



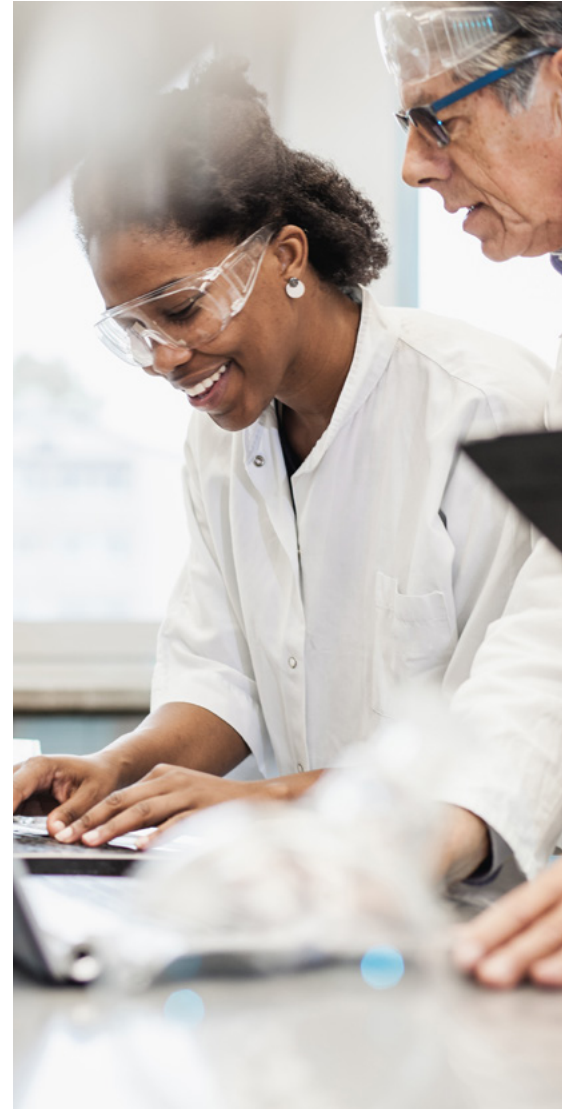
FEDERAL RESERVE BANK OF PHILADELPHIA

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# Apprenticeship Guide Update

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2020

## INTRODUCTION

Apprenticeship programs are a particularly promising workforce development strategy that allow employers to recruit and develop talented employees while employees learn on the job and gain key work experience. The “earn-and-learn” nature of apprenticeship programs enables participants to receive wages at the same time as they earn industry credentials. Participants often obtain college credits, and sometimes apprenticeships lead directly to associate’s degrees. Apprenticeships have effectively trained people in construction and the skilled trades for more than 80 years, thrived in some areas of manufacturing, and are now being adapted and applied more widely to advanced manufacturing, health care, information technology (IT), and other high-growth industries.<sup>2</sup> This expansion has resulted in not only new opportunities to advance career pathways but also increased investment from both the public and private sectors to promote growth.

Because of the changing industry landscape, the Federal Reserve Bank of Philadelphia is updating its apprenticeship guide, published in 2017, to inform stakeholders in the Third Federal Reserve District about new models, the current policy environment, and new program activity in Pennsylvania, New Jersey, and Delaware.<sup>3</sup> This update aims to strengthen the original guide by highlighting new apprenticeship and pre-apprenticeship programs that are being started on the regional and national levels. This update also includes observations on growth in the apprenticeship field and a list of key contacts and resources. While many of the programs shared in this update are new, the target audience remains the same: employers,

nonprofits, workforce development corporations, community colleges, and stakeholders interested in apprenticeship.

## APPRENTICESHIP FUNDING AND ACTIVITY

Substantial funding for expanding apprenticeships to new industries and occupations was put in place during the Obama administration and has grown during the Trump administration. The U.S. Department of Labor (DOL), which oversees the Registered Apprenticeship (RA) program, has provided almost \$1 billion for apprenticeship development since 2014. Some of the funding has been provided to states, industry associations, and educational institutions.

Federal funding, accompanied by state funding, has resulted in steady growth in the number of new RA programs and the number of apprentices. More than 600,000 apprentices were hired from January 2017 to November 2019.<sup>4</sup> During the 2013 to 2018 fiscal years, there were 1,168,957 new apprentices, 334,839 apprentice graduates, and 12,360 new programs, according to the DOL.

A presidential executive order in 2017 called for expanded use of apprenticeships, the establishment of a task force on apprenticeship expansion, and regulations for new industry-recognized apprenticeship programs (IRAPs).<sup>5</sup> Under IRAPs, industry and trade groups and other entities would approve new apprenticeship programs separately from traditional RA programs. Final guidance and regulations on IRAPs are to be issued.

An increasing number of companies and industry associations in different sectors are adopting apprenticeship programs as a means to develop employees with the specific skill sets needed to succeed in their organizations. In the IT sector, since 2017 Amazon has placed more than 500 apprentices, mostly new hires, in RAs for software development engineers, systems development engineers,

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<sup>1</sup> Keith Rolland, consultant to the Philadelphia Fed’s Community Development and Regional Outreach Department, developed the update. There were three reviewers: James Foti and Bernard E. Trembl, III, regional directors with the U.S. Department of Labor Office of Apprenticeship; and Chris Shannon, vice president for external affairs with the National Endowment for Financial Education. The author takes responsibility for any errors. The views expressed are those of the author and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

<sup>2</sup> Many of these programs are operated by joint apprenticeship and training committees consisting of an equal number of union and contractor representatives.

<sup>3</sup> The original guide provides a comprehensive overview of the U.S. apprenticeship system, including the Registered Apprenticeship (RA) program. It also mentions established international models. For additional information, please reference the original guide.

<sup>4</sup> See [www.dol.gov/newsroom/releases/osec/osec20191113](http://www.dol.gov/newsroom/releases/osec/osec20191113). Other data on Registered Apprenticeship programs are available at [www.doleta.gov/oa/data\\_statistics.cfm](http://www.doleta.gov/oa/data_statistics.cfm).

<sup>5</sup> See [www.whitehouse.gov/presidential-actions/3245/](http://www.whitehouse.gov/presidential-actions/3245/).



mechatronics technicians, and other programs.<sup>6</sup> IBM has had hundreds of apprentices since it started its program in 2017,<sup>7</sup> and Microsoft has also been active in apprenticeships and has a LEAP Engineering Acceleration Program (LEAP).<sup>8</sup> Apprenti, a program of the Washington Technology Industry Association Workforce Institute, offers 12-month IT RAs in multiple U.S. markets.<sup>9</sup>

Meanwhile, Accenture has hired 450 apprentices, many of whom have joined the company as full-time employees. The apprentices, who are not registered with DOL, learn a variety of skills in IT, human resources, finance, marketing, cybersecurity, data analytics, and software engineering.<sup>10</sup>

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<sup>6</sup> See [www.amazon.jobs/en/landing\\_pages/mil-apprentice](http://www.amazon.jobs/en/landing_pages/mil-apprentice) and [www.dol.gov/newsroom/releases/eta/eta20170119-0](http://www.dol.gov/newsroom/releases/eta/eta20170119-0).

<sup>7</sup> See [www.ibm.com/us-en/employment/newcollar/apprenticeships.html](http://www.ibm.com/us-en/employment/newcollar/apprenticeships.html) and [www.insidehighered.com/digital-learning/article/2019/10/29/interview-ibm-official-about-companys-new-collar-push-look](http://www.insidehighered.com/digital-learning/article/2019/10/29/interview-ibm-official-about-companys-new-collar-push-look).

<sup>8</sup> See [www.industryexplorers.com/](http://www.industryexplorers.com/).

<sup>9</sup> See [apprenticareers.org](http://apprenticareers.org).

<sup>10</sup> See [accenture.com/us-en/about/company/apprenticeships](http://accenture.com/us-en/about/company/apprenticeships).

