Analysis of the Registered Apprenticeship Partners Information Data Systems (RAPIDS)**, the administrative data system for most registered apprenticeship programs in the United States. The RAPIDS data are used to describe the current experiences of registered apprentices with disabilities, as well as their prevalence and characteristics relative to the population of people with disabilities from the nationally representative American Community Survey (ACS).

The research literature contains insights into the components of an inclusive apprenticeship program, but semi-structured interviews were essential for understanding understudied facets of inclusive apprenticeship, including the costs and benefits experienced by apprentices and employers. Almost no research in the literature has been able to provide a comprehensive picture of registered apprentices with disabilities in the United States because these data have only recently been collected in RAPIDS and made publicly available. More details on these data sources are provided in the Methods and Data Appendix.

1. What Are the Components of an Inclusive Apprenticeship?

Although a large and growing research literature on apprenticeship exists, only a modest amount of literature describes promising practices for what constitutes a quality inclusive apprenticeship or other work-based learning experience. This literature review spans journal articles, policy and practice briefs, practitioner guides, and other report types. Many sources focus on policies and programs based in the United States, but additional sources from Europe and Australia have been included because of the longer history of practice there. Collectively, these sources represent a systematic review of inclusive apprenticeship programs and practices across numerous national and regional contexts.

All apprenticeships combine structured on-the-job learning and related instruction as apprentices work toward a nationally recognized occupational credential.³ Inclusive apprenticeships include these

foundational elements as well as several others to ensure the success of people with disabilities. A disability advocate interviewed for this report highlighted that inclusive apprenticeships are not significantly different from any other employment opportunity for people with disabilities. The primary difference is that in apprenticeships support and training is delivered in a structured, deliberate approach through partnerships.

Partnerships Are Essential for Inclusive Apprenticeships

Partnerships are critical to every successful apprenticeship, yet they are especially vital to launching and sustaining effective inclusive apprenticeships. This finding is echoed across the literature. An evaluation of Wisconsin's Youth Apprenticeship programs concluded that high levels of program coordination and consistent communication between all stakeholder groups were associated with a greater degree of programmatic resilience for apprentices with disabilities (Mooney and Scholl 2002; Scholl and Mooney 2004). A similar evaluation of a program coordinated by the University of Washington noted that a partner network consisting of secondary and postsecondary institutions, the state Department of Vocational Rehabilitation, business and industry representatives, and nonprofit organizations were essential to guiding young people with disabilities through valuable work-based learning experiences (Burgstahler 2001).

A staff member at an apprenticeship intermediary organization shared that they partner with employers to help design and develop inclusive apprenticeship programs because employers often do not have the capacity to do this work themselves. They indicated that it is always easier to build in inclusive design from the start rather than adapt an existing apprenticeship program, because then the goal of inclusivity can be infused in all parts of the apprenticeship. Extra effort and resources are required to adapt an existing apprenticeship program to make it more inclusive. A multiphased, decade-long research effort in Australia examined several initiatives aimed at increasing the number of people with disabilities in apprenticeships and improving outcomes for those apprentices (Lewis et al. 2011). The authors found that significant benefits accrue to apprentices and trainees with disabilities when the capabilities and resources of traditional training providers are blended with those of specialist disability employment service providers.

Inclusive Apprenticeships Supplement Traditional Occupational Skills Training

Inclusive apprenticeships employ **specific ways to educate and retain** apprentices with disabilities that supplement traditional occupational skills training. An advocate for people with disabilities interviewed

for this report noted that, in their experience, some people with disabilities “really excel with the type of hands-on learning” that goes on in an apprenticeship. This learning style does not generalize to all people with disabilities, but it does highlight how apprenticeship can be more inclusive by offering various modes of learning. All apprentices, including those who do not identify as having a disability, can benefit from multiple modes of learning. Sometimes, apprenticeship training needs to be modified to include or accommodate people with disabilities. Universal Design for Learning (UDL) is another way for organizations to improve their programs and services while addressing accessibility concerns and increasing the pool of qualified candidates (Docto et al. forthcoming). As the authors discuss, UDL provides a framework through which program designers can structure programs to convey information that any learner can understand; effectively assess what a learner comprehends; and maximize a learner’s motivation and perseverance.

Self-determination training also supports apprentices with disabilities in setting their own goals and practicing self-advocacy. A paper describing Louisiana’s paid Postsecondary Apprenticeship for Youth with disabilities (PAY Check) program highlights that self-determination training is delivered throughout the program (Wilson et al. 2016). Self-determination training is associated with improved postsecondary and employment outcomes for people with disabilities. Further, an industry-specific brief makes the point that individualized training—taking into account a person’s abilities and limitations—can address earnings disparities for workers with disabilities (Gonzalez 2018).

Employers Need Specialized Training to Support Inclusive Apprenticeship

Inclusive apprenticeship often requires **specialized training and technical assistance to employers and workplace personnel**. According to Luecking and Gramlich (2003), this can help foster a welcoming and supportive environment in which apprentices with disabilities can thrive. This component relates to the imperative to provide appropriate supports and accommodations to apprentices with disabilities, a need that is widely reflected throughout the literature. If employers do not have the technical assistance and guidance they need to provide supports and accommodations, they will not successfully provide them. A study of participant and program resilience found that supports and accommodations promoted growth and independence for youth apprentices with disabilities (Mooney and Scholl 2002).

Providing specialized training to employers can avoid ad hoc accommodation of apprentices. An evaluation of Wisconsin’s Youth Apprenticeship programs by Mooney and Scholl (2002) documented the scope of failing to provide adequate supports and accommodations. The Wisconsin Youth Apprenticeship program engages high school juniors and seniors in work-based learning opportunities

that build on classroom-based career and technical education. Wisconsin Youth apprenticeships are operated by regional consortia and overseen by the Wisconsin Department of Workforce Development (DWD). At the time of the evaluation, 54 of the program's 599 apprentices (9 percent) identified as having a disability. The study's authors observed that accommodations were not systematically planned but occurred "after the fact" when specific issues arose, and few were provided to youth apprentices at their worksite (Mooney and Scholl 2002). They estimated that 70 percent of apprentices with disabilities struggled to articulate which accommodations and support services would be most effective for them in the workplace. Because the program served youth apprentices, difficulties that apprentices with disabilities experienced articulating the accommodations and supportive services they needed may be related to their age and experience. Young people with disabilities may be accustomed to having their parents' and school counselors' guidance in framing their requests. To the extent this is true, youth apprentices with disabilities may require different types of counseling and support in navigating apprenticeship than adult apprentices with disabilities.

The Wisconsin Youth Apprenticeship study goes on to assert that the program's role is to provide mechanisms and support through which apprentices "learn to capitalize on their strengths, compensate for their limitations, and develop positive strategies for responding to challenging circumstances." A specific example of such a supportive mechanism is **active engagement of mentors**. A case study describing evidence-based practices employed by a collection of University of Washington projects that engaged high school and postsecondary students with disabilities in work-based learning experiences documented that mentors, most of whom had disabilities themselves, guided students in learning about career options as well as how to be more independent, advocate for themselves, and persevere (Bellman et al. 2014). A study of the effect of Project SEARCH supplemented with additional autism spectrum disorder supports for 156 young people in Virginia found that early and consistent contact with VR counselors was a key element leading to significant and desirable employment outcomes for the treatment group (Wehman et al. 2020). Project SEARCH is not an apprenticeship program, but it operates using similar principles. It is a work-based employment preparation program that combines classroom instruction with training at a job site.

In 2018, the Welsh government sought to better understand underlying reasons for the low take-up of apprenticeships among people with disabilities. Government officials consulted with partners from disability advocacy organizations, collaborating with them to develop an action plan for inclusive apprenticeship programs. Actions taken by the Welsh government to support this vision include developing and delivering tailored equality and diversity trainings to apprenticeship training providers as well as the development and dissemination of an equality, diversity, and inclusion toolkit. The

trainings covered topics including the social model of disability, mental health, and autistic spectrum disorder awareness. The toolkit contained a range of resources and information, including guidance, tips, worksheets, informative videos, web links, and social media links, and spanned topics such as autism spectrum disorder awareness, disability awareness, and emotional behavior disorders. No evaluation or assessment of whether these materials improved outcomes exists.⁴

Apprentices Play a Key Role in Crafting Accommodations

Apprentices themselves can give employers critical feedback on what accommodations are the most valuable. After participating in work-based learning experiences, surveyed students enrolled in secondary and postsecondary schools selected the following **accommodations** as the most necessary: adaptive technology (i.e., alternate keyboards and mouse interfaces, scanners, screen readers, and software to assist with writing); accessible facilities; accessible telecommunication devices; materials in accessible formats; and additional supervision (Burgstahler and Bellman 2005). Further, students reported that barriers included inaccessible doors, meeting areas, and restrooms, while requests for furniture included chairs, step stools, and adjustable desks. A staff member at an apprenticeship intermediary organization interviewed for this report mentioned the importance of specialized computer software for people with difficulty seeing and the importance of providing Wi-Fi and hotspots for apprentices who needed to work remotely. Her organization also provided an apprentice that identified as a little person with orthopedic shoes and seating that provided support working on the shop floor. She also described supplying apprentices with mobile alarm clocks that were more effective for waking apprentices up and ensuring they arrived punctually to work.

A policy brief by the International Labour Organization (ILO) reinforces an important point about both customizing supports to a person's needs and making apprenticeship inclusive and universally accessible to all people (ILO 2018). To illustrate, the brief notes that one visually impaired person might be able to read large print, while another will require a screen reader or braille. To ensure each apprentice receives the appropriate supports and accommodations, employers can actively provide apprentices with opportunities to clarify the types of assistance they need (ILO 2018). Informed employers who actively cultivate an inclusive program will be alert to when and how they can remind apprentices about the opportunity to request accommodations, and that the apprenticeship program is committed to inclusivity and universal access. Employers often fail to communicate these principles of inclusiveness and universal access. Gonzalez (2018) reviews research suggesting that while physical and technological adjustments to workplaces are often feasible to implement, communication to

facilitate these adjustments remains a challenge in many workplaces as employer attitudes and fears around appropriate levels of sensitivity often lead to further segregation and unintentional exclusion.

Mentors and Job Coaches Can Support Inclusive Apprenticeship

In 2012, the United Kingdom released a commissioned report that examined evidence and issues relating to the goal of creating inclusive apprenticeship programs for people ages 16 to 24 with disabilities (Little 2012). Although some of the observations and recommendations in the report are specific to the UK's policy and regulatory environment, many components are transferrable to a US context. For instance, the report found that workplace support, in terms of **job coaching and mentoring**, is critical to success for apprentices with disabilities. Mentoring, according to the report, is especially effective for apprentices with disabilities, some of whom may have limited experience in the workplace. The report also cites that pre-apprenticeship training, which typically provides basic introduction of occupational skills and relevant academic instruction, can be important for success in an apprenticeship. Like other facets of universal design principles, pre-apprenticeship training is valuable preparation for all apprentices, regardless of whether they identify as having a disability.

