

Building an Apprenticeship Infrastructure for Youth Receiving SSI

April 30, 2021

Daniel Kuehn*

*The Urban Institute

The U.S. Department of Labor's Office of Disability Employment Policy funded the SSI Youth Solutions Initiative. The project sought potential solutions to improve employment outcomes for young adults ages 14 to 24 who apply for or receive Supplemental Security Income. This report is one of 12 developed for this project.

This page has been left blank for double-sided copying.

Acknowledgements

This report was prepared for the U.S. Department of Labor (DOL), Office of Disability Employment Policy, by Mathematica under contract number 1605DC-18-A0020. The views expressed are those of the authors and should not be attributed to DOL, nor does mention of trade names, commercial products, or organizations imply endorsement of same by the U.S. Government.

The author thanks Theresa Anderson, Robert Lerman, and Pam Loprest for comments on drafts of this paper. In addition, he appreciates the comments and support of staff from ODEP and its federal partners, Mathematica project staff, and two anonymous peer reviewers who reviewed earlier drafts.

This page has been left blank for double-sided copying.

Abstract

Youth apprenticeship is a potentially promising strategy for supporting youth receiving Supplemental Security Income (SSI) and other youth with disabilities as they transition from school to the world of work. Apprenticeship improves participants' employment and earnings in a paid, structured training program that ties traditional classroom instruction to work experience. This paper proposes an approach to youth apprenticeship for youth receiving SSI and youth with disabilities that relies on an intermediary model to coordinate services and benefits for apprentices and provide needed technical assistance to employers and other training providers. An apprenticeship intermediary for youth receiving SSI and youth with disabilities would need to coordinate with high schools, employers, colleges, and other training providers; supportive service agencies; and the Social Security system. The most successful models for such an intermediary are currently uncertain, so this paper proposes grants for intermediary programs and a rigorous evaluation of grantees' experiences.

This page has been left blank for double-sided copying.

I. Introduction

This paper describes a framework for supporting youth receiving Supplemental Security Income (SSI) and other youth with disabilities during the transition to adulthood using a registered youth apprenticeship training model and proposes a grant program to expand apprenticeship for youth with disabilities. Because youth apprenticeship programs are uncommon in the United States compared with apprenticeship programs for adults, the proposed intervention would encourage innovative approaches and help build an infrastructure in which programs are organized to coordinate services, accommodations, training plans, and benefits for youth with disabilities by leveraging all apprenticeship partners.

Apprenticeship is a structured training model for teaching occupational skills that combines classroom-based instruction with on-the-job training (OJT) for individuals as young as age 16 through prime working age. Apprentices are productively employed during the apprenticeship, which improves the likelihood of strong, long-term connections to the labor market and provides in-program earnings that are often not available in education and training programs. Many apprenticeship programs are registered, which requires that either the U.S. Department of Labor's (DOL's) Office of Apprenticeship or an approved state apprenticeship agency reviews and approves their training standards.¹ Registered apprenticeship programs have all of the protections afforded under the Fair Labor Standards Act (FLSA), including minimum wage standards.²

When registered or unregistered apprenticeship programs partner with high schools or other youth-serving organizations and focus on youth's transitions from high school to the workforce, they are considered youth apprenticeships. Perhaps most importantly for helping youth with disabilities succeed, registered youth apprenticeship combines this effective employment and training strategy with a broader ecosystem of program partners, including a program sponsor or employer, the youth's high school, a postsecondary training provider, and other supporting partners. This network can provide supportive services and coordinate Social Security Administration (SSA) work incentives and rule waivers, coordinate continuity of services, and ensure that employers are well informed about their responsibilities to provide accommodation and support. Simply connecting youth with disabilities to high quality jobs may be insufficient if the job does not afford a structured career pathway for growing skills and wages within an ecosystem of planned support. Youth apprenticeship not only bridges the gap between high school and work, it also creates a network of partners with real obligations to the apprentice and the program that can provide the support necessary for the youth to succeed.³

¹ Apprenticeship programs may also be unregistered, but such programs are more likely to be temporary, less organized, and otherwise less capable of serving youth with disabilities at scale.

² FLSA protections for registered apprentices help to reduce concerns that an apprenticeship program for youth receiving SSI would become an exploitative "sheltered workshop."

³ There is no formal definition of "youth apprenticeship," and youth apprenticeship programs could encompass programs that target SSI beneficiaries up to age 26. Some youth apprenticeship programs are operated by community and technical colleges, which typically serve older youth. This proposal focuses on youth apprenticeship for high school-age youth because apprenticeship programs for these youth are underdeveloped in the United States.

Research suggests that registered apprenticeship significantly increases earnings for participants (Hollenbeck and Huang 2016; Reed and others 2012) and benefits employers by raising the productivity and skill levels of apprentices (Helper and others 2016). Because of these successes, DOL's Office of Disability Employment Policy (ODEP) is exploring strategies for making apprenticeship more accessible to people with disabilities through its Apprenticeship Inclusion Model (AIM) pilots, which include but do not specifically focus on youth (Social Policy Research Associates 2020). Job training and supported employment have always been components of services for youth with disabilities. A nontrivial minority of Social Security Disability Insurance (SSDI) and SSI beneficiaries report having participated in training (13.5 percent) and education (12.6 percent), with even higher shares among the subset of beneficiaries with jobs (SSA 2018). Adults and youth receiving disability benefits who are interviewed about their experiences report an association between OJT and stable employment and highlight the importance of individualized one-on-one training for success (O'Day and others 2016). Although these interviewees do not cite apprenticeship training specifically, these aspects of training (on-the-job learning and one-on-one mentorship) are core principles of any apprenticeship program.

Section II of this paper provides background information on registered apprenticeship systems, with a focus on the various youth apprenticeship models, and analyzes the current experiences of apprentices with disabilities, again focusing on youth. DOL's Office of Apprenticeship has collected data on participants' disability status only since 2017, so this analysis provides the first detailed look at these apprentices. Section III presents in detail the proposal for an apprenticeship program focusing on youth with disabilities, including the potential division of responsibilities between a youth apprenticeship intermediary and other program partners. Apprenticeship intermediaries have no official definition, and the role that intermediaries can play varies, but they typically ease the burden of employer partners by helping to develop and register apprenticeship programs, serve as the sponsors of those programs, coordinate program partners, recruit apprentices, and manage paperwork and reporting. These important roles make them a focus of this proposed intervention. Section IV discusses how to measure the success of an apprenticeship program for youth receiving SSI, and the final section of the paper provides concluding remarks.

II. Background

An apprenticeship program for youth receiving SSI would necessarily work within the existing ecosystem of registered apprenticeship and youth apprenticeship, even if some programs for youth receiving SSI decide not to register. Understanding the contours of the existing apprenticeship system and the current efforts to support apprentices with disabilities is important for thinking about how to build apprenticeship programs for youth receiving SSI.

A. The registered apprenticeship system and youth apprenticeship

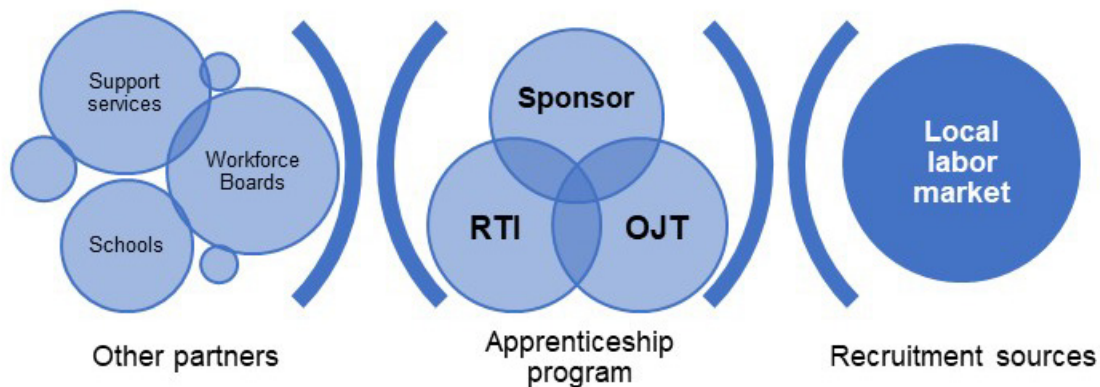
1. Registered apprenticeship

Apprenticeship is a structured training model that combines paid, productive OJT and classroom-based related technical instruction (RTI). Because apprentices are paid, productive employees, an apprenticeship program functions as both a training program and an employment program, making

it a potentially useful approach to managing school-to-work transitions or retraining for later-life career transitions.