In the health care sector, CVS Health has placed more than 1,500 employees in retail pharmacy and management positions in multiple states since it launched an RA program for pharmacy technicians in 2005.<sup>11</sup>

Financial services firms such as Aon,<sup>12</sup> Zurich North America,<sup>13</sup> the Hartford Financial Services Group, Inc.,<sup>14</sup> and JPMorgan Chase & Co.<sup>15</sup> have RA programs for positions ranging from general insurance associate to a variety of IT positions. Meanwhile, auditors of organization-wide management systems in aerospace, manufacturing, health care, food processing,

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<sup>11</sup> See [cvshealth.com/about/diversity/registered-apprenticeship-the-other-college](http://cvshealth.com/about/diversity/registered-apprenticeship-the-other-college) and [www.forbes.com/sites/nicholaswyman/2019/02/06/a-healthcare-company-finds-the-right-medicine/#2fc7ec4f788a](http://www.forbes.com/sites/nicholaswyman/2019/02/06/a-healthcare-company-finds-the-right-medicine/#2fc7ec4f788a).

<sup>12</sup> See [aon.com/careers/us/apprenticeships.html](http://aon.com/careers/us/apprenticeships.html).

<sup>13</sup> For information, see [www.zurichna.com/en/careers/apprenticeships](http://www.zurichna.com/en/careers/apprenticeships).

<sup>14</sup> For information, see [www.thehartford.com/careers/claims-apprentice](http://www.thehartford.com/careers/claims-apprentice).

<sup>15</sup> JPMorgan Chase & Co. is participating in a one-year IT RA program in Houston in cooperation with Houston Community College (HCC). The program is designed for HCC graduates who have earned an associate's of applied science degree in computer science.

and other industries are being trained in a new apprenticeship program created by the Independent Association of Accredited Registrars<sup>16</sup> in partnership with Workcred.<sup>17</sup>

Industry associations have also become active. The National Restaurant Association Educational Foundation (NRAEF)<sup>18</sup> has about 2,500 restaurant and lodging manager apprentices, many of whom are incumbent workers, with 69 employers in 45 states since it received a five-year DOL contract to serve as a hospitality industry intermediary.<sup>19</sup>

In addition to activity in the corporate sector, a wide range of nonprofits are sponsoring apprenticeship programs. Some nonprofits that include a focus on unemployed or underemployed individuals, veterans, or previously incarcerated individuals see apprenticeship as a unique opportunity to create career pathways to good-paying jobs. In the burgeoning IT sector, a number of for-profit ventures as well as nonprofits have emerged to train apprentices in response to strong industry demand.

## POLICY AND PROGRAMMATIC ENVIRONMENT

A widely held belief for one or two generations has been that a college education is the best route to a good job and career. This belief is reinforced by parents, teachers, and guidance counselors. While this is true for some individuals, it is not true for all. Increasingly, young people need not choose between apprenticeship and college. Apprentices earn college credits in many apprenticeship programs, and some apprenticeships are linked to associate's degrees. In a few emerging cases, apprenticeships are linked to bachelor's degrees.<sup>20</sup>

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<sup>16</sup> See [www.iaar.org/news.cfm](http://www.iaar.org/news.cfm).

<sup>17</sup> See [workcred.org](http://workcred.org).

<sup>18</sup> See [chooserestaurants.org/Discover-Opportunities/Apprenticeship](http://chooserestaurants.org/Discover-Opportunities/Apprenticeship).

<sup>19</sup> NRAEF also works on apprenticeship programs with the American Hotel & Lodging Association.

<sup>20</sup> In January 2020, the New Jersey Department of Labor and Workforce Development announced the availability of \$2 million in grants for an expanded NJ PLACE 2.0 Degree Apprenticeship Program. The program seeks to give apprentices the opportunity to simultaneously complete their apprenticeship program and obtain a college degree. See [www.nj.gov/labor/programs/grants/19023\\_njplace2.0.pdf](http://www.nj.gov/labor/programs/grants/19023_njplace2.0.pdf).

There is growth in apprenticeships by advanced manufacturers, which often make highly specialized medical and defense parts and cannot find skilled employees for available positions. Penn United Technologies, Inc., an advanced manufacturer located near Pittsburgh that has had more than 700 apprentices since it started RA programs nearly 50 years ago, decided to organize and fund a program in area high schools.<sup>21</sup> The program is designed for high school students who want to enter the workplace upon graduation as well as college-bound students who plan to major in a manufacturing-related field. Numerous examples of new apprenticeship programs by advanced manufacturers are included in the chapter on recent apprenticeship activity in Pennsylvania, New Jersey, and Delaware.

While there is much activity in RA programs, an unknown amount of activity is also occurring in nonregistered programs.<sup>22</sup>

## APPRENTICESHIP TRENDS

DOL officials noted the following trends in use of RA programs:

- Program refinements. There is noticeable growth in programs by group sponsors, in which companies in the same sector organize apprenticeship programs together rather than individually. Many programs are shorter in length — often one to two years; employers are increasingly using competency-based training methods. There's also significant growth in national programs suitable for companies operating apprenticeship programs in multiple states.<sup>23</sup>

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<sup>21</sup> More than 250 students have completed the program, Students Acquiring Technical Skills (SATS), since it was started in 2013. See [www.pennunited.com/sites/default/files/SATS%20Trifold.pdf](http://www.pennunited.com/sites/default/files/SATS%20Trifold.pdf). Also working to interest young people in manufacturing is The Manufacturing Advocacy and Growth Network (MAGNET), based in Cleveland and serving 18 counties in northeast Ohio. See [www.manufacturingsuccess.org](http://www.manufacturingsuccess.org).

<sup>22</sup> Industry-Driven Apprenticeship: What Works, What's Needed, by Tamar Jacoby and Robert I. Lerman, discusses independent "learn and earn" nonregistered programs and provides four case studies. See [opportunityamericaonline.org/wp-content/uploads/2019/02/OA\\_ApprenticeshipReport\\_2019.pdf](http://opportunityamericaonline.org/wp-content/uploads/2019/02/OA_ApprenticeshipReport_2019.pdf).

<sup>23</sup> The number of national programs increased by 55 percent in 2018, according to the DOL.

- **Participant inclusion.** The participation of women and members of racial and ethnic minority groups in RA programs is growing. Women constituted 13 percent of active apprentices at the end of 2019, according to the DOL. The DOL and states are seeking diversity in populations served as they fund new programs. Apprenticeships offer a unique opportunity for populations more likely to experience challenges in securing good-quality jobs, such as those who are unemployed or previously incarcerated.
- **Emergence of intermediaries.** Some intermediaries are emerging to organize apprenticeship activity on a larger scale. They typically bring together employers and apprentices, and they sometimes play the important role of expediting registration and paperwork on behalf of employers.

The DOL continues to try to provide employers with greater flexibility and is providing some funding to explore new apprenticeship models.

Another trend is an increasing use of pre-apprenticeships, which confirm apprentices' interest in a particular occupation and industry and reinforce basic employability skills such as listening, conflict resolution, communication, and teamwork.<sup>24</sup> Pre-apprenticeships can play a critical role in setting the stage for successful entry and completion of apprenticeships, especially for those who do not have previous work experience. Pre-apprenticeships are also an opportune time to address employment barriers such as housing, child care, and transportation by providing access to supportive services. Program organizers that address participant needs at an early stage increase the chances that the participants will be successful. Pennsylvania and Delaware have started to register pre-apprenticeship programs, and the two states as well as New Jersey provide some grant support for the development of such programs.

Two areas of special interest nationally and in the tristate region — youth apprenticeships and apprenticeship intermediaries — are discussed in the following sections.

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<sup>24</sup> Pre-apprenticeships are “designed to prepare individuals to enter and succeed in registered apprenticeship programs,” according to the DOL, which recommends that pre-apprenticeship programs involve formal partnerships with at least one program sponsor.