2. What Are the Benefits and Costs of Inclusive Apprenticeship?

Currently, no published studies estimate the impact of apprenticeship training on the skills, earnings, and employment of people with disabilities, nor the benefits and costs for employers who operate inclusive apprenticeships or apprentices who participate in inclusive apprenticeship programs. However, research on apprenticeship training more broadly and the experiences of experts interviewed for this report provide insights about the costs and benefits of inclusive apprenticeship. Reed and colleagues (2012), Hollenbeck and Huang (2016), and Jacoby and Haskins (2020) estimate the benefits and costs of apprenticeship for apprentices. Likewise, Helper and colleagues (2016) estimate the benefits and costs of apprenticeship for the employers who must ultimately be persuaded to support an apprenticeship program. This research provides a foundation for thinking about the benefits and costs of inclusive apprenticeship programs specifically. Key categories of benefits and costs are provided in box 1.

BOX 1

Benefits and Costs of Inclusive Apprenticeship to Apprentices and Employers

The benefits and costs of inclusive apprenticeship have not been studied rigorously, but research on the benefits and costs of other registered apprenticeship programs and interviews with experts on inclusive apprenticeship provide insights about the relevant benefits and costs. We assume that because the components of apprenticeship programs studied in the past will also be components of inclusive apprenticeship programs, many lessons learned about costs and benefits are applicable as well.

Apprentices with disabilities are likely to benefit from apprenticeship through

- improved skill levels,
- a sense of accomplishment, pride, and occupational identity,
- increased earnings,
- strong attachment to the labor market, and
- reduced tuition and student debt to pay for education and training.

Apprentices with disabilities may experience some costs associated with apprenticeship, including

- potential lower entry-level earnings compared with alternative jobs and
- loss of Social Security Disability Insurance and other benefits in response to increased earnings.

Employers operating inclusive apprenticeship programs are likely to benefit from

- improved skill levels and productivity of their employees,
- reduced turnover costs,
- improved production processes from employees with deeper knowledge of their tasks, and
- a broader talent pipeline.

Employers operating inclusive apprenticeship programs are likely to experience costs associated with apprenticeship, potentially including

- wages of the apprentice and their mentors,
- tuition costs for related instruction,
- reduced initial productivity of apprentices, and
- costs associated with accommodation of apprentices with disabilities or program design.

Benefits and Costs to Apprentices with Disabilities

The impact evaluation literature on apprenticeship has not focused on apprentices with disabilities but suggests that the net benefits for apprentices in general are large, ranging from an increase of almost

\$100,000 in lifetime earnings to an increase of more than \$235,000 in lifetime earnings. Apprenticeship programs have few, if any, financial costs for apprentices. Because apprentices are paid employees, apprenticeship carries substantial and immediate benefits relative to other education and training programs. Apprenticeship provides participants with in-demand skills, so participants form strong attachments to the labor market and experience long-term increases in earnings.

Many studies have explored the long-term earnings trajectories of apprentices, but it is important to note that they are looking at all apprentices and not only those with a disability. For example, Reed and colleagues (2012) found in a study of registered apprentices in 10 states that nine years after enrollment apprenticeship participants earned an average of \$5,839 more than comparable nonparticipants and \$98,718 more in lifetime earnings. Hollenbeck and Huang (2016) found even larger lifetime net benefits for apprentices in Washington State, exceeding \$235,000.⁵ Lastly, Jacoby and Haskins (2020) found that the Federation for Advanced Manufacturing Education (FAME) apprenticeship, a prominent unregistered apprenticeship program, increased earnings for completers by 60 to 100 percent. Although no study of apprenticeship’s impact on participants focuses on apprentices with disabilities, these findings suggest that apprenticeship training is especially promising as an approach to improve the employment and earnings of people with disabilities.

The experts who operated or partnered with inclusive apprenticeship programs interviewed for this report repeatedly noted that the apprentices with disabilities they worked with had achieved similar levels of productivity and performance—as measured by their capacity to perform productive tasks on the job—as all apprentices, and apprentices with disabilities should expect to experience similar benefits. These are the experiences of the employers and partners that were interviewed and may not generalize to all inclusive apprenticeship programs, but they do demonstrate that employers can get real productive value from an inclusive apprenticeship program. One employer described how at the end of the program an apprentice could earn \$70,000 as a software engineer. Another described the value of work experience for their apprentices, who in some cases had no prior sustained work experience.

Some of the apprentices [with disabilities] were coming on board making \$12 an hour and then got their wages way up through the steps of the program and are making \$70,000 as software engineers.

—Employer operating an inclusive apprenticeship program

One employer interviewed noted that the structured progression through the apprenticeship program and the achievement of occupational competencies were particularly appropriate for fostering the success of apprentices with autism. They noted that this structure and support is often unavailable in other jobs. An intermediary described how apprentices with difficulty hearing were highly productive in their manufacturing program with only a modest amount of accommodation. Because no accommodations costs are borne by the apprentices themselves, the expected costs experienced by apprentices with disabilities should be similar to earlier cost estimates for other registered apprenticeship programs (Reed et al. 2012; Hollenbeck and Huang 2016). Net benefits of apprenticeship for apprentices with disabilities may also differ from these earlier estimates if the benefits experienced by apprentices with disabilities differ from the benefits experienced by apprentices without a disability. For example, if productivity and wage growth for apprentices with disabilities are positive but not as high as for apprentices without a disability, the net benefit of apprenticeship will be somewhat lower than the net benefit estimated by Reed and colleagues (2012) or Hollenbeck and Huang (2016).

An interviewee with a state government agency described how apprenticeship could be especially beneficial to people with disabilities waiting to receive services from the state VR agency. VR agencies—particularly in states operating under an order of selection—tend to focus on people who are more severely limited by their disabilities and in need of the most assistance. The interviewee suggested that people with more modest levels of functional limitation can benefit from a structured training program with supportive services, especially if they do not receive these supports from VR agencies.

Benefits and Costs to Employers

Similar to the impact evaluation literature, the cost-benefit analysis literature has not focused on inclusive apprenticeship but suggests that the net benefits for employers of apprentices in general are high. In the United States, the research suggests that apprenticeship is valuable to employers because it increases worker productivity, reduces turnover, and improves workplace culture and production processes.

For example, Helper and colleagues (2016) found that the costs of a medical assistant apprenticeship program were almost entirely recouped in the program's first year and the apprentices' employer enjoyed a 40 percent internal rate of return.⁶ They also found that a major manufacturer enjoyed a 50 percent rate of return on its apprentices, compared with workers hired off the street. An important insight of Helper and colleagues was that some of the most valuable benefits provided by the

apprenticeship program were related to how the apprentices interacted with other workers. Skilled apprentices reduced the need for costly overtime pay, and apprentices were also more flexible in fulfilling other roles at the job site because of their deep understanding of their work processes. Payne (2020) similarly finds positive returns for employers of industrial manufacturing technician apprentices ranging from 26 to 72 percent.

Costs of accommodation vary depending on individual apprentices' needs and employers' prior investments in inclusive programs. An inclusive apprenticeship program is one that invests in all accommodations required for apprentices to perform at a level required by the employer. Some costs of accommodations may be higher than others, but our interview experts suggested that many employers overestimate the additional costs of inclusive apprenticeships. One staff member of a state government agency reported that employers frequently overestimate accommodation costs and are therefore less willing to develop an inclusive apprenticeship program. He suggested that "reasonable accommodations" are by definition achievable for employers and more "employers need to understand that a reasonable accommodation doesn't have to be an \$18,000 a year interpreter." He noted that some employers may be unaware of available low-cost American Sign Language (ASL) translator applications. A staff member at another state agency mentioned that virtual job coaches who check in with apprentices with disabilities remotely can be much more cost-effective than in-person job coaches. An advocate for people with disabilities similarly noted that inclusive apprenticeship depends on overcoming "myths" or outdated information that employers believe about employing people with disabilities. Whether the cost of a required accommodation is higher or lower, employers of apprentices should make decisions based on an accurate, up-to-date understanding of those costs and benefits.

Interviewees also suggested employers need to understand that many critical accommodations are not even line items on a budget and should not be interpreted so narrowly. For example, an interviewee working for an apprenticeship intermediary reported that a critical accommodation for one of their apprentices with hearing difficulties was to make an exception to the company's "no cell phones on the production line" rule. The apprentice used their cell phone to communicate through text, and accommodating this need was costless to the employer.

When necessary accommodations are relatively more costly, other interviewees highlighted the importance of state and federal financial support. Several interviewees mentioned that state VR agencies had resources to provide supports and accommodations to apprentices receiving VR services. An apprenticeship intermediary organization described how an on-site job coach to support apprentices with disabilities was paid for through DOL grant funding. The job coach helped apprentices be successful in their program and served as a line of communication with the employer. Although the

grant paid for the job coach, the employer also understood that they needed to bear certain costs associated with the apprenticeship and determined that the apprentice required an ASL interpreter, which they paid for. The employer found that interpretation costs per apprentice declined as the employer hired more apprentices with hearing difficulties and as the apprentices taught their coworkers more ASL.

In some cases, the costs of inclusive apprenticeship are influenced by the program's scale. A staff member at a state agency noted that larger employers have an easier time finding opportunities for apprentices with disabilities than smaller employers. He noted that for small employers "it gets tighter because they are registering exactly everyone who they need" and do not have a diverse set of job tasks they can fit to an apprentice's needs. Larger employers have more tasks and resources to distribute and have an easier time incorporating new apprentices of all backgrounds in operations.

[Employers should] see inclusive apprenticeship as a business solution, to have a broader pipeline of talent.

—Staff member at an apprenticeship intermediary organization

The literature on apprenticeship's costs and benefits typically acknowledges that many indirect or cultural benefits and costs can be difficult to quantify but are nevertheless valued by employers. These benefits and costs were noted by several interviewees. For example, an interviewee working for an apprenticeship intermediary organization highlighted that inclusive apprenticeship programs are important talent pipelines that introduce employers to workers with valuable skills and backgrounds. This interviewee described how they encourage employers to "see inclusive apprenticeship as a business solution, to have a broader pipeline of talent," rather than as a cost or even a social responsibility. Another employer mentioned that inclusive apprenticeships were not only a new opportunity for hiring, but also increased retention of all apprentices in the program, regardless of whether they identified as having a disability or not. Inclusive apprenticeship programs are programs that raise job quality for all apprentices registered with the program, which increases loyalty and reduces turnover.