Apprenticeship programs in the United States are either registered with the government or unregistered (Jacoby and Lerman 2019). Registered apprenticeship programs are regulated by DOL's Office of Apprenticeship and have a typical minimum required duration of one year (2,000 hours) of OJT and 144 hours of RTI, although many apprenticeships may last four or five years.⁴ Registered apprenticeship programs provide a clear program structure that outlines a set of occupational skills that all apprentices are expected to learn, which gives value to an apprenticeship completion credential. In many states, registered apprenticeships are supported by reserved workforce development funds or tax incentives. Every registered apprenticeship program has a program sponsor that is ultimately responsible for maintaining program standards and reporting to DOL. Often, the employer of the apprentice serves as the program sponsor, but other organizations serve as sponsors as well, including joint labor-management committees, nonprofits, or intermediary organizations. Sponsors are responsible for ensuring that apprentices receive the OJT and RTI specified in the apprenticeship standards. In addition to their oversight responsibilities, sponsors are the critical link between all the partners in the apprenticeship system (Figure 1). Sponsors provide the interface between the apprentice, the employer, the RTI provider, other partners, and government agencies. They are also responsible for identifying recruitment sources for the apprentice, either from the labor market or from among an employers' incumbent workers. Because sponsors play this coordinating role, they are well positioned to coordinate services and the flow of information for youth receiving SSI and youth with disabilities in a program for youth receiving SSI. (The appendix includes a high-level outline of the partnership arrangements and functions involved in three apprenticeship program models.)

Figure 1. Components of an apprenticeship program



OJT = on-the-job training; RTI = related technical instruction.

⁴ Competency-based apprenticeship programs are completed by demonstrating mastery of key competencies and may not be completed on a standard timetable. However, even competency-based programs should typically last at least one year. Some apprentices get prior learning credit for their OJT, RTI, or both, which can shorten the amount of time they are registered.

2. Youth apprenticeship

Registered apprentices in the United States are older, on average, than their counterparts in other countries. The age differential is a direct consequence of apprenticeship's use as a training or retraining model for entry-level, incumbent, and mid-career workers that is disconnected from high school curricula. In the cases where apprenticeships are coordinated with high schools to offer a structured pathway from school to paid work, the apprenticeship programs are often referred to as *youth apprenticeships*. Youth apprenticeships are not formally defined in the United States in the way that registered programs are, but the term typically refers to apprenticeship programs that exclusively enroll young people, sometimes while they are still in high school. Many practitioners and policymakers believe that bringing more apprenticeship opportunities to youth through youth apprenticeship programs is critical for strengthening the transition from school to work, providing a diverse set of learning opportunities for students, and expanding and institutionalizing apprenticeship more broadly (Hamilton 1990; Lerman 2003; Parton 2017).

Youth apprenticeship programs in the United States can be registered, as is typically the case in South Carolina and Iowa (Marotta, Boren, and San Miguel 2020), but they are also often unregistered, as in Wisconsin and Georgia (Lerman, Kuehn, and Shakesprere 2019). Many youth apprenticeship programs are operated by local high schools, whereas others are structured as more traditional employer-based programs that actively recruit from high schools or other sources. In South Carolina, youth apprenticeship programs are typically registered either with an employer or with a partnering technical college. As registered programs, South Carolina youth apprenticeships must include at least 2,000 hours of OJT and 144 hours of RTI. Local high schools are key apprenticeship partners, but each program is directed by the technical college partner and operated as a workforce development program. In Iowa, by contrast, youth apprenticeships are registered but high schools, not technical colleges, serve as program sponsors. Youth apprenticeship programs in Iowa have the same minimum training requirements as those in South Carolina, but the training is more closely tied to the classroom instruction provided in high school.

Unlike the programs in South Carolina and Iowa, Georgia's youth apprenticeship programs are not registered, although programs are active throughout the state. In Georgia, youth apprenticeship is part of a broader high school career and technical education strategy that also includes job shadowing and internships. Rather than being formally sponsored by employers or technical colleges, Georgia's youth apprenticeships are operated either by individual high schools or high school districts. The state funds over 100 apprenticeship coordinators who are embedded in local school districts to design youth apprenticeship programs and match (sometimes on a one-by-one basis) high school students with work-based learning opportunities in the community. Because these programs are unregistered, they can vary in duration and intensity.

In none of these cases are youth apprenticeship programs primarily organized and operated by employers. Educational institutions of some type—either high schools (in Iowa and Georgia) or technical colleges (in South Carolina)—are the principal partners or sponsors. This unique arrangement of youth apprenticeships, in which control is tilted more significantly toward the classroom instruction provider than the OJT provider, is a potentially important feature for serving

youth receiving SSI. Schools are already a site for service provision and coordination for youth receiving SSI and other youth with disabilities, so centering the youth apprenticeship program on the school prioritizes the student's training needs over the employer's workforce needs.

Youth receiving SSI and other youth with disabilities could register with any apprenticeship program, regardless of whether it is designated as a youth program. In fact, most young apprentices register in programs that also include adults. However, youth apprenticeship programs designed specifically to bridge the transition from high school to work are better positioned to support youth receiving SSI and other youth with disabilities than are apprenticeship programs designed for adults. Youth apprenticeship programs are uniquely tied to and able to coordinate services with high schools in a way that adult apprenticeship programs are not. Most youth apprenticeship programs are not specifically geared toward apprentices with disabilities, although apprentices with disabilities can and do succeed in those programs that provide strong supports for students as they transition into careers (Silverstein and Albanese 2019).

B. Apprenticeship and people with disabilities

DOL has increasingly focused on making registered apprenticeship accessible to people with disabilities. In 2016, DOL announced a final rule prohibiting discrimination on the basis of disability status in registered apprenticeship; that rule went into effect in 2017. The new rule also required employers to invite apprentices to self-identify as people with disabilities both before hiring and during the apprenticeship (DOL 2016). Since 2017, DOL has collected data on apprentices' disability status in order to measure improvements in access to apprenticeship.

ODEP has also made important recent investments in apprenticeship for people with disabilities by funding four AIM pilots to improve supports for apprentices with disabilities. Pilots were operated by Amazon, Microsoft, the Healthcare Career Advancement Program (H-CAP), and the Industrial Manufacturing Technician Apprenticeship Program (IMT). These pilots began in the spring of 2019 with technical assistance from Social Policy Research Associates (2020).

DOL has supported several initiatives and pilots to make apprenticeship more accessible to people with disabilities. In September 2016, DOL awarded \$20.4 million over four years to 10 industry intermediaries for expanding apprenticeship in industry sectors and 4 equity partners for expanding apprenticeship opportunities for underserved populations. One of the equity partners, North Carolina Agricultural and Technical State University (NCAT), focused on promoting access to information technology (IT) apprenticeships for people with disabilities. NCAT built partnerships with industry associations and large technology companies to create apprenticeship opportunities for people with disabilities, women, and people of color (Lerman and Kuehn, forthcoming).⁵

⁵ Although two equity partners continued their work under the contract, NCAT and the fourth equity partner (Jobs for the Future) did not have their contracts renewed after the first year. Neither of the remaining partners focused on serving people with disabilities.

1. Youth apprentices with disabilities in the administrative data

Most youth apprenticeship programs are not specifically geared toward apprentices with disabilities, although apprentices with disabilities can and do succeed in these programs. Before 2017, DOL did not track people with disabilities in the Registered Apprenticeship Partners Information Data System (RAPIDS). Now, sponsors are asked to identify the disability status of their apprentices when they register them. The number of apprentices identified as having a disability in the RAPIDS data is presumably an undercount of the actual total because employers may not know or may not report apprentices' status and because some apprentices with disabilities may not self-identify to their employers. Some research has found high rates of trainee self-identification and requests for accommodation in training programs that focus on serving youth with disabilities (Lindsay, McDougall, and Sanford 2013), although most apprenticeship programs do not have that mission or eligibility criterion.

An increasing number of apprentices registered since 2017 have been identified as having disabilities (Table 1), though the number remains small. In 2017, the first year that disability status could be entered in RAPIDS, 267 registered apprentices were identified as having a disability. This number increased to 1,151 in 2019. Similarly rapid increases were seen in the number of apprentices identified as having a disability who were age 18 or younger and age 22 or younger at registration.

