RESEARCH REPORT

Understanding the Capacity of State Apprenticeship Systems

Apprenticeship Evidence-Building Portfolio

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Executive Summary

Apprenticeship is a type of "earn and learn" model that combines classroom learning (often called related technical instruction) with on-the-job learning and a credential upon completion. State-level agencies support the system within which apprenticeship programs exist, with employers, industry and workforce intermediaries, and education and training providers also playing key roles. In recent years, the federal government has focused on expanding the American apprenticeship system. But compared with other countries, apprenticeship in the US is still not a widely used system for most of the workforce. Lerman (2014) estimates that apprenticeships account for 3.7 percent of the total labor force in Australia, 3.9 percent in Germany, 2.7 percent in the United Kingdom, 2.2 percent in Canada, and 1.7 percent in France, but only 0.3 percent in the United States.

The **State Apprenticeship Systems Capacity Assessment** study will conduct a deep dive into state-level Registered Apprenticeship systems in the United States, specifically exploring ways that the public sector and its key partners support and implement Registered Apprenticeship programs with a lens toward more inclusive and equitable strategies and models. This report is the first in a series of publications based on study findings and provides an overview of federal support for state apprenticeship systems, as well as variation of systems across states in key characteristics. These characteristics include

- differences across State Apprenticeship Agency (SAA) and U.S. Department of Labor (DOL) Office of Apprenticeship (OA) states in registration of apprenticeship and pre-apprenticeship programs;

- strategies for recruiting employers;

- recruitment, placement, and retention of diverse apprentices;

- approaches to expanding apprenticeship in rural areas, and opioid-related strategies;

- the role of financial incentives in expanding apprenticeship;

- the costs of state support for apprentices and the role of federal grants;

- implications of COVID-19 for apprenticeship systems and strategies; and

- measuring state apprenticeship expansion and success: data infrastructure and performance.

To inform this report, we scanned available apprenticeship data, as well as literature and insights from recent studies (conducted within the past four years). In 2023, we will collect additional information on these topics through interviews with key staff and partners from a subset of states to deepen understanding of state apprenticeship system capacity. This report will be used in the selection of those states for further data collection.

Key Findings

Registration Type (SAA versus OA)

One of the most significant ways that state apprenticeship systems vary is in how programs are registered. SAAs register apprenticeship programs in 29 states and territories. These states tend to have more control over the registration process and standards for programs they support (Sattar et al. 2020). OA directly oversees the registration of apprenticeship programs in 25 states and territories. These states are integrated with federal reporting systems for apprenticeship and leverage the support of OA state directors and staff for apprenticeship registration (Sattar et al. 2020).

Strategies for Recruiting Employers

Employer engagement is often critical to the success of apprenticeship programs, as on-the-job learning can drive the design of a program (Sattar et al. 2020). In a 2020 survey of state apprenticeship administrators, three of the four top major barriers (out of 14 listed barriers) to Registered Apprenticeship expansion were related to employer engagement (Rosenberg and Dunn 2020). States that received federal State Apprenticeship Expansion grants implemented a variety of approaches to directly engage employers to help address these barriers; these approaches include hosting convenings to bolster recruitment, providing one-on-one interaction with employers to facilitate program development and increase buy-in, and focusing efforts on directly addressing employer misconceptions through outreach (Sattar et al. 2020).

As another strategy, states can engage intermediaries that can serve as apprenticeship program sponsors; take responsibility for the overall operation of the program; and play an important role in identifying career pathways, assisting with program implementation, and collecting employer feedback on the performance of workers completing training (Sattar et al. 2020).

Recruitment, Placement, and Retention of Diverse Apprentices

The diversity in the apprentice population in a state could serve as a proxy to identify states using effective strategies to increase underrepresented populations' access to apprenticeship. Although the high percentage of missing data in the Registered Apprenticeship Partners Information Data System, or RAPIDS (including many participants' refusal to identify their race) complicates an analysis of racial diversity, the racial and gender diversity of apprentices has not changed a great deal nationally from 2015 to 2019, based on the data available.

Similarly, despite continued investment in youth apprenticeship programs (Katz and Elliott 2020), the percentage of youth apprentices in the 2019 RAPIDS data (36) was consistent with the percentage in the 2015 RAPIDS data (36), though the number of youth apprentices did increase by more than 50,000 in that time.

Race and Gender of Registered Apprentices in 2015 and 2019

Race and gender categories	2015	2019
White	63%	60%
People of color	18%	17%
Race data missing or refused to answer	20%	22%
Male	94%	91%
Female	6%	9%

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data for 2015 and 2019.

Note: The 2015 analysis includes 40 states, and the 2019 analysis includes 41 states (Guam is excluded in both analyses). The percentage of missing race data or "refused to answer" within each state ranges from 0 to 37 percent in 2019 and from 0 to 44 percent in 2015.

Approaches to Expanding Apprenticeship in Rural Areas, and Opioid-Related Strategies

Data from the scan indicated that some states focused apprenticeship expansion in rural areas on increasing the supply of health care workers, as well as closing skill gaps in the health care industry. In addition to federal support through the H-1B Rural Healthcare Grant Program, states such as Alaska and Washington added health care–focused apprenticeship programs aimed at rural communities.

In addition to a focus on rural areas, states such as Alaska, Rhode Island, and New Jersey have also sought ways to address the opioid crisis through economic policies, such as the use of federal and state grants to establish targeted apprenticeship programs, including those for community health workers, as well as the use of Certified Alcohol and Drug Counselors.

The Role of Financial Incentives in Expanding Apprenticeship

Employer costs associated with apprenticeship include tuition, apprentice wages, and wages for staff supporting apprentices. The cost for employers may vary widely. According to a 2016 report by the U.S. Department of Commerce and Case Western Reserve University, the most expensive program is estimated to cost employers $250,000 per apprentice; the least expensive program is estimated to cost less than $25,000 per apprentice (Helper et al. 2016).

To help offset these costs, some states provide employers with financial incentives, such as tax credits or exemptions for employers with active apprentices in a Registered Apprenticeship program. The 2020 State Apprenticeship Survey indicated that financial incentives for employers were relatively common (Rosenberg and Dunn 2020). Administrators from about 21 percent of states reported the availability of state wage subsidies, 80 percent of states reported funding workforce training and education, and 67 percent reported providing funding for apprenticeship-related technical instruction. Additionally, administrators from 37 percent of states reported the availability of tax credits for employers. These incentives were reported to be more widely available in SAA states than in OA states. Fifty percent of SAA states reported the availability of tax credits or other tax savings,

compared to only 23 percent of OA states. Similarly, 18 percent of SAA states reported the availability of local wage subsidies, compared to only 4 percent of OA states (Rosenberg and Dunn 2020).

The Costs of State Support for Apprentices and the Role of Federal Grants

Since 2016, DOL has invested more than $960 million in apprenticeship systems and programs through grants and contracts. DOL also oversees and funds state activities under the Workforce Innovation and Opportunity Act (WIOA), and WIOA was reported to be the most common source of financial support for states' Registered Apprenticeship efforts among the 37 State Apprenticeship Expansion grantees, including funding for individual training accounts and on-the-job learning (Sattar et al. 2020). Two main sources of federal guidance inform states' efforts to integrate Registered Apprenticeship into the public workforce system: (1) WIOA legislation that allowed WIOA funds to support Registered Apprenticeships (Sattar et al. 2020) and (2) DOL guidance that emphasized "leveraging Registered Apprenticeship as a workforce strategy" (U.S. Department of Labor 2017).

Implications of the COVID-19 Pandemic for Apprenticeship Systems and Strategies

Because all public and private sectors have been affected by the COVID-19 pandemic, state apprenticeship programs also face challenges. In response to closures and stay at home orders, states such as South Carolina moved to virtual learning platforms. To address economic challenges caused by the pandemic, other states developed programs like Iowa's Coronavirus Relief Fund, which is designed to increase apprenticeship opportunities in areas hit hardest by the pandemic, including opportunities for youth, small businesses, and nonprofits.

Measuring State Apprenticeship Expansion and Success: Data Infrastructure and Performance

Although tracking outcomes data such as retention, diversity, wages, and attainment allows for ongoing program improvement, these data are not consistently tracked across states. In the 2020 survey of state apprenticeship administrators, 10 states reported tracking apprenticeship outcomes. Further sources of information on performance tracking approaches across state systems was not identified in the scan.

Next Steps

To further explore how specific states are making progress in these and other areas of interest described in the report, the State Apprenticeship Systems Capacity Assessment study team will select a subset of states for further data collection and analysis. This analysis will produce a series of briefs providing more in-depth information on state system structures, key partnerships, and ways that states continue to strengthen Registered Apprenticeship in support of a diverse and skilled workforce.

Introduction

This report sets the stage for a series of briefs that will be published under the ***State Apprenticeship Systems Capacity Assessment*** study.[1] The study will conduct a deep dive into state-level Registered Apprenticeship systems in the United States, exploring how the public sector and its partners are supporting and implementing Registered Apprenticeship programs, including the use of more inclusive and equitable strategies and models. Box 1 defines state apprenticeship systems as they are presented in this report. This introductory report provides an overview of federal support for state apprenticeship systems and discusses variation across states in terms of system characteristics and efforts to support apprenticeship as a viable workforce strategy. Based on the variation discussed here, the study team will collect additional data from selected states on a range of topics related to strengthening state Registered Apprenticeship systems; these data will be presented in a series of briefs.

Box 1: What is a State Apprenticeship System?

For the purpose of this study, a state apprenticeship system is defined as the state and local workforce agencies and their partners that work to prepare people for, or support people in, apprenticeship programs in their state or local area; agencies and partners that work to develop those opportunities; and activities those agencies and partners carry out for those purposes. Partners can include the public sector, nonprofits, employers, local industry, and trade organizations, as well as education and training providers.

Source: Adapted from Eyster and colleagues' (2016) definition of apprenticeship system.

