

Apprenticeship: Earn-and-Learn Opportunities Can Benefit Workers and Employers

GAO-25-107040

Q&A Report to Congressional Requesters

April 28, 2025

Why This Matters

Many workers look to develop skills while maintaining self-sufficiency and meaningful employment. Some workers accomplish this through earn-and-learn opportunities, which provide practical experience that can help them gain needed skills to progress in their careers. For example, Registered Apprenticeship Programs (RAP) are structured earn-and-learn opportunities that combine a mix of on-the-job training, mentorship, and classroom-based instruction as part of employment. RAPs can benefit employers in filling gaps for workers in a wide range of industries, such as construction, shipbuilding, aviation mechanics, and healthcare.

We were asked to examine how specific federal programs support earn-and-learn opportunities such as apprenticeship, how these federal programs coordinate and target industries with projected growth, and the benefits and challenges associated with apprenticeship and other earn-and-learn opportunities. This report focuses on earn-and-learn opportunities that generally include paid on-the-job occupational training and are intended to lead to career advancement, such as higher wages, a certification, or a more senior position. Earn-and-learn opportunities may also be referred to by terms such as work-based learning, career-connected learning, apprenticeship, internship, or work and learn.

Several federal agencies, including the Department of Labor (DOL), administer programs that can support earn-and-learn opportunities. This report describes how these programs help jobseekers find employment in high-growth and high-wage occupations.

Key Takeaways

- We identified at least 26 programs at five federal agencies—the Departments of Commerce, Defense (DOD), Education, Labor (DOL), and Veterans Affairs (VA)—that could include support for earn-and-learn opportunities, even if that support is not their primary purpose. Many of these programs target services to certain populations, such as veterans, youth, or individuals with disabilities.
- We found that RAP participants were generally in high-growth and high-wage occupations. Specifically, of the 10 most common RAP occupations in fiscal year 2024, six were projected to grow faster than the average occupation by 2033, according to Bureau of Labor Statistics (BLS) data. In addition, BLS data show that nine of these occupations paid above the median wage.
- Earn-and-learn opportunities may lead to benefits for participants and employers. DOL and BLS report that as of 2023, RAP completers earned average annual wages upon completion of their program higher than those of associate's degree holders. In addition, studies we reviewed report that employers may receive a positive return on investment from RAPs.
- Barriers to expansion of earn-and-learn opportunities, including RAPs, include limited awareness of these options among jobseekers and employers, as well as concerns among employers about administrative

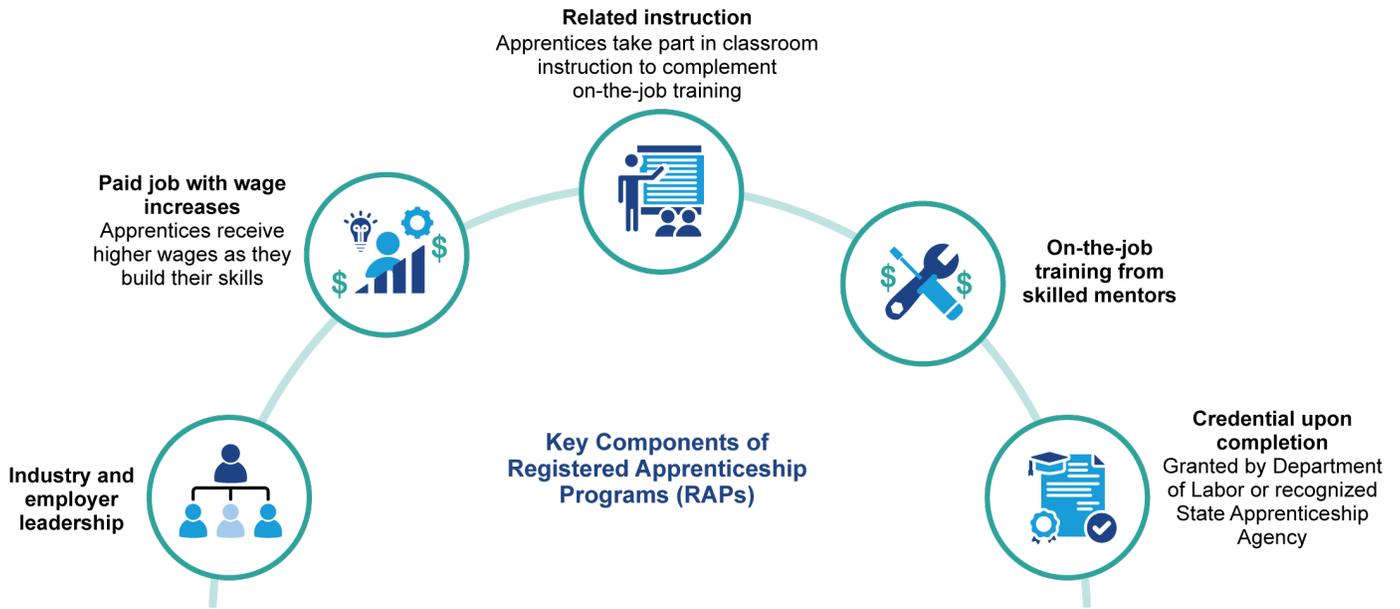
burden and cost. Some stakeholders said employers had been motivated to implement earn-and-learn opportunities during worker shortages or when other pathways did not provide qualified workers.