Table 1. Number of apprentices with disabilities identified in RAPIDS, by registration year, 2017 to 2019

Registration year	All apprentices	All youth apprentices (18 or younger at start)	All youth apprentices (22 or younger at start)	Apprentices identified as having a disability (all ages)	Youth apprentices identified as having a disability (18 or younger at start)	Youth apprentices identified as having a disability (22 or younger at start)
2017	137,312	2,548	29,868	267	7	33
2018	145,564	3,363	32,950	639	9	92
2019	154,440	4,078	36,887	1,151	36	234

Source: Author's calculations based on data from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Note: Apprentices are restricted to those in programs in states that reported to the RAPIDS database or nationally registered programs from 2017 to 2019. Only 33 states are included in RAPIDS. Included states accounted for 72.8 percent of the population of the United States in 2017 (Kuehn 2019). The table is restricted to apprentices registered since 2017 because information on disability status was not collected in RAPIDS before that year. Some apprentices with disabilities may not be identified in the RAPIDS data.

The small number of apprentices identified by sponsors as having a disability and the substantial increase in the count between 2017 and 2019 raise questions about whether RAPIDS currently captures an accurate picture of youth with disabilities in apprenticeship. Some of the increase in the number of apprentices with disabilities between 2017 and 2019 may reflect an increasing awareness of sponsors' ability to identify an apprentice as a person with a disability in the RAPIDS data system or an increased willingness of apprentices to self-identify. Many apprentices with disabilities may

remain unidentified in the RAPIDS data, and potentially even to their employers, if they do not know how to self-identify or are reluctant to do so. The following analysis profiles apprentices with disabilities who are identified to their sponsors and recorded as having a disability in the available data, with the caveat that the data may be subject to underreporting of the prevalence of apprentices with disabilities.

Youth with a disability may access apprenticeship at lower rates because programs are not designed to be universally accessible. Docto, Koller, and Grey (forthcoming) found that programs developed using the Universal Design for Learning (UDL) framework were more accessible to apprentices with disabilities, as were programs that trained staff on workplace accommodations, self-disclosure, and rights and responsibilities in the workplace. Youth with a disability may also face discrimination from employers, which could require technical assistance, monitoring, or legal remediation.

Apprentices identified as having a disability are older, on average, at registration than apprentices who are not identified as having a disability (age 33 compared with age 30). Figure 2 plots the share of apprentices with and without identified disabilities at each starting age. Apprentices with no identified disability are more likely to be age 28 or younger than apprentices with disabilities. This suggests that although people with disabilities have difficulties accessing apprenticeship training at all ages, the problem may be particularly acute for young people. A more optimistic interpretation, noting that roughly equal shares of apprentices with and without disabilities enroll at or before age 18, might be that apprenticeship programs serving the youngest youth cohort do a fairly good job of enrolling (or identifying) participants with disabilities.

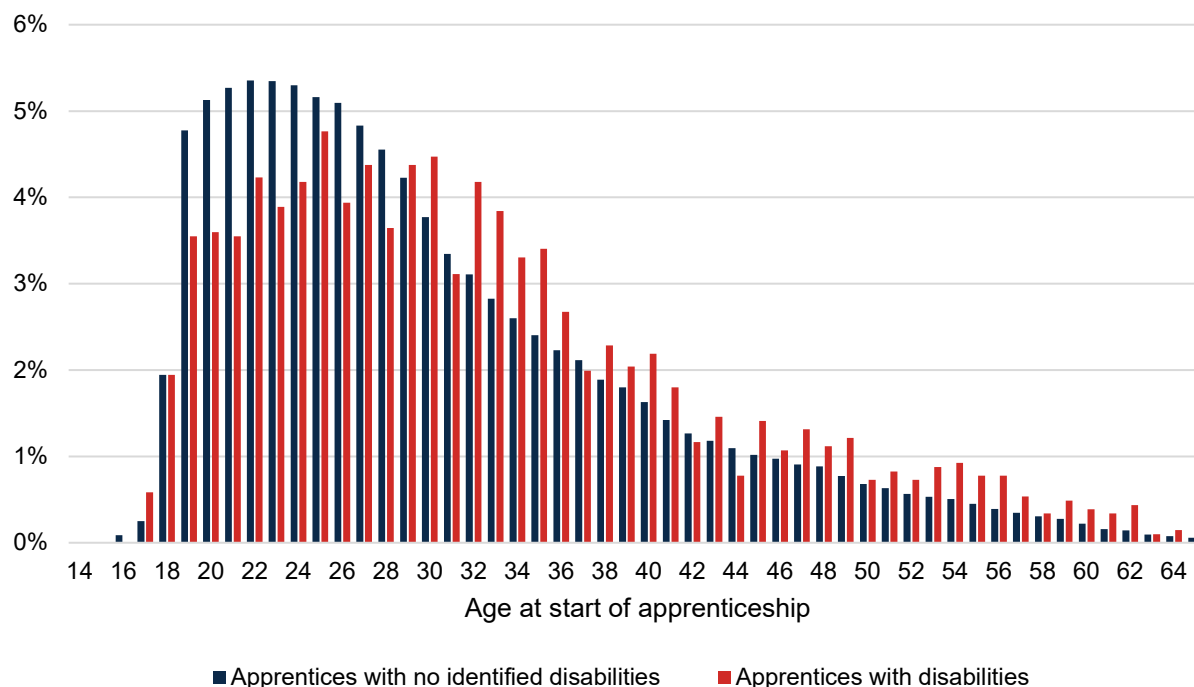
The number of apprentices identified as having a disability in RAPIDS who registered between 2017 and 2019 is small (2,057 apprentices). Because most of these apprentices are older (Figure 2), there are even fewer youth apprentices with identified disabilities. Only 52 apprentices who were age 18 or younger when they started their program are identified as having a disability. Three hundred fifty-nine apprentices who were age 22 or younger when they started are identified as having a disability.

Although there is a clear definition of a registered apprenticeship program, there is no official definition of a youth apprenticeship program. A traditional youth apprenticeship model starts in high school and would therefore generally serve students who begin their apprenticeship at ages younger than 18 or 19. However, many youth programs serve disconnected youth, who may be somewhat older. This could be particularly true of students with individualized education programs (IEPs) who participate in youth apprenticeship programs, now or in the future, because these students can continue high school through age 21 or 22. For this analysis, I adopt a somewhat arbitrary definition of youth apprenticeship programs as apprenticeship programs in which more than half of the apprentices who registered between January 2017 and April 2020 were age 18 or younger at registration and no apprentices were older than 22.⁶ This definition acknowledges that

⁶ Two exceptions to these rules allow certain other programs to be counted as youth apprenticeship programs. The RAPIDS data include a relatively underutilized data field, called “program type,” that provides additional descriptive details on apprenticeship programs. I include programs with “program type” identified as “Job Corps” and “High School Registered Apprenticeship” as youth apprenticeships, even though both programs have a few apprentices who were older than 22 at the time of registration. Job Corps is a work-based learning program for youth, so all Job Corps

apprentices in a youth apprenticeship program should primarily be at the secondary school level, but it also accommodates true youth-serving programs that provide training to somewhat older—possibly out-of-school—youth.

Figure 2. Age distribution of apprentices with and without identified disabilities at registration, 2017 to 2019



Source: Author's calculations based on data from the Registered Apprenticeship Partners Information Data System (RAPIDS), 2017 to 2019.

Overall, few youth apprentices participate in youth-specific programs, but these programs provide an important source of apprenticeship slots for youth with identified disabilities. Only 14 percent of all youth apprentices who registered when they were 18 or younger, regardless of disability status, registered with a youth apprenticeship program as defined above. In contrast, 43 percent of apprentices with identified disabilities who were 18 or younger at registration participated in a youth apprenticeship program. The high share of youth apprentices with identified disabilities registered with youth programs may reflect the importance of these programs for increasing access for or identifying apprentices with disabilities.

Apprenticeship is different from many other training models because apprentices are paid while they train. Youth apprentices with identified disabilities who were 18 or younger at registration had an average starting wage of \$13.28 per hour, compared with \$13.86 for all youth apprentices. The

programs share similar characteristics with registered apprenticeship programs. However, not all Job Corps programs are actually registered apprenticeships.

average starting wage for all apprentices with identified disabilities (\$16.80 per hour) was higher than the wages of most SSI recipients and SSDI beneficiaries (SSA 2020).