Focus of the Report

This report on the capacity of state apprenticeship systems provides an initial understanding of how states have been expanding apprenticeship with and without federal support. The report is organized by a set of topics related to state apprenticeship system structures, partnerships, and strategies. The topics include the following:

- differences across State Apprenticeship Agency (SAA) and U.S. Department of Labor (DOL) Office of Apprenticeship (OA) states in registration of apprenticeship and pre-apprenticeship programs

- strategies for recruiting employers

- recruitment, placement, and retention of diverse apprentices

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[1]   The Chief Evaluation Office (CEO) within the U.S. Department of Labor (DOL), in collaboration with DOL's Office of Apprenticeship (OA) and Office of Policy Development and Research (OPDR), commissioned this study, which is being led by the Urban Institute in partnership with Mathematica. Study data collection is expected to take place in 2023, with periodic briefs released beginning in late 2023.

- approaches to expanding apprenticeship in rural areas, and opioid-related strategies
- the role of financial incentives in expanding apprenticeship
- the costs of state support for apprentices and the role of federal grants
- implications of COVID-19 for apprenticeship systems and strategies
- measuring state apprenticeship expansion and success: data infrastructure and performance

The study team scanned available apprenticeship data and literature and reviewed insights from prior studies (conducted within the past four years), which provided useful context for examining how state apprenticeship systems may vary across these topics, as well as identifying state-specific challenges and successes to explore in further study.

In 2023, the study team will collect information from a subset of states to provide a more detailed picture of the capacity of state apprenticeship systems to develop and implement apprenticeship programs. This initial scan will inform the selection of states for further study; within those states, the team will conduct interviews with state officials, local organizations leading apprenticeship expansion efforts, and state and local apprenticeship partners to gather more in-depth information on state approaches. Findings from those interviews will be presented in the series of briefs, with the goal of providing policymakers and practitioners at the federal, state, and local levels with a better understanding of state apprenticeship systems, system typologies, and apprenticeship expansion strategies that are potentially promising for replication.

Background on Apprenticeship

Apprenticeship is a type of "earn and learn" model that combines classroom learning (often called related technical instruction) with on-the-job learning and a credential upon completion. State-level agencies support the system within which apprenticeship programs exist, with employers, industry and workforce intermediaries, and education and training providers also playing key roles in the system. Employers typically sponsor apprenticeship programs; provide work-based learning opportunities; and supply participants with jobs, ensuring that education and training offerings align with labor market needs. Industry and other intermediaries are involved in bringing employers together, informing program design, identifying the necessary skills and credentials, and assisting with program implementation. Community and technical colleges are critical partners in developing and delivering training and granting credentials to apprenticeship participants.

Registered Apprenticeship programs are a type of apprenticeship program operated across 54 states and territories[2]; the programs are registered by either DOL's OA or a recognized SAA (figure 1). Not all states operate an SAA. If a state elects to establish an SAA, the state must apply to DOL, demonstrating that its standards for registration align with federal apprenticeship standards (Collins

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[2] Registered Apprenticeship programs operate in all 50 states, Washington DC, Puerto Rico, the U.S. Virgin Islands, and Guam.

2019). These standards[3] include elements such as having a written program plan, addressing training in a skilled occupation, measuring completion through a time and/or competency requirement, and providing instruction in technical subjects related to the occupation. Recognition as an SAA is reviewed every five years. Currently, DOL's OA directly oversees the registration of apprenticeship programs in 25 states and territories, and SAAs register apprenticeship programs in 29 states and territories.[4]

Apprenticeship Program Types and Registration of Apprenticeships in the United States

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                                      ┌──────────────────────┐
                                      │ Registered by U.S.    │
                                      │ Department of Labor   │
                                      │ Office of             │
                                      │ Apprenticeship        │
                                      └──────────────────────┘
                ┌────────────────────┐
                │ Registered          │
                │ Apprenticeship      │
                └────────────────────┘
                                      ┌──────────────────────┐
┌──────────────┐                      │ Registered by State   │
│ Apprenticeship│                     │ Apprenticeship        │
└──────────────┘                      │ Agencies              │
                ┌────────────────────┐└──────────────────────┘
                │ Unregistered        │
                │ apprenticeship      │
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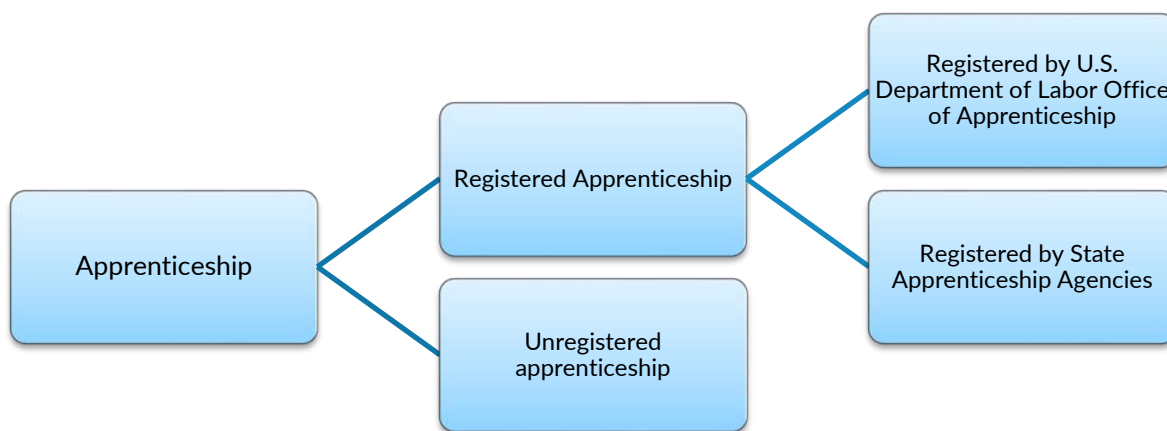
Source: Created by authors.

As discussed in the "Federal Support for State Apprenticeship Systems" section of this report, the federal government has focused on developing the American apprenticeship landscape in recent years. However, in comparison to adoption rates in other countries, apprenticeship is still not a widely used option for most of the U.S. workforce. Lerman (2014) estimates that apprenticeships account for 3.7 percent of the total labor force in Australia, 3.9 percent in Germany, 2.7 percent in the United Kingdom, 2.2 percent in Canada, and 1.7 percent in France, but only 0.3 percent in the United States. Lerman, Kuehn, and Shakeprere (2019) noted that the observed gap between U.S. and global apprenticeship use is related to the strong U.S. focus on academic attainment as it relates to degrees and performance on standardized tests, which has led to increased spending on postsecondary education rather than vocational training (Lerner 2018).

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[3] The standards are defined in 29 CFR 29.

[4] See appendix A for registration status in each state/territory.

Data Sources for the Environmental Scan

This report refers to several data sources that we included in the scan for information on state apprenticeship systems, including the following:

- **DOL's Registered Apprenticeship Partners Information Data System (RAPIDS)**. RAPIDS data, which are referred to throughout this report, cover fiscal years (FYs) 2015, 2019, and the first three quarters of 2020.[5] The report does not present data for each of the years between 2015 and 2020, as only relatively small incremental changes were observed from 2016 to 2018. RAPIDS data tables include records on apprentices in registered programs, including characteristics such as apprentice age, race, and veteran status, and program occupation and industry. Throughout the report, the study team makes reference to changes in the data between the 2015 and 2019 datasets. The comparison was not made for 2020, as RAPIDS did not have the full year of program data at the time of the drafting of this report. Additionally, the COVID-19 pandemic may have delayed state-level reporting, further limiting the data accessible at that time. It should be noted that the number of states included in RAPIDS varies slightly each year (2020: 39 states and territories, including Guam; 2019: 42 states and territories, including Guam and the District of Columbia; 2015: 41 states and territories, including Guam).[6] All 25 OA states are included in RAPIDS data in each of the three cited years, but several SAA states do not report their data to RAPIDS and thus are not included. Thus, the analysis of RAPIDS data does not reflect the entire Registered Apprenticeship system, but it does account for a majority of states and provides helpful context.[7]

- **2020 State Apprenticeship Survey**. In early 2020, state apprenticeship administrators participated in a DOL-sponsored, online survey to document their efforts to support the expansion of apprenticeship programs and learn about their challenges and needs for technical assistance to further expand apprenticeships (Rosenberg and Dunn 2020). Fifty-three states and territories completed the survey, for a response rate of 93 percent.[8]

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[5] While RAPIDS data are available dating back to 2000, we chose to focus on the most recent data available (for 2020), the latest full year of data (2019), and a prior year (2015) for comparison.

[6] States and territories included in the RAPIDS data in 2020, 2019, and 2015 are referred to as "states" hereafter.

[7] In 2015, there were a total of 41 states and territories (including Guam and DC) included in RAPIDS data. The SAA states excluded from the RAPIDS database in 2015 are Connecticut, Delaware, Massachusetts, Minnesota, New Mexico, New York, North Carolina, Oregon, Vermont, Washington, and Wisconsin. In 2019, there were a total of 42 states and territories (including Guam and DC) included in RAPIDS data. The SAA states excluded from the RAPIDS database in 2019 are Connecticut, Massachusetts, Minnesota, New Mexico, New York, North Carolina, Oregon, Vermont, Washington, and Wisconsin. In 2020, there were a total of 39 states and territories (including Guam) included in RAPIDS data. The SAA states excluded from the RAPIDS database in 2020 are Connecticut, Delaware, Massachusetts, Minnesota, New Mexico, New York, North Carolina, Oregon, Vermont, Virginina, Washington, Wisconsin, and DC.

[8] Territories represented in the survey data include American Samoa, the Commonwealth of the Northern Mariana Islands, District of Columbia, Guam, Palau, and Puerto Rico. The states and territories that did not complete the survey were Louisiana, New Jersey, Tennessee, and the Virgin Islands; any data in this report that refer to the 2020 state survey exclude these states.