## YOUTH APPRENTICESHIPS

Government agencies, nonprofits, foundations, and others show growing interest in creating apprenticeships that put young people on a trajectory to develop in-demand workplace skills and access living wage employment. Young people typically start pre-apprenticeship programs in high schools and enter full apprenticeship programs after they graduate. Youth apprenticeships bridge the educational and employment sectors and require instructional alignment between schools and businesses, flexible scheduling options in high schools, and the cooperation of school districts, teachers, principals, superintendents, and others in the educational sector. Community colleges may also be involved in providing credits for related training and instruction in apprenticeship programs. Potentially, high school apprenticeships can be started by building upon existing high school career and technical education programs or career academies.<sup>25</sup>

In a recognition of the importance of reaching young people early to think about careers, the DOL partnered with Scholastic, Inc. in 2019 to develop the Jobs of the Future educational program to inform middle school students, parents, and teachers about apprenticeships.<sup>26</sup> The DOL has a guide to assist those starting high school apprenticeship programs.<sup>27</sup>

Long-established youth apprenticeship programs exist in Wisconsin and Washington. More recently, Georgia,<sup>28</sup> North Carolina,<sup>29</sup> South Carolina,<sup>30</sup> Maryland,<sup>31</sup> and Kentucky<sup>32</sup> have developed substantial youth

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<sup>25</sup> See report by Advance CTE, *Connecting Secondary Career and Technical Education and Registered Apprenticeship: A Profile of Six State Systems* at [cte.careertech.org/sites/default/files/files/resources/Opportunities\\_Connecting\\_Secondary\\_CTE\\_Apprenticeships.pdf](http://cte.careertech.org/sites/default/files/files/resources/Opportunities_Connecting_Secondary_CTE_Apprenticeships.pdf).

<sup>26</sup> See [www.scholastic.com/jobsofthefuture/](http://www.scholastic.com/jobsofthefuture/).

<sup>27</sup> See [www.apprenticeship.gov/sites/default/files/2019-04/HS\\_Apprenticeship\\_Youth\\_Guide\\_FINAL\\_2010831.pdf](http://www.apprenticeship.gov/sites/default/files/2019-04/HS_Apprenticeship_Youth_Guide_FINAL_2010831.pdf).

<sup>28</sup> See [www.gadoe.org/Curriculum-Instruction-and-Assessment/CTAE/Pages/Youth-Apprenticeship-Program.aspx](http://www.gadoe.org/Curriculum-Instruction-and-Assessment/CTAE/Pages/Youth-Apprenticeship-Program.aspx).

<sup>29</sup> See [www.apprenticeshipnc.com/sites/default/files/file-uploads/nccc-printablehandbook-final-r1-print\\_quality.pdf](http://www.apprenticeshipnc.com/sites/default/files/file-uploads/nccc-printablehandbook-final-r1-print_quality.pdf).

<sup>30</sup> See [www.apprenticeshipcarolina.com/youth-apprenticeship.html](http://www.apprenticeshipcarolina.com/youth-apprenticeship.html).

<sup>31</sup> See [www.dllr.state.md.us/employment/appr/youthappr.shtml](http://www.dllr.state.md.us/employment/appr/youthappr.shtml).

<sup>32</sup> See [education.ky.gov/CTE/cter/Pages/TRACK.aspx](http://education.ky.gov/CTE/cter/Pages/TRACK.aspx).

apprenticeship or pre-apprenticeship programs. However, the lack of a common definition or standard for youth apprenticeships impedes growth in the field.

A significant initiative is the Partnership to Advance Youth Apprenticeship (PAYA), established in 2018 by New America, a public policy nonprofit, in collaboration with nine national partner organizations. A New America report, *Youth Apprenticeship in America Today: Connecting High School Students to Apprenticeship*, highlights new state innovations in youth apprenticeship policy and practice, as well as wide variations in communities' approaches.<sup>33</sup> PAYA developed a definition of high-quality youth apprenticeships<sup>34</sup> and held a national funding competition that resulted in nine grants to states and localities working to develop youth apprenticeships.<sup>35</sup> A PAYA technical assistance network includes several organizations in Pennsylvania, New Jersey, and Delaware. PAYA partner organizations have produced three youth apprenticeship resources: a community self-assessment tool, a report on the role of intermediaries, and a report on the role of data and accountability. (They are listed in the Key Contact Individuals and Resources section under Youth Apprenticeships.)

In a state initiative, the New Jersey Department of Education has awarded nearly \$600,000 in grants to six New Jersey school districts for the creation of pre-apprenticeship programs.<sup>36</sup> The initiative uses federal Perkins Leadership funds and targets school districts that are operating career and technical education programs or programs of study.

Powerful developmental benefits for young people who participate in apprenticeships are described in *The Means to Grow Up: Reinventing Apprenticeship as*

*a Developmental Support in Adolescence*, by Robert Halpern and *Apprenticeship for Adulthood: Preparing Youth for the Future*, by Stephen F. Hamilton.

## INTERMEDIARIES

Three leading examples of apprenticeship intermediaries are based in South Carolina, Colorado, and Vermont. They are employer-led and oriented, which makes it easier to achieve employer engagement.

### Apprenticeship Carolina

Apprenticeship Carolina is a statewide apprenticeship program embedded in the community college system since 2014. In this program, a half-dozen marketing specialists meet with employers statewide to determine workforce needs and “pain points” and assist employers in starting apprenticeships that respond to those needs.

An interesting youth apprenticeship regional partnership that uses the Apprenticeship Carolina program has taken hold in Charleston, SC. The partnership involves the Charleston Metro Area Chamber of Commerce, Trident Technical College (TTC), and high schools in a three-county region.<sup>37</sup> The chamber is a founding funder of the regional partnership and helps fund tuition, books, and materials related to the apprenticeship-related TTC courses. The youth apprentices take high school classes as well as industry-specific courses at TTC and choose from more than 15 career pathways.

### CareerWise Colorado

CareerWise Colorado is a statewide intermediary that has employer-led programs designed in partnership with high schools.<sup>38</sup> It was founded in 2016 by businessman Noel Ginsburg and inspired by the apprenticeship system in Switzerland, where 70 percent of students choose apprenticeships.

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<sup>33</sup> See [www.newamerica.org/education-policy/policy-papers/youth-apprenticeship-america-today/](http://www.newamerica.org/education-policy/policy-papers/youth-apprenticeship-america-today/).

<sup>34</sup> PAYA defines high-quality youth apprenticeships as those that include paid on-the-job learning under skilled mentorship, related classroom-based instruction, ongoing assessment against established skills standards and culmination in an industry-recognized credential and postsecondary credit. See [www.newamerica.org/education-policy/partnership-advance-youth-apprenticeship/about/our-principles/](http://www.newamerica.org/education-policy/partnership-advance-youth-apprenticeship/about/our-principles/).

<sup>35</sup> For information on PAYA grantees, see [www.newamerica.org/education-policy/partnership-advance-youth-apprenticeship/about/our-grantees/](http://www.newamerica.org/education-policy/partnership-advance-youth-apprenticeship/about/our-grantees/).

<sup>36</sup> See [www.nj.gov/education/news/2020/Murphy%20Administration%20Awards%20ExPAND%20Pre-Apprenticeship%20Grants.pdf](http://www.nj.gov/education/news/2020/Murphy%20Administration%20Awards%20ExPAND%20Pre-Apprenticeship%20Grants.pdf).

<sup>37</sup> See [www.charlestonchamber.org/career/youth-apprenticeships/](http://www.charlestonchamber.org/career/youth-apprenticeships/).

<sup>38</sup> See [www.careerwisecolorado.org](http://www.careerwisecolorado.org).

CareerWise Colorado provides three- and four-year apprenticeships in advanced manufacturing, business operations, education, financial services, health care, hospitality, and IT. CareerWise has partnered to help launch youth apprenticeship models in Elkhart County, Indiana and New York City, and a new pilot is being planned in Washington, D.C. In the three cases, education-oriented nonprofits help coordinate involvement of area high schools and act as the intermediary for their community.<sup>39</sup>

### Vermont HITEC

Vermont HITEC has organized pre-apprenticeship and apprenticeship programs in health care, IT, advanced manufacturing, and business services in Vermont and New Hampshire during the past 20 years.<sup>40</sup> For the past three years, Vermont HITEC's nonprofit affiliate, the Institute for American Apprenticeships, has been acting as a national workforce intermediary, providing technical assistance to DOL contractors as well as states and cities to create and implement RAs.

## RECENT ACTIVITY IN PENNSYLVANIA, NEW JERSEY, AND DELAWARE

Many new programs have started in the past two years. A sampling of programs is provided to illustrate some notable activity; it is not intended to be all-encompassing. Some of the programs involve young people or intermediaries, two subjects discussed previously. The programs are organized by industry sectors, which are listed alphabetically.