Apprentices with identified disabilities who were 18 or younger at registration were much more likely to be registered in competency-based or hybrid programs (38 percent) than either youth apprentices generally (21 percent) or older apprentices with identified disabilities (25 percent).⁷ Competency-based programs and hybrid programs that incorporate some competencies provide additional flexibility for apprentices by requiring them to spend as much or as little time mastering occupational skills as they need. This flexibility could be especially important for supporting the successful completion of apprenticeship programs among participants with disabilities.

Decisions about program design, including whether the program is time based or competency based, are usually in the hands of the employer or the sponsor that is responsible for implementing the apprenticeship program. Competency-based programs are perceived as having many advantages by practitioners, employers, and technical assistance providers, but they can be difficult to design and implement.

Although youth apprentices with identified disabilities are more likely than other youth apprentices to be in competency-based and hybrid programs, they are less likely to have been awarded credit for prior OJT. Being awarded credit for prior OJT functions like a prior learning assessment in postsecondary education and can help apprentices complete apprenticeship programs more quickly. Because they have less prior work experience, youth apprentices generally are not awarded OJT credit at high rates, and youth apprentices with identified disabilities are even less likely than other youth to be awarded credit for prior OJT (Table 2).

The race and ethnicity distribution of youth apprentices with identified disabilities also differs from that of other youth apprentices. Youth apprentices with identified disabilities are more likely than those without identified disabilities to be White (Table 2), which may reflect broader problems of underidentification of disabilities for students of color (Elder and others 2019; Morgan and others 2017). However, youth apprentices with identified disabilities also have their race and ethnicity reported to RAPIDS by their sponsors at higher rates than other youth apprentices, which makes a clear accounting of the extent of racial disparities difficult. One important goal of the proposed apprenticeship intermediary should be to advocate for racial justice on behalf of youth apprentices, including equity in access, pay, treatment, and retention after completion of training.

⁷ A chi-square test of the frequency of youth with and without disabilities across the three program types was statistically significant at the 5 percent level; a chi-square test of the frequency of youth with disabilities and adults with disabilities across the three program types was statistically significant at the 1 percent level.

Table 2. Characteristics of youth apprentices and apprentices with identified disabilities, 2017 to 2019

	Youth apprentices (18 or younger at start)	Apprentices with identified disabilities (all ages)	Youth apprentices with identified disabilities (18 or younger at start)	Youth apprentices with identified disabilities (22 or younger at start)
Apprentices registered, 2017 to 2019	9,989	2,057	52	359
Average age at start	17.8	32.4	17.8	20.2
Female	14%	13%	8%	8%
In a youth apprenticeship program	14%	1%	40%	6%
Average apprenticeship length (hours)	5,985	5,712	5,258	6,373
Average starting hourly wage	\$13.86	\$16.80	\$13.28	\$15.81
Program type				
Competency based	8%	10%	23%	8%
Hybrid	13%	15%	15%	9%
Time based	79%	75%	62%	83%
Awarded OJT credit	14%	23%	9%	15%
Race or ethnicity				
American Indian or Alaska Native	1%	1%	2%	1%
Asian	1%	2%	0%	1%
Black or African American	7%	14%	12%	6%
Latinx	18%	16%	15%	17%
Native Hawaiian or other Pacific Islander	1%	1%	0%	1%
White	59%	62%	63%	70%
Multiple non-Latinx	1%	2%	8%	1%
Do not wish to answer	12%	3%	0%	3%

Source: Author's calculations based on data from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Note: Apprentices are restricted to those in programs in states that reported to the RAPIDS database or nationally registered programs from 2017 to 2019. Only 33 states are included in RAPIDS. Included states accounted for 72.8 percent of the population of the United States in 2017 (Kuehn 2019). The table is restricted to apprentices registered since 2017 because information on disability status was not collected in RAPIDS before that year. Some apprentices with disabilities may not be identified in the RAPIDS data.

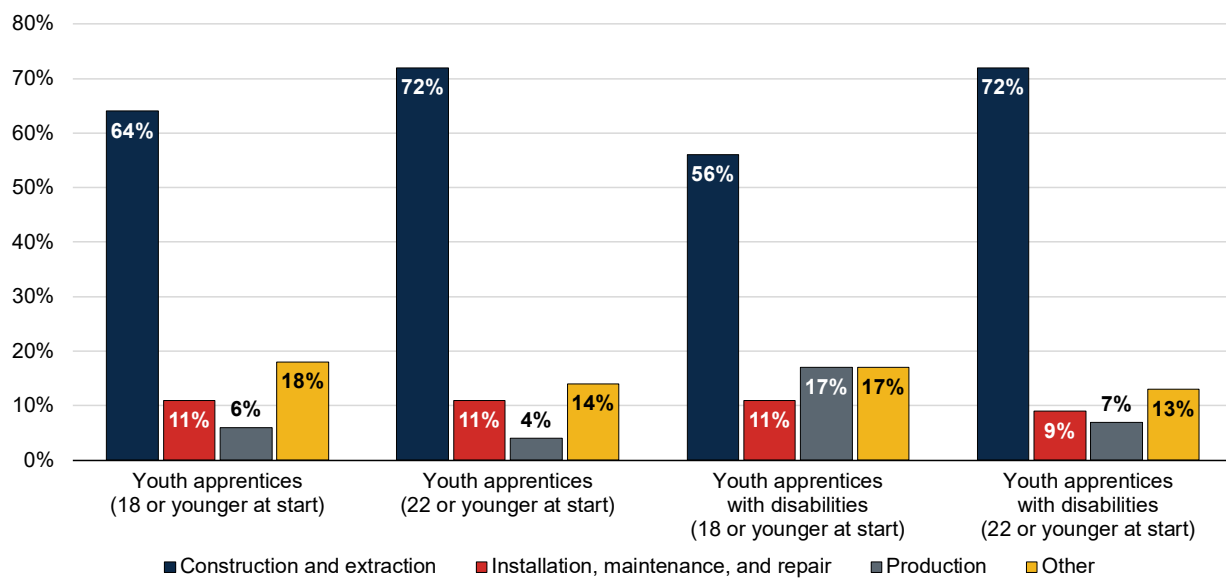
OJT = on-the-job training.

People with disabilities are underrepresented in certain occupations (Kaye 2009, 2010), which has led to concerns that apprenticeships may be less accessible in some occupations than in others. Lynn and Mack (2008) worried that construction programs in particular could be difficult to access. However, RAPIDS data show that youth apprentices with identified disabilities are employed in similar occupations as youth apprentices generally.⁸

⁸ Author's calculations based on data from RAPIDS. These results are not presented in Table 2.

Most youth apprentices, regardless of their disability status, are employed in construction occupations. Although fewer youth under 18 with identified disabilities are registered in a construction program (56 percent) than youth apprentices under 18 generally (64 percent), youth under 22 with identified disabilities are as likely to be working in construction (72 percent) as their peers without disabilities (72 percent). The second most common occupational category for youth apprentices with identified disabilities who are under 18 is production occupations (17 percent). Although apprenticeship accessibility is a broader problem for youth with disabilities, accessibility problems do not appear to be disproportionately concentrated in certain occupations (Figure 3).⁹

Figure 3. Occupations of all youth apprentices and youth apprentices with disabilities, 2017 to 2019



Source: Author's calculations based on data from the Registered Apprenticeship Partners Information Data System (RAPIDS).

Although most youth apprentices and apprentices with identified disabilities are employed in construction apprenticeship programs, apprenticeship is expanding to include nontraditional occupations, such as health care and IT. To the extent that apprenticeship expands to these nontraditional occupations, youth receiving SSI should also be supported in starting careers in these fields. The ODEP AIM pilots for apprentices with disabilities are focused on these nontraditional occupations, including IT (Amazon and Microsoft), health care (H-CAP), and advanced manufacturing (IMT).

