



The Changing Face of Apprenticeships

New Opportunities
for Employers and STARs

STARs 
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Apprenticeships Help Employers Address Hiring Challenges

Apprenticeships have long offered employers a means to build a reliable pipeline of workers with specific job skills, but they remain underutilized in the U.S. compared to other [countries](#). Approximately 600,000 workers were enrolled in apprenticeship programs in 2021, a fraction of the [nearly 11 million students attending bachelor's degree programs full-time](#), and the vast majority of these apprenticeships are in the trades. Our original analysis of data from the Department of Labor on registered apprenticeships, supplemented by proprietary data from Lightcast on employer job postings, reveals a significant expansion in apprenticeships since 2010. Apprenticeships — both registered and informal — are emerging across a wide range of job roles and industries. These new apprenticeships demonstrate the broad utility of the apprenticeship model and its potential for meeting labor market challenges.

The Apprenticeship Model is Highly Adaptable

Across all occupations and industries in the U.S. economy, approximately 475 roles — more than half the occupations in the labor market — have registered or informal apprenticeship programs. Since 2010, registered apprenticeships have expanded into over 100 roles that did not previously have one. At the same time, employers advertised jobs as apprenticeship or work-based training programs in an additional 200 roles. Reaching far beyond trades, apprenticeships are showing notable growth in management, healthcare, and information technology roles.

What is an apprenticeship?

Apprenticeships offer [paid, work-based skills development](#) through hands-on, employer-directed training often supplemented with classroom instruction. They typically last one to six years and result in credentials or occupational certificates.

In this paper, we analyze apprenticeships using data from the Department of Labor's [Registered Apprenticeship Partners Information Management Data System](#) and [Lightcast](#) proprietary job postings data. We describe two types of apprenticeships:

- **Registered apprenticeships** meet Department of Labor [requirements](#). There were approximately 240,000 new apprentices in 2021 and 600,000 total registered apprentices.
- **Informal apprenticeships** are not registered with the Department of Labor but are advertised as “apprentice,” “apprenticeship,” “in-training,” or “trainee” in the job postings.



New Apprenticeships Open the Door to Diverse Talent

By creating new pathways into jobs, these emerging apprenticeships open opportunities for [STARs, workers who are skilled through alternative routes](#). STARs, as a talent category, are more than half the workforce and reflect its full diversity. When employers make jobs more accessible to STARs, they see increased diversity in their talent pipeline. Our analysis shows increased racial diversity in apprenticeships that opened opportunities for STARs. We also see increased participation of women in apprenticeships for roles that tend to employ more men.

Our analysis points to the critical role that employers play in supporting the growth of apprenticeships.

Employers Are Using This Model for Hard-to-Fill Roles

Our analysis shows sustained growth in apprenticeships for roles that currently pose hiring challenges for employers. Apprenticeships for high-volume jobs, like pharmacy technicians and sales representatives, have grown steadily over the past 10 years, as have apprenticeships for jobs that are relatively new to the labor market, like cybersecurity analyst, or require a unique skill set, like healthcare roles. This growth suggests employers are reaping benefits from these investments.

This paper supplements an extensive body of work on apprenticeships. Others have rigorously documented the [benefits](#) of apprenticeships and the barriers to expanding them in the U.S. That work includes robust recommendations for easing [regulatory hurdles](#) and strengthening [the infrastructure](#) for these types of programs. Policymakers are taking note and working to make apprenticeships a more common tool. Our analysis points to the critical role that employers play in supporting the growth of apprenticeships. We provide evidence that employers are driving the expansion to new roles and that their sustained investments in both registered and informal apprenticeships are working for them. We encourage others to look at this evidence and consider how apprenticeships might help them address their hiring challenges.



STARs
SKILLED THROUGH
ALTERNATIVE ROUTES™

STARs are individuals currently active in the workforce, who have a high school diploma, but no bachelor's degree.

They're more than 50% of the workforce that has developed valuable skills through military service, community college, training programs, partial college completion, or, most commonly, on-the-job experience.

Employers Are Expanding Apprenticeships Into New Roles

Our analysis of Department of Labor data on registered apprenticeships and proprietary Lightcast data on job postings reveals an expansion in employers' use of apprenticeships. While apprenticeships retain their historical concentration in the trades, we see the emergence of a growing number of apprenticeships across occupations and industries. Apprenticeships, both registered and informal, now exist for the majority of job roles in the economy, with numbers of apprentices varying across roles from a handful to tens of thousands. We see notable growth in higher-wage roles in management, healthcare, and information technology.

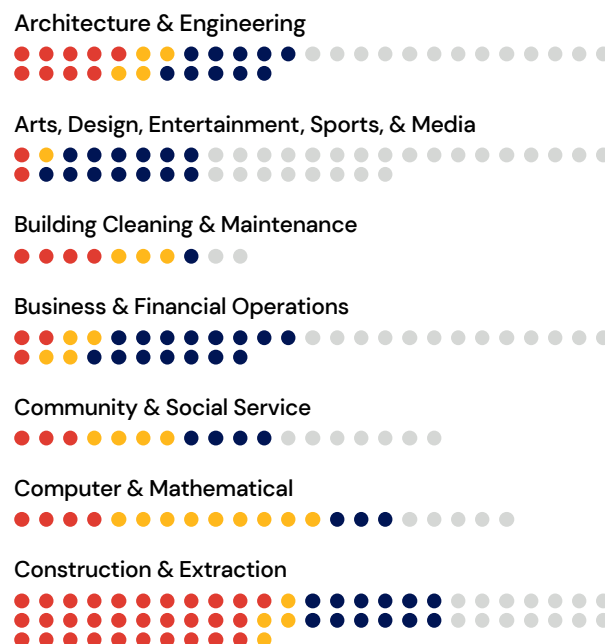
Traditional Apprenticeships Focus on the Trades

Apprenticeships are and have always been concentrated in the trades. Data from RAPIDS shows the majority of registered apprenticeships in construction and manufacturing, with programs led by trade unions or joint apprenticeship and training committees. Of the approximately 240,000 workers who entered apprenticeship programs in 2021, 55% were in construction and extraction occupations (for jobs such as electricians, plumbers, and carpenters). The next most common field, at 14% of apprenticeships, was installation, maintenance, and repair (jobs such as electrical power line installers and HVAC mechanics). Effectively 70% of apprenticeships offer entry to jobs that make up just 8% of the labor force.