- **State Apprenticeship Expansion (SAE) Grant Study**. The study team incorporated findings into this report from a recent study for DOL of grant activities across 37 states and territories that received SAE grants, including an analysis of grant applications, grantee quarterly performance reports, and interviews with grantee representatives (Sattar et al. 2020). The SAE study used these data to document the approaches used, and assess grantee and contractor stated lessons learned and progress toward the two main objectives of DOL's apprenticeship investments: expanding and diversifying apprenticeships. Data collection for this study took place in early 2020.

- **Existing literature on relevant topics**. The study team conducted keyword searches across academic journals, the DOL website, and websites of other relevant organizations for additional literature on topic areas. During searches, the study team included sources published since 2014 to focus on more recent literature.

Findings from the Scan of State Apprenticeship Systems

The remainder of the report is organized by the topic areas of interest identified in the introduction. Within each topic, we discuss the findings from the scan of literature on apprenticeship systems, available RAPIDS data, and prior studies of state apprenticeship efforts.

Differences across SAA and OA States in Registration of Apprenticeship and Pre-apprenticeship Programs

Box 2: What Is a Pre-apprenticeship Program?
Pre-apprenticeship programs are designed to prepare individuals to enter Registered Apprenticeship programs. These programs may range in duration from a few weeks to months and may include wages or stipends. **Source**: Apprenticeship.gov (2022).

One of the most significant ways in which state apprenticeship systems vary is in how programs are registered:

- **SAAs** register apprenticeship programs in 29 states and territories. These states tend to have more control over the registration process and standards for programs they support (Sattar et al. 2020).

- **OA** directly oversees the registration of apprenticeship programs in 25 states and territories. These states are integrated with federal reporting systems for apprenticeship and leverage the support of OA state directors and staff for apprenticeship registration (Sattar et al. 2020).

Our scan was not able to identify a body of research on how the registration processes differ or the implications of these differences for how apprenticeship or pre-apprenticeship is implemented across OA and SAA states. However, three of the four states with the largest apprentice populations are OA states, based on RAPIDS data from 2019. The states with the largest reported numbers of apprentices were California (83,726), South Carolina (27,065), Ohio (26,515), and Michigan (25,654). Ohio is an SAA state. Appendix A includes total apprentice counts by state in 2019.

The number of apprentices has been increasing across OA and SAA states. In 2019, among the states that reported in RAPIDS, there were 445,855 registered apprentices, which is 152,979 more than in 2015. In 2015, only one state reported more than 20,000 registered apprentices (California,

with 52,248), compared with nine states in 2019.[9] Table 1 provides data on the state share of registered apprenticeship systems by program size across 2015 and 2019, highlighting the growth in the number of large states (more than 20,000 apprentices) across those time periods.

State Share of Registered Apprenticeship Systems in 2015 and 2019, by Size (Number of Apprentices)

State size (number of apprentices)	Fiscal year 2015	Fiscal year 2019
Small states (fewer than 4,000 apprentices)	19 (46%)	16 (38%)
Medium states (4,000–19,999 apprentices)	21 (51%)	17 (40%)
Large states (20,000 or more apprentices)	1 (3%)	9 (22%)
Total number of apprentices	**292,876**	**445,855**

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data.
Note: The 2015 data include 41 states, and the 2019 data include 42 states.

As of Q3, for states reporting in RAPIDS, there were a total of 113,900 registered apprentices in FY 2020, with only California reporting more than 20,000 apprentices (23,177). The states with the next-largest numbers of apprentices are South Carolina (11,791), Pennsylvania (6,658), and Michigan (6,557). Pennsylvania is an SAA state. Although states reported over 300,000 more registered apprentices in RAPIDS in all of 2019 than in the first three quarters of 2020, it is important to note that the difference may reflect the COVID-19 pandemic's impact on Registered Apprenticeship across the country from March 2020 onward.

These data do not provide conclusive evidence as to whether program registration type influences the size of the apprentice population in a state. In our scan of data across other topics in the report, we highlight where registration type may be related to differences in state efforts in other areas to provide context for further exploration.

Strategies for Recruiting Employers

Employer engagement is often critical to the success of apprenticeship programs, because on-the-job learning can drive the design of a program (Sattar et al. 2020). States that face challenges with employer engagement may struggle to expand their apprenticeship programs. In a 2020 survey of state apprenticeship administrators, three of the four top major barriers (out of 14 listed barriers) to Registered Apprenticeship expansion were related to employer engagement (table 2). OA states reported employer engagement barriers—including lack of employer knowledge about apprenticeship (66.7 percent of OA states and 46.2 percent of SAA states) and employer concerns about

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[9] 2019 RAPIDS data include a total of 42 states (including Guam and DC), and 2015 RAPIDS data include a total of 41 states (including Guam and DC). The same states are included in RAPIDS data in 2015 and 2019, except for Delaware, which is excluded from 2015 RAPIDS data.

apprenticeship (54.2 percent of OA states and 40.0 percent of SAA states)—as major barriers more often than SAA states (Rosenberg and Dunn 2020).

TABLE 2

Top Major Barriers to Registered Apprenticeship Expansion, as Reported by Survey Respondents

Types of barriers	% of all states	% of SAA states	% of OA states
Lack of knowledge among employers about apprenticeship	52.8	46.2	66.7
The public's lack of understanding of how to enter the apprenticeship system	52.8	46.2	66.7
Employer concerns about apprenticeship	46.2	40.0	54.2
Lack of funding or capacity for marketing to employers or other potential sponsors	39.6	42.3	41.7
Challenge of recruiting qualified applicants	36.5	32.0	41.7
Lack of resources to support related technical instruction or wages	33.3	28.0	37.5
Lack of guidance or road maps for establishing apprenticeships	28.3	15.4	41.7
Challenge of collaboration between siloed agencies or divisions	26.4	23.1	29.2
Low state staff knowledge or capacity	25.0	20.0	29.2
Delays in registering programs with the federal or state apprenticeship entities	24.5	11.5	33.3
Lack of champions or leaders	24.5	23.1	29.2
Limited availability of data on apprenticeship	20.8	15.4	25.0
Lack of interest among training providers	19.2	12.0	25.0
Lack of communication with the federal Office of Apprenticeship	18.9	3.8	33.3

Source: 2020 State Apprenticeship Survey (Rosenberg and Dunn 2020).

Note: SAA= State Apprenticeship Agency OA= U.S. Department of Labor (DOL) Office of Apprenticeship. Total number of states = 53. Respondents were asked to rate each of the 14 barriers to expanding Registered Apprenticeship in their states as a major barrier, a minor barrier, or not a barrier.

Direct Engagement of Employers by States

States that received federal State Apprenticeship Expansion grants implemented a variety of approaches to directly engage employers to help address these barriers. Some of these approaches could be especially helpful in recruiting employers from nontraditional industries (industries other than the building trades; Sattar et al. 2020). Examples of these approaches include the following:

- Hosting convenings, such as employer forums, apprenticeship summits, industry meetings, or other events to bolster recruitment.

- Increasing state staff capacity to provide one-on-one interactions with employers to facilitate successful program development and improve employer buy-in. States with more capacity reported that staff could specialize in certain aspects of apprenticeship work, such as employer outreach, program development and registration, and apprentice support, which helped facilitate recruitment efforts.

- Directly addressing employer misconceptions through outreach events and one-on-one interactions. Employer misconceptions can sometimes hinder recruitment of employers and sponsors. Examples of these misconceptions include the beliefs that apprenticeship is strictly for building trades and unions, that apprenticeship is heavily regulated, and that

apprenticeship is too expensive for small businesses. States recommended tailoring information sharing to employers to directly address these misconceptions, such as by including testimonials from employers in nontraditional industries in marketing materials or on event panels.

Engaging Different Types of Intermediaries and Partners

Intermediaries are emerging with important roles in Registered Apprenticeships (Sattar et al. 2020) and youth apprenticeships (Education Strategy Group 2019), making state partnerships with intermediaries an important aspect to consider for further study. The partnerships are often a way to increase demand for Registered Apprenticeship, expand into new sectors, and bring diversity to and connect more underrepresented populations to apprenticeship.

Although there is no single model for or definition of intermediaries, they are often nonstate entities such as nonprofit organizations, community colleges, chambers of commerce, local workforce development boards, school districts and schools, or other organizations that work with employers to develop apprenticeship (Sattar et al. 2020). Joint labor-management organizations and industry and employer associations are also common intermediaries. Intermediaries act on behalf of, link, or mediate between apprentices and employers to convene and connect industry, education, and community-based partners; facilitate collaboration; and boost the capacity and expertise of other partners (Sattar et al. 2020; International Labour Organization 2019). Although a program may have multiple partners with varying types of involvement, intermediaries can serve as apprenticeship program sponsors; take responsibility for the overall operation of the program; and play an important role in identifying career pathways, assisting with program implementation, and collecting employer feedback on the performance of workers completing training (Sattar et al. 2020).

The types of entities that are active in apprenticeship in a state could be an important factor for system development; for example, certain types of entities may be better suited to establishing nontraditional apprenticeship programs or reaching new populations of potential apprentices. Based on the 2020 state administrator survey, entities considered major partners in the system vary widely across states (table 3). Box 3 discusses some examples of how different types of intermediaries support apprenticeship.

In the same survey, joint labor-management organizations were the most commonly reported type of sponsor across states in all apprenticeship occupations (45 percent of sponsors), but in occupations outside construction, they represented only 8 percent of reported sponsors across states (Rosenberg and Dunn 2020). Industry or professional associations represented 9 percent of sponsors reported in all occupations and 4 percent of sponsors in occupations outside construction. More than half of states surveyed (51 percent) reported that their top priority is to increase the number of sponsors for Registered Apprenticeships.