Even though apprentices with identified disabilities are registered in the same types of occupations as other apprentices, disability-specific barriers to certain occupations may still be relevant for individual apprentices. Regulations require that apprenticeship sponsors provide reasonable accommodations for people with disabilities in apprenticeship programs, which should improve

⁹ A chi-square test showed that occupational shares for youth with and without disabilities under age 18 and youth with and without disabilities under age 22 were statistically different from each other at the 5 percent level.

occupational access. DOL has provided technical assistance to apprenticeship sponsors to ensure that they are equipped to accommodate people with disabilities (for example, see DOL, n.d.) and provides this assistance in the ODEP AIM pilots. Now that disability status is recorded in RAPIDS, DOL should be able to track the success of youth with disabilities in states and programs that report to RAPIDS.

III. An apprenticeship infrastructure for youth with disabilities

An apprenticeship program for youth with disabilities could be a regional, state, or even national intermediary-based model in which the intermediary supports youth receiving SSI and other youth with disabilities by coordinating apprenticeship partners, managing or funding supportive services, providing technical assistance and training to employers, and securing work incentives and rule waivers for SSI recipients. Different intermediary models are likely to have different strengths and weaknesses. Intermediaries based in secondary school systems would presumably have important advantages in transition planning and crafting apprenticeship opportunities that are cognizant of the apprentice's IEP. Vocational rehabilitation agencies serving as youth apprenticeship intermediaries may have less direct connections to the school system, but they might be better placed to coordinate services and establish connections with workforce development partners. Advocacy organizations serving as intermediaries might have advantages over school systems or vocational rehabilitation agencies in providing technical assistance to employers. Apprentice recruitment would reflect these alternative intermediary models. Apprentices could be recruited through the IEP development process in partnering schools or through coordination with state Medicaid, vocational rehabilitation, or disability agencies where state laws permit. For youth receiving SSI, the Work Incentives Planning and Assistance program could provide information on youth apprenticeship programs to youth before or after a disability redetermination.

Initially, the intermediaries could be supported by a competitive grant program funding four or five years of project activities, with the understanding that grantees would develop a plan for sustainability after the grant period. A grant program would allow intermediaries to experiment with different approaches to recruiting and serving youth receiving SSI and other youth with disabilities. Grants would also provide opportunities for different types of organizations to take the lead in developing and sponsoring apprenticeship training. Taking as a guidepost the recent Youth Apprenticeship Readiness Grants (YARG), which distributed over \$42 million in grants to 14 grantees (DOL 2020), the proposed youth apprenticeship intermediary grantees could be supported at a comparable funding level of \$3 million each, on average. A grant program supporting 10 grantees would therefore cost \$30 million dollars, plus any program support costs incurred by DOL and a \$1 million third-party evaluation. The YARG grants aim to serve from 200 to over 1,000 apprentices each, though programs like the intermediary model contemplated here might ultimately recruit fewer apprentices for the same funding level. Apprenticeship intermediary grantees for youth receiving SSI could be required to work with an existing youth apprenticeship system to ensure that grant resources are focused on serving more youth with disabilities, rather than on building a youth apprenticeship program from scratch.

An apprenticeship intermediary for youth with disabilities would likely have to operate regionally, statewide, or nationally because a single local apprenticeship program or school district would serve only a limited number of youth with disabilities. In Georgia, a state with a robust unregistered youth apprenticeship program, over 3,000 youth apprentices are enrolled across the state in a year (Lerman, Kuehn, and Shakesprere 2019). Nationally, roughly 13 percent of all students identify as having a disability (National Center for Education Statistics 2019), which implies that almost 400 youth apprentices in Georgia may identify as having a disability. A statewide apprenticeship intermediary for youth receiving SSI in Georgia might therefore expect to serve at least a few hundred students currently participating in the program. As mature youth apprenticeship systems in Wisconsin or Georgia grow, this number could grow proportionally. In states where the youth apprenticeship system is less developed, the same grant funding may support many fewer youth apprentices with disabilities. However, a statewide or national intermediary could achieve scale by working with youth with disabilities in youth apprenticeship programs across the country, either sponsoring or partnering with smaller registered programs, depending on the employer and school district's needs. An employer or school district partnering with the intermediary would help support and accommodate the youth apprentices who are receiving SSI. Case management and other services could be directly provided by the sponsor or a partner organization, particularly if that organization provided case management services to the youth prior to the apprenticeship, as might be the case with a nonprofit sponsor or school. The intermediary organization would be responsible for several forms of support.

- **Coordinating apprenticeship partners and program development**, including support for writing new apprenticeship standards and registering new apprenticeship programs with the Office of Apprenticeship or a state apprenticeship agency. For example, intermediary organizations could coordinate with traditional registered apprenticeship partners (RTI providers and employers), youth apprenticeship partners (high schools), and partners serving youth receiving SSI and youth with disabilities (service providers, counselors, vocational rehabilitation agencies, and SSA).
- **Operating or partnering with a pre-apprenticeship program**, which would serve as a recruitment source for apprentices and provide basic occupational and academic training for youth who are not yet prepared to enter the apprenticeship. Pre-apprentices could be guaranteed an apprenticeship position upon successful completion of the pre-apprenticeship program or guaranteed an interview for the apprenticeship.
- **Managing or funding supportive services**, including case management for participants not already receiving it from a partner organization, college navigation, and financial literacy education (Karas and Lerman 2016). Intermediaries can identify and help apprentices access social services and support services such as child care, transportation, and academic supports more easily than employers, who are not typically as aware of apprentices' social service needs and options (Rolland 2016). SSI benefits counselors engaged by the intermediary could help to provide services that are especially responsive to the needs of youth receiving SSI and youth with disabilities.
- **Providing technical assistance and training to employers**, including assistance with accommodation for apprentices, proper reporting of disability status to the Office of

Apprenticeship through RAPIDS, and compliance with Equal Employment Opportunity requirements. Intermediaries may also provide training for mentors on mentorship best practices, disability rights, and accommodation of apprentices with disabilities. Mentors of apprentices are skilled workers, but they are often not trained teachers and mentors, so mentorship training may be significant for improving the quality of training.

- **Facilitating use of work incentives and rules waivers**, including the Student Earned Income Exclusion (SEIE), Plan to Achieve Self-Support (PASS), individual development accounts (IDAs), and continuing disability reviews. Many youth receiving SSI in work or school are eligible for these work incentives and rule waivers but do not receive them (Government Accountability Office 2017). Because all youth apprentices who are receiving SSI and apprentices with disabilities are employed and many will be enrolled in qualified educational programs, most should be eligible for these benefits as well. An apprenticeship intermediary organization for youth receiving SSI can assist apprentices in qualifying for and obtaining these benefits.
- **Providing incentives for employers**, potentially including per-apprentice incentive payments to defray the cost of RTI or OJT instruction. Discretionary apprenticeship grant programs are typically restricted from subsidizing apprentice wages, but an apprenticeship intermediary for youth receiving SSI could consider adopting a wage subsidy or unconditional incentive payment.

Some vocational rehabilitation agencies may be well suited to fulfilling the intermediary's role of coordinating benefits for youth apprentices receiving SSI or apprentices with disabilities or well suited to partnering with an intermediary organization to fulfill these functions. One possible model for the apprenticeship intermediary may be a vocational rehabilitation agency that takes responsibility for recruiting apprentices and coordinating services for multiple partner employers. The vocational rehabilitation agency could serve as a group sponsor for these employers to maintain control of program standards, or it could serve as a partner for separately sponsored apprenticeship programs. Mack, Hebbbar, and Oettinger (forthcoming) have described how vocational rehabilitation agencies and other SSA employment network service providers can operate as partners for inclusive apprenticeship programs. However, many vocational rehabilitation agencies face significant budget and staff time constraints, which would limit the possibility that they could serve as an intermediary.

A. The intermediary role: CareerWise Colorado as a model

One potential model for an apprenticeship program for youth receiving SSI is CareerWise, a youth apprenticeship intermediary that has been successful at scaling youth apprenticeship and coordinating program partners in Colorado (Katz and Elliott 2020). CareerWise is one of the 14 YARG grantees discussed above. CareerWise does not focus on youth apprentices with disabilities. Nonetheless, it offers a useful framework for thinking about how to organize a program that would seek to engage youth receiving SSI.

As an intermediary, CareerWise is responsible for facilitating employers' relationship with educational institutions that provide RTI, recruiting apprentices, operating a summer bootcamp for apprentices, and training the mentors who will work with apprentices on the job. These intermediary contributions reduce the employers' planning and program development burden, which helps to

encourage employer participation. Employers partnering with CareerWise are responsible for paying apprentices' wages and providing OJT and mentoring. Employers pay CareerWise a per-apprentice fee for the services it provides (CareerWise Colorado 2019). Not all of CareerWise's youth apprenticeship programs are registered, and those programs that do register can choose between having CareerWise serve as the sponsor or sponsoring their own program.