FIGURE 1.1: APPRENTICESHIPS ARE BEING USED ACROSS THE MAJORITY OF OCCUPATIONS

Each circle represents an individual occupation. The Bureau of Labor Statistics identifies **848** detailed occupations across **22** non-military occupation groups.

Registered Apprenticeships:
 ● Traditional (154) ● New (112) **Informal Apprenticeships:**
 ● Informal (208)



(continued)

See page 17 for notes and sources.

The largest traditional programs are for electricians, plumbers, and carpenters.

New Apprenticeships Are Broad in Scope

The remaining 30% of registered apprenticeships reflect the broader scope of the labor market, with new apprenticeships emerging at an accelerating pace. In 2021, there were registered apprenticeships in 266 different occupations across 367 distinct industries. More than 40% of those apprenticeships did not exist in 2010, and the vast majority of these 112 new apprenticeships appeared after 2015. Data on employer job postings confirms an even broader expansion of informal apprenticeships in the recent decade. An analysis of all U.S. job postings including “apprentice,” “apprenticeship,” “in-training,” or “trainee” in the job title revealed 320,000 postings in 2021.¹ These informal apprenticeship programs offer employee onramps across an additional 208 occupations, 120 of which were created since 2010. Together, registered and informal apprenticeship programs provide entry to 56% of all occupations.² The breadth of coverage of these registered and informal apprenticeships is illustrated in **Figure 1.1**.

The new apprenticeships differ from the older traditional apprenticeships in terms of wages and education requirements. In 2021, nearly 40% of workers entering these new registered apprenticeship programs were going into high-wage roles that have traditionally required a bachelor’s degree, compared to only 2% among traditional apprenticeship programs. **Table 1**, in the Appendix, provides a summary of the most common traditional, new, and informal apprenticeships, illustrating a trend towards a broader set of jobs with more varied wages and education requirements.

FIGURE 1.1: CONTINUED

Each circle represents an individual occupation.

Registered Apprenticeships:
 ● Traditional (154) ● New (112)
Informal Apprenticeships:
 ● Informal (208)

Educational Instruction & Library



Farming, Fishing, & Forestry



Food Preparation & Serving



Healthcare Practitioners & Technical



Healthcare Support



Installation, Maintenance, & Repair



Legal



Life, Physical, & Social Science



Registered nurses make up the largest new apprenticeship program.

(continued)

See page 17 for notes and sources.

Employers Are Critical to the Growth of Apprenticeships

Employers are playing a direct role in this expansion. Whereas unions and JATCs were the largest sponsors of traditional apprenticeships, employers are the most common sponsor of new registered apprenticeship programs and all of the informal apprenticeship programs we identified in the job-posting data.³ As drivers of this expansion, employers are in a position to do much more.



FIGURE 1.1: CONTINUED

Each circle represents an individual occupation.

Registered Apprenticeships:

● Traditional (154) ● New (112)

Informal Apprenticeships:

● Informal (208)

Management



Office & Administrative Support



Personal Care & Service



Production



Protective Service



Sales & Related



Transportation & Material Moving



Despite growth in new and informal programs, many management occupations remain unserved, including some of the largest occupations like computer & information system managers.

First-line supervisors of retail sales workers is the largest informal apprenticeship program.

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See page 17 for notes and sources.

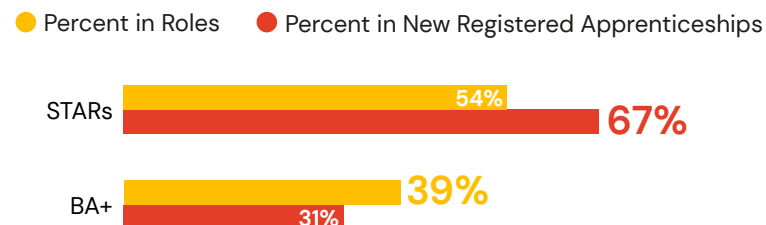
New Apprenticeships Expand and Diversify Talent Pipelines

Our analysis of the new registered apprenticeships demonstrates that these apprenticeships are effective pathways for diversifying talent pipelines. By creating new reliable pathways into jobs, these apprenticeships open opportunities for STARS. STARS include two-thirds of all Black workers, more than half of Hispanic workers, and more than half of all women in the workforce. Any inclusive hiring effort must, therefore, include STARS.

New apprenticeships create a talent pipeline for their target roles that is more diverse than the current population in those roles.