TABLE 3

Percentage of Survey Respondents That Perceived Intermediaries as Major or Minor Partners in Apprenticeship

Intermediary types	Major partners	Minor partners
Community colleges	75.5	17.0
Other state entities (such as state workforce boards)	69.2	26.9
Unions	66.7	21.6
Employer associations	63.5	28.8
Local workforce development boards	54.0	34.0
School districts or high schools	52.9	43.1
Professional associations	35.3	47.1
Other intermediaries	34.8	34.8

Source: 2020 State Apprenticeship Survey (Rosenberg and Dunn 2020).

Note: Total number of states = 53. The number of responses per item varies because of nonresponse.

Box 3: Examples of How States Work with Various Intermediaries

Unions. In Hawaii, unions have helped develop apprenticeship programs for women in construction and carpentry. In Michigan and Indiana, unions have offered support for training efforts and Registered Apprenticeship more generally (Sattar et al. 2020).

Employer/industry associations. Industry associations can offer pre-apprenticeship programs, as the Hotel and Restaurant Association and Contractors Association offer in Guam, and they can help develop related technical instruction, as the electrical trade industry has done in Montana. In South Carolina, the state partners with many associations that actively promote Registered Apprenticeship to partner firms (Sattar et al. 2020).

Many industry partners are members of health care systems. States reported that the key benefits of engaging health systems are that they can deliver scale and speed and follow a stackable credentials model (so apprentices can earn certificates that aggregate up to degrees) while offering career pathways that promote mobility (Sattar et al. 2020).

Community and technical colleges. Community and technical colleges often have broad reach in the community, and states reported them as typically having excellent partnerships with local employers and the ability to engage multiple employers as sponsors for one program. At the same time, they enroll and therefore can recruit many potential apprentices, and they are in the unique position of being able to gauge the interests and needs of the apprentice population (Sattar et al. 2020).

Local workforce development boards. In some states, the workforce development system provides direct service by helping to recruit and screen candidates, providing apprentices with case management and supportive services, and conducting outreach to employers (Sattar et al. 2020). In California, local workforce development boards receive the largest share of federal Workforce Innovation and Opportunity Act funds in the state and are active in expanding apprenticeships

through partnering with school districts and community colleges (Grow Apprenticeship California 2020).

K–12 schools and technical highs schools. Schools are another type of intermediary with close proximity to potential apprentices. In Connecticut, the state apprenticeship agency is working with the Connecticut Technical Education and Career System to operate a pre-apprenticeship aviation program. In Delaware, vocational and technical high schools provide related technical instruction for Registered Apprenticeship programs (Sattar et al. 2020).

Recruiting Employers in Nontraditional Industries

The 2020 State Apprenticeship Survey of apprenticeship administrators revealed that expanding apprenticeship in nontraditional industries or occupations, or industries that traditionally do not have a Registered Apprenticeship presence, was perceived as the top priority for 18 percent of states and the second priority for 30 percent of states that were asked to rank several items in order of perceived priority for their apprenticeship system (Rosenberg and Dunn 2020). Examples of key nontraditional industries in the United States include education, public administration, manufacturing, and transportation (table 4). Other countries have also moved beyond the traditional building trades and offer apprenticeships in less traditional occupations. In Switzerland, apprenticeship programs are available in health care, social work, the electrical industry, culinary arts, and information technology (State Secretariat for Education, Research and Innovation 2021). The United Kingdom includes industries such as business and administration; creative, media, and the arts; energy; health and well-being; hospitality and travel; customer service and retail; and public services in its apprenticeship programs (The Apprenticeship Guide 2020). Similarly, Germany has diverse apprenticeship program options for more than 300 occupations (Lerman 2014).

TABLE 4

Share of Registered Apprentices by Top Industries in the United States

Industries	No. of registered apprentices, 2015	No. of registered apprentices, 2019
Building trades	167,026 (57%)	236,209 (53%)
Education	49,258 (17%)	82,964 (19%)
Public administration	24,205 (8%)	33,020 (7%)
Manufacturing	20,868 (7%)	29,334 (7%)
Transportation	7,766 (3%)	17,547 (4%)
Total number of apprentices	**269,123 (92%)**	**399,074 (90%)**

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data.

Analyzing the share of apprentices in traditional versus nontraditional industries for apprenticeship in each state is one way to understand how states differ in their efforts to expand apprenticeships to new industries. For the purpose of our RAPIDS analysis below, nontraditional industries are defined as any industries that are not in the building trades. Among states that reported

in RAPIDS in 2019, 47 percent of apprentices (209,371) participated in nontraditional industries—an increase from 43 percent (125,580) in 2015 (table 5). In both 2015 and 2019, 13 states reported that more than 50 percent of their apprentices were in nontraditional industries. In 2019, 21 states had 25 to 49 percent of their apprentices in nontraditional programs, up from 15 states in 2015. State-by-state shares of apprentices in nontraditional industries in 2019 are provided in appendix A.[10]

TABLE 5

State Share of Registered Apprentices in Nontraditional Industries in 2015 and 2019

Percentage ranges	No. of states, 2015	No. of states, 2019
50 percent or more	13 (31%)	13 (31%)
25 to 49 percent	15 (37%)	21 (50%)
Less than 25 percent	13 (32%)	8 (19%)
Total number of apprentices	**125,580 (43%)**	**209,371 (47%)**

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data.
Note: The 2015 data include 41 states, and the 2019 data include 42 states. Nontraditional industries as defined in this table include any industry other than the building trades.

Recruitment, Placement, and Retention of Diverse Apprentices

Both the public and private sectors have paid attention recently to the importance of diversity in the U.S. workforce, and an Executive Order by the Biden Administration in January 2021 committed the administration to advancing equity across federal programs and policies (Executive Office of the President 2021). The State Apprenticeship Systems Capacity Assessment study will analyze how states are recruiting and retaining apprentices from diverse backgrounds and encouraging more diversity across the apprenticeship system. Diversity includes an emphasis on populations traditionally underrepresented in apprenticeship, such as people of color, women, and youth. Our scan examined data on the characteristics of apprentices across states, as well as what is known about how states promote diversity in apprenticeship and potentially promising practices for recruiting and placing individuals.

Diversity of Apprentices across States

The extent of diversity in the apprentice population in a state could serve as a proxy to identify states using effective strategies to increase underrepresented populations' access to apprenticeship. Although the high percentage of missing data in RAPIDS (including many participants' refusal to identify their race) complicates an analysis of racial diversity, the racial and gender diversity of apprentices has not changed a great deal nationally from 2015 to 2019, based on the data available. In 2019, in states reporting in RAPIDS, 60 percent of all apprentices were white, 17 percent were people of color, and 22 percent refused to answer or the data were missing (table 6). In addition, 91 percent

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[10] As mentioned in the section on data sources, all the years between 2015 and 2020 are not presented in this report, as the changes during 2016–2018 were relatively small and incremental.

were male and 9 percent were female. Comparatively, for states reporting in RAPIDS in 2015, 63 percent of all apprentices were white, 18 percent were people of color, and 20 percent refused to answer or the data were missing. Additionally, 94 percent were male and 6 percent were female. Demographic data for youth apprentices were similar to those for all apprentices in 2019, with a slightly higher share of white apprentices among the youth than overall. In 2019, 66 percent of youth apprentices were white, 12 percent were people of color, and 22 percent refused to answer or the data were missing.

Consistent with previous years, as of FY 2020 Q3, 58 percent of apprentices from states reporting in RAPIDS were white, 15 percent were people of color, and 28 percent refused to answer or their race information was missing. Additionally, 93 percent were male and 7 percent were female. Twenty percent of apprentices nationally reported being Hispanic, and 33 percent did not provide a response.

TABLE 6
Race and Gender of Registered Apprentices in 2015 and 2019

Race and gender categories	2015	2019
White	63%	60%
People of color	18%	17%
Racial data missing or refused to answer	20%	22%
Male	94%	91%
Female	6%	9%

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data for 2015 and 2019.
Note: The 2015 analysis includes 40 states, and the 2019 analysis includes 41 states (Guam is excluded in both analyses). The percentage of missing race data or "refused to answer" within each state ranges from 0 to 37 percent in 2019 and from 0 to 44 percent in 2015.

In 2019, in states reporting in RAPIDS, 10 percent of all apprentices were veterans, compared with 9 percent in 2015. The project team looked at the percentage of apprentices that reported having a disability, but more than 99 percent of apprentices did not provide this information in 2015 and 2019.

As another proxy to identify states using effective strategies to increase underrepresented populations' access to apprenticeship, it may also be useful to compare the diversity of apprentices with the diversity of the overall state population. In 2019, 41 percent of states in RAPIDS reported a percentage of white, non-Hispanic apprentices that was higher than their state population percentage (table 7). Conversely, only 2 percent of states reported that the percentage of apprentices of color was higher than their state population percentage, with Hawaii being the only state in 2019 that had a higher percentage of apprentices of color than its state population percentage. Reviewing gender data in RAPIDS reveals that in 2019 no state had a percentage of female apprentices that was higher than the state population percentage. RAPIDS data for 2015 show similar figures for the racial and gender diversity of apprentices.

TABLE 7

Comparison of Registered Apprentices to State Population in Race and Gender

State racial and gender diversity levels	2015	2019
Percentage of states where the share of apprentices who are white, non-Hispanic, is higher than general state population (less diverse)	40%	41%
Percentage of states where the share of apprentices of color is higher than state percentage (more diverse)	1%	2%
Percentage of states where share of apprentices who are male is higher than general state population (less diverse)	100%	100%

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data; Governing (2017).

Note: The 2015 analysis includes 40 states, and the 2019 analysis includes 41 states (Guam is excluded in both analyses). In this table, 2017 American Community Survey race data are used as the benchmark for comparisons with both 2015 and 2019. States that have a higher percentage of white apprentices compared with the percentage of white people in that same state are defined as "less diverse." States that have a higher percentage of apprentices of color compared with the percentage of people of color in that same state are defined as "more diverse." States that have a higher percentage of male apprentices compared to the percentage of men in that same state are defined as "less diverse."