Katz and Elliott (2020) reported that one of the most difficult partner relationships that CareerWise helped to manage as an intermediary was the relationship with Colorado high schools. High schools traditionally do not have strong relationships with employers or experience providing occupational training in the same way that community and technical colleges do, making it difficult for employers to work with schools to develop youth apprenticeship programs. An effective sponsor for an apprenticeship program for youth receiving SSI would serve the same intermediary role to bridge the gap between the educational plan and services that youth receiving SSI receive in their school setting and their new experience as apprentices on a job site.

Grantees through this initiative might also have an alternative, non-intermediary structure, given that not all youth apprenticeship programs rely on intermediaries. Intermediary organizations are not used in Georgia's youth apprenticeship program, although Georgia's school-based apprenticeship coordinators serve many of the same roles, as individual staff members, that an intermediary would serve. In South Carolina, the statewide apprenticeship agency, Apprenticeship Carolina, serves some intermediary functions by helping employers develop and register their youth apprenticeships. However, the agency provides less ongoing coordination of apprenticeship partners after a program is registered, which might make it less well suited than an intermediary for apprenticeship programs for youth receiving SSI, because these programs would require a more significant ongoing partnership to coordinate services.

B. Interaction of benefits and wages

Youth apprenticeship provides a strong framework for delivering necessary services and supports to youth receiving SSI as they transition to work, but because apprenticeship is a work-based solution, it interacts in significant ways with SSI program rules, particularly the SSI benefit offset. Past employment and training interventions for SSI recipients have improved employment rates but have not increased earnings enough to substantially offset benefits (Duggan, Kearney, and Rennane 2015; Fraker and others 2014). However, estimated impacts of apprenticeships on earnings are sufficiently large (Hollenbeck and Huang 2016; Reed and others 2012) that offsets to benefit may have a more substantial impact on youth apprentices who are receiving SSI and apprentices with disabilities than it would on other employed beneficiaries. Even low-wage employment in a full-time apprenticeship can quickly eliminate SSI cash benefits. However, the SSI program includes many special incentives and waivers to help counteract these disincentives. Navigators and sponsors of apprenticeship programs for youth receiving SSI could help youth access the benefits of these incentives and waivers, which have been underutilized by eligible youth receiving SSI in the past (Government Accountability Office 2017).

- **Student Earned Income Exclusion:** The SEIE allows SSI recipients enrolled in school to exclude some earnings from their countable income in the SSI benefit calculation. Many youth apprentices would qualify for the SEIE if their RTI is delivered through a qualifying educational institution. Because youth apprenticeship programs typically deliver RTI through career and technical education courses in high school and dual enrollment in local colleges, participants in most of these programs should qualify for the SEIE. In the case of longer youth apprenticeship programs, SEIE age limits could be waived for apprentices as they were for participants in the Youth Transition Demonstration (YTD) pilot.
- **Plan to Achieve Self-Support:** PASS allows SSI recipients to exclude some expenses from countable income, most notably expenses for education but also expenses for transportation and assistive technology. Youth apprentices who pay for their own RTI or other costs could be eligible for PASS incentives. Sponsors and intermediaries for apprenticeship programs for youth receiving SSI can facilitate the submission of PASS plans, and completion of a registered apprenticeship can be identified as a PASS-eligible plan for self-sufficiency. This may be less relevant if youth apprentices are not paying for their RTI.
- **Individual development accounts and Achieving a Better Life Experience accounts:** For those eligible, IDAs and Achieving a Better Life Experience (ABLE) accounts allow SSI recipients to save money for certain goals while preserving their SSI eligibility. Earned income deposited into an IDA qualifies for SSA matching, and IDA deposits do not count against income limits for the SSI program. Deposits into ABLE accounts still count as income, but they do not trigger asset-based eligibility cutoffs as long as they remain below certain high thresholds. Youth apprentices who pay for their own RTI or other costs could benefit from these models.
- **Continuing disability reviews:** At age 18, youth receiving SSI undergo a continuing disability review to determine whether they can continue receiving cash benefits. Individual youth receiving SSI who lose their eligibility can apply for a special Section 301 waiver to continue receiving SSI while in training, and under the right circumstances, apprenticeships for youth with disabilities could qualify students for Section 301 waivers.
- **Continued Medicaid eligibility while working:** Eligibility for SSI typically confers Medicaid eligibility as well. Whereas cash benefits are reduced or even eliminated for SSI recipients who earn money from work, Medicaid eligibility often continues. Apprenticeship intermediaries could help alleviate potential anxiety about the loss of Medicaid benefits by highlighting this fact to potential participants.

These incentives and waivers have important caveats and limitations. First, Fraker and others (2014) found that SSA waivers, benefits counseling, and other services delivered through the YTD pilot had mixed effectiveness, with only two of the five pilot sites showing positive impacts on youth employment and earnings. These results suggest that incentives are unlikely to be a driver of significant expansion in the number of youth apprentices receiving SSI. However, four of the five YTD pilot sites showed positive effects on total income, despite their weaker effects on paid employment and earnings (Fraker and others 2014). The apprenticeship intermediary should therefore counsel apprentices on obtaining or maintaining benefits not as a lever for increased recruitment but in the interest of income support. Second, approval for an SEIE or PASS can be difficult and may not be approved. Success in securing these incentives and benefits for apprentices

may depend on special arrangements with SSA, as in the case of the YTD pilot. These arrangements may be difficult or impossible to negotiate.

Ensuring that the income of youth apprentices who are receiving SSI does not threaten their benefit eligibility is not a core function of apprenticeship training, but it will be an essential function of the apprenticeship intermediary, ensuring that the youth apprenticeship model can function effectively for these youth. An employment and training intervention could be weakened if the treatment of an apprentice's earnings under SSI rules substantially discourages employment.

IV. Measuring success

Success of the proposed apprenticeship infrastructure should be measured on at least two levels: program-level success in increasing access to apprenticeship for youth receiving SSI and other youth with disabilities, and apprentice-level success in program completion, wage growth, and persistence in employment. RAPIDS and Workforce Integrated Performance System (WIPS) administrative data collected by DOL could provide a basis for measuring success at both levels. These data could also be supplemented with additional program data and evaluation research. Success can and should be measured in multiple ways, including documentation of performance and outcomes, qualitative research on the implementation of the grants, and quantitative analysis of the impact of apprenticeship on the outcomes of youth receiving SSI and other youth with disabilities. Ideally, funding announcements would anticipate and require participation in a randomized controlled trial to test the impact of training and supportive services on apprentices' earnings and employment.

Program-level success could be measured by growth in the number of registered youth apprentices who are (1) identified as apprentices with disabilities and (2) SSI recipients, if the program is focused specifically on this population. Since 2017, apprentices with disabilities have been identified in RAPIDS, so the success of any apprenticeship program for youth receiving SSI reporting to RAPIDS on this measure can be tracked. Currently, SSI recipients are not identified in the RAPIDS system, so a data-sharing arrangement between SSA and DOL would be required to track the registration of SSI beneficiaries in apprenticeship programs for youth receiving SSI (unless the intermediary exclusively serves SSI beneficiaries).¹⁰ This may prove difficult in practice because of statutory restrictions on SSA data sharing.

An alternative to matching apprenticeship records and SSA records is collecting new data from grantees in a system such as WIPS. Beginning in January 2021, performance data for all DOL-funded apprenticeship grants will be reported in WIPS. WIPS data include information on program participants' disability status, which should be reported accurately by grantee intermediaries that are developing inclusive apprenticeship programs for youth receiving SSI.

Program-level success could also be measured by aggregate outcomes for apprentices, including the completion rate of apprentices with disabilities and youth apprentices who are receiving SSI. Programs should also be assessed on their success in addressing racial inequalities in the

¹⁰ Although they are not publicly released, DOL does hold Social Security numbers for apprentices who report them in the RAPIDS system.

identification of youth with disabilities and the provision of services to youth from communities of color. Research suggests that disability status is underreported for students of color (Elder and others 2019; Morgan and others 2017), and this problem is likely to persist in apprenticeship. Apprenticeship intermediaries for youth receiving SSI should closely monitor the apprenticeship programs with which they partner to ensure disability status is appropriately reported for all apprentices.