### Advanced Manufacturing

The **German American Chamber of Commerce (GACC)** in Pittsburgh has developed a pre-apprenticeship program for mechatronics technicians, polymer technicians, and sales engineers in partnership with 17 manufacturers, 15 school districts, the Community College of Allegheny County, and

education providers in southwestern Pennsylvania. In the pre-apprenticeship, high school seniors rotate through different areas of a company's operations, take technical courses and practice labs, have a paid internship, and earn an industry-recognized manufacturing technician certificate and six community college credits. Upon graduation, the seniors are considered for full apprenticeship programs, which average 30 months in length.

The GACC handles much of the apprenticeship registration and paperwork for employers and seeks grants that reduce apprenticeship costs and subsidize apprentice wages. The GACC takes a flexible approach with employers and high schools, working within their respective constraints. For information, contact Rachel Mauer at [rmauer@gaccpit.com](mailto:rmauer@gaccpit.com); [www.gaccpit.com](http://www.gaccpit.com).

The GACC's New York office has begun to provide "train the trainer" programs for New Jersey employers starting apprenticeships. It is also sponsoring a three-year RA program in mechatronics. For information, contact Matthew Allen at [mallen@GACCNY.COM](mailto:mallen@GACCNY.COM); [www.ahk-usa.com](http://www.ahk-usa.com).

**Pennsylvania College of Technology (PCT)** in Williamsport, PA is building on its four-year experience in advanced manufacturing apprenticeships to create new apprenticeship models that increase accessibility and flexibility for participating employers. In 2019, the DOL awarded PCT and the New Jersey Institute of Technology a grant of nearly \$8 million to develop modular industry-driven apprenticeship strategies (MIDAS) that will serve about 3,200 individuals. For information, contact Shannon Munro at [smunro@pct.edu](mailto:smunro@pct.edu); [www.pct.edu/business/workforce-development/apprenticeships](http://www.pct.edu/business/workforce-development/apprenticeships).

**The New Jersey Manufacturing Extension Program, Inc. (NJMEP)** is an intermediary that is assisting primarily small and midsize manufacturers with participation in apprenticeship programs. NJMEP's seven-member apprenticeship team assumes much of the responsibility for the registration of manufacturers and apprentices and other paperwork, helps manufacturers develop programs, assists in apprentice recruitment, and conducts assessment and competency tests. Currently, NJMEP works with 24 participating manufacturers and 40 apprentices. NJMEP created one of the first apprenticeship programs to train technical sales representatives. Its

<sup>39</sup> The nonprofits are Horizon Education Alliance in Elkhart County, Indiana; HERE to HERE, located in the Bronx in New York; and CityWorks, an initiative of CityBridge, in Washington, D.C.

<sup>40</sup> See [www.vthitec.org/page1/index.html](http://www.vthitec.org/page1/index.html).

## Industry Spotlight

B. Braun Medical, Inc., a German-based global medical device manufacturer with its North American headquarters in Bethlehem, PA, has started apprenticeship programs for tool and die makers, electromechanical technicians, and plastic processing technicians, and is starting a pre-apprenticeship program. In a presentation at the 2019 Pennsylvania Apprenticeship Summit, Vincent Beller, manager of technical training operations, and John Keefe, mold shop manager, identified best practices for employers starting apprenticeship programs.

According to the presentation, employers may want to:

- Initially clarify the business needs for an apprenticeship program, set short- and long-term goals and ways to measure progress, and develop plans to address costs of a program. Costs include pre-apprentice stipends, apprentice wages and time spent in program administration, development of external relationships, and lost productivity of mentors.
- Form a core internal group of individuals committed to the program's success, possibly including an executive, a department manager, a mentor and/or apprentice coordinator, a representative of the human resources department, and a school-to-work coordinator.
- Establish a group of external supporters — for example, vocational-technical high schools, colleges, workforce development corporations, industry associations, and local media.
- Get senior management's long-term commitment to a program's plans, costs, personnel support, timeframe, and goals. The plan should not be susceptible to short-term economic conditions or departmental decisions.
- Train mentors and others who are directly involved in the program and enlist them to be committed to the program's success.
- Strive for effective communication with internal and external individuals from different generations involved in the program.
- Plan apprenticeship recruitment — for example, through pre-apprenticeships in which high school seniors participate in job shadowing, internships, and/or cooperative programs. Candidates should be interviewed as potential employees. Employers may want to consider open houses or other methods to promote understanding and support for pre-apprenticeships or apprenticeships among parents and siblings.
- Provide related training and instruction that accommodates different learning preferences, for example, in the use of community college courses, online tools, shop visits, internal training programs, and vendors.
- Apply for state approval of apprenticeship programs to enhance the ability to apply for and obtain state grants that support the program.
- Create the apprenticeship program as part of a staffing plan with a budget and a structure that defines the program's operation.
- Develop a vital program that has visibility in the company, schools, and in the community.

For information, contact Vincent Beller at [Vincent.beller@bbraunusa.com](mailto:Vincent.beller@bbraunusa.com) or John Keefe at [john.keefe@bbraunusa.com](mailto:john.keefe@bbraunusa.com); [www.bbraunusa.com](http://www.bbraunusa.com).



most popular apprenticeship program, which trains industrial manufacturing production technicians, is now operating at various locations across the state. NJMEP's programs last a year to a year and a half. For information, contact Patricia Moran at [pmoran@njmep.org](mailto:pmoran@njmep.org); [www.njmep.org/registered-apprenticeship/](http://www.njmep.org/registered-apprenticeship/).

**The Hanover Area Chamber of Commerce** in York County, Pennsylvania is the first chamber in the state to sponsor an apprenticeship program. It brought together school districts and manufacturers and has an intermediary coordinating and administrative role, relieving employers of some administrative responsibilities. High school students can start as pre-apprentices in their junior year and take technical courses and gain workplace experience at a participating manufacturer; upon graduation, they can spend a second year as paid employees at the manufacturer. For information, contact Gary M. Laird, president, Hanover Area Chamber of Commerce, at [glaird@hanoverchamber.com](mailto:glaird@hanoverchamber.com); [www.hanoverchamber.com/workforce-development](http://www.hanoverchamber.com/workforce-development); [www.starttheconversationhere.com/workforce\\_spotlight/2108/Elsner\\_Engineering\\_Winter\\_2017/](http://www.starttheconversationhere.com/workforce_spotlight/2108/Elsner_Engineering_Winter_2017/).

**Keystone Community Education Council (KCEC)** developed an apprenticeship program for 12 plastics manufacturers in northwestern Pennsylvania that wanted to upgrade the skills of their current midlevel workers. The two-year group program in a rural region trains plastics process technicians. For information, contact Lance J. Hummer at [lhummer@keystonecec.org](mailto:lhummer@keystonecec.org); [keystonecec.org/apprenticeships/](http://keystonecec.org/apprenticeships/).

**Rhoads Industries, Inc.**, a fourth-generation Philadelphia manufacturer founded in 1896, works on defense industry and commercial projects and started a four-year welding apprenticeship program in collaboration with its union, Boilermakers Local 19. Eight incumbent workers are initially being trained as apprentices for positions requiring higher-level skills. Rhoads projects it will need an additional 100 skilled workers in the next few years and is exploring the feasibility of an advanced manufacturing pre-apprenticeship program in conjunction with Philadelphia Works, Inc. and other employers to meet the talent needs of small to midsize manufacturers in the Delaware Valley region. Rhoads provides on-the-

job learning and related technical instruction at its 6,800-square-foot apprenticeship training center in Philadelphia's Navy Yard. For information, contact Randy McCullough at [rmccullough@rhoadsinc.com](mailto:rmccullough@rhoadsinc.com); [chamberphl.com/2018/11/member-perspective-tomika-hendricks/](http://chamberphl.com/2018/11/member-perspective-tomika-hendricks/).