Although interviewees noted employer benefits and costs beyond a deeper sense of social responsibility, many highlighted the transformative power of equity and inclusivity. An apprenticeship intermediary interviewee believed that having apprentices with disabilities "truly changes a culture" and

causes managers and workers to think about and interact with each other differently. She compared it with her own early career experiences in workplaces where colleagues were verbally and sexually hostile to women. As inclusion of women in the workplace became more prominent as a legal and social imperative, employees began to treat each other more respectfully, regardless of their gender. She argued that, in a similar way, the active inclusion of apprentices with disabilities makes managers, mentors, and coworkers more sensitive to the inclusion of all apprentices. One employer interviewed described his company's commitment to providing apprenticeships and employment opportunities for people with autism. The company functions like a nonprofit in the US but is classified in Europe as a "social enterprise" earning profits that are reinvested in the organization rather than retained by owners. The interviewee noted that the apprenticeship program was "profitable," in this sense but that the primary justification for hiring apprentices with autism was to fulfill the company's fundamental mission.

3. What Federal and State Supports Exist for Inclusive Apprenticeship?

This section describes federal and state government supports for inclusive apprenticeship. It begins with a discussion of the new Equal Employment Opportunity regulations for registered apprenticeships and then summarizes recent federal and state activities and investments in inclusive apprenticeship.

Equal Employment Opportunity (EEO) Regulations for Registered Apprenticeship Programs for People with Disabilities

The EEO regulations for apprenticeships were originally published in 1978. The 1978 regulations prohibited discrimination on the basis of race, color, religion, national origin, and sex. The 2016 regulations add further protected bases—disability, age, sexual orientation, and genetic information—and seek to increase access to and success in registered apprenticeship programs for people with disabilities.⁷

Apprenticeship sponsors are prohibited from discriminating on the basis of disability. As part of this requirement, all sponsors must provide reasonable accommodations, upon request, to applicants and apprentices with disabilities to allow them to perform critical job functions—consistent with the Americans with Disabilities Act (ADA) and ADA Amendments Act. Some examples of reasonable accommodations are making sure facilities are physically accessible, providing flexible work schedules, buying new or modifying existing tools and equipment, and providing personnel support as needed.

Registered apprenticeship sponsors with five or more apprentices are required to develop Affirmative Action Programs and must invite all apprentices and applicants for apprenticeship to voluntarily self-identify whether they have a disability, established in Section 503 of the Rehabilitation Act of 1973. When inviting people to self-identify, sponsors must use the “Voluntary Disability Disclosure Form” (see below) and maintain strict confidentiality of the information provided. The information provided cannot be used to make personnel decisions, and sponsors are required to update the forms annually. DOL provides sponsors flexibility on the timeline to implement disability self-identification: either by January 18, 2019, or two years from the date of apprenticeship program registration (whichever is later). Programs registered with a SAA would need to consult with their SAA to determine when the self-identification would go into effect.

One goal for self-identification is to collect data on the number of people with disabilities applying to and in apprenticeship programs. In the final rule,⁸ DOL notes the paucity of data collection on people with disabilities in apprenticeship programs and acknowledges that they are both underemployed and unemployed in the labor market despite advances in modern workplaces that can accommodate a number of jobs that can be successfully performed by people with disabilities. Another goal for data collection is to understand and address barriers people with disabilities face. Removing barriers not only enables more people with disabilities to access apprenticeship programs, but also grow and advance in their chosen career pathways.

Registered apprenticeship program sponsors should also count the number of apprentices with disabilities in their programs and measure that against an “aspirational” national goal of 7 percent⁹—a benchmark goal that is not mandatory to reach. The 7 percent aspirational goal for apprentices with disabilities applies to “every covered sponsor, regardless of the availability data in that sponsor’s particular relevant recruitment area.”¹⁰ This is in contrast with utilization goals for race, sex, and ethnicity, which vary by sponsor depending on data on the availability of those workers in their local labor market.

The final rule further clarifies that “the Department is retaining the 7 percent national utilization goal and declines to allow sponsors to set their own goals based on availability in the relevant recruitment area.”¹¹ As an aspirational goal, sponsors must do their best to reach this 7 percent goal by hiring qualified people with disabilities as they scale their apprenticeship programs. If sponsors do not reach the 7 percent goal, they should review and revise their outreach and recruitment efforts to make them more inclusive. The 7 percent goal mirrors the Office of Federal Contract Compliance Programs (OFCCP) affirmative action obligations established in Section 503 of the Rehabilitation Act of 1973 and accounts for the share of people with disabilities in the workforce. Advocacy organizations posit that if met, this could lead to apprenticeship opportunities opening up for more than 25,000 people with disabilities.¹²

FIGURE 1
Registered Apprenticeship Voluntary Disability Disclosure Form

| | | |
|---|---|---|
| Program Registration and Apprenticeship Agreement Office of Apprenticeship | U.S. Department of Labor Employment and Training Administration |  |
| Voluntary Disability Disclosure OMB No. 1205-0223 Expiration Date: 03/31/2023 | | |
| <p><u>Please check one of the boxes below:</u></p> <p><input type="checkbox"/> YES, I HAVE A DISABILITY (or previously had a disability)</p> <p><input type="checkbox"/> NO, I DON'T HAVE A DISABILITY</p> <p><input type="checkbox"/> I DON'T WISH TO ANSWER</p> <p>Your name: _____</p> <p>Date: _____</p> <p>Why are you being asked to complete this form?</p> <p>Because we are a sponsor of a registered apprenticeship program and participate in the National Registered Apprenticeship System that is regulated by the U.S. Department of Labor, we must reach out to, enroll, and provide equal opportunity in apprenticeship to qualified people with disabilities.^[1] To help us learn how well we are doing, we are asking you to tell us if you have a disability or if you ever had a disability. Completing this form is voluntary, but we hope that you will choose to fill it out. If you are applying for apprenticeship, any answer you give will be kept private and will not be used against you in any way.</p> <p>If you already are an apprentice within our registered apprenticeship program, your answer will not be used against you in any way. Because a person may become disabled at any time, we are required to ask all of our apprentices at the time of enrollment, and then remind them yearly, that they may update their information. You may voluntarily self-identify as having a disability on this form without fear of any punishment because you did not identify as having a disability earlier.</p> <p>How do I know if I have a disability?</p> <p>You are considered to have a disability if you have a physical or mental impairment or medical condition that substantially limits a major life activity, or if you have a history or record of such an impairment or medical condition. Disabilities include, but are not limited to: blindness, deafness, cancer, diabetes, epilepsy, autism, cerebral palsy, HIV/AIDS, schizophrenia, muscular dystrophy, bipolar disorder, major depression, multiple sclerosis (MS), missing limbs or partially missing limbs, post-traumatic stress disorder (PTSD), obsessive compulsive disorder, impairments requiring the use of a wheelchair, and intellectual disability (previously called mental retardation).</p> <p>_____</p> <p>^[1] Part 30 – Equal Employment Opportunity in Apprenticeship. For more information about this form or the equal employment obligations of Federal contractors, visit the U.S. Department of Labor's Office of Apprenticeship website at https://www.doleta.gov/OA/eoo/.</p> | | |

Source: "Voluntary Disability Disclosure Form," DOL, April 15, 2020,

https://www.dol.gov/sites/dolgov/files/ETA/apprenticeship/pdfs/Disability_Disclosure_form-671.pdf.

Notes: Sponsors that develop Affirmative Action Plans for apprenticeship invite apprentices and applicants to voluntarily self-identify whether or not they have a disability, using a standard voluntary disability disclosure form. Applicants for apprenticeship will be asked to complete the form at two stages in the hiring process: during the pre-offer stage and again when they have been offered an apprenticeship position.

Federal Activities to Promote Inclusive Apprenticeship

The federal government has been deeply involved in promoting registered apprenticeship in the United States through a series of grant programs and investments in the state and federal apprenticeship system. Many grantees and partners in these efforts have worked to build inclusive apprenticeships for people with disabilities, even if that has not been the primary focus of federal activities.

For example, the Shenandoah Valley Workforce Development Board (SVWDB) was one of several grantees who used resources from its American Apprenticeship Initiative (AAI) grant, awarded in 2015, to support apprentices with disabilities. SVWDB developed a pre-apprenticeship pipeline for people with disabilities to enter registered apprenticeship programs and funded job coaches to support those apprentices after they were hired (NGA 2020). In 2016, one of four National Equity Partner contracts was awarded to North Carolina A&T State University, which worked to expand apprenticeships for people with disabilities (in addition to women and people of color).¹³

ODEP has led a more focused effort to expand inclusive apprenticeships by supporting a network of apprenticeship intermediary organizations and a community of practice to support sponsors in making apprenticeship programs fully accessible to people with disabilities, including the Apprenticeship Inclusion Model (AIM) pilot, the Partnership for Inclusive Apprenticeship (PIA), and the State Exchange on Employment and Disability (SEED), which supports employment for people with disabilities more broadly, including apprenticeship opportunities.

APPRENTICESHIP INCLUSION MODEL (AIM) PILOT

Before launching the PIA initiative, ODEP funded the Apprenticeship Inclusion Model (AIM) pilot, a two-year effort to research and develop inclusive apprenticeship programs. The AIM pilot was led by Social Policy Research Associates (SPRA), in partnership with two Apprenticeship Intermediary Organizations (Jobs for the Future and Apprenti) and the Wheelhouse Group. SPRA provided technical assistance to four apprenticeship programs through its apprenticeship intermediary organization partners: Amazon, Microsoft, the Healthcare Career Advancement Program (H-CAP), and the Industrial Manufacturing Technician (IMT) Apprenticeship program.

The purpose of the AIM pilot was to research, test, and evaluate innovative practices in inclusive apprenticeship for HGHD industries and occupations. The AIM apprenticeship intermediary organizations were tasked with helping inclusive apprenticeship programs connect apprentices with supportive services and partnerships. Staff reported success in developing technical assistance materials and resource repositories and making these available to their intermediary partners. SPRA

formed strong partnerships with intermediaries, which they believed would continue under the PIA initiative. Two limitations identified by partners in the AIM pilot included the compressed timeline that partners and apprenticeship intermediary organizations had available to develop inclusive apprenticeship programs and the lack of direct funding for apprenticeship intermediary organization activities.