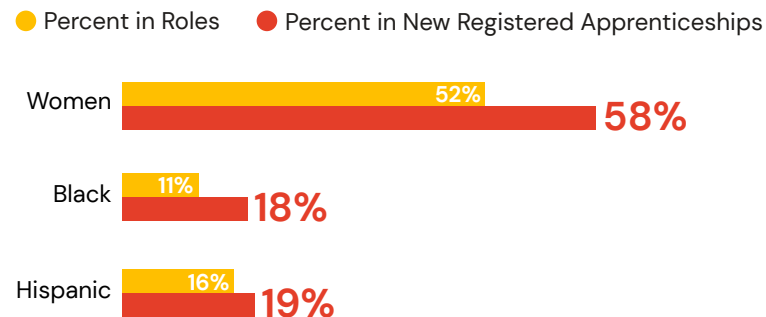
Apprenticeships have historically been a reliable route to good jobs for STARS and they are overwhelmingly used by STARS — in 2021, nearly nine out of 10 participants in registered apprenticeships were STARS.⁴ When apprenticeships expand to new roles, STARS see new opportunities and, our analysis suggests, they take advantage of these openings. As shown in **Figure 2.1A**, STARS fill 67% of apprenticeship seats across the 112 new apprenticeships, even as they represent only 54% of the workers in those job roles. **Figure 2.1B** shows the impact on racial and gender diversity in the pipeline. Workers of color and women participate in new apprenticeships at rates higher than their representation in the roles for which they are training. New apprenticeships create a talent pipeline for their target roles that is more diverse than the current population in those roles.

FIGURE 2.1A: NEW REGISTERED APPRENTICESHIPS ATTRACT STAR WORKERS INTO THE TALENT PIPELINE



See page 17 for notes and sources.

FIGURE 2.1B: STARS BRING DIVERSITY TO THE TALENT PIPELINE



See page 17 for notes and sources.

Apprenticeships are particularly impactful for jobs that lack diversity due to exclusionary degree requirements. Approximately 40% of workers in new registered apprenticeships are preparing for roles that typically require a bachelor's degree. These jobs, such as software developers and management analysts, routinely screen out STARs because they prefer candidates with degrees. Their job descriptions effectively communicate "need not apply" to STARs. Apprenticeships, on the other hand, invite participation

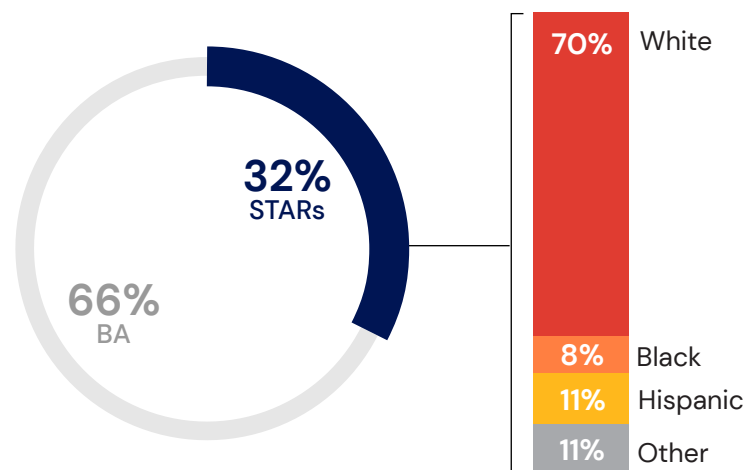
by STARs and offer the opportunity to demonstrate their skills to employers. **Figure 2.2** demonstrates the potential impact of this influx of talent into 30 roles that traditionally require bachelor's degrees.⁵ STARs are filling 43% of these apprenticeships, exceeding their representation of 32% in the target jobs, and this shows up in the demographic diversity. The workers participating in these apprenticeships reflect the demographics of the workforce more so than the workers currently in these roles.

FIGURE 2.2: NEW APPRENTICESHIPS PROVIDE ALTERNATIVES TO BACHELOR'S DEGREES AND CREATE A MORE DIVERSE TALENT PIPELINE

These 30 new apprenticeships were developed to prepare talent for jobs that typically require a bachelor's degree.

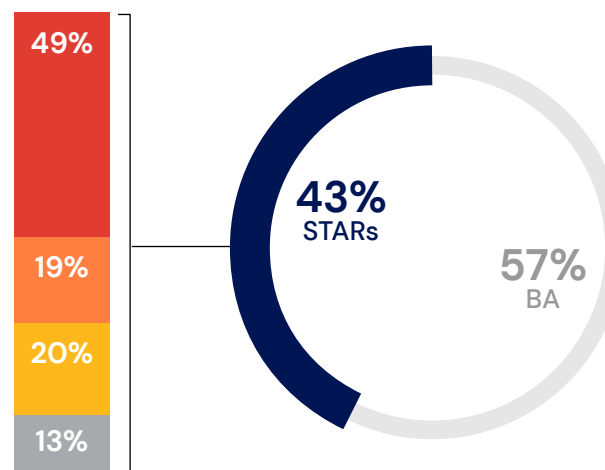
In the Roles

In these jobs, only 32% of workers are STARs and most of those STARs are white.



In the New Apprenticeships

The apprenticeships for these jobs are more inclusive of STARs and reflect the diversity of the labor market.



See page 17 for notes and sources.

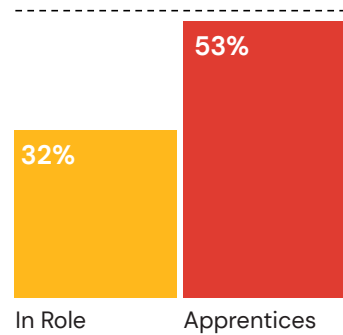
As employers explore ways to attract more and diverse talent, apprenticeships can play an important role in their strategy. STARs' participation in new apprenticeships and the related increase in Black, Hispanic, and women workers in their talent pipelines shows the power of opening new routes and roles to this skilled and diverse talent category. **Figure 2.3** illustrates the significant impact apprenticeships can have on three roles with limited diversity.