Youth Apprenticeship

Youth apprenticeship programs serve students who are at least 16 years old and enrolled in high school or postsecondary education, and they combine academic and technical classroom instruction with work experience through a Registered Apprenticeship (U.S. Department of Labor n.d[c]). As mentioned, DOL and states are increasingly investing in youth apprenticeship programs (Katz and Elliott 2020). However, compared with other countries, the United States continues to lag in connecting youth to apprenticeship opportunities. Lerman (2014) notes that apprenticeships "reach 55 to 70 percent of youth in Austria, Germany, and Switzerland." In Switzerland, almost two-thirds of young people pursue a vocational program. Lerman also notes that Austria, Switzerland, and Germany have closely aligned apprenticeships and secondary schools. Some Swiss companies begin recruiting youth beginning in 7th grade to begin apprenticeships in 10th grade (Hoffman and Schwartz 2015). In comparison, the United States has typically focused on apprenticeship after secondary school, as reflected in the 2019 RAPIDS data, which indicate that approximately 98 percent of apprentices are age 19 or older.

Examining the share of youth in Registered Apprenticeship programs could help to determine which states devote more attention to youth apprenticeship and thus might be able to share valuable strategies with other states. Similar to Registered Apprenticeships, youth apprenticeships involve on-the-job learning, related instruction, progressive wages, mentoring, and nationally recognized credentials (Marotta 2020). Federal programs that focus on youth ages 16–24 and feature pre-apprenticeship include YouthBuild and Job Corps. In a 2020 survey, state apprenticeship program administrators reported that increasing the participation of youth was the seventh-highest state priority for apprenticeship, out of 11 priorities (table 8) (Rosenberg and Dunn 2020).

TABLE 8
States' Priorities for Apprenticeship, from Highest to Lowest Weighted Ranking Reported by Program Administrators

Priorities	All states	SAA	OA
Increase the number of sponsors for Registered Apprenticeship	3.1	3.6	2.7
Build apprenticeship in nontraditional industries or occupations	3.3	3.2	3.4
Increase the apprenticeship pipeline	4.1	4.1	4.0
Increase the participation of women	6.0	5.3	6.6
Increase industry-sponsored or intermediary-sponsored apprenticeship	6.0	6.4	5.7
Increase the participation of racial and ethnic minorities	6.3	6.0	6.5
Increase the participation of youth	6.5	6.5	6.4
Increase the retention of apprenticeships	6.5	6.4	6.6
Increase the participation of veterans	7.7	7.8	7.5
Increase the participation of individuals with disabilities	8.0	8.1	7.9
Increase the participation of justice-involved individuals	8.5	8.5	8.5
Total responses	**49**	**23**	**26**

Source: 2020 State Apprenticeship Survey (Rosenberg and Dunn 2020).

Note: Respondents were asked to rank each item in order of its priority for apprenticeship in their state. The weighted rankings reported in this table indicate how highly each item was ranked across all states. A ranking closer to 1 was an overall higher priority, whereas rankings closer to 11 were a lower priority. Only the 49 respondents who ranked all priorities are included in the weighted priority ranking. OA = Office of Apprenticeship; SAA = State Apprenticeship Agency.

Among states that reported in RAPIDS in 2019, 36 percent (158,786) of apprentices were youth apprentices (between 16 and 24 years old), a percentage that is consistent with 2015 RAPIDS data (table 9). Although the overall share of youth apprentices did not change between 2015 and 2019, the total number of youth apprentices increased from 104,535 in 2015 to 158,786 in 2019. Furthermore, the share of youth apprentices across states ranged from 0 to 50 percent in 2015 and from 20 to 54 percent in 2019. State-level proportions of youth apprentices in 2019 are provided in appendix A.

TABLE 9

Share of Registered Apprentices Who Are 16 to 24 Years of Age at Time of Registration

Share of youth apprentices	No. of states, 2015	No. of states, 2019
45 percent or more	4 (10%)	6 (14%)
35–44 percent	20 (49%)	20 (48%)
Less than 35 percent	17 (41%)	16 (38%)
Total youth apprentices	**104,535 (36%)**	**158,786 (36%)**

Source: RAPIDS data; Governing (2017).

Note: The analysis for 2015 included a total of 41 states and territories, and the analysis for 2019 included 42 states and territories. There were 8 records included in 2015 data and 5 records included in 2019 data for participants whose ages were under 16, even though the minimum age for Registered Apprenticeship is 16 years. Youth apprentices in this table refer to youth ages 16 to 24 years old at the time of registration.

A review of the first three quarters of 2020 RAPIDS data reveals that the percentage of youth apprentices is consistent with 2019 and 2015 data. As of FY 2020 Q3, for states reporting in RAPIDS, 37 percent of registered apprentices were youth (42,640). States with the highest percentages of

registered youth apprentices include Alabama (49 percent), Kentucky (48 percent), and Maryland (48 percent); states with the lowest percentages of youth apprentices include Kansas (0 percent), West Virginia (20 percent), and Guam (24 percent).

The state of Georgia allocates state funding specifically for youth apprenticeships. In Georgia, $3 million is allocated for youth apprenticeships yearly, distributed as competitive grants to local programs (Lerman, Kuehn, and Shakesprere 2019). Most of the Georgia state funding for youth apprenticeship is directed to approximately 350 schools that hire coordinators who administer the programs, recruit high school juniors and seniors, work with employers, and match students to employers. Each student requires a detailed individualized training agreement. In 2019, Georgia had 4,813 registered youth apprentices, representing 44 percent of all apprentices in the state; in the 2017–18 school year, 25 percent were in manufacturing, 20 percent in education and training, and 17 percent in health science.

When considering state capacity for youth apprenticeship, it is important to also evaluate challenges that youth Registered Apprenticeship programs may face. For example, challenges in data collection and reporting are highlighted for youth apprenticeships in other reports. According to a 2020 Advance Career Technical Education (CTE report (Partnership to Advance Youth Apprenticeship 2020), states should be cautious in using existing state systems or RAPIDS data to monitor youth apprenticeship outcomes, as these systems typically have no mechanism to differentiate information about registered youth apprentices from information about traditional apprentices. As an example of more program-specific monitoring, the report indicates that CareerWise New York administered year-end surveys to apprentices, teaching staff, and employers to identify areas for program improvement. Other data collection challenges include confusion regarding responsibilities for collecting data across the vast network of partners, such as K–12 entities and workforce agencies; limited resources to establish tracking systems; student privacy laws impacting intermediary access to youth data; and scaling these efforts.

Approaches to Expanding Apprenticeship in Rural Areas, and Opioid-Related Strategies

Skill gaps and worker shortages that plague some industries are exacerbated in rural areas because access to training programs and employers can be affected by the quality of public transportation systems (Thakuriah and Metaxatos 2000). The opioid crisis has also had workforce-related impacts across the country (Segel et al 2019). Some states have built capacity to address these challenges through the creation of apprenticeship programs designed to upskill the workforce in ways that meet the local community's needs. States with upskilling initiatives may provide useful lessons for states with a large share of employers or job seekers in rural areas, or states facing opioid crisis–related workforce challenges.

Apprenticeship in Rural Areas

Some states focused their rural development efforts on increasing the supply of health care workers, as well as closing skills gaps in the health care industry, which are even more important because of the COVID-19 pandemic. For example, the Alaska Department of Labor and Workforce Development (DOLWD) partnered with the Alaska Primary Care Association to open four new apprenticeship pathways. Using the association's large network, the Alaska Department of Labor and Workforce Development has been able to efficiently reach large numbers of employers to implement apprenticeships. Additionally, the programs include online learning and distance mentoring to help address accessibility constraints for rural communities (Alaska DOLWD 2017).

Similarly, the Washington Association of Community and Migrant Health Centers created a multiemployer apprenticeship model[11] with 27 federally qualified health centers located throughout the state, increasing accessibility for rural participants. This model allows rural and smaller employers to enroll one or two employees at a time, and the association reports an increase in wages, as well as high program retention.

In response to these challenges, in 2021 DOL funded the H-1B Rural Healthcare Grant Program,[12] awarding $40 million in grant funds to partnerships of public- and private-sector entities to address health care workforce shortages by creating employment and training programs (including Registered Apprenticeship programs) in health care occupations that serve rural communities.

Apprenticeship Initiatives to Address the Opioid Crisis

As the United States continues to battle the opioid crisis,[13] government agencies at federal, state, and local levels are seeking effective ways to address the challenge through economic or other policies. Existing state efforts to harness apprenticeship as a means of addressing the crisis may provide useful lessons for other states. In 2018, six states including Alaska and Rhode Island were awarded upwards of $5 million in National Health Emergency Demonstration Grants by DOL to address the economic and workforce-related impacts of the opioid crisis. Two of the states intend to use these funds for apprenticeship. The Alaska Department of Labor and Workforce Development was awarded $1,263,194 and plans to use a portion of funds for apprenticeship.[14] The Rhode Island Department of Labor and Training was awarded $3,894,875 and intends to use a portion of the funds to support

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[11] "Rural Healthcare Providers Use Apprenticeship to Address Staffing Needs," National Fund for Workforce Solutions blog, November 13, 2018, https://nationalfund.org/rural-healthcare-providers-use-apprenticeship-to-address-staffing-needs/.

[12] "H-1B Skills Training Grants," U.S. Department of Labor, accessed October 2, 2020, https://www.dol.gov/agencies/eta/skills-grants/h1-b-skills-training.

[13] "What is the Opioid Epidemic?" U.S. Department of Health and Human Services, accessed April 12, 2022, https://www.hhs.gov/opioids/about-the-epidemic/index.html.