PARTNERSHIP FOR INCLUSIVE APPRENTICESHIP (PIA)

To build on the technical assistance materials, repository of resources, and strong intermediary partnerships of the AIM pilot, ODEP launched the Partnership for Inclusive Apprenticeship (PIA) initiative. The primary objective of PIA is to enhance awareness, policy, and practices for improving the recruitment, participation, supports, and outcomes for people with disabilities in apprenticeship programs. Similar to the AIM pilot, PIA will work through apprenticeship intermediary organizations to effect change in inclusive apprenticeship programs. PIA is also responsible for providing technical assistance and training to apprenticeship intermediary organizations and apprenticeship programs, as well as eliciting input from core stakeholder groups. Major envisioned activities for PIA include:

- providing technical assistance to apprenticeship intermediary organizations and employers;
- developing policy recommendations on inclusive apprenticeship for federal, state, and local government agencies;
- supporting employer associations, the DOL Office of Apprenticeship, and other stakeholder organizations;
- supporting outreach and dissemination of information;
- driving pipeline development for inclusive apprenticeship; and
- fostering a Community of Practice (CoP) that includes subject matter experts, affinity groups, employer associations, apprenticeship intermediary organizations, state workforce agencies, and so on.

The study team will investigate the specific strategies and partnerships of the PIA initiative as a part of the formative evaluation study.

STATE EXCHANGE ON EMPLOYMENT AND DISABILITY (SEED)

SEED is a state-federal collaborative launched by ODEP to support state and local policymakers in creating inclusive policies that support employment success for people with disabilities and building a more inclusive workforce in the US. The program partners with organizations that represent

policymakers at the state and local levels to develop context-driven options and focus on priorities related to employing people with disabilities. Partners include the following:

- Board of Hispanic Caucus Chairs (BHCC)
- Council of State Governments (CSG)
- Council of State Governments West
- National Conference of State Legislatures (NCSL)
- National Governors Association (NGA)
- The United States Conference of Mayors
- Western Governors' Association
- Women in Government

Some ways in which SEED and its partners assist states and localities are by providing subject matter expertise, conducting needs assessments and analyses, and developing policy. SEED produced a framework called “Work Matters” that provides policymakers with action-oriented policy options and best practices to build an inclusive workforce. These policy options range from broad (states’ support of employment training and opportunities) to specific (preparing and accessing work opportunities to advancing at work) for people with disabilities. Although all of the insights and the framework can be applied to inclusive apprenticeship programs, SEED has taken a particular interest in understanding the future of the apprenticeship system and features of inclusive apprenticeship. SEED’s National Task Force on the Future of the Workforce includes an Apprenticeship Subcommittee that makes recommendations specific to apprenticeship. The state exchange model is particularly important for collecting lessons on inclusive apprenticeship, because so many apprenticeship expansion efforts are decentralized and state led.

State Activities to Promote Inclusive Apprenticeship

In June 2020, the federal government gave \$73 million in grants to states and territories to expand registered apprenticeship through the “Building State Capacity to Expand Apprenticeship through Innovation.” These State Capacity grants build on prior rounds of State Apprenticeship Expansion grants to modernize state apprenticeship systems and provide resources to expand apprenticeship into new industries and occupations.

The State Capacity grants are three-year grants totaling \$450,000 in Tier I funding for all states, with baseline goals to expand registered apprenticeship programs and improve data collection and sharing. Some states also received more targeted Tier II funding of up to \$9 million to support activities incorporating specific strategies proposed by the state to support or expand registered apprenticeship opportunities for all workers, including people with disabilities. The additional Tier II funding resources are particularly important for supporting more targeted interventions in state apprenticeship systems to make apprenticeship more inclusive. Certain states have made plans to use State Capacity grants for people with disabilities:

- The Maryland Department of Labor (\$5,562,924 in Tier II funding) is using some of its State Capacity grant funds to incorporate the Disability and Youth Services program in registered apprenticeship outreach, training, and education.
- The Michigan Department of Labor and Economic Opportunity Employment and Training (\$8,997,886.00 in Tier II funding) is using some of its State Capacity grant funds to increase youth apprenticeship, with a goal of at least 10 percent of its new youth apprentices for young people with disabilities. This goal exceeds the 7 percent goal for apprentices with disability laid out by the federal government.
- The Ohio Department of Job and Family Services (\$8,957,129 in Tier II funding) will use some of its State Capacity grant funds to work with Opportunities for Ohioans with Disabilities, the Comprehensive Case Management Employment Program (CCMEP), and the Ohio Workforce Association to develop a pre-apprenticeship model to help young people with disabilities access registered apprenticeship programs.
- The State of Wisconsin, Department of Workforce Development, Bureau of Apprenticeship Standards (\$8,550,000.00 in Tier II funding) is using some of its State Capacity grant funds to direct outreach and marketing campaigns at employers, students, parents, and young people out of school to increase apprenticeship awareness. Marketing efforts will be directed at underrepresented populations, including people with disabilities. Campaigns will highlight apprenticeship pathways, including certified pre-apprenticeship, along with registered apprenticeship. Additional efforts will be directed at increasing employer awareness of and openness to hiring people with disabilities into registered apprenticeships.

Simultaneously as states are receiving federal grant funds to expand apprenticeship, state legislatures and apprenticeship agencies are implementing their own approaches to making registered apprenticeship more inclusive and accessible to people with disabilities. Elise Gurney (2020), at the

Council of State Governments, provides a useful framework based on the stage of the apprenticeship process, to understand state approaches to inclusive apprenticeship. Some states integrate requirements for inclusive apprenticeship in grant opportunity structures whereas other states provide funding and resources that lead to the success of apprentices in pre-apprenticeship or apprenticeship programs. State approaches to expanding inclusive apprenticeship documented by the Council of State Governments can be classified under the categories of developing apprenticeships, preparing apprentices, hiring apprentices, and supporting apprentices.

DEVELOPING APPRENTICESHIPS

This approach considers states where stakeholders from the disability community and local agencies are incorporated in the apprenticeship planning and design process from the beginning. Building the disability community into the planning process empowers stakeholders to shape apprenticeship programs:

- California A. B. 1019 creates a subcommittee on apprenticeships that are inclusive of people with disabilities and adds the director of rehabilitation and the executive director of the State Council on Developmental Disabilities to California's Interagency Advisory Committee on Apprenticeships.¹⁴
- The Wisconsin Bureau of Apprenticeship Standards partners with the Division of Vocational Rehabilitation and in its apprenticeship grant applications.

PREPARING APPRENTICES

These approaches help people with disabilities become aware of apprenticeship programs and use pre-apprenticeship programs to improve skills and overcome barriers to entry into apprenticeship programs:

- The Texas Workforce Commission piloted a new Explore Apprenticeships program in summer 2019 for high school students with disabilities. The program's goal was to build awareness about career pathways in apprenticeship through individualized and experiential learning. The program took place at two community college districts: San Jacinto College (SJC) and Dallas County Community College District (DCCCD). A cohort of 16 students participated in the program.
- Pennsylvania's Office of Vocation Rehabilitation developed a pre-apprenticeship program in warehousing. Ralph Roach of the Office of Vocational Rehabilitation reports of the program that "soft skills and the warehousing curriculum use a variety of accommodations including

verbal relay of information and test taking, visual representation of workstation tasks, accessible ramps to the facility,” as well as coordination with local public transportation to ensure that the pre-apprentices’ shifts aligned with public transportation schedules.¹⁵

- Several bills have been introduced in the New Jersey Senate to support inclusive apprenticeship in the state. S. B. 688 has been introduced but not voted on, and it proposes pre-apprenticeships that are inclusive of people with disabilities by building in counseling, life skills training, math and literacy training, and tutoring.¹⁶

HIRING APPRENTICES

These states use several different strategies to not only connect people with disabilities to apprenticeship programs and help them navigate the hiring process, but also incentivize employers to hire people with disabilities:

- Ohio’s Opportunities for Ohioans with Disabilities (OOD) Vocational Apprentice Program¹⁷ will develop apprenticeship programs for people with disabilities in collaboration with multiple state agencies. The apprenticeship program provides support for people with disabilities over the course of the application, interviewing, and onboarding processes.
- New Jersey S. B. 1159 provides additional tax credit incentives to businesses that hire apprentices with disabilities. The bill is currently pending in the New Jersey Senate Budget and Appropriations Committee.¹⁸

SUPPORTING APPRENTICES

These approaches range from providing resources for protecting apprentices with disabilities to helping apprentices succeed in their apprenticeships:

- Michigan H. B. 4579 establishes a peer-mentoring program for apprentices with disabilities. The bill is currently pending in the Michigan House Commerce and Tourism Committee.¹⁹
- Virginia H. B. 1252 amended and added to § 40.1-121 of the Code of Virginia to prohibit sponsors of registered apprenticeship programs from discriminating against apprentices or apprentice applicants based on disability (among other demographic characteristics).²⁰
- New Jersey’s S. B. 3067 passed as P.L. 2019, Chapter 419, and establishes a five-year Apprentice Assistance and Support Services Pilot program to address two significant barriers to people participating in apprenticeships by subsidizing affordable and reliable transportation and childcare services.²¹

4. What Data Exist on Inclusive Apprenticeship and Apprentices with Disabilities?

Information about the experiences of registered apprentices with disabilities is limited by the types of data available. Apprentices' disability status has only been included as a field in the RAPIDS database since 2017, and RAPIDS does not record any detail on the type of disability an apprentice has. More importantly, disability status is an optional field in RAPIDS and apprentices may or may not choose to self-identify, so apprentices identified as having a disability in the data represent a lower bound. Before 2017, RAPIDS data covered only 35 states. That number has gradually increased since 2017 to 39 in 2020, but the data still only provide a partial snapshot of registered apprenticeship in the United States.²² Further, RAPIDS only covers the registered apprenticeship system, so these data do not include unregistered or industry-recognized apprenticeship program participants.

Table 1 provides information on the number of apprentices identified as having a disability reported to the RAPIDS database between 2017 and 2019. In that time frame (the only full years of data currently available), few registered apprentices identified as having a disability (table 1), although this number grew rapidly from 330 apprentices active in 2017 to 1,900 active in 2019. A similarly small number of apprentices affirmatively reported they have no disability. However, in each year, a large majority of registered apprenticeship programs reported no information at all on their apprentices' disability status. It is plausible that even more sponsors of registered apprenticeship programs reported the disability status of their apprentices in 2020, as sponsors and state agencies have become better acquainted with the requirements of 29 CFR § 30, rules governing equal employment opportunity in apprenticeship.²³ However, because RAPIDS data have not been released for the fourth quarter of 2020, apprentices in 2020 cannot be compared with prior years. Future reports will update the data in this report to reflect apprenticeship registration in 2020 and subsequent years.²⁴

TABLE 1

Apprentices with Disabilities in Registered Apprenticeship Programs, 2017–19

Restricted to states that report data to the Registered Apprenticeship Partners Information Data System

| Year | Active apprentices with an identified disability | Active apprentices who affirmatively report that they have no disability | Active apprentices where disability information is not provided | Total active apprentices |
|------|--|--|---|--------------------------|
| 2017 | 330 | 381 | 401,221 | 401,932 |
| 2018 | 947 | 452 | 442,734 | 444,133 |
| 2019 | 1,900 | 580 | 479,551 | 482,031 |

Source: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Notes: Restricted to states that report to the RAPIDS database.