FIGURE 2.3: APPRENTICESHIPS ATTRACT A MORE DIVERSE TALENT POOL

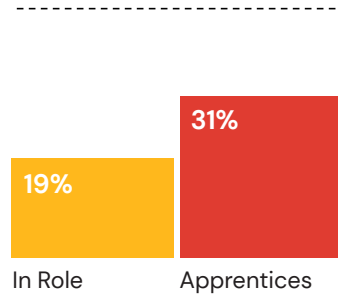
STAR Information Security Analysts

55% of all workers
are STARs



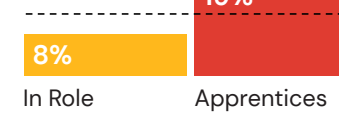
Women Software Developers

48% of all workers
are women



Black Management Analysts

12% of all workers
are Black



See page 17 for notes and sources.

Employers Are Using Apprenticeships Strategically

As apprenticeships expand into new occupations and attract new talent, they are showing sustained growth in a number of roles that present hiring challenges. This signifies that employers are finding a positive return on their investment.

Opportunity 1: High-Volume Roles

Employers are leveraging apprenticeships to support a reliable supply of talent to high-volume roles. In 2021, the 25 occupations with the greatest hiring demand all had apprenticeship programs.⁶ Six of these most in-demand occupations are being served by new apprenticeships that were initiated in the past 10 years. These include a number of medical roles, such as registered nurses and medical assistants, as well as high-volume roles in other industries, like food service managers and sales representatives. Perhaps the most illustrative example is the pharmacy technician, a role that expanded significantly with the onset of COVID-19 and had nearly 154,000 job postings in 2021. We see increasing numbers of apprenticeships — both registered and informal — for this role. A small program started by CVS in 2005 expanded steadily and was replicated by other companies when demand increased in 2020, as described in **Snapshot 1**.

Opportunity 2: Industry- and Employer-Specific Skills

Employers are using apprenticeships to teach unique industry- and employer-specific skills. Among new apprenticeships, we see sustained growth in programs in healthcare, information technology, and business. In technical fields, evolving technologies make it difficult for school-based programs to stay current

with the latest tools. The on-the-job training offered in an apprenticeship allows computer programmers and software developers to learn company-specific technology. Similarly, roles like management analysts and real estate agents (a common informal apprenticeship) benefit from context-specific information on markets and strategies that are best learned by engaging in the business. And in problem-solving roles, like computer support specialist and sales associates, apprentices improve their skills by engaging in the daily challenges of the role. The value of this work-based learning has fueled growth in apprenticeships for roles like software developers, as described in **Snapshot 2**.

Opportunity 3: Jobs That Are New to the Labor Market

Finally, employers are filling a gap in talent pipelines with apprenticeships for jobs that are relatively new in the labor market. Jobs that depend on new and evolving technologies can have a limited supply of candidates because of the relatively small number of people with relevant experience. Our data show several occupations where demand increased dramatically and where there was a corresponding deployment and expansion of apprenticeships to meet needs in information technology, cybersecurity, and clean energy. **Snapshot 3** illustrates the utility of the apprenticeship in training new talent.

These examples represent just a slice of the activity around apprenticeships and similar work-based learning programs, but they illustrate the potential. Imagine the expansion in talent that employers could see if they deployed apprenticeships and similar work-based learning programs across more hard-to-fill roles.

SNAPSHOT 1

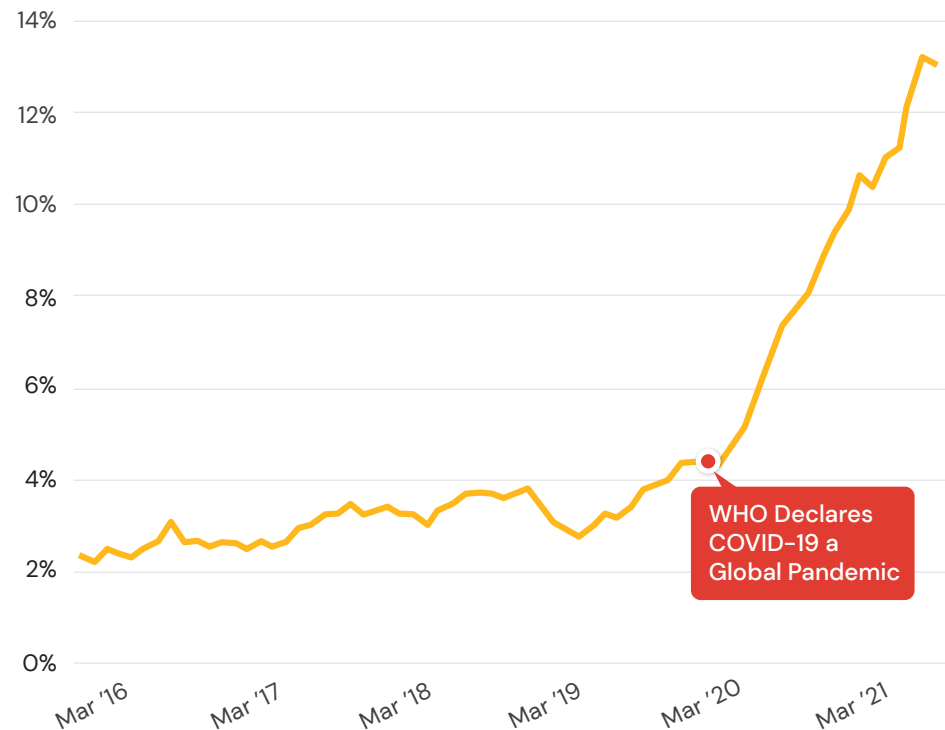
Apprenticeships Helped Get the Pharmacy Technicians Needed to Respond to Covid-19

CVS initiated a registered pharmacy technician apprenticeship in 2005. With close to 60,000 pharmacies nationwide, pharmacy technicians are in regular demand. They provide critical support to pharmacists in filling a prescription, from intake to fulfillment to payment. In most states, pharmacy technicians must meet formal training and licensing requirements to ensure they have the necessary knowledge of pharmaceuticals, medical billing, and patient privacy. CVS recognized the need for a steady supply of pharmacy technicians, especially [with roots in the communities they served](#). This program grew steadily over the years, training over 8,000 pharmacy technicians since inception.