What are common examples of earn-and-learn opportunities?

Earn-and-learn opportunities vary from highly structured DOL-recognized training programs that provide a formal credential to more varied initiatives run by employers. We identified the following examples of earn-and-learn opportunities:

- **Apprenticeships.** A registered apprenticeship is a voluntary industry-led career pathway where employers can develop and prepare their future workforce, and individuals can gain paid work experience. According to DOL, for a program to be considered a RAP by DOL's Office of Apprenticeship or one of 32 recognized State Apprenticeship Agencies, it must include certain key components. (See fig. 1.)

Figure 1: Key Components of Registered Apprenticeship Programs (RAPs)



Source: GAO analysis of Department of Labor information; stock.adobe.com (icons). | GAO-25-107040

Outside of RAPs, jobseekers and employees may participate in a variety of earn-and-learn opportunities not registered with DOL or state apprenticeship agencies. These opportunities may include components of RAPs or mirror the structure of RAPs, but do not need to meet RAP requirements and do not lead to a DOL certification. Some employers may initially create a nonregistered apprenticeship and register their program later.

- **Pre-apprenticeships.** DOL defines pre-apprenticeship as a training model that is designed to prepare individuals to enter and succeed in a RAP. Pre-apprenticeships are not registered at the federal level. Pre-apprenticeships are often shorter than apprenticeships and targeted to younger or less-experienced workers or potential workers.
- **Internships.** Internships and co-operative experiences (“co-ops”) are typically associated with education programs. These experiences provide short-term opportunities aligned to a student’s field of study to enable the student to gain exposure to an occupation through hands-on tasks in the workplace. Co-ops are generally paid, but internships vary in whether they are paid. Opportunities for employment after the internship or co-op vary among employers.

- **Work-study.** Work-study involves combining subsidized work with higher education to complement educational and career goals.

Practicums, residencies, fellowships, and employer-sponsored bootcamps could also provide earn-and-learn opportunities. In addition, certain observation-based forms of career exploration—including job shadowing programs—provide jobseekers and students opportunities to interface with employers but may not provide direct instruction or access to a credential.

What information is available on earn-and-learn opportunities and outcomes?

While DOL maintains comprehensive data on RAPs, similar data do not exist for other types of earn-and-learn opportunities and outcomes. For example, a nationally representative 2016 survey of U.S. adults found that about 7 percent had completed a work experience training program outside of a formal education program, which could include earn-and-learn opportunities.¹ However, those data do not track which work experience programs were earn-and-learn opportunities. Similarly, the U.S. Census Bureau collects some data on both employer investment and employee participation in training as part of the Annual Business Survey, but it is not possible to isolate earn-and-learn opportunities in these data.

In our review of 18 studies relating to earn and learn, we did not identify any data source that systematically tracks participation or investment in earn-and-learn opportunities. Commerce, DOL, and Education officials did not identify any sources of such data.

There is some evidence that links RAPs with positive outcomes, such as wage growth.

- A 2022 DOL-sponsored study found that RAP participants' earnings surpassed those of comparable workers—i.e., those who had the same sex, race, ethnicity, education level, and state residence—in the long-run, although this comparison did not reflect the direct impacts of RAPs on earnings.²
- A 2016 study of Washington-based workforce training programs found that completed RAPs were associated with an average, long-term wage increase of over \$14 per hour after 2–3 years.³

In 2016, DOL launched an evaluation of its American Apprenticeship Initiative to research, among other topics, benefits that accrue to employers of apprenticeship and employment outcomes for apprentices. DOL officials told us that as of 2024, they had studies underway looking at the impact of pre-apprenticeship and RAP grant programs.

However, a 2023 DOL-funded review of literature on RAPs found that information gaps remain about whether benefits are consistent across industries, employers, workers, and program models.⁴ In addition, our review of relevant literature did not identify evidence on the relative value of the individual components of RAPs.

How do RAP participants' experiences compare with those of participants in other pathways into career and technical occupations?

Participants in RAPs are likely to earn higher post-completion wages than students pursuing an associate's degree, incur less debt than those students in technical education, and benefit from industry-connected skills education, according to relevant studies, DOL officials, and earn-and-learn stakeholders.