Information on apprentices' disabilities can be entered into RAPIDS in one of two ways:

1. Program sponsors entering information on their apprentices into RAPIDS can report disability status when they first register their apprentice. Reporting disability status to RAPIDS is voluntary for the sponsor, and the apprentice must choose to self-identify to the sponsor for the sponsor to report it. Apprenticeship programs with five or more apprentices who must develop an affirmative action plan are required to provide apprentices with a voluntary disability disclosure form (figure 1) during the pre-offer stage and again when they have been offered an apprenticeship position. Smaller apprenticeship programs may collect this information through other means.
2. Apprenticeship programs, who must develop an affirmative action plan because they have five or more apprentices, are required to provide all of their apprentices with an annual opportunity to self-identify as having a disability. Sponsors are encouraged, but not required, to use this information to update RAPIDS. A representative of a state agency interviewed for this report indicated that state apprenticeship agencies may receive these disclosure forms and can update information in RAPIDS themselves, although they reported it is unlikely that all states will take this step.

The large number of registered apprentices without disability status information reported (e.g., with no self-identification as having or not having a disability) might suggest that the information in voluntary disability disclosure forms is generally not used to update the RAPIDS database. A state agency representative interviewed said an obstacle to reporting disability status is that the field for program sponsors to fill out is voluntary. He indicated that he is aware of more apprentices who self-identify as having a disability than are reflected in the RAPIDS data, but they are not included in reports either because they do not self-identify to the employer or the employer does not report the information. This suggests that the numbers in RAPIDS are an underreporting of the true incidences nationally.

Table 2 provides a sense of the prevalence of people with disabilities in apprenticeships compared with their prevalence in the overall workforce. Few workers in the United States are registered apprentices, regardless of whether or not they identify as having a disability. This is because apprenticeship training is usually only provided when workers enter an occupation and because the apprenticeship system in the United States is relatively underdeveloped compared with apprenticeship in Australia, Canada, and Europe. Only 0.133 percent of workers without a disability in states that report to RAPIDS are registered apprentices in those states (table 2). Although this prevalence rate was

low, only 0.008 percent of workers with disabilities in states that report to RAPIDS are registered as apprentices in those states, a negligible share of the total workforce, and they are 16.6 times less likely to be registered than workers without a disability. If apprentices with disabilities are underreported in RAPIDS, as is suspected, then this share is likely higher but the magnitude is uncertain. Table 2 also only reports the prevalence of *registered* apprenticeship among workers with disabilities in the United States. No information is available on *unregistered* apprenticeship for people with disabilities.

TABLE 2

Prevalence of Registered Apprenticeship among People Identified as Having a Disability, 2019

Restricted to states that report data to the Registered Apprenticeship Partners Information Data System

| | Identified as having a disability | Not identified as having a disability |
|---------------------------------|-----------------------------------|---------------------------------------|
| Apprentices | 1,727 | 440,358 |
| All workers | 20,854,738 | 330,843,219 |
| Apprentice share of all workers | 0.008% | 0.133% |

Sources: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS) and the 2019 American Community Survey (ACS).

Note: Restricted to states that report to the RAPIDS database.

Characteristics of Registered Apprentices Identified as Having a Disability

Apprentices with identified disabilities are different in many respects from apprentices with no identified disabilities (i.e., apprentices who affirmatively report no disabilities or who do not report their disability status at all). Table 3 provides information on the demographics and program characteristics of apprentices identified as having a disability and those not identified as having a disability. Only statistically significant differences are described here, and they are also noted in table 3.

A small minority of active apprentices identified as having a disability are women (12.3 percent), although this is higher than the share of apprentices with no identified disability who are women (9.3 percent). Apprentices with an identified disability are more likely to be white (63 percent compared with 55.7 percent) than those without an identified disability, but less likely to be Hispanic (15.3 percent compared with 20.9 percent). Apprentices with an identified disability are approximately two years older than apprentices with no identified disability, on average. One of the starkest differences between the two groups is that apprentices with an identified disability are much more likely to be veterans than those without a disability (36 percent compared with 9.9 percent). The share of apprentices with an identified disability who are veterans is even higher than the share of employed people with disabilities nationally who are veterans (11.1 percent).²⁵

TABLE 3

Characteristics of Registered Apprentices with and without Identified Disabilities, 2019*Restricted to states that report data to the Registered Apprenticeship Partners Information Data System*

| | Active apprentices identified as having a disability | Active apprentices with no identified disability |
|---------------------------------------|--|---|
| Women | 12.3%*** | 9.3%*** |
| Race or ethnicity | | |
| White | 63.0%*** | 55.7%*** |
| Hispanic | 15.3%*** | 20.9%*** |
| Black or African American | 12.7% | 11.7% |
| Multiple race or ethnicity | 2.0%*** | 0.6%*** |
| Asian | 1.7% | 1.8% |
| American Indian or Alaska Native | 1.4% | 1.0% |
| Native Hawaiian or Pacific Islander | 0.6%** | 1.3%** |
| Do not wish to answer | 3.3%*** | 7.0%*** |
| Average age at registration | 31.9*** | 29.7*** |
| Veteran | 36.0%*** | 9.9%*** |
| Average starting wage | \$17.00*** | \$16.59*** |
| Receiving credit for prior OJT | 22.9% | 22.2% |
| Average apprenticeship length (hours) | 5,894*** | 6,307*** |
| Program type | | |
| Time-based | 77.3%*** | 84.7%*** |
| Competency-based | 8.9%*** | 3.9%*** |
| Hybrid | 13.8%*** | 11.4%*** |

Source: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Notes: Restricted to states that report to the RAPIDS database. *** means apprentices with identified disabilities are different from apprentices with no identified disabilities at the 1 percent level, ** means at the 5 percent level, and * means at the 10 percent level. OJT means on-the-job training.

Apprentices with an identified disability have starting wages \$0.41 higher than their counterparts with no identified disabilities (\$17 an hour compared with \$16.59 an hour), which may reflect the fact that they are older and potentially have more work experience. Although people with disabilities nationally have lower employment rates than people with no disabilities, this is not necessarily true of people with disabilities hired as apprentices (a third of whom have prior work experience as military veterans). Apprentices are about as likely to receive on-the-job training (OJT) credit for prior work (no statistically significant difference), which may indicate comparable levels of work experience.

People with disabilities are registered in shorter apprenticeship programs, on average, than apprentices with no identified disabilities. On average, apprentices with disabilities are registered in programs developed to have a length of less than three years on average (5,894 hours) compared with programs developed to have a length of more than three years on average for those with no identified disabilities (6,307 hours). Apprentices with identified disabilities are more likely to be in competency-based or hybrid programs than apprentices without identified disabilities. Competency-based programs

allow more flexible program completion timelines by marking apprentices' progress through the program based on their mastery of key competencies. This flexibility may provide more support and accommodation for apprentices with identified disabilities.

Registered apprenticeship programs are occupationally specific, and the occupation that an apprentice trains in shapes the skills they master and can have a large influence on the apprentices' future income and employment prospects. Table 4 provides 2019 data on the occupations that apprentices with identified disabilities and no identified disabilities are employed in. In general, registered apprentices with identified disabilities are employed in similar occupations as those with no identified disabilities (table 4).

The majority of all apprentices are employed in construction occupations, although apprentices with no identified disabilities are about 10 percentage points more likely to be employed in these fields. Apprentices with an identified disability are much more likely than other apprentices to be employed in computer and mathematical occupations (8.7 percent compared with 0.6 percent). Many recent federal investments to expand investment in registered apprenticeship have focused on information technology apprenticeships, which opens many new potential opportunities for apprentices with disabilities attracted to these fields.

Background interviews conducted with employers of apprentices with disabilities in information technology fields suggested that apprentices with autism in particular had strong interests and abilities in computer-related occupations. Workplace accommodations for these apprentices were readily available and well understood, and in many cases accommodations and supportive services were focused on integrating autistic apprentices in teams on the job site rather than on the occupational skills training itself. However, there is also a risk that the success of some apprentices with autism in technology-intensive fields may feed into assumptions about the preferences of people with autism or may lead employers to be more open to people with autism but less inclusive of other potential apprentices. These types of risks reinforce the importance of providing continued education and technical assistance to employers of apprentices to ensure that their programs and practices support inclusion in apprenticeship rather than working against it.

TABLE 4

Occupations of Registered Apprentices with and without Identified Disabilities, 2019*Restricted to states that report data to the Registered Apprenticeship Partners Information Data System*

| Occupation | Active apprentices identified as having a disability | Active apprentices with no identified disability |
|--|---|---|
| Management | 1.2% | 0.8% |
| Business and financial operations | 0.4% | 0.3% |
| Computer and mathematical | 8.7% | 0.6% |
| Architecture and engineering | 0.9% | 1.0% |
| Life, physical, and social science | 0.0% | 0.1% |
| Community and social service | 0.4% | 0.1% |
| Legal | 0.0% | 0.0% |
| Educational instruction and library | 0.1% | 0.1% |
| Arts, design, entertainment, sports, and media | 0.9% | 0.3% |
| Health care practitioners and technical | 0.5% | 1.2% |
| Health care support | 2.3% | 1.7% |
| Protective service | 1.3% | 2.7% |
| Food preparation and serving related | 0.9% | 1.2% |
| Building and grounds cleaning and maintenance | 1.9% | 1.0% |
| Personal care and service | 1.5% | 1.1% |
| Sales and related | 0.1% | 0.2% |
| Office and administrative support | 0.9% | 0.4% |
| Farming, fishing, and forestry | 0.2% | 0.0% |
| Construction and extraction | 55.7% | 64.9% |
| Installation, maintenance, and repair | 9.1% | 12.2% |
| Production | 7.2% | 4.8% |
| Transportation and material moving | 5.9% | 5.3% |
| Military specific | 0.0% | 0.0% |

Source: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Notes: Restricted to states that report to the RAPIDS database.

Data on apprentices with identified disabilities are only recently available, so little is known about outcomes for these apprentices. The typical apprentice with an identified disability is enrolled in a program that lasts for almost three years, so if they registered in 2017, they may not have had a chance to complete their program by 2020. A preliminary assessment of the performance of apprentices with identified disabilities is available by focusing on people who registered in 2017 in programs that only last for a year or two. All of these apprentices should have had an opportunity to complete their training by 2020, although some may still be registered.