[14] "Alaska Awarded $1.2 Million to Expand Workforce Opportunities for Individuals Affected by the Opioid Crisis." Alaska Department of Labor and Workforce Development, accessed December 2, 2021, https://labor.alaska.gov/news/2018/news18-30.htm.

participants in becoming skilled health care professionals to address the opioid crisis using the apprenticeship model (U.S. Department of Labor n.d[a]). Rhode Island created an 18-month Registered Apprenticeship program[15] to certify community health workers to support individuals and communities impacted by the opioid crisis through prevention and recovery services.

In 2017, New Jersey announced a $1.3 million grant in state funding to the New Jersey Healthcare Talent Development Center at Rutgers University to establish an apprenticeship program[16] in response to the opioid crisis. The apprenticeship program, the nation's first program for Certified Alcohol and Drug Counselors, was designed to offer 270 hours of free classroom instruction at Rutgers combined with paid on-the-job learning, allowing approximately 200 apprentices to be trained in 2018.

The Role of Financial Incentives in Expanding Apprenticeship

Employers must weigh related program costs in their decision to participate in apprenticeships. These costs include tuition for training, apprentice wages, and wages for staff time spent supervising and mentoring apprentices. To help offset these costs, some states provide employers with financial incentives, such as tax credits or exemptions for employers with active apprentices in a Registered Apprenticeship program.

Estimating the Costs of Apprenticeship

According to a 2016 report by the U.S. Department of Commerce and Case Western Reserve University that details case studies of 13 firms operating apprenticeship programs, employers generally do not compile and analyze cost and benefit data to adequately measure the return on investment for apprenticeship programs (Helper et al. 2016). The report indicates that employers are typically able to provide cost data (such as hiring or training costs) but do not track quantitative data on benefits gained from the program. One of the cited barriers to collecting data on benefits was that systems do not typically allow for the blending of production metrics and cost data to create productivity measures that could be linked to the way workers were hired and trained.

The report's authors determined that the most expensive program is estimated to cost employers $250,000 per apprentice, while the least expensive program is estimated to cost less than $25,000 (Helper et al. 2016). The primary drivers of cost included length of program, program start-up, tuition

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[15] "Alaska Awarded $1.2 Million to Expand Workforce Opportunities for Individuals Affected by the Opioid Crisis." Alaska Department of Labor and Workforce Development, accessed December 2, 2021, https://labor.alaska.gov/news/2018/news18-30.htm.

[16] Rutgers University, "Fighting the Opioid Epidemic, Rutgers Launches the Nation's First Apprenticeship for Certified Alcohol and Drug Counselors," *Rutgers Today* (blog), December 12, 2017, https://www.rutgers.edu/news/fighting-opioid-epidemic-rutgers-launches-nations-first-apprenticeship-certified-alcohol-and.

and materials, mentors' time, and overhead. Subsequently, the Department of Commerce developed a return on investment calculator[17] designed to take in company-specific information, identify costs and benefits, and develop a simple return estimate. Further, some states, such as Michigan[18] and Oregon,[19] have developed their own calculators to assist employers with quantifying benefits received through apprenticeship programs.[20]

Financial Incentives for Apprenticeship across States

The 2020 State Apprenticeship Survey indicated that financial incentives for employers were relatively common (Rosenberg and Dunn 2020). Administrators from about 21 percent of states reported the availability of state wage subsidies, 80 percent of states reported funding workforce training and education, and 67 percent reported providing funding for apprenticeship-related technical instruction. Additionally, administrators from 37 percent of states reported the availability of tax credits for employers.

The survey also found that financial incentives were reported to be more widely available in SAA states than in OA states. For example, 50 percent of SAA states reported the availability of tax credits or other tax savings, compared to only 23 percent of OA states. Similarly, 18 percent of SAA states reported the availability of local wage subsidies, compared to only 4 percent of OA states (Rosenberg and Dunn 2020). Of the states offering tax credits to employers hiring apprentices, incentives ranged from $750 for each new apprentice in Montana to $7,500 maximum per apprentice or 50 percent of actual wages in Connecticut, as of 2020 (U.S. Department of Labor n.d[b]). Some states offer additional tax credits for specific populations, such as veterans. Seventeen states offer tuition support for apprentices, which can cover tuition and fees as well as instructor and other program costs (U.S. Department of Labor n.d[b]). Appendix A outlines the availability of tax credit and tuition support across states based on data provided in the state survey conducted in 2020. Box 4 highlights some state-specific examples of available financial incentives.

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[17] "Return on Investment (ROI)," AppreNEXT, accessed November 1, 2020, https://nationalapprenticeship.org/roi.

[18] "ROI Calculator," MI Apprenticeship, accessed November 1, 2020, https://miapprenticeship.org/employers/roi-calculator/.

[19] "ROI Calculator," Oregon Apprenticeship, accessed November 1, 2020, https://oregonapprenticeship.org/roi-calculator/.

[20] Further information on costs and benefits to employers is anticipated in the American Apprenticeship Initiative return-on-investment study.

Box 4: Examples of Financial Incentives Offered by States

- A $1,500 tax credit for each new apprentice who is a veteran (Montana, SAA state)
- Credits ranging from $1,000 to $3,000 each year, over five years, to businesses that hire "disadvantaged" youth as apprentices (New York, SAA state)
- A $1,000 direct tax credit for each registered apprentice employed for at least seven months during each year of apprenticeship, for up to four years, to eligible businesses that are sponsors (South Carolina, OA state)
- Nonrefundable tax credits against Illinois income tax for 100 percent of the qualified education expenses of a qualifying apprentice, up to $3,500 per apprentice per year, plus an additional $1,500 credit per apprentice living in an underserved area (Illinois, OA state)
- Funding by the state workforce agency to local public educational institutions to support the costs of related classroom instruction for Registered Apprenticeship training programs (Texas, OA state)
- $5,800 per apprentice per year in tuition assistance, for two years (Tennessee, OA state)
- 50 percent tuition reduction at community and technical colleges for apprentices (Washington, SAA state)

Source: "State Tax Credits and Tuition Support," U.S. Department of Labor, accessed December 2, 2021, https://www.apprenticeship.gov/investments-tax-credits-and-tuition-support/state-tax-credits-and-tuition-support.

The Costs of State Support for Apprentices and the Role of Federal Grants

All SAA states included in the 2020 survey of state apprenticeship administrators have allocated a portion of their state budget for Registered Apprenticeship programs since 2016, with 63 percent reporting that they increased their state budget allocations between 2016 and 2020 (Rosenberg and Dunn 2020). By comparison, 68 percent of OA states reported allocating state budget funds for Registered Apprenticeship programs. Additional support reported for state Registered Apprenticeship programs comes from federal initiatives, including public workforce system funding through the Workforce Innovation and Opportunity Act (WIOA).

Federal Support for State Apprenticeship Systems

DOL actively supports state agencies and other entities in their apprenticeship efforts. Since 2016, DOL has invested more than $960 million in apprenticeship systems and programs through grants and contracts (figure 2).[21] DOL also oversees and funds state activities under WIOA, and WIOA was reported to be the most common source of financial support for states' Registered Apprenticeship

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[21] For more information on DOL's active grants and contracts related to apprenticeship, see "Active Grants and Contracts," Apprenticeship.gov, accessed May 17, 2022, https://www.apprenticeship.gov/investments-tax-credits-and-tuition-support/active-grants-and-contracts.

efforts among the 37 State Apprenticeship Expansion grantees, including funding for individual training accounts and on-the-job learning (Sattar et al. 2020). According to the 2020 survey of state apprenticeship administrators, 42 percent of the SAA states reported increasing their funding of apprenticeship through WIOA between 2016 and 2020, while 75 percent of OA states reported increasing their funding over this period (Rosenberg and Dunn 2020).

FIGURE 2

DOL Funding for Registered and Unregistered Apprenticeship, 2015–21

$ millions
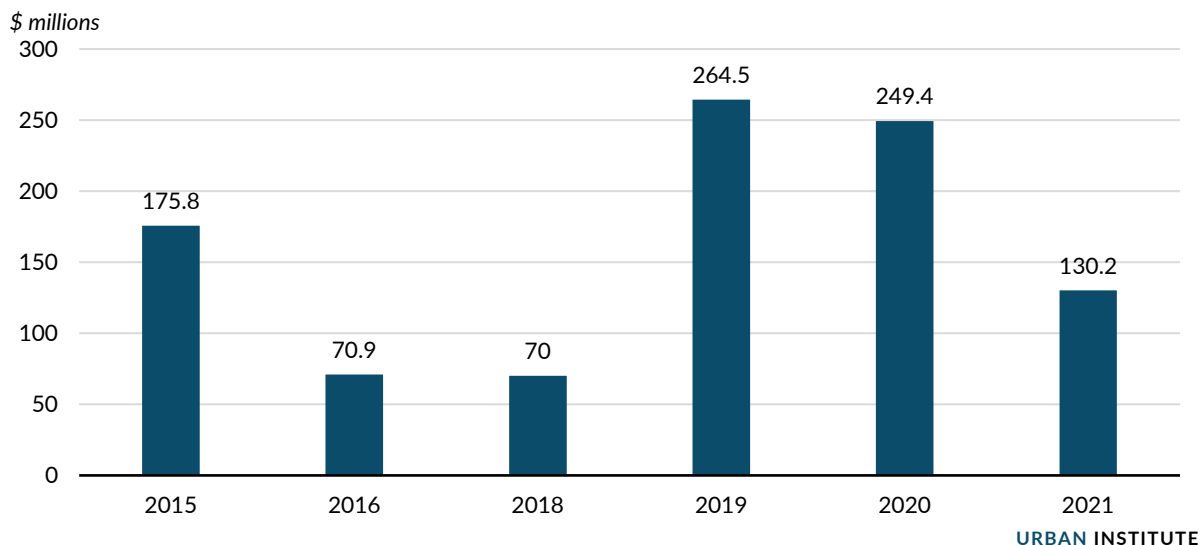
Source: "State Tax Credits and Tuition Support," U.S. Department of Labor, accessed November 1, 2020, https://www.apprenticeship.gov/investments-tax-credits-and-tuition-support/state-tax-credits-and-tuition-support.
Note: 2021 represents a partial year.