Apprentice-level success could be measured using either RAPIDS data on apprentice outcomes or WIPS data, if intermediary grantees are required to submit data to WIPS. RAPIDS includes data on in-program wage growth and program completion for apprentices. However, RAPIDS does not provide information on the postprogram experiences of apprentices. Post-apprenticeship wage growth, employment retention, and career progression are essential outcomes for apprentices. To track these outcomes, RAPIDS data on youth apprentices who are receiving SSI and youth apprentices with disabilities would have to be linked to other administrative wage records. WIPS performance measures include postcompletion wage records.

In addition to the standard success metrics for registered apprenticeship (expansion of apprenticeship, completion, wage growth, and so on), policymakers will be interested in other outcomes for youth apprentices and youth receiving SSI, including high school completion, postsecondary enrollment and completion, self-sufficiency, and reduced dependence on public benefits, most of which would need to be accessed at the state level. None of these outcomes are currently collected in administrative data for the registered apprenticeship system and would require additional data linking across federal agencies.

Although the expansion of apprenticeship programs for youth receiving SSI and the performance of individual apprentices are the key metrics of success for a new apprenticeship infrastructure for youth receiving SSI, several other types of assessment are also critical.

- **Net social benefit studies and return-on-investment analysis of apprenticeship programs for youth receiving SSI:** We currently know little about the return on investment that employers or society can expect from apprenticeship programs, and we know nothing about the return on investment associated with youth apprentices or apprentices with disabilities. Helper and others (2016) suggested that registered apprenticeship has a positive return on investment for employers, and efforts are underway to assess employers' net benefits in South Carolina's registered apprenticeship system and from the American Apprenticeship Initiative grants. But employers will still be interested in the payoff associated with employing youth apprentices with disabilities (Luecking and Mooney 2002). Even if a rigorous study identifies weaker employer return on investment associated with programs for youth receiving SSI, perhaps due to higher supportive services costs, it could help guide policymakers in understanding how to subsidize these programs to support youth receiving SSI.
- **Impact and implementation evaluation efforts:** In addition to tracking outcomes for youth apprentices who are receiving SSI and apprenticeship programs for youth receiving SSI, success should be measured using rigorous impact and implementation evaluations, which are standard for other employment and training programs. Impact evaluations will help policymakers

understand what improvements in apprentice outcomes are attributable to the apprenticeship program for youth receiving SSI. Implementation evaluations will help policymakers and practitioners understand how programs were structured, what obstacles were experienced, and how those obstacles were overcome.

Youth apprenticeship programs are relatively new in the United States, and employers and schools are still testing new models of youth apprenticeship. Sponsors have even less experience with apprenticeship programs to support people with disabilities, and none with programs that fully implement the apprenticeship model for youth receiving SSI discussed here. It may be appropriate to initiate a grant program before launching a major research and evaluation effort. A competitive grant program would allow for testing multiple differing, but related, intermediary models and assessing the strengths and weaknesses of different approaches. Although an apprenticeship program for youth receiving SSI could benefit from the experiences of the AIM pilot, the two efforts would be distinct. AIM apprenticeships are not youth apprenticeships, and they do not incorporate the same work incentives and rule waivers envisioned for the apprenticeships for youth receiving SSI.

V. Conclusion

Youth apprenticeship provides a promising solution to the challenges faced by youth receiving SSI and youth with disabilities during the transition to adulthood. The evaluation literature on apprenticeship has found that apprenticeship has large, positive impacts on participants' earnings and employment. Youth apprenticeships tie education and training to a post-high school job so that there is no gap between school and work for youth to fall off track. Because youth apprenticeship is a highly coordinated partnership among a sponsor or employer, a high school, a postsecondary education and training provider, and other supporting partners, it is also an ideal framework for coordinating and ensuring the continuity of benefits for youth receiving SSI. By coordinating benefits and providing structured training and mobility, much like the YTD programs, apprenticeship intermediaries and grantees for youth receiving SSI in the proposed grant program can support youth apprentices who are receiving SSI in obtaining work incentives. Intermediaries could approach SSA about potential strategies to avoid offsets to benefits that would penalize participation in apprenticeship and other employment, although SSA may not be in a position to support such an effort in the way that it supported the YTD pilots. Because these approaches to serving youth receiving SSI are new, and the evidence base on youth apprenticeship is smaller than the evidence base on registered apprenticeship generally, it is essential to closely measure and monitor success and, eventually, to rigorously evaluate the apprenticeship approach for youth receiving SSI. Much of this evaluation work can be done with routinely collected administrative data on apprenticeship programs, although certain research questions may require partnerships among DOL, SSA, and other agencies.

References

- CareerWise Colorado. 2019. “2019 Apprenticeship Program Cohort Agreement.” Accessed September 24, 2020. <https://www.careerwisecolorado.org/wp-content/uploads/2018/08/2019-CareerWise-Business-Partner-MOU-.pdf>.
- Docto, Caleb van, Vinz Koller, and Caitlin Grey. Forthcoming. *Using Universal Design for Learning in Apprenticeship*. Oakland, CA: Social Policy Research Associates, Inc.
- DOL (U.S. Department of Labor). 2016. “Apprenticeship Programs; Equal Employment Opportunity.” *Federal Register* 81, no. 243 (December 19): 92026.
- DOL (U.S. Department of Labor). 2020. “U.S. Department of Labor Announces over \$42 Million in Youth Apprenticeship Readiness Grant Awards to Increase Youth Participation in Registered Apprenticeships.” News Release 20-1274-NAT. <https://www.dol.gov/newsroom/releases/eta/eta20200630-1>.
- DOL (U.S. Department of Labor). n.d. “Equal Opportunity in Apprenticeship for People with Disabilities.” ApprenticeshipUSA FactSheet. Accessed October 28, 2020. https://www.doleta.gov/oa/eoo/assets-eoo/pdf/Disabilities_Fact_Sheet.pdf.
- Duggan, Mark, Melissa S. Kearney, and Stephanie Rennane. 2015. “The Supplemental Security Income Program.” In *Economics of Means-Tested Transfer Programs in the United States*, vol. 2, edited by Robert A. Moffitt, 1–58. Chicago, IL: University of Chicago Press.
- Elder, Todd, David Figlio, Scott Imberman, and Claudia Persico. 2019. *School Segregation and Racial Gaps in Special Education Identification*. Working Paper 25829. Cambridge, MA: National Bureau of Economic Research.
- Fraker, Thomas, Arif Mamun, Todd Honeycutt, Allison Thompkins, and Erin J. Valentine. 2014. *Final Report on the Youth Transition Demonstration Evaluation*. Washington, DC: Mathematica Policy Research.
- Government Accountability Office. 2017. *Supplemental Security Income: SSA Could Strengthen Its Efforts to Encourage Employment for Transition-Age Youth*. GAO-17-485. Washington, DC: Government Accountability Office.
- Hamilton, Stephen F. 1990. *Apprenticeship for Adulthood. Preparing Youth for the Future*. New York, NY: Free Press.
- Helper, Susan, Ryan Noonan, Jessica R. Nicholson, and David Langdon. 2016. *The Benefits and Costs of Apprenticeships: A Business Perspective*. Washington, DC: U.S. Department of Commerce.
- Hollenbeck, Kevin and Wei-Jang Huang. 2016. *Net Impact and Benefit-Cost Estimates of the Workforce Development System in Washington State*. Upjohn Institute Technical Report No. 16-033. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Jacoby, Tamar, and Robert I. Lerman. 2019. *Industry-Driven Apprenticeship: What Works, What’s Needed*. Washington, DC: Opportunity America.