Completion rates for apprentices registered in these shorter-term programs are provided in table 5, although they should be understood as preliminary because some apprentices have not completed their programs. Subsequent reports produced as a part of this research effort will update these analyses with newer data on more apprentices with identified disabilities. Apprentices with identified disabilities consistently complete their programs at higher rates than those with no identified disabilities and cancel at lower rates. Although these results are preliminary and only represent the experiences of a

small number of apprentices with identified disabilities (namely, those who are registered in shorter programs in 2017), they suggest that people with disabilities who enter apprenticeship programs are at least as successful as other apprentices, even under the current system. Inclusive apprenticeship programs designed more deliberately to support the success of people with disabilities have a strong, albeit small, foundation to build on.

TABLE 5

Current Status of Registered Apprentices with and without Identified Disabilities, 2017

Restricted to states that report data to the Registered Apprenticeship Partners Information Data System

| | Active apprentices with an identified disability | Active apprentices with no identified disability |
|---|---|---|
| Current status for apprentices in programs less than or equal to 2,000 hours | | |
| Still registered | 23.1% | 27.0% |
| Completed | 48.7% | 37.5% |
| Canceled | 25.6% | 35.1% |
| Registration suspended | 2.6% | 0.4% |
| Current status for apprentices in programs less than or equal to 4,000 hours | | |
| Still registered | 21.0% | 25.1% |
| Completed | 34.3% | 27.3% |
| Canceled | 26.7% | 46.8% |
| Registration suspended | 18.1% | 0.7% |

Source: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Note: Restricted to states that report to the RAPIDS database. Current status is reported as of the beginning of 2020.

State Variation in Registration of Apprentices Identified as Having a Disability

Table 6 provides the number and share of apprentices in each state that are identified as having a disability. The share of registered apprentices with disabilities varies widely across states, ranging from 0.03 percent of all apprentices in Arkansas in 2019 to 1.36 percent of all apprentices in Nebraska in 2019 (table 6). Across all states reporting to RAPIDS, only 0.39 percent of apprentices report having a disability, compared with 13.2 percent of all people ages 16 or older and 5.9 percent of all employed people who report having a disability in the states reporting to RAPIDS.²⁶ Only three states who report to the RAPIDS database (Nebraska, Louisiana, and Arizona) report that more than 1 percent of their apprentices have a disability.

One advocate for people with disabilities interviewed for this report indicated that many states are making progress in developing an inclusive apprenticeship infrastructure and partnerships between agencies, but that “it doesn’t happen overnight” so it has not yielded large numbers of apprentices with disabilities to date. Now that the infrastructure is in place, she expects improved numbers in the future.

TABLE 6

Apprentices with Disabilities in Registered Apprenticeship Programs, 2019*Restricted to states that report data to the Registered Apprenticeship Partners Information Data System*

| State | Apprentices without a disability | Apprentices with disabilities | Total apprentices | Share of apprentices with a disability | Share of all workers with a disability (ACS) |
|-------|----------------------------------|-------------------------------|-------------------|--|--|
| AL | 5,921 | 23 | 5,944 | 0.39% | 7.04% |
| AK | 2,650 | 6 | 2,656 | 0.23% | 7.14% |
| AZ | 6,485 | 71 | 6,556 | 1.09% | 6.23% |
| AR | 7,522 | 2 | 7,524 | 0.03% | 8.02% |
| CA | 85,321 | 198 | 85,519 | 0.23% | 4.56% |
| CO | 8,928 | 85 | 9,013 | 0.95% | 5.70% |
| FL | 17,719 | 86 | 17,805 | 0.49% | 5.53% |
| GA | 10,948 | 25 | 10,973 | 0.23% | 5.66% |
| HI | 8,974 | 23 | 8,997 | 0.26% | 4.75% |
| ID | 2,973 | 18 | 2,991 | 0.61% | 7.71% |
| IL | 20,646 | 94 | 20,740 | 0.46% | 5.07% |
| IN | 23,902 | 104 | 24,006 | 0.44% | 6.57% |
| IA | 11,082 | 46 | 11,128 | 0.42% | 5.94% |
| KY | 5,350 | 12 | 5,362 | 0.22% | 8.04% |
| LA | 4,643 | 59 | 4,702 | 1.27% | 7.39% |
| MD | 10,403 | 10 | 10,413 | 0.10% | 5.57% |
| MI | 25,904 | 88 | 25,992 | 0.34% | 6.43% |
| MS | 3,816 | 5 | 3,821 | 0.13% | 7.38% |
| MO | 22,416 | 160 | 22,576 | 0.71% | 6.91% |
| NE | 8,590 | 117 | 8,707 | 1.36% | 6.90% |
| NV | 7,498 | 46 | 7,544 | 0.61% | 6.19% |
| NH | 3,954 | 12 | 3,966 | 0.30% | 6.30% |
| NJ | 9,663 | 46 | 9,709 | 0.48% | 4.45% |
| NM | 1,458 | 10 | 1,468 | 0.69% | 7.58% |
| ND | 1,368 | 3 | 1,371 | 0.22% | 6.52% |
| OH | 26,903 | 65 | 26,968 | 0.24% | 6.65% |
| OK | 2,207 | 9 | 2,216 | 0.41% | 8.62% |
| PA | 22,095 | 51 | 22,146 | 0.23% | 6.52% |
| SC | 27,372 | 46 | 27,418 | 0.17% | 6.41% |
| SD | 921 | 5 | 926 | 0.54% | 7.02% |
| TN | 7,307 | 27 | 7,334 | 0.37% | 7.06% |
| TX | 24,853 | 137 | 24,990 | 0.55% | 5.89% |
| UT | 5,160 | 21 | 5,181 | 0.41% | 5.68% |
| WV | 5,406 | 17 | 5,423 | 0.31% | 8.40% |
| Total | 440,359 | 1,727 | 442,085 | 0.39% | 5.92% |

Sources: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS) and the 2019 American Community Survey (ACS).

Notes: Restricted to states that report to the RAPIDS database. Figures exclude nationally registered programs.

More than half of all registered apprentices are in construction occupations, and construction apprenticeship programs are among the largest and oldest programs in the country. Construction apprenticeship programs also have a history of implementing affirmative action programs going back

decades (Baran 2018).²⁷ Table 7 presents the number and share of apprentices with a disability in construction programs by state. Restricting the analysis exclusively to apprentices in construction occupations,²⁸ a somewhat lower share of apprentices report having a disability (0.34 percent), ranging from no construction apprentices with an identified disability in New Mexico to 1.3 percent in Nebraska (table 7).

TABLE 7

Apprentices with Disabilities in Registered Construction Apprenticeship Programs, 2019

Restricted to states that report data to the Registered Apprenticeship Partners Information Data System

| State | Construction apprentices without a disability | Construction apprentices with disabilities | Total construction apprentices | Share of construction apprentices with a disability |
|-------|---|--|--------------------------------|---|
| AL | 4,984 | 11 | 4,995 | 0.22% |
| AK | 1,919 | 3 | 1,922 | 0.16% |
| AZ | 5,155 | 59 | 5,214 | 1.13% |
| AR | 6,466 | 2 | 6,468 | 0.03% |
| CA | 74,017 | 87 | 74,104 | 0.12% |
| CO | 6,823 | 65 | 6,888 | 0.94% |
| FL | 12,538 | 61 | 12,599 | 0.48% |
| GA | 7,283 | 19 | 7,302 | 0.26% |
| HI | 7,250 | 12 | 7,262 | 0.17% |
| ID | 1,009 | 10 | 1,019 | 0.98% |
| IL | 17,821 | 82 | 17,903 | 0.46% |
| IN | 14,111 | 96 | 14,207 | 0.68% |
| IA | 6,231 | 22 | 6,253 | 0.35% |
| KY | 2,830 | 7 | 2,837 | 0.25% |
| LA | 3,183 | 15 | 3,198 | 0.47% |
| MD | 5,081 | 5 | 5,086 | 0.10% |
| MI | 16,443 | 27 | 16,470 | 0.16% |
| MS | 1,682 | 5 | 1,687 | 0.30% |
| MO | 13,511 | 84 | 13,595 | 0.62% |
| NE | 1,595 | 21 | 1,616 | 1.30% |
| NV | 5,618 | 21 | 5,639 | 0.37% |
| NH | 2,129 | 4 | 2,133 | 0.19% |
| NJ | 7,517 | 40 | 7,557 | 0.53% |
| NM | 648 | 0 | 648 | 0.00% |
| ND | 1,068 | 3 | 1,071 | 0.28% |
| OH | 17,658 | 47 | 17,705 | 0.27% |
| OK | 1,505 | 6 | 1,511 | 0.40% |
| PA | 15,371 | 39 | 15,410 | 0.25% |
| SC | 1,419 | 8 | 1,427 | 0.56% |
| SD | 684 | 1 | 685 | 0.15% |
| TN | 5,453 | 25 | 5,478 | 0.46% |
| TX | 18,349 | 97 | 18,446 | 0.53% |
| UT | 3,180 | 11 | 3,191 | 0.34% |
| WV | 3,771 | 12 | 3,783 | 0.32% |
| Total | 294,302 | 1,007 | 295,309 | 0.34% |

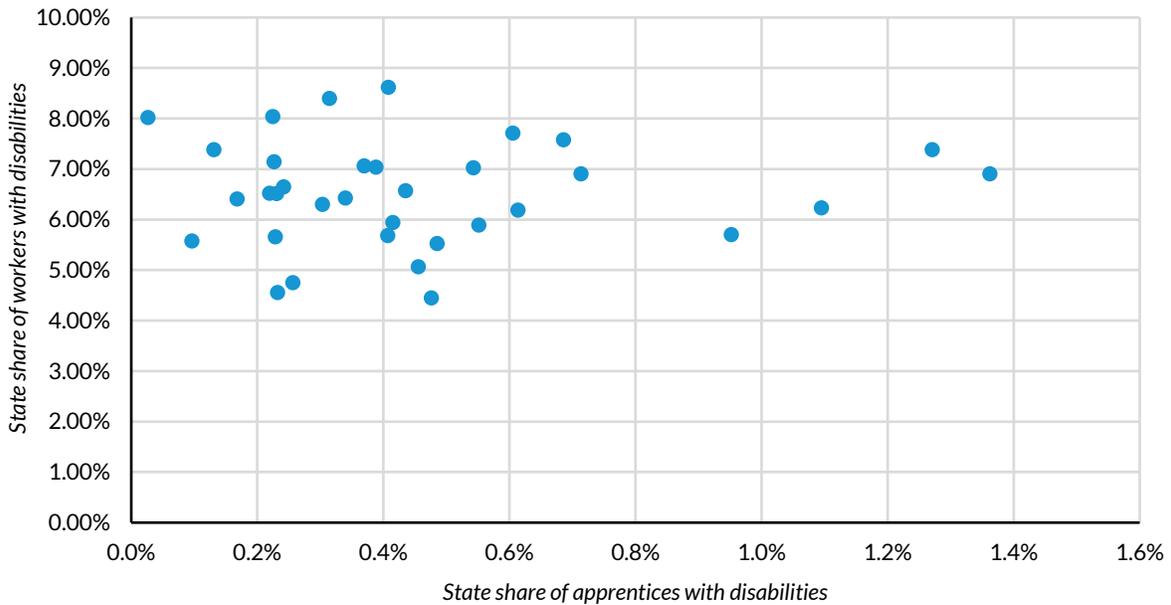
Source: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Notes: Restricted to states that report to the RAPIDS database. Figures exclude nationally registered programs.