With the onset of the COVID-19 crisis, pharmacies nationwide experienced an urgent need for pharmacy technicians, especially as their role was expanded, through special authorization, to include giving COVID vaccinations. [CVS announced they would add thousands of pharmacy technicians](#), and there was explosive growth in job postings for pharmacy technician apprenticeships across all retail pharmacies. From 2019 to 2021, the proportion of pharmacy technician job postings advertised as apprenticeships more than doubled.

FIGURE 3.1: EMPLOYERS USED APPRENTICESHIPS TO FILL PHARMACY TECHNICIAN ROLES DURING THE PANDEMIC

Percent of pharmacy technician job postings advertised as apprenticeships (6 month rolling average)



See page 17 for notes and sources.

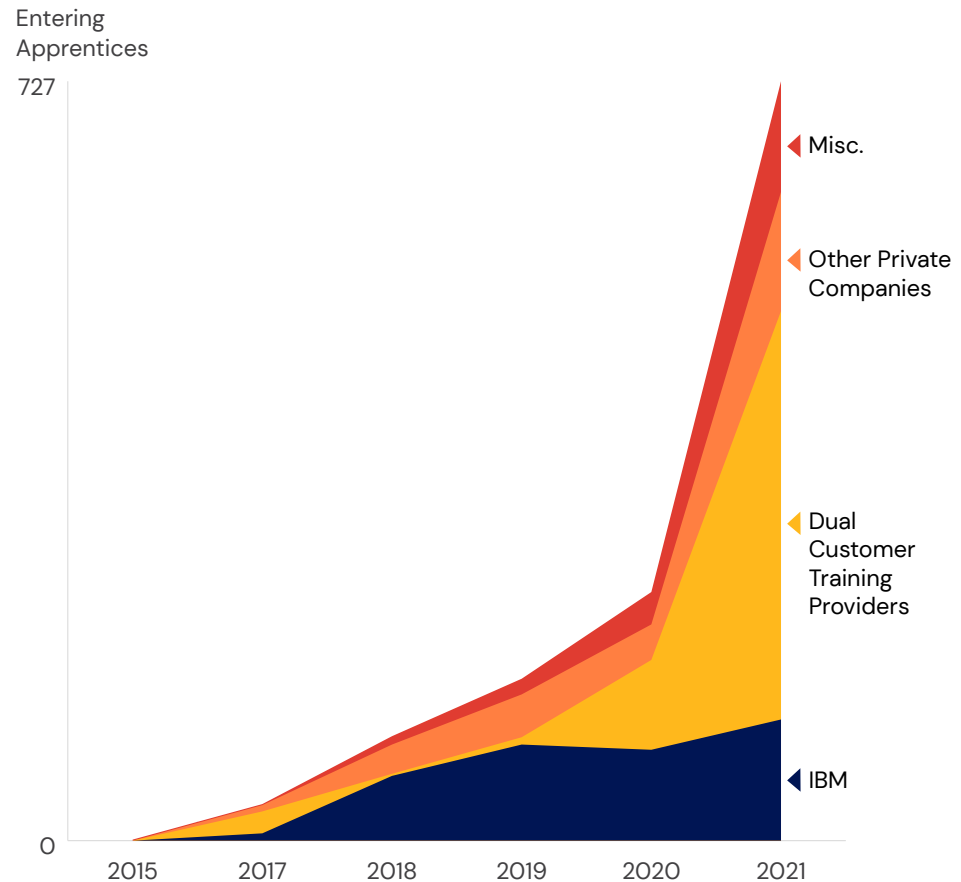
IBM Leads the Way on Tech Apprenticeships — and Dual Customer Training Programs Help Fill the Gap

High schools, community colleges, and universities have been increasing their classes in computer science, but the growing demand for skilled workers still outpaces supply. More importantly, as technology evolves rapidly, schools can't always teach the specific skills needed. Employers are finding that customized training is necessary to develop up-to-date practical skills.

In 2017, seeking to develop new talent, IBM deployed a software development apprenticeship program, beginning with a cohort of less than 10 apprentices. Based on the success of this cohort, the next year IBM grew the cohort to more than 60. Since 2017, IBM has continued to expand the program, while adding new programs for more than 25 roles, including cybersecurity, data science, and design.

Other employers are taking notice and starting their own programs. Most of the growth in software development apprenticeships, however, is taking place with the support of dual customer training programs. These talent developers, who define their customers as both the trainee and the employer, design custom curricula for their employer partners and source apprentices for tech jobs. In 2021, DCTs trained about one-third of all tech apprentices and more than half of all software developer apprentices, making them responsible for much of the growth in training options.

FIGURE 3.2: TRAINING PROVIDERS ARE HELPING TO EXPAND SOFTWARE DEVELOPER APPRENTICES



See page 17 for notes and sources.