**County College of Morris (CCM)** in New Jersey was awarded a \$4 million DOL grant in 2019 to expand advanced manufacturing apprenticeships and leads a consortium of community colleges and one four-year college in New Jersey to work with small to midsize manufacturers to create 1,600 apprenticeships during a four-year period. CCM plans to develop RAs and other workforce development models and conduct "boot camps," short immersion programs leading to a continuum of options, including entry-level positions and apprenticeships. For information, contact Patrick Enright at [penright@ccm.edu](mailto:penright@ccm.edu); [morriscountynj.gov/2019/07/ccm-awarded-4-million-to-lead-expansion-of-apprenticeship-programs/](http://morriscountynj.gov/2019/07/ccm-awarded-4-million-to-lead-expansion-of-apprenticeship-programs/).

**The New Jersey Community College Consortium for Workforce & Economic Development** has started apprenticeship programs for CNC manual mill and lathe operators and industrial maintenance mechanics, and it is working to create other apprenticeship opportunities. For information, contact Robert Rosa at [rrosa@njworkforce.org](mailto:rrosa@njworkforce.org); [njworkforce.org/about-us/](http://njworkforce.org/about-us/).

## Agriculture and Horticulture

**The Pennsylvania Association for Sustainable Agriculture** facilitates a two-year dairy grazing apprenticeship and 18-month diversified vegetable apprenticeship to prepare apprentices to become farm managers or start their own farms. Apprentices develop their skills with individual mentors on working farms in the two RA programs. For information, contact Aaron deLong at [aaron@pasafarming.org](mailto:aaron@pasafarming.org); [www.pasafarming.org](http://www.pasafarming.org).

**The Monmouth County Vocational School District (MCVSD)** in New Jersey has started a greenskeeper and sports turf management apprenticeship for students enrolled in the school's horticulture landscaping program in Freehold, NJ. Students in the two-year apprenticeship complete relevant courses and training at MCVSD's Career Center and get paid on-the-job



training during the summer at one of the Monmouth County Parks golf courses. For information, contact Nathan Kraemer at [NKraemer@ctemc.org](mailto:NKraemer@ctemc.org); [www.mcvsd.org](http://www.mcvsd.org).

### Automotive Trades

**The New Jersey Coalition of Automotive Retailers** started a two-year automotive technician apprenticeship program. Apprentices work full-time at \$15 an hour at participating new car dealers and attend classes two evenings a week at vocational high schools. About 70 apprentices are initially working at 15 new car dealers in Middlesex and Ocean counties. In addition, Motors Management Corp. in New Jersey is starting an automotive technician and diesel mechanic program. The programs are a response to a shortage of auto technicians that could reach 25,000 workers in New Jersey in the next few years, according to an industry spokesperson. For information, contact Breanna Esquilin at [besquilin@njcar.org](mailto:besquilin@njcar.org); [atap.njcar.org](http://atap.njcar.org).

**Atlantic County Institute of Technology (ACIT)** in New Jersey is developing a pre-apprenticeship program for automotive technicians. Seniors will take general and technical courses and visit work sites in the second of their two terms. The technical courses and work experience constitute a structured learning experience for which the students will receive credit.<sup>41</sup> After graduation, the seniors will be considered for RAs in their respective occupations. For information, contact Gina DeMaio at [gdemai@acitech.org](mailto:gdemai@acitech.org); [www.acitech.org](http://www.acitech.org).

### Construction and Skilled Trades

**The Builders Guild of Western Pennsylvania** is operating a six-week pre-apprenticeship program to increase diversity and the awareness of career opportunities in construction and the skilled trades. Recruitment targets high school juniors and

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<sup>41</sup> See [www.nj.gov/education/cte/sle/](http://www.nj.gov/education/cte/sle/).

seniors, parents, and guidance counselors; includes previously incarcerated individuals; and uses referrals from career fairs, nonprofits, and workforce development corporations (WDCs). Participants earn several industry-recognized certifications in the pre-apprenticeship, which consists of math skills, communication and other soft skills, and financial literacy. The Urban League of Greater Pittsburgh helps participants with funds for tools or transportation, and Builders Guild staff members mentor participants during and after the program. Primary funders are Partners4Work and other WDCs in the region, the Pittsburgh Regional Building Trades Council, and Highmark. Program graduates tend to enter a union apprenticeship program or be hired by a union contractor. In 2019, of 72 people who started the pre-apprenticeship, about 98 percent completed the program and about 70 percent entered a union apprenticeship, typically as laborers, painters, and plasterers. For information, contact Chaquita Barnett at [cbarnett@buildersguild.org](mailto:cbarnett@buildersguild.org); [www.buildersguild.org/](http://www.buildersguild.org/).

**York, PA Electrical Institute (YEI)**, an apprenticeship and training center of the International Brotherhood of Electricians, has experience with several types of youth pre-apprenticeship programs, including a six-week youth “boot camp,” an electrical industry curriculum for first-year students at York County School of Technology, and an online electrical industry training curriculum. Based on its experience, it developed 10 key components of youth pre-apprenticeship programs that are included in an online resource at [yorkelectricians.org/pre-apprenticeship-best-practices/](http://yorkelectricians.org/pre-apprenticeship-best-practices/). For information, contact Scott Brenneman at [sbrenneman@yorkelectricians.org](mailto:sbrenneman@yorkelectricians.org).

**Sussex Technical School District’s Adult Division** in Sussex County, Delaware is taking steps to meet the needs of construction and skilled trades apprentices who have limited proficiency in English. The vocational school’s adult education division provides related training and instruction two evenings a week and has added a third evening, in which an instructor fluent in English and Spanish teaches English, civics, and job readiness. The bilingual instructor is funded by adult education funds under Title II of the Workforce Innovation and Opportunity Act. Twenty-seven apprentices were attending the third evening in

December 2019.<sup>42</sup> For information, contact Michael Hague at [mike.hague@sussexvt.k12.de.us](mailto:mike.hague@sussexvt.k12.de.us); [sussexvt.org/adult\\_education/apprenticeship\\_training](http://sussexvt.org/adult_education/apprenticeship_training).

## Culinary

**The Delaware Restaurant Association Educational Foundation (DRAEF)** started a two-year apprenticeship program for cooks in 2019, in which five apprentices spend about 40 hours a week at participating restaurants and three hours a week in classroom instruction taught by a retired chef. In addition, nine apprentices are participating in a restaurant manager apprenticeship. DRAEF plans to expand the program statewide and works closely with the National Restaurant Association Educational Foundation. For information, contact Raelynn Grogan at [raelynn@delawarerestaurant.org](mailto:raelynn@delawarerestaurant.org); [www.delawarerestaurant.org/assets/Education-Policy-Brief.pdf](http://www.delawarerestaurant.org/assets/Education-Policy-Brief.pdf). (Other culinary programs have been started in the three states.)

## Education

**District 1199C’s Training and Upgrading Fund** developed and implemented an early childhood education (ECE) program in southeastern Pennsylvania and is replicating the program in multiple regions in Pennsylvania. The program is one of the first nationally to enable ECE workers to obtain associate’s and bachelor’s degrees and become lead teachers. The program complements pre-K child care initiatives in Pennsylvania and Philadelphia. For information, contact Cheryl Feldman at [cfeldman@1199ctraining.org](mailto:cfeldman@1199ctraining.org); [www.1199ctraining.org](http://www.1199ctraining.org).

## Health-Care, Pharmacy, and Scientific Research

**District 1199C’s Training and Upgrading Fund** has apprenticeship programs in the Philadelphia region for behavioral health direct support professionals, addictions counselors, community health workers,

<sup>42</sup> The school district previously operated a one-year pre-apprenticeship program in the electrical field that used an ESL instructor. The program is described at [apprenticeshipusa.workforcegps.org/blog/general/2018/06/07/16/11/Integrating-Electrical-and-English-Instruction-to-Meet-Demand-for-Electricians-in-Delaware](http://apprenticeshipusa.workforcegps.org/blog/general/2018/06/07/16/11/Integrating-Electrical-and-English-Instruction-to-Meet-Demand-for-Electricians-in-Delaware).

nurse aides, advanced home health aides, and advanced medical assistants. Approximately 142 apprentices were participating with 40 employers in the fund's apprenticeship programs as of September 2019. For information, contact Cheryl Feldman at [cfeldman@1199ctraining.org](mailto:cfeldman@1199ctraining.org); [www.1199ctraining.org](http://www.1199ctraining.org).