For comparison, we examined the most recent available data on the experiences of (1) RAP participants and (2) career and technical education (CTE) students pursuing an associate's degree or certificate. These two pathways can in some cases lead to the same careers, and CTE courses can sometimes provide the classroom instruction components of RAPs (e.g., healthcare RAPs may provide related instruction to apprentices through relevant CTE courses). RAP participants also generally enter their apprenticeships without prior college education and take around 2 years to complete their programs.⁵ Based on fiscal year 2024 DOL RAP data, there

were about 940,000 participants in RAPs. Of these RAP participants, about 660,000 apprentices were active as of the end of the fiscal year, while roughly 110,000 apprentices completed their programs and 165,000 canceled their programs during the fiscal year. In addition, based on our analysis of a nationally representative survey of college students conducted by Education, there were an estimated 1.8 million students who were majoring in CTE fields and expected an associate's degree or certificate in 2020.⁶

Comparisons of outcomes between RAP participants and CTE students have some limitations. RAP participants have already been hired, which is not a necessary component of CTE. Regardless of how these pathways compare in terms of individual outcomes, studies show that both college experience and good jobs may lead to other positive benefits, such as better personal and family health, higher productivity of others, or better social cohesion.⁷

We found RAP participants who completed their programs, on average, earned higher wages than associate's degree holders. In addition, some CTE students pursuing an associate's degree or certificate took on student debt and worked concurrently in occupations that were unconnected to their field of study. We also found that overall, students pursuing associate's degrees or certificates at 2-year colleges completed their programs at a lower rate than RAP participants.

- **Wages.** In some instances, RAPs can lead to high-wage occupations. For example, RAP participants who completed their programs between April 2022 and March 2023 and retained employment earned over \$80,000 in annual wages their first year after exiting their program, according to DOL reports.⁸ These average wages exceed the average for all associate's degree holders, according to 2023 BLS data. (See table 1.)

Table 1: Average Annual Wages by Highest Educational Attainment, as of 2023

Educational attainment	Average annual wages
Master's, professional, or doctoral degree	\$142,820
Bachelor's degree	\$94,660
Registered Apprenticeship Program (RAP) completer	~\$80,000
Associate's degree	\$61,797
Some college, no degree	\$47,504
High school graduate	\$35,903

Source: GAO analysis of Department of Labor (DOL) data and reports. | GAO-25-107040

Note: DOL publicly reported that RAP participants who completed their program and retained employment between April 2022 and March 2023 earned an annual starting salary of over \$80,000. This reporting is based on Kansas Department of Commerce (DOC) analysis of wages earned in the second and third quarters after RAP participants completed their program. DOL then doubles those two-quarter earnings to report annual wages. Kansas DOC performed this earnings analysis for all RAP completers whose records included a Social Security Number (SSN) to match with wage records and who were not in Federal Bureau of Prisons apprenticeships. As such, the annual wages for RAP participants who completed their program are not updated throughout the course of completers' careers and do not include RAP participants who left before program completion or who did not provide their SSNs. Kansas DOC also performed an earnings analysis of all participants who exited a RAP, including those who cancelled their programs and those in Federal Bureau of Prisons apprenticeships, during the same period. Using the same methodology as above, those RAP participants who exited their program between April 2022 and March 2023 earned about \$68,500 in annual wages. In addition, the wages by degree attainment are based on data from the Bureau of Labor Statistics.

The median starting wage for newly enrolled apprentices among fiscal year 2024 participants was \$19 per hour, or nearly \$30,000 annually for full-time employment. While there are no directly comparable data on wages for CTE students pursuing an associate's degree or certificate, the median annual earnings for these students surveyed in 2020 were about \$18,000 and about \$26,000 for those employed full-time.

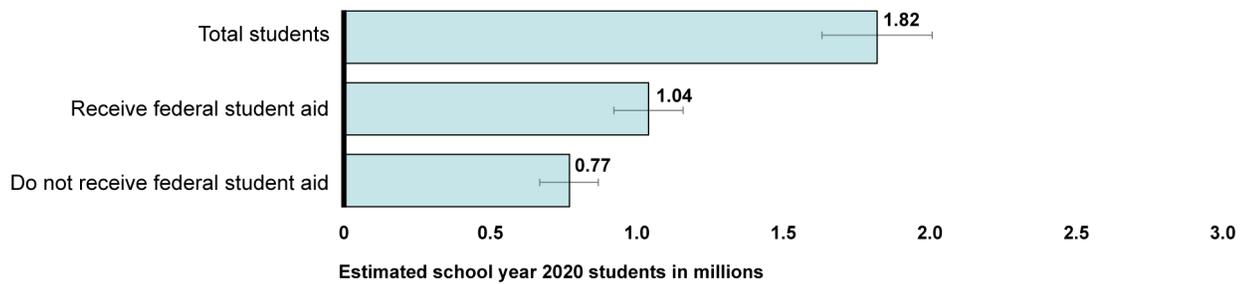
- **Program completion.** According to our analysis of DOL data, about 42 percent of RAP participants complete their programs within 1 year of their expected completion date. This exceeds the completion rate for first-time,

full-time students seeking a degree or certificate at 2-year colleges. According to an Education report, about 34 percent of first-time, full-time students at 2-year colleges had completed their associate’s degree or certificate program within 150 percent of the normal time required to complete their program, as of 2020.⁹