SNAPSHOT 3

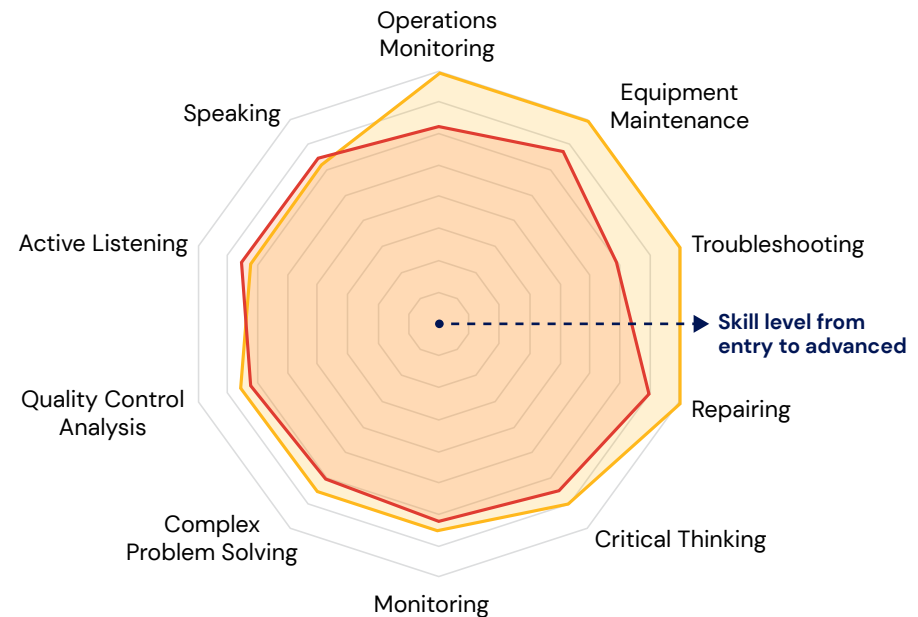
Apprenticeships Teach Skills for Green Jobs

As solar, wind, and other alternative technologies grow in market share, these industries need a steady supply of talent with new and unique skill sets. Overall, these positions are relatively small in number, but employers are already facing significant challenges sourcing skilled talent — [specifically citing](#) the need for increased technical training and certifications. And this need will only grow. Wind turbine service technician roles, for example, are expected [to grow by 44% in the next decade](#).

Employers can look to similar jobs for talent sourcing. For example, radio, cellular, and tower equipment installers and repairers have many of the critical skills needed for wind turbine service technicians, including experience with schematic diagrams, preventive maintenance, troubleshooting, and repair. Electrical and electronics repairers for powerhouse, substation, and relay also have similar skills. These jobs make excellent feeder jobs for the wind turbine role, and they provide a model for training: over 40% of the job postings in 2021 for these roles were advertised as apprenticeships. Given the high skills overlap, it stands to reason that apprenticeships are the right mechanism to train wind turbine service technicians.

FIGURE 3.3: COMMON ROLES HAVE SIGNIFICANT SKILLS OVERLAP WITH NEWER GREEN JOBS

● Wind Turbine Service Technicians ● Radio, Cellular, & Tower Equipment Installers



See page 17 for notes and sources.

Leverage the Apprenticeship Model to Strengthen Talent Pipelines

Over the past decade, employers have developed and deployed registered and informal apprenticeship programs across a wide range of occupations, creating new onramps for hard-to-fill jobs and opening the doors to diverse talent, especially in roles that have traditionally relied on workers with bachelor's degrees. Consistent year-over-year investments in these programs confirm that these apprenticeships are meeting a need. Employers looking to strengthen their talent pipelines should take note.

Employers have a great deal of flexibility when they consider how to implement an apprenticeship program. They will consider their volume of hiring, the skill sets they seek, and their organizational resources to determine if a registered apprenticeship, an informal apprenticeship, or other work-based learning method is best for them. In all cases, there are lessons from the apprenticeship model that can be applied to any talent strategy.



How can apprenticeships make a difference?

The software developer role illustrates apprenticeships' potential to fill labor market gaps. In 2021, of the 132,000 entry-level software developer job postings, more than half — 71,000 — required a bachelor's degree. Yet only 29,000 recent graduates with bachelor's degrees were hired into these roles, leaving 42,000 positions unfilled.⁷

Our analysis shows that 10,000 STARs transition annually into software developer roles from jobs like computer support specialists and network administrators, which do not reflect software development skills.⁸ We surmise that they learn these skills through training programs and self-guided study. If 10,000 STARs are doing this on their own, imagine how this number might grow if STARs had access to apprenticeships.

If employers effectively deploy apprenticeships for software developers, surely this strategy can be used in other jobs. Every year, nearly 300,000 STARs move into jobs that typically require a degree — such as financial managers, human resource specialists, and health service managers — by gaining skills outside of their current role. The number of STARs who might transition to these roles would significantly grow if employers create more work-based learning opportunities.

Think Expansively About Work-Based Learning

The expansion of apprenticeships demonstrates the broad applicability of the model to skills across occupations and industries. As employers seek to hire workers with specific skills, they should think about how those skills can be developed on the job. Apprenticeships — registered or informal — offer a useful template. If an employer is not ready to embrace the full model, they can incorporate its essential characteristics.

- **Develop a curriculum** that targets the specific skills and business-specific knowledge you need.
- **Create a blended program** of learning that combines technical classroom training with on-the-job practice.
- **Provide active supervision and mentoring** of new hires as they onboard and develop the critical skills needed for the job.