The following are summaries of initiatives by DOL and other federal agencies to support states, as well as intermediaries and other partners, in expanding apprenticeship. The section focuses on federal support for apprenticeship and does not discuss nongovernment or philanthropic support.

DOL INITIATIVES

DOL provides program and capacity development grants to states, as well as grants and contracts to intermediaries, industry associations, and other partners within states to assist with development and adaptation of apprenticeship models. Below we summarize initiatives targeted to multiple groups, with a focus on those awarding funds to states (U.S. Department of Labor. n.d[e]).

- **American Apprenticeship Initiative.** In 2015, DOL awarded $175 million across 46 American Apprenticeship Initiative grantees, including community colleges, state agencies, nonprofit intermediaries, and joint labor-management organizations to expand apprenticeship in nontraditional occupations and industries.

- **Registered Apprenticeship-College Consortium.** DOL launched the Registered Apprenticeship-College Consortium program with the U.S. Department of Education in 2015

to increase participation in apprenticeship programs among community colleges. The consortium is composed of Registered Apprenticeship sponsors and two- and four-year postsecondary institutions. The membership also includes state, regional, and national organizations that represent sponsors and colleges. Consortium members agree to accept the college credit value of the Registered Apprenticeship completion certificate as recommended by a recognized third-party evaluator for purposes of facilitating the transfer of credit between consortium member colleges.

- **Expansion of Registered Apprenticeship Programs by Industry Intermediaries.** Intermediaries may also receive funding directly from DOL. In 2016, DOL awarded $20.4 million across 14 industry intermediaries and equity partners to support expansion and diversity inclusion efforts. In 2020, DOL awarded an additional $22 million across 12 industry intermediaries to expand apprenticeship programs.

- **State Apprenticeship Expansion (SAE).** In 2016, DOL awarded $50.5 million in SAE grants to support 36 states and one territory in developing and implementing comprehensive expansion strategies for apprenticeships. In 2018, 36 of the existing SAE grants were renewed, with a total of an additional $49 million distributed through October 2020.

- **Inclusive Apprenticeship Initiative for Youth and Adults with Disabilities**. In 2019, DOL awarded a $1.9 million contract to Social Policy Research Associates, Inc., to fund the Apprenticeship Inclusion Models demonstration. This initiative was designed to research, develop, test, and evaluate innovative strategies in existing apprenticeship programs that provide skills training to people with disabilities.

- **Apprenticeship State Expansion.** In 2019, DOL awarded $73 million across a set of states through Apprenticeship State Expansion grants to help states expand their apprenticeship programs.

- **Expanding Community College Apprenticeships.** In 2019, the American Association of Community Colleges, in partnership with DOL, launched the Expanding Community College Apprenticeships initiative. The program's advisory body conducts outreach to community colleges. The American Association of Community Colleges also maintains the Virtual Apprenticeship Network for community college participants.

- **Veterans' Employment and Training Services Apprenticeship Demonstration.** In 2019, DOL awarded $3.5 million to the Veterans' Employment and Training Services Transition Assistance Program to aid service members' transition into the workforce by connecting service members to employers providing apprenticeship programs. The Transition Assistance Program placed apprenticeship placement counselors in eight military locations in California, Nevada, North Carolina, Texas, and Virginia.

- **Women in Apprenticeship and Nontraditional Occupations.** DOL's Women's Bureau awards Women in Apprenticeship and Nontraditional Occupations grants to support female apprenticeship participants in male-dominated fields. In 2019, the program awarded grants totaling $1,492,515 to Chicago Women in Trades, the Hampton Roads Workforce Council, and the Wisconsin Regional Training Partnership.

- **Youth Apprenticeship Intermediaries.** To help expand youth apprenticeship programs nationally for in- and out-of-school youth, DOL awarded $7.7 million in 2019 across four youth intermediaries: Jobs for the Future, NetAmerica, the Urban Institute, and ICF (U.S. Department of Labor n.d[d]).

- **Scaling Apprenticeship through Sector-Based Strategies.** In June 2019, DOL awarded $183.8 million in three-year grants across 23 colleges and consortia to expand apprenticeship in the

advanced manufacturing, information technology, health, finance, construction, transportation, and hospitality industries.

- **Closing the Skills Gap.** In June 2019, DOL awarded $100 million across 28 public and private entities to increase apprenticeship opportunities in sectors that otherwise might not have embraced the apprenticeship training model.

- **Building State Capacity to Expand Apprenticeship through Innovation.** A 2020 initiative funded by DOL's Employment and Training Administration, Building State Capacity to Expand Apprenticeship through Innovation provides more than $80 million across 42 states to expand Registered Apprenticeship programs, with a focus on addressing local apprenticeship priorities and employer engagement, performance, and positive outcomes for apprentices.

- **Youth Apprenticeship Readiness.** In 2020, the Employment and Training Administration awarded $42,296,247 in Youth Apprenticeship Readiness grants across 14 organizations to increase participation in Registered Apprenticeship programs for youth ages 16 to 24 (U.S. Department of Labor 2020b).

- **State Apprenticeship Expansion, Equity, and Innovation Grants.** In 2021, DOL awarded more than $99 million to develop, modernize, and diversify Registered Apprenticeship programs in 15 states.

- **Registered Apprenticeship Technical Assistance Centers of Excellence.** In 2021, DOL awarded nearly $31 million to three states and Washington, DC, to provide technical expertise and services and accelerate the expansion of Registered Apprenticeship programs.

More information about the state agencies that received the SAE grant, Apprenticeship State Expansion (ASE) grant, and the Building State Capacity (BSC) to Expand Apprenticeship through Innovation is provided in in appendix A.

OTHER FEDERAL AGENCY INITIATIVES

Federal agencies other than DOL, including the U.S. Departments of Energy and Education, also support the apprenticeship efforts of states and other entities.

- **Department of Energy.** Since 2014, the Department of Energy has supported apprenticeship programs for veterans wishing to join the solar energy workforce. The Solar Foundation recently launched the Solar Opportunities and Readiness initiative, which will develop and launch a formal apprenticeship program for veterans who wish to work in the solar energy sector, and the Solar Ready Vets Fellowship, a 12-week on-the-job learning fellowship.[22]

- **Department of Education.** States can access a variety of federal resources to fund apprenticeship training, including Pell grants, federal work-study funds, and the GI Bill for veterans. Eligible apprentices may be able to access Pell grants and work-study funds, to fund tuition, fees, books and supplies for technical instruction, and supplement training wages while apprentices are enrolled in certificate or degree programs. Institutions of higher education, individually or in partnership, can also use federal work-study funds to create a Job Location and Development Program to develop student apprenticeships. In 2018, the Department of Education awarded $3 million grants to six states (Kentucky, Maryland, Nebraska, Oregon, Rhode Island, and Tennessee) to help high school career and technical

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[22] For more information on the Solar Opportunities and Readiness initiative, see "Solar Ready Vets Network," Energy.gov, accessed May 17, 2022: https://www.energy.gov/eere/solar/solar-ready-vets-network.

education students transition to college and apprenticeships in science, technology, engineering, and mathematics. Grantees provide both youth and adult apprenticeship programs.

Integration with the Workforce System

DOL's emphasis on work-based and career-connected learning, nondegree credentials, and sector-based training under WIOA encourages the integration of apprenticeship into the federal workforce system. Two main sources of federal guidance inform states' efforts to integrate Registered Apprenticeship into the public workforce system:

- **WIOA legislation that allowed WIOA funds to support Registered Apprenticeships.** As the primary federal legislation guiding workforce programs, WIOA enables local workforce boards to spend their WIOA Title I funds on Registered Apprenticeship training, and it requires coordination between state apprenticeship staff and OA to maintain current information about those training programs. The legislation also requires the Registered Apprenticeship programs to be represented on state and local workforce boards. These provisions create institutional links between the Registered Apprenticeship system and local boards at both the policy and governance levels to support Registered Apprenticeship programs (Sattar et al. 2020).

- **DOL guidance that emphasized "leveraging Registered Apprenticeship as a workforce strategy."** This guidance focuses on how Registered Apprenticeship can help local areas and states achieve performance measures and advance employer-centered initiatives and career-pathway efforts (U.S. Department of Labor 2017).

According to Sattar et al. (2020), states that received SAE grants in 2016 employed four levers to link their Registered Apprenticeship efforts with WIOA programs:

- Encouraging WIOA customers under Titles I and II and other titles to apply for entry into Registered Apprenticeship programs through local workforce development boards and American Job Centers. Twenty-seven states receiving SAE funds reported actively encouraging customers of WIOA programs to apply for entry into apprenticeship, reflecting a simple and low-stakes effort to expand access to apprenticeship opportunities and increase participation in apprenticeship programs.

- Encouraging local workforce development boards to use individual training accounts to support apprenticeship training. Twenty states reported encouraging the use of individual training accounts, which are agreements to pay for training by eligible training providers on behalf of WIOA customers, to offset training costs.

- Placing Registered Apprenticeship programs on the state eligible training provider list. Twenty states reported progress in placing Registered Apprenticeship programs on their eligible training provider lists, which makes it easier for local programs to support participants in Registered Apprenticeship programs because the state pays for related technical instruction and supportive services.

- Supporting business engagement staff in working with employers to launch new Registered Apprenticeship programs. Twenty-one states reported engaging business services staff of local boards or American Job Centers in launching new Registered Apprenticeship programs.

OA states reported local workforce development boards as a major partner in Registered Apprenticeship at a higher rate than SAA states (69 percent and 38 percent, respectively) (Rosenberg and Dunn 2020). California, an OA state, provides another example of how Registered Apprenticeship

can be integrated into the workforce system. To promote apprenticeship, the California Workforce Development Board funded a California Labor and Workforce Development Agency position to work with local workforce development boards, employers, and community colleges on apprenticeship (Grow Apprenticeship California 2020).