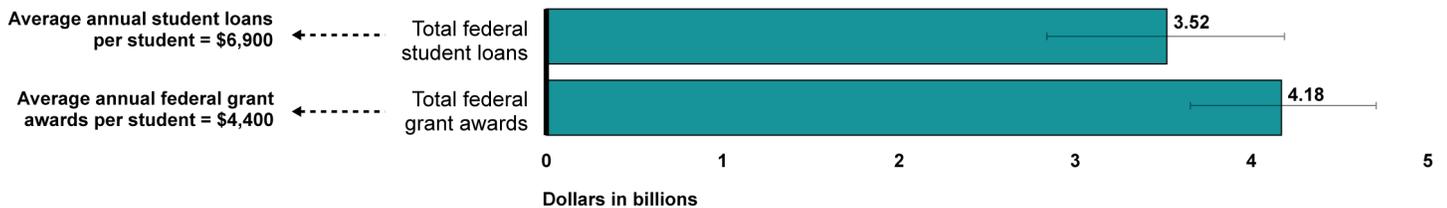
- Student aid.** RAP participants may also avoid taking on student debt and may be paid for their time in technical instruction in addition to their paid time at the work site. In RAPs where related instruction is delivered by accredited institutions, participants who qualify can use federal student aid, such as Pell Grants. However, DOL literature states that RAPs can benefit career seekers by providing college credit while avoiding student debt. For instance, officials from a stakeholder in the construction industry told us that the more than 300,000 apprentices in its joint labor-management funded programs do not take on student loans to complete their apprenticeships. By contrast, our analysis of a 2020 generalizable survey of college students shows that a little over one-quarter of the college CTE students expecting an associate’s degree or certificate reported they had taken out student loans, and about one-half received federal grant aid. These CTE students paid on average \$10,900 per year for their education. (See fig. 2.)

Figure 2: Estimated Federal Student Aid for Career and Technical Education (CTE) Students Expecting an Associate’s Degree or Certificate, 2020

Total students expecting a CTE associate’s degree or certificate



Total federal student loans and grant aid for students expecting a CTE associate’s degree or certificate



Brackets show 95% confidence interval

Source: GAO analysis of 2020 National Postsecondary Student Aid Study data. | GAO-25-107040

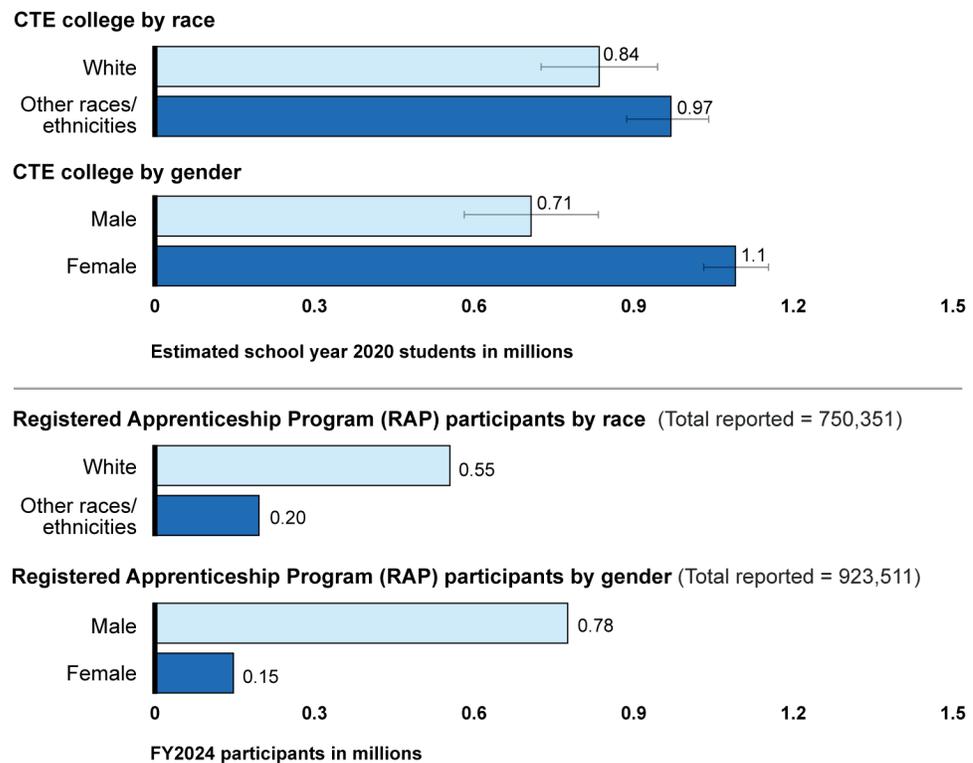
- Skills alignment.** RAPs provide occupation-relevant skills and education. By comparison, based on our analysis of Education’s nationally representative 2020 survey, an estimated 1.25 million CTE students were employed or had an internship while attending school. We found that about 63 percent of these students worked in jobs unrelated to their field of study. Some college students receive subsidized wages through federal work study that help finance their education. Education regulations state that federal work study should complement and reinforce the student’s educational or career goals to the maximum extent practicable. However, Education officials said that this requirement is very broad. For example, they said learning work habits such as timely arrival could meet the requirement.