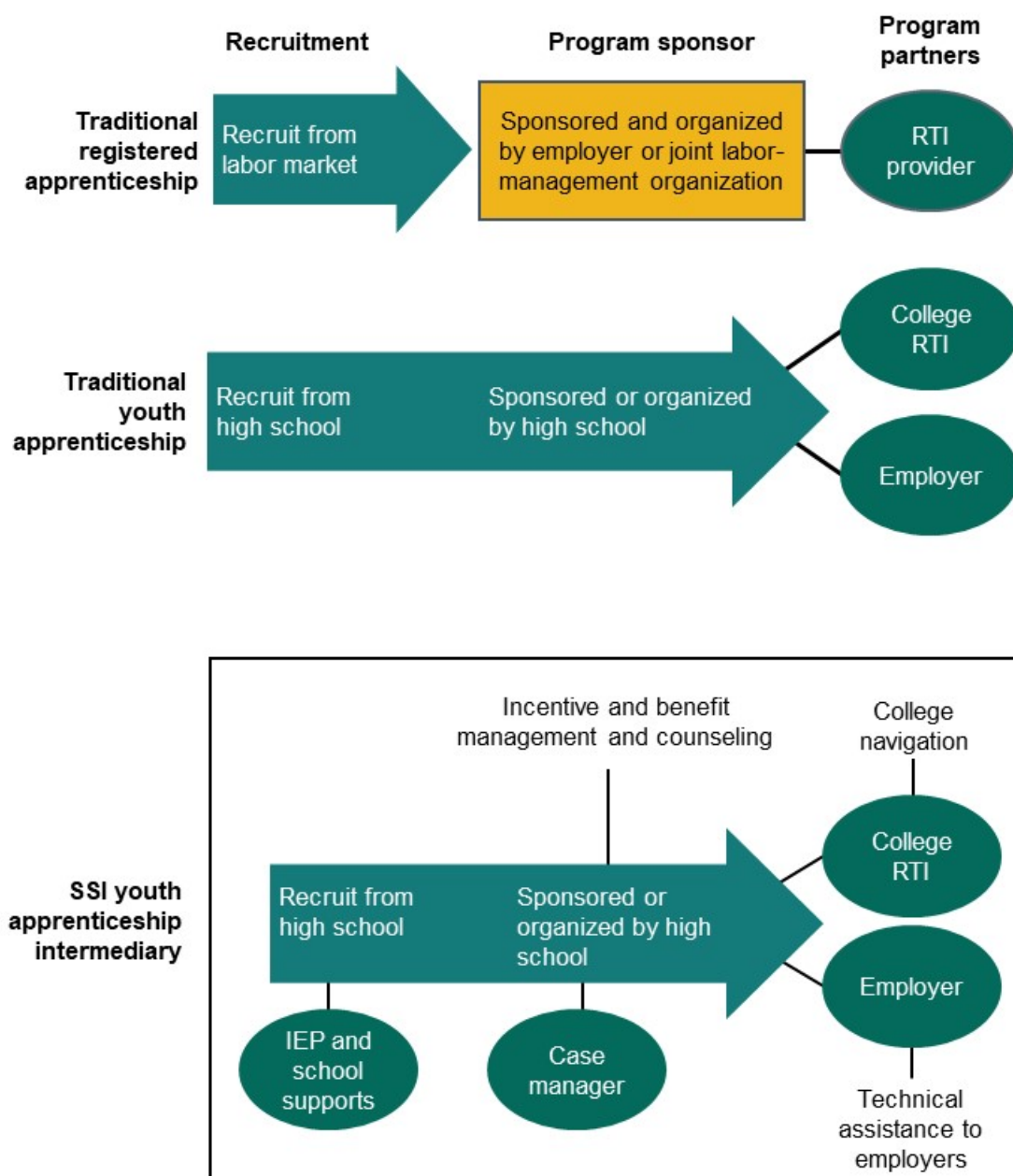
- Karas, Andrew, and Robert I. Lerman. 2016. *Implementing Financial Education in Youth Apprenticeship Programs: An Exploratory Study*. Washington DC: The Urban Institute.
- Katz, Batia, and Diana Elliott. 2020. *CareerWise: Case Study of a Youth Apprenticeship Intermediary*. Washington, DC: The Urban Institute.
- Kaye, H. Stephen. 2009. “Stuck at the Bottom Rung: Occupational Characteristics of Workers with Disabilities.” *Journal of Occupational Rehabilitation* 19, no. 2: article 115.
<https://doi.org/10.1007/s10926-009-9175-2>.
- Kaye, H. Stephen. 2010. “The Impact of the 2007–09 Recession on Workers with Disabilities.” *Monthly Labor Review* 133, no. 10: 19–30.
- Kuehn, Daniel. 2019. “Registered Apprenticeship and Career Advancement for Low-Wage Service Workers.” *Economic Development Quarterly* 33, no. 2: 134–150.
- Lerman, Robert I. 2003. “Is the School-to-Work Movement on the Right Track?” In *The School-to-Work Movement: Origins and Destinations*, edited by William J. Stull and Nicholas M. Sanders, 221–238. Westport, CT: Praeger Publishers.
- Lerman, Robert I., and Daniel Kuehn. Forthcoming. *Assessment of National Industry Intermediaries’ and National Equity Partners’ Efforts to Expand Apprenticeship Opportunities*. Washington, DC: U.S. Department of Labor, Employment and Training Administration, Office of Policy Development and Research.
- Lerman, Robert I., Daniel Kuehn, and Jessica Shakesprere. 2019. *Youth Apprenticeships in Georgia: Experiences and Recommendations*. Washington, DC: The Urban Institute.
- Lindsay, Sally, Carolyn McDougall, and Robyn Sanford. 2013. “Disclosure, Accommodations and Self-Care at Work among Adolescents with Disabilities.” *Disability and Rehabilitation* 35, no. 26: 2227–2236.
- Luecking, Richard G., and Marianne Mooney. 2002. “Tapping Employment Opportunities for Youth with Disabilities by Engaging Effectively with Employers.” *NCSET Research to Practice Brief* 1, no. 3 (December).
- Lynn, Irene, and Dominique Mack. 2008. *Improving Transition Outcomes of Youth with Disabilities by Increasing Access to Apprenticeship Opportunities*. Washington, D.C. Institute for Educational Leadership and HeiTech Services, Inc.
- Mack, Melissa, Leela Hebbbar, and Jessie Oettinger. Forthcoming. *Connecting Ticket to Work and Apprenticeship*. Oakland, CA. Social Policy Research Associates, Inc.
- Marotta, John, Zach Boren, and Mica San Miguel. 2020. *Iowa High School Apprenticeships: Creating Pathways to Promising Careers*. Washington DC: The Urban Institute.
- Morgan, Paul, George Farkas, Marianne Hillemeier, and Steve Maczuga. 2017. “Replicated Evidence of Racial and Ethnic Disparities in Disability Identification in U.S. Schools.” *Educational Researcher* 46, no. 6: 305–322.
- National Center for Education Statistics. 2019. *Digest of Education Statistics, 2018*. NCES 2020-009. Washington, DC: U.S. Department of Education.

- O'Day, Bonnie, Hannah Burak, Kathleen Feeney, Elizabeth Kelley, Frank Martin, Gina Freeman, Grace Lim, and Katie Morrison. 2016. *Employment Experiences of Young Adults and High Earners Who Receive Social Security Disability Benefits: Findings from Semi-structured Interviews*. Washington, DC: Mathematica Policy Research.
- Parton, Brent. 2017. *Youth Apprenticeship in America Today: Connecting High School Students to Apprenticeship*. Washington, DC: New America Foundation.
- Reed, Debbie, Albert Y.-H. Liu, Rebecca Kleinman, Annalisa Mastri, Davin Reed, Samina Sattar, and Jessica Ziegler. 2012. *An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in Ten States*. Oakland, CA: Mathematica Policy Research.
- Rolland, Keith L. 2016. "Intermediaries Play Key Role in Expanding Apprenticeships." Federal Reserve Bank of Philadelphia. *Cascade* 90 (Summer 2016).
- Silverstein, Robert, and Katia Albanese. 2019. "Disability Inclusion in Apprenticeship Programs." In *Skilling Up: The Scope of Modern Apprenticeship*, edited by Ervin Dimney, Deborah Williamson, Lisa Yates, David Hinson, 174–188. Washington, DC: The Urban Institute.
- Social Policy Research Associates. 2020. "Apprenticeship Inclusion Models (AIM): Expanding Career Pathways for People with Disabilities." Social Policy Research Associates (website). Accessed September 24, 2020. <https://www.spra.com/aim/>.
- SSA (Social Security Administration). 2018. *National Beneficiary Survey: Disability Statistics, 2018*. Washington, DC: Social Security Administration.
- SSA (Social Security Administration). 2020. *DI and SSI Program Participants: Characteristics and Employment, 2015*. Washington, DC: Social Security Administration.

Appendix

Apprenticeship program model examples

Figure A.1. Partners and functions in three apprenticeship program models



Note: IEP = individualized education program; RTI = related technical instruction; SSI = Social Security Income.