Implications of the COVID-19 Pandemic for State Apprenticeship Systems and Strategies

The COVID-19 pandemic has affected public and private sectors, and state apprenticeship systems are no exception. As the pandemic continues to impact economic activity and the federal workforce development system, some states could benefit from an understanding of strategies implemented in other states.

Apprenticeship programs in states, such as South Carolina, responded to business closures and canceled on-the-job learning by moving to virtual learning. For example, in the Charleston Regional Youth Apprenticeship Program in South Carolina, the intermediary and primary training provider moved coursework to online formats when on-the-job learning was no longer available. To help sustain this change, the intermediary secured additional funding and committed to further supporting coursework regardless of when students may return to the jobsite.[23] In North Carolina, Senate Bill 704 stipulated that pre-apprentices and apprentices are eligible for tuition waivers for community college courses to continue their path of study.[24] DOL also provided guidance that includes (1) shifting to online learning where possible and (2) adjusting the program scheduling to front-load classroom programming that might lend itself well to online administration (U.S. Department of Labor 2020a).

Other states are looking to apprenticeship to address the economic challenges caused by the pandemic. In September 2020, Iowa announced the establishment of the Coronavirus Relief Fund, which is designed to increase apprenticeship opportunities in areas hit hardest by the pandemic, including opportunities for youth, small businesses, and nonprofits.[25] DOL also encouraged states or grantees to work with their local workforce boards, economic development entities, and institutes of higher education to identify potential apprentices and expand placement options in high-demand

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[23] Joyce Hwang and Taylor White, "Youth Apprenticeship Programs Adapt to Meet Crucial Needs in Pandemic," New America blog, June 11, 2020, https://www.newamerica.org/education-policy/edcentral/youth-apprenticeship-programs-adapt-meet-crucial-needs-pandemic/.

[24] Joyce Hwang and Taylor White, "Youth Apprenticeship Programs Adapt to Meet Crucial Needs in Pandemic," New America blog, June 11, 2020, https://www.newamerica.org/education-policy/edcentral/youth-apprenticeship-programs-adapt-meet-crucial-needs-pandemic/.

[25] "Gov. Reynolds Announces Coronavirus Relief Fund Registered Apprenticeship Expansion Grant Opportunities," Iowa Workforce Development press release, September 28, 2020, https://www.iowaworkforcedevelopment.gov/gov-reynolds-announces-coronavirus-relief-fund-registered-apprenticeship-expansion-grant.

fields, such as health care, biotechnology, and logistics.[26] Alongside these recommendations, DOL provided guidance on Occupational Safety and Health Administration compliance and unemployment compensation for individuals affected by the pandemic.[27] As states continue to face an evolving pandemic crisis, lessons from state implementation of these recommendations and their own efforts could provide useful direction.

Measuring State Apprenticeship Expansion and Success: Data Infrastructure and Performance

Tracking Registered Apprenticeship outcomes data, such as data on apprentice retention, diversity, wages, and credential attainment, allows for ongoing program improvement, and evaluation of how states are using program data, metrics, and outcomes to make improvements is needed to determine or demonstrate the effectiveness of apprenticeships. However, outcomes data are not consistently tracked across states. In the 2020 survey of state apprenticeship administrators, 10 states reported tracking apprenticeship outcomes. Of those states, 4 reported that the source of outcomes data was unemployment insurance wage records, 3 cited surveys of apprentices, and 2 used a combination of wage records and surveys of apprentices. DOL has provided a template for Registered Apprenticeship programs to use in tracking outcomes over key metrics across stakeholders for each program (ApprenticeshipUSA n.d.).

Our scan did not identify further sources of information on performance tracking approaches across state systems. Additional study would be beneficial to understand best practices and useful lessons for states moving forward.

Next Steps

The findings from the scan of state apprenticeship systems summarized in this report provide an initial understanding of how states may be approaching various aspects of state system implementation, including engaging employers across nontraditional industries and rural areas, and recruitment of diverse apprentices. To further explore how specific states are making progress in these and other areas of interest described in the report, the State Apprenticeship Systems Capacity Assessment study team will select a subset of states for further data collection and analysis. The subsequent series of briefs will provide more in-depth information on the structures of apprenticeship systems in these states, the partnerships that are an integral part of the systems, and the ways that states continue to strengthen Registered Apprenticeship in support of a diverse and skilled workforce.

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[26] "COVID-19 Frequently Asked Questions," U.S. Department of Labor, accessed October 8, 2020, https://www.dol.gov/agencies/eta/coronavirus.

[27] "WorkforceGPS Coronavirus (COVID-19) Resources and FAQs," WorkforceGPS, accessed October 8, 2020, https://www.workforcegps.org/resources/2020/03/18/23/35/Coronavirus-COVID-19-Resources.

Appendix A: State Apprenticeship System Characteristics by State and Territory

Characteristics of State and Territory Apprenticeship Systems

States and territories	Registration oversight	Number of apprentices (2019)	Youth apprentices % (2019)	Non–building trade % (2019)	Federal grant support SAE	Federal grant support ASE	Federal grant support BSC	Tax credit or tuition support for employers (2020)
Alaska	OA	2,645	38%	40%	X	X	-	Neither
Alabama	SAA	5,911	47%	20%	-	X	X	Tax credit
Arkansas	OA	7,515	48%	6%	X	-	X	Tax credit
Arizona	SAA	6,552	32%	34%	-	X	X	Neither
California	OA	83,726	32%	71%	X	-	X	Tuition support
Colorado	OA	9,010	34%	40%	X	X	X	Neither
Connecticut	SAA	NA	NA	NA	X	X	-	Tax credit
District of Columbia	SAA	198	27%	100%	-	X	X	Neither
Delaware	SAA	256	54%	13%	X	X	X	Tuition support
Florida	SAA	17,780	34%	23%	X	X	X	Tuition support
Georgia	OA	10,835	44%	32%	-	X	-	Tuition support
Guam	SAA	994	29%	63%	X	X	X	Tax credit
Hawaii	SAA	8,343	37%	24%	X	-	-	Neither
Iowa	OA	11,121	41%	39%	X	X	X	Tuition support
Idaho	OA	2,944	24%	69%	X	X	-	Neither
Illinois	OA	20,624	38%	14%	X	X	X	Tax credit
Indiana	OA	23,952	36%	38%	X	X	X	Tuition support
Kansas	SAA	1,379	37%	34%	X	-	X	Neither
Kentucky	SAA	5,349	48%	47%	X	X	X	Neither
Louisiana	SAA	4,666	41%	39%	X	-	X	Tax credit
Massachusetts	SAA	NA	NA	NA	X	X	X	Neither
Maryland	SAA	10,317	44%	28%	X	X	X	Tax credit
Maine	SAA	1,104	31%	61%	-	X	X	Tuition support
Michigan	OA	25,654	36%	42%	X	X	X	Neither
Minnesota	SAA	NA	NA	NA	X	X	X	Tax credit

States and territories	Registration oversight	Number of apprentices (2019)	Youth apprentices % (2019)	Non-building trade % (2019)	Federal grant support SAE	Federal grant support ASE	Federal grant support BSC	Tax credit or tuition support for employers (2020)
Missouri	OA	22,535	34%	53%	X	X	X	Tax credit
Mississippi	OA	3,818	38%	70%	X	X	X	Neither
Montana	SAA	2,708	38%	31%	X	-	-	Neither
North Carolina	SAA	NA	NA	NA	X	X	X	Tuition support
North Dakota	OA	1,359	47%	23%	-	X	-	Neither
Nebraska	OA	8,699	20%	81%	-	X	-	Neither
New Hampshire	OA	3,959	33%	67%	X	X	X	Neither
New Jersey	OA	9,576	35%	31%	-	X	X	Neither
New Mexico	SAA	NA	NA	NA	X	X	-	Neither
Nevada	SAA	7,516	34%	99%	X	-	X	Tax credit
New York	SAA	NA	NA	NA	X	X	X	Tax credit, tuition support
Ohio	SAA	26,515	39%	37%	X	X	X	Neither
Oklahoma	OA	2,204	37%	30%	-	X	X	Neither
Oregon	SAA	NA	NA	NA	X	X	X	Neither
Pennsylvania	SAA	21,523	40%	22%	X	X	X	Neither
Puerto Rico	OA	NA	NA	NA	-	X	-	Neither
Rhode Island	SAA	2,976	33%	29%	-	X	X	Tax credit
South Carolina)	OA	27,065	27%	95%	X	X	X	Tax credit
South Dakota	OA	920	47%	37%	X	X	X	Neither
Tennessee	OA	7,024	42%	35%	-	X	X	Tax credit, tuition support
Texas	OA	24,811	39%	30%	X	X	X	Tuition support
Utah	OA	5,138	35%	26%	-	X	-	Neither
Virginia	SAA	605	33%	81%	-	X	-	Tax credit
Vermont	SAA	NA	NA	NA	X	X	X	Neither
Virgin Islands	SAA	NA	NA	NA	-	-	X	Neither
Washington	SAA	NA	NA	NA	X	X	X	Tuition support
Wisconsin	SAA	NA	NA	NA	X	X	-	Tuition support
West Virginia	OA	5,407	31%	63%	-	X	-	Tax credit
Wyoming	OA	622	38%	46%	-	-	-	Tuition support

Source: Registered Apprenticeship Partners Information Data System (RAPIDS) data, Apprenticeship.gov.

Note: ASE = Apprenticeship State Expansion; BSC = Building State Capacity to Expand Apprenticeship through Innovation; OA = Office of Apprenticeship; SAA = State Apprenticeship Agency; SAE = State Apprenticeship Expansion; NA = not available; '-' = Did not receive Federal grant.

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