How do RAP participant demographics compare with those of other pathways into career and technical occupations?

Participants in RAPs are a less diverse group than college students pursuing similar career pathways. Based on our analysis of fiscal year 2024 DOL RAP data, registered apprentices are predominantly male and white. Specifically, about 84 percent of the approximately 920,000 RAP participants who reported their gender were male.¹⁰ Of the approximately 750,000 apprentices who identified their race in the data, about 74 percent were white. RAP demographics largely reflect those of the predominantly male construction industry, which makes up nearly half of all RAP participation. For instance, in fiscal year 2024, among construction RAP participants who reported gender or race, about 95 percent were male and 82 percent were white.¹¹

By comparison, the estimated 1.8 million students in 2020 who expected to complete an associate's degree or certificate in a CTE field were majority female (60 percent). The majority of these students did not identify as white (54 percent), according to our analysis of a 2020 nationally representative survey of college students.¹² (See fig. 3.)

Figure 3: Demographics of Registered Apprenticeship Program Participants and Career and Technical Education (CTE) College Students Expecting an Associate's Degree or Certificate



Brackets show 95% confidence interval

Source: GAO analysis of 2020 National Postsecondary Student Aid Study and 2024 Department of Labor data. | GAO-25-107040

Note: GAO's analysis of gender did not include transgender or gender nonconforming students or RAP participants. Both the 2020 National Postsecondary Student Aid Study and the fiscal year 2024 Department of Labor RAP data were the most recent available at the time GAO performed its analysis.

DOL launched initiatives designed to increase both RAP participation and awareness among underrepresented groups. For example, DOL funded grants focused on the establishment of pre-apprenticeships leading to RAP enrollments that were targeted at women and jobseekers from other underrepresented groups. DOL funded some grants focused on construction industry RAPs, and others to expand RAPs to high-growth occupational fields, such as healthcare. In addition, DOL's Registered Apprenticeship equal opportunity regulations require that program sponsors with five or more participants develop and implement an affirmative action program to ensure equal opportunity for apprentices and applicants for apprenticeships (29 C.F.R. Part 30).¹³ Additional efforts to increase awareness are discussed below.

What federal programs may support earn-and-learn opportunities?

Within the five federal agencies we selected—Commerce, DOD, DOL, Education, and VA—we identified at least 26 federal programs that may support one or more aspects of earn-and-learn opportunities, such as on-the-job training, related instruction, or mentorship.¹⁴ While these programs can provide an array of services to support earn-and-learn opportunities, that support is not the primary objective for 20 of them. Table 2 lists examples of the ways selected federal programs provide complete or partial support for earn-and-learn opportunities.

Table 2: Examples of Federal Support for Earn-and-Learn Opportunities

Example of federal support for earn-and-learn opportunities	Examples of federal programs that provide this support
Registering and setting standards for Registered Apprenticeship Programs (RAP) or funding pre-apprenticeship opportunities	<ul style="list-style-type: none"> Department of Labor (DOL) Office of Apprenticeship and associated State Apprenticeship Agencies DOL YouthBuild DOD SkillBridge
Providing full or partial financial assistance to employers, participants, or training providers	<ul style="list-style-type: none"> DOL Workforce Innovation and Opportunity Act (WIOA) Adult and WIOA Dislocated Worker programs Department of Education Title IV Federal Student Aid Department of Veterans Affairs GI Bill Program
Sponsoring advancement of earn-and-learn opportunities in specific sectors	<ul style="list-style-type: none"> Department of Commerce Manufacturing Extension Partnership DOL H1-B Job Training Grants
Referring potential candidates for earn-and-learn opportunities	<ul style="list-style-type: none"> DOL Wagner-Peyser Employment Service

Source: GAO analysis of federal agency responses relating to earn-and-learn opportunities. | GAO-25-107040

Agency officials reported that most of those 26 federal programs could support both RAPs and other aspects of earn-and-learn opportunities, such as on-the-job training, classroom-based related instruction, or mentorship.¹⁵ For a complete list of federal programs supporting earn and learn at Commerce, DOD, DOL, Education, and VA, see appendix I.