**GlaxoSmithKline (GSK)** has four apprenticeship programs at its Montgomery County, Pennsylvania manufacturing facility, in which apprentices earn associate's degrees. Apprenticeships for validation technicians, biochemist associates, and biotechnology associates are linked to associate's degrees at Montgomery County Community College, while apprenticeships for automation technicians are linked to an associate's degree at Reading Area Community College. (GSK also has a fifth apprenticeship program for maintenance mechanics that is not linked to an associate's degree.) Apprentices spend about 80 percent of each week in on-the-job training and the balance in community college courses. GSK pays apprentices for their time at work and at college, and it pays the cost of their college tuition. For information, contact Maoliosa Denye at [maoliosa.x.denye@gsk.com](mailto:maoliosa.x.denye@gsk.com); [us.gsk.com/en-us/careers/apprentices-students-and-graduates/apprenticeships/](http://us.gsk.com/en-us/careers/apprentices-students-and-graduates/apprenticeships/).

**The Wistar Institute**, a leader in cancer research and vaccine development in Philadelphia, started a biomedical research technician (BRT) apprenticeship program that provides apprentices with specialized training in research laboratories at academic institutions and biotechnology and pharmaceutical companies. For information, contact William Wunner at [wunner@wistar.org](mailto:wunner@wistar.org); [www.wistar.org](http://www.wistar.org).

**The Princeton Plasma Physics Laboratory** in New Jersey has started an apprenticeship program to train mechanical and electrical technicians. Four apprentices who took a six-week summer pre-apprenticeship program started a pilot apprenticeship program in September 2019 to build components for PPPL's fusion energy and plasma experiments. For information, contact Andrew P. Zwicker at [azwicker@pppl.gov](mailto:azwicker@pppl.gov) [www.pppl.gov](http://www.pppl.gov).

**Atlantic County Institute of Technology (ACIT)** in New Jersey is developing a pre-apprenticeship program for medical assistants. For information, contact Gina DeMaio at [gdemai@acitech.org](mailto:gdemai@acitech.org); [www.acitech.org](http://www.acitech.org).

## Information Technology

**ApprenticeIT**, a partnership between Mercer County Community College (MCCC) and Domain Computer Services, an IT service provider based in Cranbury, NJ, was founded to give MCCC students access to paid on-the-job training and enable area businesses to receive IT services at a lower cost than is otherwise available. Domain provides training on technical and soft skills before the students assist businesses on remote and onsite help desk support, peripheral hardware and software support, and PC deployment. For information, contact Lorin M. Fisher at [lorinf@go-domain.com](mailto:lorinf@go-domain.com); [apprenticeitnj.com/about/](http://apprenticeitnj.com/about/).

**NPower's** New Jersey affiliate has developed an IT generalist apprenticeship program and is creating a cybersecurity technician apprenticeship program. NPower, a nonprofit based in Brooklyn, focuses on young adults, veterans, and veterans' spouses in the two competency-based programs. NPower developed national standards of apprenticeship guidelines for its IT generalist apprenticeship program with the DOL's New Jersey office; the standards are registered in different states in which NPower operates the program. An NPower representative said that the nonprofit developed with the DOL a one-page agreement for employers to sign and hire apprentices that streamlined the administrative process for its career teams and employer partners. For information, contact Bea Tassot at [Bea.Tassot@npower.org](mailto:Bea.Tassot@npower.org); [npower.org](http://npower.org).

**NuPaths, LLC**, cofounded by Harrisburg University in 2018, provides IT training for young people looking for a college alternative, adults who are unemployed or underemployed or want to make a career change, as well as veterans and others who were previously incarcerated. NuPaths' training leads to apprenticeships, internships, or full-time or contract entry-level IT employment. NuPaths has a six-month pre-apprenticeship program; graduates are considered for IT, digital media, and cybersecurity RA programs operated by TranZed Apprenticeship Services, based in Baltimore.

NuPaths also works with several public high schools in the Harrisburg, PA region to provide seniors with IT training leading to employment following graduation. NuPaths partners with JEVS Human Services in

Philadelphia as well as workforce development agencies throughout the state. For information, contact Elizabeth McCurdy at [emccurdy@nupaths.org](mailto:emccurdy@nupaths.org); [www.nupaths.org](http://www.nupaths.org).

## PROGRAMS TARGETED TO SPECIAL POPULATIONS

### Reentry

**Berks Connections/Pretrial Services (BCPS)**, a nonprofit in Reading, PA, has started a pre-apprenticeship program leading to apprenticeships in the construction trades. In 2017, BCPS developed a comprehensive program called Rebuilding Reentrants and Reading (R3), in which participants attend BCPS' eight-week employment-focused curriculum and evening classes at Reading Muhlenberg Career and Technology Center and help renovate properties for Habitat for Humanity of Berks County and Neighborhood Housing Services. BCPS provides case management, mentoring, and support for one year following graduation. In 2019, BCPS signed an articulation agreement with the Associated Builders and Contractors' Keystone chapter, under which R3 graduates receive six months credit toward any of the chapter's RA programs in seven construction trades. For information, contact Peggy Kershner at [pkershner@bcpsreentry.org](mailto:pkershner@bcpsreentry.org); [www.berksconnections.org/r3trainingprogram](http://www.berksconnections.org/r3trainingprogram).

**The New Jersey Reentry Corporation (NJRC)**, a nonprofit founded in 2015, has started a pre-apprenticeship program of six to 12 months leading to apprenticeships, employment, or enrollment in community college. The pre-apprenticeship program prepares NJRC clients for jobs in logistics, auto repair, IT, and drug and alcohol counseling, and apprenticeships in construction and other industries. NJRC provides individualized assessment and treatment plans and provides support for a year after clients are employed. For information, contact Jennifer Pena at [jpena@njreentry.org](mailto:jpena@njreentry.org); [www.njreentry.org](http://www.njreentry.org).

### Opportunity Youth

Different organizations are seeking to address needs of opportunity youth (out of school and out of work).

**Philadelphia Works, Inc.** has funded and/or provided technical assistance to nine pre-apprenticeship programs that serve out-of-school or in-school youth in health care, IT, and the skilled trades. It has also funded or provided technical assistance to apprenticeship programs for both youth and adult populations. Philadelphia Works has also led formation of ApprenticeshipPHL, a regional public/private collaboration of apprenticeship partners.<sup>43</sup> For information, contact Mark Genua at [MGenua@philaworks.org](mailto:MGenua@philaworks.org); [www.philaworks.org](http://www.philaworks.org).

**JEVS Human Services (JEVS)**, a Philadelphia-based nonprofit, has started an IT generalist apprenticeship and associated pre-apprenticeship programs in the Philadelphia region, primarily for out-of-school youth who are 18 to 24 years old. The programs are overseen by the Philadelphia Information Technology Opportunities Collaborative, a public-private collaborative that is a group sponsor of an IT apprenticeship program in partnership with Philadelphia Works, Inc., Community College of Philadelphia, and others. JEVS is also organizing apprenticeships for manufacturers. For information, contact Madison Helmick at [madison.helmick@jevs.org](mailto:madison.helmick@jevs.org); [www.jevshumanservices.org/apprenticeships/](http://www.jevshumanservices.org/apprenticeships/).

**Philadelphia Youth Network (PYN)** works with employers to develop career pathways through apprenticeships and manages a CVS Health pharmacy technician apprenticeship program that engages opportunity youth in Philadelphia, Bucks, Chester, and Montgomery counties in partnership with CVS Health, community colleges, workforce development corporations, the School District of Philadelphia, and Job Corps Philadelphia.<sup>44</sup> For information, contact Kelsey DeMerlis at [kdemerlis@pyninc.org](mailto:kdemerlis@pyninc.org); [www.pyninc.org](http://www.pyninc.org).

<sup>43</sup> See [apprenticeshipphl.org](http://apprenticeshipphl.org).

<sup>44</sup> See [aspencommunitysolutions.org/who-are-opportunity-youth/](http://aspencommunitysolutions.org/who-are-opportunity-youth/).