Use Apprenticeship Concepts to Support Inclusive Hiring

Our analysis shows that STARS make active use of apprenticeships, often to enter jobs where they otherwise lack access. Employers can apply apprenticeship concepts to attract, recruit, and develop STAR talent.

- **Remove barriers to STARS** by replacing degree requirements with other demonstrations of skill, such as work experience.
- **Create onramps for STARS** who need last-mile training through apprenticeships and other work-based training.
- **Advertise these opportunities** to raise awareness and attract applicants. Include language in job descriptions and outreach materials about on-the-job training and work-based learning opportunities.

Create Partnerships to Strengthen Apprenticeship

Employers' sustained investments in apprenticeships underscores their common need for talent and the opportunities for collective action. The Department of Labor maintains [an extensive inventory](#) of apprenticeship partners.

- **Talent developers**, including DCTs, can provide training in common skills and design specialized programs for individual employers.
- **Intermediaries** are organizations that help develop apprenticeship programs, such as industry associations and community colleges.
- **Consortia and apprenticeship networks** bring together employers, talent developers, and workforce entities to implement shared apprenticeship programs.

Apprenticeships have always been a reliable way to prepare workers for skilled work. Our analysis shows that this well-established model is finding renewed relevance among employers seeking workers for a wide range of roles. We hope employers will see this trend as motivation to invest in apprenticeships and other work-based learning approaches as a way to expand opportunities for workers and revitalize their talent pipelines.



TABLE 1: LARGEST APPRENTICESHIP PROGRAMS

Traditional Registered Apprenticeships							
Occupation	2021 Apprentices	Typical Education Requirement	STAR Apprentices	STARs in Role	Jobs Open to STARs	Wage Group	Top Training Provider
Electricians	26,030	High School	96%	84%	100%	Middle-Wage	Union
Plumbers, Pipefitters, and Steamfitters	13,738	High School	96%	81%	100%	Middle-Wage	JATC
Carpenters	11,072	High School	92%	68%	100%	Middle-Wage	Union
Construction Laborers	9,137	No Formal Education	86%	62%	100%	Middle-Wage	Union
Tractor-Trailer Truck Drivers	7,609	Some College / Associates	92%	78%	100%	Middle-Wage	Private Sector
New Registered Apprenticeships							
Occupation	2021 Apprentices	Typical Education Requirement	STAR Apprentices	STARs in Role	Jobs Open to STARs	Wage Group	Top Training Provider
Registered Nurses	1,798	Bachelor's	27%	34%	63%	Upper-Wage	Community / Four Year College
Food Service Managers	1,692	High School	99%	67%	84%	Middle-Wage	Trade Association
Software Developers	727	Bachelor's	54%	13%	6%	High-wage	Private Sector
Medical Assistants	706	Some College / Associates	85%	83%	100%	Middle-Wage	Community / Four Year College
Computer User Support Specialists	496	Some College / Associates	49%	52%	57%	Middle-Wage	Private Sector
Informal Apprenticeships							
Occupation	2021 Job Postings	Typical Education Requirement	STAR Apprentices	STARs in Role	Jobs Open to STARs	Wage Group	Top Employer Industries
Sales Reps. Wholesale & Manufacturing	10,816	High School	N/A	49%	46%	Upper-Wage	Construction / Manufacturing
Insurance Sales Agents	7,915	High School	N/A	52%	74%	Middle-Wage	Finance & Insurance
Real Estate Sales Agents	5,108	High School	N/A	48%	72%	Middle-Wage	Real Estate / Rental and Leasing
Automotive Glass Installers and Repairers	3,935	High School	N/A	83%	100%	Middle-Wage	Other Services
Retail Salespersons	2,820	No Formal Education	N/A	71%	93%	Middle-Wage	Retail Trade

Note: Counts of 2021 apprentices are based on individuals entering apprenticeship programs in a given year, and do not include individuals who are already enrolled. Typical education requirements are based on Bureau of Labor Statistics employment projections and indicate the typical education needed to enter an occupation; this does not mean other pathways into this occupation are nonviable, or that a given level of education is required to successfully perform the role. Data on the demographic characteristics of apprentices are not available for informal apprenticeship programs, as data is based solely on job postings. Jobs open to STARs are based on the proportion of employer job postings listing minimum educational requirements that do not require a bachelor degree. Wage groups are based on national median occupation specific wages relative to national wages for all workers. JATC programs refer to Joint Apprenticeship and Training Committees organized through both unions and employers.

Source: Lightcast™ labor data; 2019 1-year American Community Survey Integrated Public Use Microdata Series; Bureau of Labor Statistics Employment Projections 2021; and Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1.

Endnotes

1. Of 320,000 apprenticeship job postings in 2021, 27% contained the word “apprentice” or “apprenticeship” in the job title. These primarily consisted of occupations closely aligned with traditional registered apprenticeships, with the most common occupations being in construction and installation. The remaining 73% of postings contained “trainee,” “in-training,” “cadet,” or “recruit” in the job title. While structured very similarly to job postings referring to “apprentice” or “apprenticeship,” these postings primarily consisted of sales and healthcare related occupations. Example occupations in this group include first-line supervisors of retail sales workers; insurance sales agents; nursing assistants; and medical records specialists.
2. Based on 848 distinct non-military occupations.
3. All registered apprenticeships have a sponsor who is responsible for the design and implementation of the program. The sponsors are commonly unions, nonprofit organizations, associations, or employers. Informal apprenticeship programs are generally administered by employers, sometimes in partnership with a training program.
4. Typically, analysis of a worker’s educational attainment is limited to those aged 25 and older in order to better ensure that individuals have completed schooling. However, apprentices may be any age — in 2021 37% of people entering apprenticeship programs were under the age of 25 — so in order to compare the characteristics of apprentices with workers in their target occupation, labor force estimates are based on the civilian, non-institutionalized labor force, without regard to worker’s age.
5. Occupational degree requirements are based on Bureau of Labor Statistics Employment Projections and the typical education level most workers need to enter an occupation.
6. Based on the number of unique job postings in 2021.
7. Employer demand and education requirements are based on job postings in 2021. Entry-level roles are defined as those requiring zero to two years minimum experience. Data on the hiring of recent graduates is based on the 2021 Current Population Survey, Education Supplement, which provides data on the number of currently employed workers who graduated the prior fall.
8. Data on occupational transitions are based on observed year-to-year occupation changes measured through the 2012 to 2021 Current Population Survey, Annual Social and Economic Supplement.