One possible explanation for the variation in a state's share of apprentices identified as having a disability could be the share of workers in the state with a disability. States with a higher share of workers with a disability might be expected to have a higher share of apprentices with a disability. If the most important determinant of the share of apprentices in a state identifying as having a disability was the underlying share of workers in the state with a disability, then we would expect a strong empirical correlation between those two values.

To assess this hypothesis, figure 2 presents data on the share of apprentices identified as having a disability and the share of workers in a state with a disability. In fact, a state's share of apprentices reporting a disability is uncorrelated with the state's share of all workers reporting a disability in the American Community Survey (figure 2). This lack of correlation indicates that apprentice hiring and retention and data-reporting practices in state apprenticeship systems are primarily responsible for variation in the share of apprentices reporting a disability, rather than the underlying prevalence of disability in a state's workforce, or the employment rate of people with a disability in the state.

FIGURE 2
State Shares of Apprentices with Disabilities and Workers with Disabilities, 2019



Sources: Authors' calculations from the Registered Apprenticeship Partners Information Data System (RAPIDS) and the American Community Survey (ACS).

Note: Restricted to states that report to the RAPIDS database.

The share of apprentices who identify as having a disability is low relative to the share of workers who identify as having a disability. This may reflect both a lack of inclusivity and access in

apprenticeship programs currently, as well as a failure to properly report current apprentices who self-identify as having a disability. To the extent that people with disabilities are underrepresented in apprenticeship because programs are not inclusive, apprenticeship intermediary organizations and other partners will need to provide technical assistance on developing and sustaining an inclusive apprenticeship program. However, if existing inclusive apprenticeship programs are failing to report apprentices who self-identify as having a disability, those programs could also benefit from technical assistance on apprenticeship reporting practices.

5. How to Expand Inclusive Apprenticeship

The literature and data discussed in this report offer evidence and testimony about what constitutes an inclusive apprenticeship, which strategies and practices appear to be effective at achieving inclusivity, and implications for governments, training providers, and employers for making apprenticeship more inclusive for people with disabilities. The implications of the literature, interview data, and quantitative data discussed in this report are as follows.

1. Several sources in the literature (Wilson et al. 2016; Mitchell et al. n.d.) and interviewed experts advocate for **unregistered apprenticeships and other types of work-based learning programs to go through the process of registering their programs with DOL or the relevant State Apprenticeship Agency**. Reasons for this include the following:
 - » Making programs more attractive to employers and easing the path to replicability in different locations.
 - » Registration may provide the opportunity for state workforce or apprenticeship agencies to collaborate closely with vocational rehabilitation (VR) agencies; in their evaluation of the PAY Check program, researchers document that the ongoing involvement of VR counselors, in concert with other partners, was a significant success factor for the program (Wilson et al. 2016).
2. Apprenticeships for people with disabilities may be bolstered by **increasing the knowledge of and familiarity with Registered Apprenticeship among VR agency staff** (Gonzalez 2018).
 - » An implementation guide advises VR agencies to examine the need for apprenticeship programs by assessing client demand, determining their capacity to develop a pipeline of viable candidates, and maintaining strong partnerships with apprentice agencies to establish and improve apprenticeship programs (Mitchell et al. n.d.).

- » An impact evaluation of a nine-month internship for young people with disabilities found that a seamless transition to adult services, and especially early and consistent contact with VR counselors, was a key element leading to significant and desirable employment outcomes for the treatment group (Wehman et al. 2020).
 - » Finally, an AIM practice brief describes how employment service providers in the Ticket to Work network can develop pre-apprenticeship programs that align with registered apprenticeships, thereby creating a pool of qualified candidates for those programs (Mack et al. forthcoming).
3. **Stronger business engagement** in inclusive apprenticeship can be supported by understanding and the benefits and costs experienced by employers and better alignment with employer needs.
- » An apprenticeship implementation guide aimed at VR agencies recommends that staff reflect on how their agency can meet employer demand and be responsive to hiring needs for growing occupations and industry sectors (Mitchell et al. n.d.). One way to continually improve the recruitment of employers to adopt inclusive apprenticeships is to gather testimonials from supervisors who have positive experiences with apprentices that can be used in marketing and outreach materials (Burgstahler and Bellman 2005).
 - » One paper recommends that school systems leverage the local public workforce system for tapping into existing mechanisms to connect with employers and link students to work-based learning opportunities (Luecking and Gramlich 2003). The Workforce Innovation and Opportunity Act (WIOA)²⁹ generally strengthened the ability of VR agencies and the public workforce system to help young people with disabilities. WIOA requires that 15 percent of VR agencies' federal funds be used on preemployment transition services for high school and postsecondary education students, and it allows VR agencies to serve students who are potentially eligible for services (Honeycutt and Livermore 2018).
 - » Program evaluators found that a key element associated with better outcomes for students with disabilities was a focus on meeting business needs (Wehman et al. 2020). Employers opted to participate in the program only if they had a demonstrable need to hire, and students with disabilities were expected to complete job tasks at the same standard as other employees. These high expectations were correlated with a higher quality of job skills learned.
4. Several international reports laid out **recommendations for how to cultivate and structure partnerships for successful inclusive apprenticeships.**

- » The Little report (2012) suggests that the UK apprenticeship system collaborate with disability-serving community organizations to consider how innovative new models of apprenticeships might be developed and funded.
 - » In Australia, researchers found there needs to be a clear and shared understanding of expectations and responsibilities among partners, which can be achieved through well-crafted agreements that describe mutual responsibilities (Lewis et al. 2011). In addition, the authors note that it is necessary for staff across partner organizations to have a shared commitment to the programs and candidates they seek to support, a recognition and appreciation of the expertise of all partners, a commitment to work collaboratively, and a willingness to resolve issues that arise.
 - » The authors further documented that the most effective partnerships jointly developed outreach materials, cross-linked their websites, and held joint meetings with prospective employers during which they explained the benefits and fitness of their candidate and outlined the roles of each organization in supporting the candidate and employer (Lewis et al. 2011). This fortified the partnership and conveyed to the employer that they were not only receiving a carefully matched and motivated apprentice, but also the support and expertise of coordinated and complementary organizations. To reach this level of synergy and synchronization, community organizations serving people with disabilities must acquaint themselves with concepts and challenges of work-based learning and apprenticeship, study good practice, and understand business needs (ILO 2018). This will enable them to support the practical implementation of inclusive apprenticeships from program design through completion.
5. The literature scan also revealed there is a **lingering perception among people with disabilities that a career path that goes through a college degree program is the only pathway to a well-paying job** (Gonzalez 2018). If the country aims to expand the number of people with disabilities in apprenticeships, the perception that a college degree is the only path to a stable, well-paid career must be altered. That will entail direct engagement with young people, their families, school personnel, and community organizations.
6. **People with disabilities need to be empowered**, better informed about potential employment accommodations, and better equipped to discuss their disabilities directly with supervisors (Burgstahler and Bellman 2005).
- » Young people could receive assistance with developing disclosure strategies and the opportunity to practice articulating them. The National Collaborative on Workforce and

Disability for Youth (2016) provides a disclosure guide for young people with disabilities that could be adapted to apprenticeship programs' needs.

- » Based on their observations of youth apprenticeship programs in Wisconsin, Mooney and Scholl (2002) recommend that supports and accommodations be planned in advance of an apprentice's entry into the program and then monitored closely and adjusted, as necessary, throughout the program.
7. A British study advises the UK to **improve self-declaration methods** so that all disabilities and learning difficulties can be captured, as well as review and enhance the self-declaration process so that information regarding learning difficulties or disabilities is reliably disclosed and reported (Little 2012).
- » These points lead to a further recommendation to closely monitor the number of apprentices declaring a disability and react to trends accordingly. A journal article centering on the UK apprenticeship system advocates for improving data collection and conducting analyses to identify both the actual and desired levels of representation of apprentices with different disabilities (Waters 2017).
 - » A similar suggestion was made in a Welsh Disability Action Plan for Apprenticeships—namely, that the government assess its processes to encourage apprentices to disclose a disability and to create a supportive, safe environment for apprentices who do make this declaration.³⁰
8. The literature on the **benefits and costs of apprenticeship indicate that net benefits (benefits minus costs) are high for both apprentices and employers**. The costs of apprenticeship, including apprentices' wages and training, are higher than many training programs, but the payoff to employers is comparatively higher.
- » No studies of the benefits and costs of inclusive apprenticeship have been conducted, but interviewees emphasized that the costs of accommodations and UDL may be overestimated by employers and that it is important to ascertain the cost of a necessary accommodation rather than assume it when developing an inclusive apprenticeship program.
 - » When the cost of accommodations and UDL are higher, public agency partners and disability advocacy organizations can often support employer efforts. Future investigation of the benefits and costs of apprenticeship for employers could explore the “cost threshold” that might require an employer to rely on partners to support their inclusive apprenticeship programs. A better understanding of the types of program components that

partners can effectively assist with could raise the likelihood that an employer will develop an inclusive apprenticeship program.

Developing an inclusive apprenticeship and skills development system entails a lengthy process, as it involves reform through policies, budgets, infrastructure, attitudes, and training delivery itself. The practices and lessons described in this report provide strategies for influencing apprenticeship and workforce development systems in a way that is far more inclusive of people with disabilities.