## APPRENTICESHIP INTERMEDIARIES

**Keystone Development Partnership (KDP)** has started an innovative competency-based Registered Apprenticeship (RA) program in Pennsylvania to train Apprenticeship Navigators to provide technical assistance to those seeking to start and enhance RA programs. KDP, Penn State University, and other apprenticeship experts provide the related training and instruction. The first cohort in southeastern Pennsylvania, managed by KDP and Philadelphia Works, includes representatives of several nonprofits, two unions, PA CareerLink staff, a vocational high school, and a community college. In February 2020, the Apprenticeship Navigator program received the Pinnacle Award for Business Development from the National Association of State Workforce Agencies. For information, contact Tara Toms at [ttoms@kdpworks.org](mailto:ttoms@kdpworks.org); [kdpworks.org](http://kdpworks.org), or Mark Genua of Philadelphia Works at [MGenua@philaworks.org](mailto:MGenua@philaworks.org).

## OBSERVATIONS

Apprenticeship is an employer-led strategy that integrates education and on-the-job learning in preparing people for jobs and careers. Many new apprenticeship and pre-apprenticeship programs are being started, and a great deal of activity and experimentation is taking place nationally and in Pennsylvania, New Jersey, and Delaware. This, in turn, is generating further interest by employers, nonprofits, and government agencies that are intrigued about the potential of apprenticeships as a winning strategy for both employers and employees.

Assessment and evaluation will be needed to understand new programs' results and outcomes, especially completion rates. Best practices may emerge in the process. Initial funding has typically come from the DOL and/or state programs, and some program sponsors are searching for ways to make their programs self-sustaining. Many practitioners in the apprenticeship field also seek an infrastructure or ecosystem that supports apprenticeship programs.

As future programs are developed, it seems appropriate to consider the likely impact of automation on certain occupations and the long-term career prospects in those

occupations, as suggested in a research paper by Daniel Kuehn of the Urban Institute. Kuehn noted that in New Jersey, many of the skilled trades, such as the electrical and plumbing fields, have a low risk of being automated and strong job growth prospects and should continue to be supported. Other occupations to which apprenticeship could be expanded also have low automation risk and strong job prospects, he indicated.<sup>45</sup>

Despite their promise, opportunities available through apprenticeships are not always widely understood by the public, including by parents and educators, who play an important part in the career decisions of young people. Some leaders in the field say a national brand is needed to make apprenticeship more widely known.

There are also financial considerations for those embarking on this career pathway. Apprentices who are unemployed or underemployed can encounter barriers, such as child care, transportation, or housing needs. They may need supportive services, typically provided by a nonprofit, or they may need small loans, for example to buy a car, that are sometimes provided by a community development financial institution. An apprenticeship is an opportune time to learn about checking and savings accounts, budgeting, and the use of credit. Nonprofits exist that specialize in financial education and linkages can be made with these existing programs to provide a sound financial foundation as apprentices move forward in their lives.

There is greater focus on apprenticeships that start in high school or at an early stage in a person's career. In order for high school students to make sound decisions about apprenticeships and a career direction, students ideally will have some understanding of their abilities, aptitudes, and personalities; have an awareness of different careers; and have done some career exploration. Discussion of these subjects may begin in age-appropriate ways in the middle school grades.

The apprenticeship field is a dynamic environment that is still unfolding. Apprenticeship has great potential for wider use and benefit in American society if difficult issues and challenges can be overcome. ■

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<sup>45</sup> See Daniel Kuehn, *Apprenticeship Training and the Future of Work in New Jersey: Targeting Occupations that will Thrive with Emerging Technologies*, Urban Institute, September 2019, available at [www.urban.org/research/publication/apprenticeship-training-and-future-work-new-jersey](http://www.urban.org/research/publication/apprenticeship-training-and-future-work-new-jersey).

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[www.dli.pa.gov/Individuals/Workforce-Development/apprenticeship/Pages/default.aspx](http://www.dli.pa.gov/Individuals/Workforce-Development/apprenticeship/Pages/default.aspx)  
Note: For technical assistance on developing RA standards and registering an RA or pre-apprenticeship program in Pennsylvania, contact [ra-liato-appr-train@pa.gov](mailto:ra-liato-appr-train@pa.gov).

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## RESOURCES

### U.S. Department of Labor (DOL)

The DOL offers a one-stop source for career seekers, employers, and educators who want to learn about apprenticeship options at [apprenticeship.gov](http://apprenticeship.gov).

The DOL's Office of Apprenticeship's website has resources related to apprenticeship programs, investment opportunities, and policy, among others: [www.dol.gov/apprenticeship](http://www.dol.gov/apprenticeship).

The DOL's frequently asked questions on apprenticeship cover everything from the fundamentals to an employer's role in the process: [www.dol.gov/apprenticeship/toolkit/toolkitfaq.htm](http://www.dol.gov/apprenticeship/toolkit/toolkitfaq.htm).

WorkforceGPS offers reports, tools, and articles on apprenticeships' return on investment in the U.S. and other countries: [apprenticeshipusa.workforcegps.org/resources/2017/08/29/12/43/Expanding-Apprenticeship-Return-on-Investment-ROI](http://apprenticeshipusa.workforcegps.org/resources/2017/08/29/12/43/Expanding-Apprenticeship-Return-on-Investment-ROI).

Veterans resources are available at [www.doleta.gov/OA/veterans.cfm](http://www.doleta.gov/OA/veterans.cfm).

The DOL maintains a list of apprenticeable occupations at [www.doleta.gov/oa/occupations.cfm](http://www.doleta.gov/oa/occupations.cfm).

Registered Apprenticeship College Consortium is a network of colleges and RA programs: [doleta.gov/oa/racc.cfm](http://doleta.gov/oa/racc.cfm).

### Other Resources on Apprenticeships

*Apprenticeship and the Justice System: Adapting a Proven Training Model to Serve People in Prison*, by Ian Hecker and Daniel Kuehn of the Urban Institute, gives an overview of how apprenticeships function in the federal and state corrections institutions, available at [www.urban.org/sites/default/files/publication/99822/apprenticeship\\_and\\_the\\_justice\\_system\\_0.pdf](http://www.urban.org/sites/default/files/publication/99822/apprenticeship_and_the_justice_system_0.pdf).

*An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States*, by Debbie Reed, Albert Yung-Hsu Liu, Rebecca Kleinman, et al., of Mathematica Policy Research, includes analyses of New Jersey and Pennsylvania, available at [www.dol.gov/apprenticeship/leaderslist.htm](http://www.dol.gov/apprenticeship/leaderslist.htm).

*Bridging the Gap Between Talent and Opportunity: An Apprenticeship Playbook for Professional Jobs*, developed by the Chicago Apprentice Network, helps companies think through key stages involved in starting apprenticeship programs, available at [s3.amazonaws.com/brt.org/Chicago-ApprenticeNetwork\\_BridgingtheGap\\_Digital\\_Final-2.pdf](http://s3.amazonaws.com/brt.org/Chicago-ApprenticeNetwork_BridgingtheGap_Digital_Final-2.pdf).

*Industry-Driven Apprenticeship: What Works, What's Needed*, by Tamar Jacoby and Robert I. Lerman, examines independent "learn-and-earn" nonregistered programs and provides four case studies, available at [opportunityamericaonline.org/wp-content/uploads/2019/02/OA\\_ApprenticeshipReport\\_2019.pdf](http://opportunityamericaonline.org/wp-content/uploads/2019/02/OA_ApprenticeshipReport_2019.pdf).

*Leading by Example: Public Sector Apprenticeships in Kentucky*, by Robert I. Lerman, John Marotta, and Myca San Miguel of the Urban Institute, examines Kentucky's efforts to expand apprenticeships in the state, available at [www.urban.org/sites/default/files/publication/99914/leading\\_by\\_example\\_public\\_sector\\_apprenticeships\\_in\\_ky\\_0.pdf](http://www.urban.org/sites/default/files/publication/99914/leading_by_example_public_sector_apprenticeships_in_ky_0.pdf).