According to the agency officials, the 26 programs may target specific populations or industry sectors and can support earn and learn through an array of mechanisms and funding streams. For instance, 20 of these programs were designed to target specific populations (e.g., veterans, youth, military service members, disabled workers). Three of these programs target specific industry sectors, which include manufacturing and infrastructure (see table 3).

Table 3: Federal Programs that may Support Earn-and-Learn Opportunities by Agency

Agency	Programs supporting earn-and-learn opportunities	Targets specific population	Targets specific industry sector
Department of Labor	12	10	1
Department of Education	4	4	0
Department of Commerce	5	1	2
Department of Defense	2	2	0
Department of Veterans Affairs	3	3	0

Source: GAO analysis of federal agency responses relating to earn-and-learn opportunities. | GAO-25-107040

Agency officials reported that most programs provide funds to workforce boards, educational institutions, and qualified individuals rather than directly to employers. For example, some of the programs can provide direct funding for training to participants or state workforce agencies, which deliver training, employment, career, and labor market services. In a few cases, agency officials indicated that program funds could be provided directly to employers to offset the cost of training. In

addition, DOL's website (<https://www.apprenticeship.gov>) lists various tax credits and allowances that are available to employers for RAPs and related activities.

In addition, agency officials said that recent legislation has included workforce development provisions which could support earn-and-learn opportunities. For example, Commerce and DOL officials highlighted funding for workforce development initiatives or tax incentives aimed at increasing RAP participation in targeted sectors included in the Infrastructure Investment and Jobs Act, Inflation Reduction Act of 2022, and CHIPS Act of 2022.¹⁶

What are examples of federal agency coordination regarding earn-and-learn opportunities?

We identified a variety of examples of ongoing and past coordination among federal agencies regarding earn and learn. These include the establishment of a formalized committee to support apprenticeship and inter-agency collaboration on relevant guidance. For example,

- Officials from Commerce, DOL, and Education sat alongside industry and union stakeholders on the Advisory Committee on Apprenticeship. The committee provided advice and recommendations to DOL on ways to better use the apprenticeship training model. In April 2025, DOL officials informed us that the committee had been terminated.
- Education officials told us they regularly communicate with DOL officials to coordinate about how the agency's Perkins V program, which funds high school and college CTE, interacts with RAPs. They also coordinate Perkins V support with programs under the Workforce Innovation and Opportunity Act (WIOA), which helps job seekers access employment, education, training, and supportive services.¹⁷ Education also published guidance on how Perkins V funding for CTE can be used to support RAPs.
- DOD officials said they coordinate with DOL to ensure military occupations eligible for the United Services Military Apprenticeship Program are aligned with occupations in the civilian workforce.¹⁸
- DOL created a webpage of guidance regarding the Registered Apprenticeship-related provisions of the Inflation Reduction Act, which includes links to regulations published by the Department of the Treasury and the Internal Revenue Service.

Within DOL, officials from Registered Apprenticeship and the WIOA programs coordinate, including on efforts to improve co-enrollment where different programs may serve the same population. In 2021, DOL established a Registered Apprenticeship Technical Assistance Center of Excellence for Strategic Partnerships and System Alignment. This center focuses on establishing, building, and sustaining partnerships that support alignment of the national workforce and education systems to accelerate Registered Apprenticeship adoption and expansion. In addition, beyond RAPs, WIOA programs can support other types of earn-and-learn opportunity through on-the-job training, incumbent worker training, and customized training.

While DOL reports that co-enrollment in RAPs among WIOA participants is low, Registered Apprenticeship and WIOA program officials have collaborated to develop resources to increase co-enrollment. RAPs are available in occupations for which WIOA trains participants. However, in 2022, of the roughly 106,000 participants who exited the WIOA Adult or WIOA Dislocated Worker training, about 2 percent had co-enrolled in RAPs as part of their WIOA training, based on our analysis of the most recent DOL WIOA reporting. DOL and some workforce agency officials said one reason for low co-enrollment may be that RAPs are not a good fit for certain WIOA participants, who typically seek short-term opportunities to get back into the workforce. Through the Technical Assistance Center of Excellence for Strategic Partnerships and System Alignment, DOL has developed training so workforce system staff can better understand how WIOA works to support RAPs and boost co-enrollment.

Which occupations and industries are most commonly involved with RAPs?