Inclusive Apprenticeship Resource List

The literature review and interviews with experts conducted for this report produced a series of resources valuable to inclusive apprenticeship programs, provided below. This resource list will be updated and expanded over the course of the formative evaluation:

- **The Workforce Innovation Technical Assistance Center (WINTAC)**, <http://www.wintac.org/>, provides technical assistance to state vocational rehabilitation agencies to effectively implement WIOA requirements. WINTAC provides trainings, reports, and updates from a Community of Practice.
- The **Apprenticeship Inclusion Model (AIM) pilot program**, <https://www.spra.com/aim/>, was a pilot effort by ODEP to expand inclusive apprenticeship. The AIM pilot website includes resources, research and practice briefs, and updates from a Community of Practice.
- The **National Collaborative on Workforce and Disability for Youth (NCWDY)** provides a disability disclosure guide for young people that can be used by youth apprentices, http://www.ncwd-youth.info/wp-content/uploads/2016/10/411_Disability_Disclosure_complete.pdf.
- The **National Disability Institute (NDI)** provides a **resource page on apprenticeship**, <https://www.nationaldisabilityinstitute.org/employment/apprenticeships/>, including training and resources on Ticket to Work, WIOA, and career pathways.
- The **Workforce GPS resources page for expanding apprenticeship for people with disabilities**, <https://apprenticeshipusa.workforcegps.org/resources/2017/03/10/16/09/Expanding-Apprenticeship-for-Individuals-with-Disabilities>, provides links to inclusive apprenticeship programs and federal resources on inclusive apprenticeship.

- The **US Department of Labor Office of Apprenticeship’s website on equal employment opportunity**, <https://www.dol.gov/agencies/eta/apprenticeship/eeo/disabililty/self-id>, provides detailed information on the self-identification of apprentices with disabilities.
- The **US Department of Labor Office of Disability Employment Policy’s website on apprenticeship**, <https://www.dol.gov/agencies/odep/program-areas/apprenticeship>, provides apprenticeship toolkits and resources on registered apprenticeship.

Methods and Data Appendix

This report draws on three sources of information on inclusive apprenticeship: a targeted literature review, interviews with experts in inclusive apprenticeship, and analyses of data from the Registered Apprenticeship Partners Information Data System (RAPIDS) and the American Community Survey (ACS). This methods and data appendix provides additional details on how this information was collected and analyzed.

Targeted Literature Review

As a part of the Knowledge Development phase of the Research to Support the Partnership on Inclusive Apprenticeship (PIA) project, the Urban Institute conducted a targeted literature review of existing research on inclusive apprenticeship to inform this report. The targeted literature review included resources gathered from ODEP and from a thorough search of online databases. The search of online databases included an academic literature search on Google Scholar and on disability and employment-focused resources and organizations, including the Clearinghouse on Labor Evaluation and Research (CLEAR), the Kessler Foundation’s impact reports and white papers, and research available from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR).

The review of online resources focused on people with disabilities (e.g., the Kessler Foundation impact reports and NIDILRR) consisted of a search for papers mentioning or tagged with apprenticeship-related terms:

- “Apprenticeship” OR “Registered apprenticeship”
- “Work-based learning” OR “On the job learning” OR “On the job training”
- “Employer provided training”
- “Journeyman” OR “Journeyman”

The priority for the literature review was to identify and synthesize research on apprenticeship, but the broader literature on inclusive employment and inclusive occupational skills training also provided important insights for employers of apprentices. The search of online resources focused on people with disabilities also included papers mentioning or tagged with employment and occupational skills training related terms:

- “Occupational skills training”
- “Customized training”
- “Community college”
- “Competency based education”
- “Hiring” OR “Job search”
- “Job retention”

The literature review also included a search of research clearinghouses with an employment and training focus, including DOL’s CLEAR. The team reviewed all studies in CLEAR identified with “apprenticeship and work-based learning” and “disability employment policy” to determine their appropriateness for inclusion in this report. The team also reviewed the AIM Resource Library for relevant literature (under reports, journal articles, and case studies).

In addition to reviewing research clearinghouses and curated databases for the literature review, the Urban team will search Google Scholar for additional literature on inclusive apprenticeship. This literature search will rely on combinations of key words to focus specifically on inclusive apprenticeships. These search terms will include, but may not be limited to:

- “People with disabilities” AND “apprenticeship”
- “People with disabilities” AND “On the job training” OR “work-based learning”
- “Inclusive apprenticeship”

The Urban team also targeted academic journals that are likely to publish research on inclusive apprenticeship but may not appear prominently in search results. These academic journals include *The Journal of Vocational Education and Training*, *Empirical Research in Vocational Education and Training*, *International Journal of Training and Development*, *Education + Training*, *Journal of Disability Policy Studies*, and the *Journal of Rehabilitation*.

The studies identified in the review were synthesized and reported on thematically to determine what is known about inclusive employment and training that can be applied to apprenticeship. The literature review was restricted to papers and reports published in the past 20 years. The reason for this limitation is that people’s perceptions and attitudes about disability have changed over time, including the perceptions and attitudes of people with disabilities themselves. These changes affect the way the topic is studied.

Interviews with Inclusive Apprenticeship Experts

The existing literature on inclusive apprenticeship is limited and unlikely to reflect recent developments in apprenticeship. To supplement the literature review, the Urban team conducted eight semi-structured interviews with experts in inclusive apprenticeship. Interviewees represented various perspectives and included staff at apprenticeship intermediary organizations, employers, disability rights advocates, and staff at public apprenticeship and vocational rehabilitation agencies. Interviewees were asked about:

- the characteristics of all-inclusive apprenticeship programs they sponsored or partnered with, including the number of active apprentices and apprentices who identified as having a disability, the occupational area of the program, and the duration and structure of training;
- experiences with providing accommodations to apprentices;
- experiences applying the principles of Universal Design for Learning;
- experiences with the self-identification process and registering apprentices with the US Department of Labor or a State Apprenticeship Agency;
- recruitment sources for the apprenticeship program;
- technical assistance provided to employers and the technical assistance needs of employers;
- potentially promising tools, technologies, policies, and practices for making apprenticeship more inclusive;
- costs and benefits of inclusive apprenticeship for employers and for apprentices, and
- lessons learned and future plans for inclusive apprenticeship.

The information collected from the semi-structured interviews was synthesized and reported on thematically to complement the literature review and determine what is known about inclusive employment and training that can be applied to apprenticeship.

Analysis of Registered Apprenticeship Partners Information Data System (RAPIDS) and American Community Survey (ACS) Data

This report includes RAPIDS and ACS data to understand the prevalence of apprenticeship among workers with a disability and the characteristics and experiences of apprentices with disabilities. Registered apprenticeship programs in most states report data on their apprentices to the US Department of Labor's RAPIDS data system. RAPIDS data include apprentice characteristics, including self-identified disability status, as well as information on registered apprenticeship programs. Before 2017, 35 states reported data to RAPIDS. That number has gradually grown since 2017 so that currently 41 states report data to RAPIDS. RAPIDS only includes information on an apprentice's disability status beginning in 2017. RAPIDS data are updated quarterly.

Because disability status is a voluntary field for apprenticeship sponsors, it can only provide a lower-bound estimate of how many apprentices self-identify as having a disability. This report acknowledges that RAPIDS data cannot provide a complete count of apprentices with disabilities, but it does provide important information on the few apprentices who self-identify to their employers and are recorded in the RAPIDS data. Section 3 of this report describes the process of self-identification for apprentices with disability in detail.

The report uses data from the nationally representative American Community Survey (ACS) to estimate the prevalence of apprenticeship among people with disabilities. The ACS collects information on self-reported disabilities, including cognitive difficulty, ambulatory difficulty, independent living difficulty, self-care difficulty, vision difficulty, and hearing difficulty. For the purposes of this report, we followed the standard practice of identifying anyone reporting these difficulties as a person with a disability. ACS data on workers with self-identified disabilities were used as a benchmark for assessing the prevalence of apprenticeship among workers with disabilities.

Notes

- ¹ A list of approved SREs can be found here: “Approved Standards Recognition Entities,” Apprenticeship.gov, accessed January 15, 2021, <https://www.apprenticeship.gov/employers/industry-recognized-apprenticeship-program/approved-standards-recognition-entities>. One SRE, FASTPORT, Inc., has worked to make trucking apprentices more inclusive of apprentices with disabilities: Jennifer Sheehy, “Creating Apprenticeship Programs That Work for Everyone,” DOL blog, November 15, 2019, <https://blog.dol.gov/2019/11/15/apprenticeship-programs-that-work-for-everyone>.
- ² “Apprenticeship Programs; Equal Employment Opportunity,” Fed. Reg. 81, no. 243 (Dec. 19, 2016), <https://www.govinfo.gov/content/pkg/FR-2016-12-19/pdf/2016-29910.pdf>.
- ³ “A Quick Start Toolkit: Building Registered Apprenticeship Programs,” DOL, September 6, 2017, https://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf.
- ⁴ “Inclusive Apprenticeships: Disability Action Plan for Apprenticeships 2018–21,” Welsh Language and Lifelong Learning, November 27, 2018, <https://careerswales.gov.wales/sites/default/files/images/inclusive-apprenticeships-disability-action-plan-for-apprenticeships-2018-21-1.pdf>.
- ⁵ Washington State has a more robust workforce development and apprenticeship system than many states, which may explain the large impacts there. These benefits do not appear limited to registered apprenticeship programs.
- ⁶ The internal rate of return is a measure of the profitability of investment. It is the discount rate that makes the net present value of the flow of costs and benefits from an investment equal to zero.
- ⁷ “Apprenticeship Programs; Equal Employment Opportunity,” Fed. Reg. 81, no. 243 (Dec. 19, 2016), <https://www.govinfo.gov/content/pkg/FR-2016-12-19/pdf/2016-29910.pdf>.
- ⁸ “Apprenticeship Programs; Equal Employment Opportunity,” Fed. Reg. 81, no. 243 (Dec. 19, 2016), <https://www.govinfo.gov/content/pkg/FR-2016-12-19/pdf/2016-29910.pdf>.
- ⁹ “Enhancing Participation of Individuals with Disabilities in Apprenticeship Programs: Understanding the 7% Disability Utilization Goal” (fact sheet), DOL, accessed January 15, 2021, <https://www.doleta.gov/oa/eoo/pdf/EEO-FactSheet.pdf>.
- ¹⁰ “Apprenticeship Programs; Equal Employment Opportunity,” Fed. Reg. 81, no. 243 (Dec. 19, 2016), <https://www.govinfo.gov/content/pkg/FR-2016-12-19/pdf/2016-29910.pdf>.
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- ²⁷ Significant progress in hiring Black apprentices in the building trades occurred in the 1970s as a result of affirmative action requirements implemented at that time. Currently, Black workers’ share of apprenticeship positions is similar to their share of the workforce, although as Baran (2018) notes concerns remain that Black apprentices are disproportionately represented in lower-wage apprenticeable occupations.
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