*Starting a Registered Apprenticeship Program: A Guide for Employers or Sponsors*, by Diane Auer Jones and Robert I. Lerman of the Urban Institute, helps businesses or program sponsors launch an apprenticeship program, available at [innovativeapprenticeship.org/wp-content/uploads/2017/06/Employer-Guide\\_June-2017.pdf](http://innovativeapprenticeship.org/wp-content/uploads/2017/06/Employer-Guide_June-2017.pdf).

*Training for Jobs of the Future*, by Robert I. Lerman, Pamela J. Loprest, and Daniel Kuehn of the Urban Institute, outlines apprenticeships as one of three major policy initiatives to maximize worker training and bolster productivity, available at [www.urban.org/research/publication/training-jobs-future](http://www.urban.org/research/publication/training-jobs-future).

*Why Tech Companies Should Offer Apprenticeships*, by the Consumer Technology Association, helps tech companies incorporate apprenticeships into their talent strategies, available at [cdn.cta.tech/cta/media/media/resources/research/pdfs/cta-apprenticeship-white-paper.pdf](http://cdn.cta.tech/cta/media/media/resources/research/pdfs/cta-apprenticeship-white-paper.pdf).

Jobs for the Future's Center for Apprenticeship and Work-Based Learning provides resources on apprenticeship approaches for businesses, students, and workers at its website, [www.jff.org/what-we-do/impact-stories/center-for-apprenticeship-and-work-based-learning/](http://www.jff.org/what-we-do/impact-stories/center-for-apprenticeship-and-work-based-learning/).

American Institute for Innovative Apprenticeship provides detailed information and resources on apprenticeships in the U.S., including national occupational frameworks and analysis of apprenticeships in other countries, at its website, [innovativeapprenticeship.org](http://innovativeapprenticeship.org).

American Apprentice Round Table, founded in 1943, is an organization of companies with apprenticeship programs: [aart-us.org](http://aart-us.org).

Apprenticeship School, founded in 1919, recruits and trains apprentices for shipbuilding careers in Newport News, VA. [www.as.edu](http://www.as.edu).

Eastern Seaboard Apprenticeship Conference consists of apprenticeship representatives of 14 Atlantic coast states and Washington, D.C. The group holds an annual conference. [www.esaconference.org/about/](http://www.esaconference.org/about/).

International Foundation of Employee Benefits Plans provides a number of resources on apprenticeship on its website: [www.ifebp.org/Resources/apprenticeships/Pages/default.aspx](http://www.ifebp.org/Resources/apprenticeships/Pages/default.aspx).

## Pre-Apprenticeships

WorkforceGPS features resources and descriptions of 16 pre-apprenticeship programs on its website: [apprenticeshipusa.workforcegps.org/resources/2017/04/10/11/56/Pre-Apprenticeships-Building-Strong-Apprentices](http://apprenticeshipusa.workforcegps.org/resources/2017/04/10/11/56/Pre-Apprenticeships-Building-Strong-Apprentices).

## Youth Apprenticeships

U.S. Department of Labor:

*High School Apprenticeships: A Guide for Starting Successful Programs*, from the DOL, offers guidelines for starting apprenticeship programs at the high school level, available at [www.apprenticeship.gov/sites/default/files/2019-04/HS\\_Apprenticeship\\_Youth\\_Guide\\_FINAL\\_2010831.pdf](http://www.apprenticeship.gov/sites/default/files/2019-04/HS_Apprenticeship_Youth_Guide_FINAL_2010831.pdf).

*Jobs of the Future: Grades 6–8*, by Scholastic, Inc. in cooperation with the U.S. Department of Labor, introduces middle school students to apprenticeships and careers with a variety of resources, available at [www.scholastic.com/jobsofthefuture/](http://www.scholastic.com/jobsofthefuture/).

WorkforceGPS offers resources on youth apprenticeships, including state and local programs, the federal framework, and youth apprenticeship tools, at [apprenticeship.workforcegps.org/resources/2017/02/02/10/56/Apprenticeship\\_Youth](http://apprenticeship.workforcegps.org/resources/2017/02/02/10/56/Apprenticeship_Youth).

## OTHER RESOURCES

*Apprenticeship for Adulthood: Preparing Youth for the Future*, by Stephen F Hamilton, proposes that the U.S. incorporate some of the structure and emphasis of the German apprenticeship system to help motivate and train noncollege-bound youth and assist youth to make the transition to adulthood.

*The Critical Role of Intermediary Organizations in Expanding Youth Apprenticeship*, by Education Strategy Group, outlines the barriers, strategies, and opportunities that policymakers, employers, and educators can consider in advancing youth apprenticeships, available at [edstrategy.org/resource/expandingya/](http://edstrategy.org/resource/expandingya/).

*How Governors Scale High-Quality Youth Apprenticeship*, by the National Governors Association, considers the policy, funding, and action strategies governors can take to expand youth apprenticeship opportunities, available at [www.nga.org/wp-content/uploads/2020/01/youth-apprenticeship.pdf](http://www.nga.org/wp-content/uploads/2020/01/youth-apprenticeship.pdf).

*The Means to Grow Up: Reinventing Apprenticeship as a Developmental Support in Adolescence*, by Robert Halpern, describes the powerful developmental benefits of apprenticeship for young people. The book shows through ethnographic profiles how apprenticeships enable young people to learn a craft alongside experienced adults, benefit from mentoring, and gain a better sense of career direction.

*The Role of Data and Accountability in Growing Youth Apprenticeship Programs*, by Advance CTE, considers the data states are collecting on youth apprenticeships and offers steps on how those data can be used to support program development and expansion, available at [careertech.org/resource/youth-apprenticeship-data](http://careertech.org/resource/youth-apprenticeship-data).

*Self-Assessment and Planning Tool for Youth Apprenticeship Programs*, by Jobs for the Future, offers assistance for governments and partners in

establishing high school apprenticeships, available at [center4apprenticeship.jff.org/resources/self-assessment-and-planning-tool-youth-apprenticeship-programs/](http://center4apprenticeship.jff.org/resources/self-assessment-and-planning-tool-youth-apprenticeship-programs/).

apprenticeships, including electricians and plumbers. The report is available at [www.urban.org/research/publication/apprenticeship-training-and-future-work-new-jersey](http://www.urban.org/research/publication/apprenticeship-training-and-future-work-new-jersey).

## Union Apprenticeships

The AFL-CIO maintains a list of apprenticeship programs and labor-management partnerships at its website: [aflcio.org/about-us/careers-and-apprenticeships](http://aflcio.org/about-us/careers-and-apprenticeships).

*Manufacturing and Registered Apprenticeship: A Toolkit*, from the AFL-CIO Working for America Institute and ApprenticeshipUSA (U.S. Department of Labor) discusses RAs, career pathways, and joint labor-management partnerships in the manufacturing sector, available at [www.expandapprenticeship.org/system/files/wai\\_apprenticeship\\_toolkit\\_june17.pdf](http://www.expandapprenticeship.org/system/files/wai_apprenticeship_toolkit_june17.pdf).

## Pennsylvania

*Inventory of Pre-Apprenticeship Programs Across Pennsylvania* from the Keystone Research Center contains the results of a survey on pre-apprenticeships, profiles of 10 pre-apprenticeship programs, and options for strengthening pre-apprenticeship and apprenticeship programs, available at [www.dli.pa.gov/Businesses/Workforce-Development/wdb/Documents/82233%20-%20PAWDP%20-%20Pre-ApprenticeshipReport%20%2004-19\\_FINAL.pdf](http://www.dli.pa.gov/Businesses/Workforce-Development/wdb/Documents/82233%20-%20PAWDP%20-%20Pre-ApprenticeshipReport%20%2004-19_FINAL.pdf).

The Pennsylvania Apprentice Coordinators Association provides information on apprenticeship programs in the unionized building trades at [www.apprentice.org/index.html](http://www.apprentice.org/index.html).

## New Jersey

*Apprenticeship Training and the Future of Work in New Jersey: Targeting Occupations that Will Thrive with Emerging Technologies*, by Daniel Kuehn of the Urban Institute, concludes that expanding apprenticeships to nontraditional trades doesn't need to happen at the expense of the trades traditionally associated with



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