Our analysis of fiscal year 2024 RAP data found that the most popular occupations for RAP participants were concentrated in the construction trades, with electricians representing the most common occupation (16 percent). Nine of the top 10 RAP occupations paid above the 2023 U.S. median earnings of \$48,060, based on our analysis of the most recent available BLS data.¹⁹ In addition, these 10 occupations had overall 2023 employment levels ranging from 123,400 to 2,211,300, and six were projected to grow at a faster than average pace through 2033. (See table 4.)

Table 4: Most Common Registered Apprenticeship Program (RAP) Occupations, as of Fiscal Year 2024

Most common RAP occupations (FY 2024 data) ^a			Occupational characteristics (FY 2023 data) ^b		
Rank	Occupation	Percentage of FY 2024 RAP participants	Median earnings (2023)	Expected growth by 2033 ^c	Total U.S. employment (2023)
1	Electricians	16	\$61,590	Much faster than average	779,800
2	Plumbers, pipefitters, and steamfitters	8	\$61,550	Faster than average	473,400
3	Computer occupations, all other ^d	7	\$104,920	Much faster than average	470,900
4	Carpenters	6	\$56,350	Average	923,100
5	Construction laborers	5	\$45,300	Faster than average	1,401,200
6	Electrical power-line installers and repairers	3	\$85,420	Faster than average	123,400
7	Heavy and tractor-trailer truck drivers	3	\$54,320	Average	2,211,300
8	Sheet metal workers	2	\$58,780	Slower than average	124,200
9	Heating, air conditioning, and refrigeration mechanics and installers	2	\$57,300	Much faster than average	441,200
10	Nursing Assistants	2	\$38,200	Average	1,419,400

Source: GAO analysis of Department of Labor (DOL) RAP fiscal year (FY) 2024 data and Bureau of Labor Statistics (BLS) 2023 data on U.S. employment, wages, and projected employment by occupation. | GAO-25-107040

^aGAO analyzed occupational data for the roughly 750,000 RAP participants that were either active, cancelled their program, or completed their program during FY 2024 and had an associated occupational code in DOL's data. About 190,000 FY 2024 RAP participants did not have an associated occupational code, and GAO did not include them in calculating the percentage of overall participants.

^bGAO analyzed characteristics of identified occupations, including their projected growth between 2023 and 2033, based on BLS data for 2023, the most recent data available.

^cBLS projections for expected growth correspond to the following rates: much faster than average growth (9 percent or greater increase), faster than average growth (6 to 8 percent increase), average growth (3 to 5 percent increase), slower than average (1 to 2 percent increase), little or no change (between 1 percent decrease and 1 percent increase), and decline (1 percent or greater decrease).

^dThis standard occupational classification includes computer occupations with a wide range of characteristics, but excludes certain occupations for which BLS keeps specific data, such as web administrators, information security engineers, and computer systems engineers/architects.

While occupations in the construction and skilled trade industries comprise most of the top 10, other industries have seen an uptick in RAPs. In January 2025, DOL published fact sheets on RAP participation in construction and 10 other highlighted industries: advanced manufacturing, agriculture, education, energy, financial services, healthcare, hospitality, technology, telecommunications, and transportation. DOL's fact sheets indicate that between fiscal years 2020 and 2024, RAP participation in highlighted industries outside construction grew by about 42 percent, compared with 22 percent growth in construction. However, RAP participation in the

construction industry still outnumbers participation in those other industries. For instance, in fiscal year 2024 there were about 451,000 construction RAP participants, compared to about 298,000 participants in the highlighted industries.

To support expansion across industries, DOL has contracted with industry intermediaries, which act as a bridge between industry and DOL. Intermediaries we spoke with said they provided grants to support selected public-private partnerships. One of the roles the intermediary contractors play is to implement industry-driven strategies to expand RAPs to growing sectors, which include cybersecurity, healthcare, and early childhood education. These strategies can include creating pre-apprenticeship programs to build pipelines to RAPs or providing a stipend to employers for each RAP participant to help offset costs.

What is known about the benefits of earn-and-learn opportunities for employers?

Employers can benefit from certain earn-and-learn opportunities through increased employee retention and positive return on investment, according to relevant studies and several earn-and-learn stakeholders, including officials with employers, workforce organizations, and state agencies. Specifically, three studies—which cover a range of locations and industries—used self-reported employer or apprenticeship-sponsor data and indicated that RAPs provided employers with reduced employee turnover.²⁰ In addition, officials associated with employers, DOL contractors, workforce organizations, and education stakeholders told us that apprenticeship or earn-and-learn opportunities could increase employee retention. For example, officials at one financial services company said high retention was a hallmark of its nonregistered apprenticeship program’s success, and that teams with apprentices saw higher overall retention. They attributed this to increased motivation in response to increased commitment on the part of both apprentices and other employees.