Figure Notes & Sources

Figure 1.1

Note: Limited to occupations with at least five registered apprenticeships or 20 informal apprenticeship job postings in 2021. New registered apprenticeship occupations are those where registered apprenticeship programs did not exist in 2010. In some cases, occupations are served by both registered and informal apprenticeships. Informal apprenticeships shown here are limited to those without registered programs.

Source: Lightcast™ labor data and Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1.

Figure 2.1A/B

Note: Labor force estimates limited to workers employed in the 112 occupations identified as having new registered apprenticeships.

Source: Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1 and 2019 1-year American Community Survey, Integrated Public Use Microdata Series.

Figure 2.2

Note: Labor force estimates limited to workers employed in the 30 occupations identified as having new registered apprenticeships and typically requiring a bachelor degree. Estimates may not sum to 100 due to rounding and the presence of workers or apprentices without a high school diploma.

Source: Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1 and 2019 1-year American Community Survey, Integrated Public Use Microdata Series.

Figure 2.3

Source: Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1 and 2019 1-year American Community Survey, Integrated Public Use Microdata Series.

Figure 3.1

Source: Lightcast™ labor data.

Figure 3.2

Source: Department of Labor Registered Apprenticeship Partners Information Database, FY2022, Quarter 1.

Figure 3.3

Source: Occupational Information Network 27.0 Skills Database.

Data on registered apprenticeships is provided by the [Department of Labor Registered Apprenticeship Partners Information Management Data System](#). This public use dataset provides information on the characteristics of individual apprentices and apprenticeship programs dating back to 2000. While this data source is exceptionally comprehensive, there are some limitations. Not all records in the RAPIDS datafile include complete information for fields such as start date, occupation, educational attainment, or training provider. When producing estimates of proportions, cases with missing fields are excluded from estimates. Further, the RAPIDS datafile does not include program information from Minnesota, Oregon, Vermont, Washington, or the District of Columbia; and in some cases training providers (such as prison systems and the U.S. military) report data on apprenticeships in aggregate, and thus are not included in the individual level RAPIDS dataset. In this paper, when estimates from the RAPIDS datafile vary from those published by DOL, we provide the DOL estimate.

Data on informal apprenticeships is derived from [Lightcast](#) job postings analytics, based on data collected from hundreds of

millions of public job postings. Lightcast collects postings from over 45,000 online job sites to develop a comprehensive, real-time portrait of labor market demand. Lightcast's software parses top line information about each job such as title including whether the position is an apprenticeship or trainee, employer, and industry, and then "reads" each job description to identify actual skills and qualifications that employers are seeking. While job postings data can identify and track important labor market trends as they happen, some occupations are less likely to be advertised online, e.g., roofers, welders, and other trade fields. However, apprenticeships in these fields are more likely to be registered in the RAPIDS database.

In order to contrast the demographic characteristics of apprentices to those in the workforce, we compare data from RAPIDS to estimates from the [2019 American Community Survey](#) for workers employed—or apprentices being trained—in a given occupation. Demographic data is only available for workers in registered apprentices, limiting our ability to study the characteristics of workers who are hired into jobs advertised as informal apprenticeships.

Acknowledgements

This report was authored by Ashley Edwards and Amy Mortimer of Opportunity@Work and Scott Bingham and Rucha Vankudre of Lightcast.

We received guidance and feedback from Lightcast's Bledi Taska and Layla O'Kane and Opportunity@Work's Papia Debroy; research assistance from Mikaela Spruill, Psychology Doctoral Candidate at Cornell University; and important editorial feedback from Scott Bittle of Lightcast and Leslie Heilbrunn, a consultant for Opportunity@Work. Evan Potler of Factor3 Digital designed this report.

Suggested citation: "The Changing Face of Apprenticeships: New Opportunities for Employers and STARS." Published by Lightcast and Opportunity@Work, November 2022.



About Opportunity@Work

Opportunity@Work is a 501(c)3 nonprofit organization whose mission is to enable at least 1 million working adults in America to translate their learning into earning — generating a \$20 billion boost in annual earnings. Opportunity@Work engages with corporate, philanthropic, and workforce partners to directly address the barriers that STARS face, recognize STARS talent and remove bachelor's degree screens.

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About Lightcast

Lightcast provides trusted global labor market data, analytics, and expert guidance that empowers communities, corporations, and learning providers to make informed decisions and navigate the increasingly complex world of work. With a database of more than one billion job postings and career profiles, our team provides best-in-class customer service with robust data, clear analysis, and expert guidance on skills, jobs, and opportunities. Headquartered in Boston, Massachusetts, and Moscow, Idaho, Lightcast is active in more than 30 countries and has offices in the United Kingdom, Italy, New Zealand, and India. The company is backed by global private equity leader KKR. For more, visit lightcast.io.