Four studies indicate that RAPs provide employers with a positive return on investment (ROI). For instance, one 2022 study found that the median estimate of the employer’s ROI from RAPs was 44 percent, when including both direct and indirect benefits.²¹ However, each study’s ROI calculation was limited in some capacity. For example, one study of 68 employers incorporated data from one representative apprentice in each program rather than all apprentices.²² In the remaining studies, some employers were unable to provide necessary data to calculate ROI.²³ Despite these limitations, we believe the evidence is sound because these findings reflect RAPs across a diverse set of locations and industries. In addition, officials at two healthcare organizations said that their employers implemented nursing apprenticeship programs in part because the cost of the earn-and-learn program to develop hospital staff to fill these roles was less than the cost of hiring traveling nurses.

Earn and learn can also provide opportunities for employers to work with education partners to fill gaps in their workforce. For instance, officials from a state community college system told us that they consult with local businesses about their needs and have scheduled courses to help businesses meet the educational requirements of RAPs. In one case, a technical college became a hub for a program supporting earn-and-learn opportunities funded by a geographic association of heating, ventilation and air conditioning contractors seeking to share the cost of training installers to become repair technicians.

Some officials associated with employers, research agencies, and DOL contractors said that businesses have begun to shift toward seeing themselves as coproducers of the workforce, along with the higher education system. For instance, one employer stakeholder said that earn and learn had played a key role in an organizational shift away from the mindset that a 4-year degree was the sole indicator of talent. In addition, officials of two employers said that they had diversified their workforces by creating apprenticeship pathways and ensuring employee readiness through earn-and-learn opportunities. Some stakeholders said employers had been motivated to implement earn-and-learn approaches during worker shortages or when other pathways did not provide qualified workers.

What barriers have been cited to expanding earn-and-learn opportunities?

Stakeholders and selected studies highlighted certain barriers participants and employers may face that could affect earn-and-learn expansion and participation. Stakeholders highlighted barriers for participants, including awareness gaps, low wages, and pressure to pursue a college degree:

- **Awareness gaps.** DOL officials said potential participants might not be aware of earn-and-learn opportunities, including their use across a wide range of occupations. Even in industries with established RAPs, some jobseekers might not know that apprenticeships are available to them. For instance, officials from a group representing women in skilled trades said that many women assume that construction industry apprenticeships are not open to them, even though they are.
- **Low wages.** Officials from two RAP sponsors said some apprentices drop out due to low wages, especially in the first 6 months of an apprenticeship, when wages are lowest. Wage growth is a necessary component of RAPs, but DOL does not dictate the wages provided, as long as they meet legal standards.
- **Pressure to pursue a college degree.** DOL officials said that potential participants in earn and learn may face pressure, especially from their families, to pursue a college education.

Stakeholders also highlighted employers' concerns related to lack of awareness, administrative burden, and cost:

- **Awareness gaps.** Officials from DOL and several other employer or workforce-related stakeholders said that there is a lack of awareness about RAPs on the part of employers, especially among those in industries not historically reliant on RAPs. They also said that in some cases the term "registered apprenticeship" can confuse employers, who may associate RAPs with unions or specific industries.
- **Administrative burden.** Several employer and workforce-related stakeholders said the burden—or perceived burden—of registering and reporting for federal programs can limit employer participation in formalized earn-and-learn opportunities. Some stakeholders said registration and reporting for RAPs was especially challenging for smaller employers, which might not have personnel reporting systems capable of the recordkeeping required to participate in certain government programs. However, two employer stakeholders told us that RAP administration was not burdensome. Stakeholders at two workforce organizations also said that they were aware of employers turning down available funding, including subsidized wages for on-the-job training, due to concerns about administrative burden or hesitation about working with the federal government. Some stakeholders said that employers might create nonregistered apprenticeship programs for this reason.
- **Cost.** Some stakeholders told us employers may not want to pay for earn-and-learn opportunities, which could include costs related to start-up, instruction and training materials, mentors' time, and overhead.

Similarly, a 2020 survey of state workforce agencies reported "major barriers" to expanding apprenticeships: employers' lack of awareness (e.g., misperception that apprenticeships require union involvement), concerns about apprenticeship (e.g., costs), and the lack of public knowledge regarding how to enter the RAP system.²⁴

Some other earn-and-learn stakeholders, such as education providers, also highlighted barriers, including difficulty hiring and affording faculty with relevant

experience to teach in CTE programs that could be part of earn-and-learn opportunities. They said that often those individuals could earn higher wages in their occupation than the school was able to pay. One of these education providers spoke about having addressed this issue using agreements for employers to supply faculty and share the cost of paying them.

What initiatives have federal agencies implemented to address the identified barriers?

Federal agencies have implemented several initiatives to address the challenges listed above, though some are recent and results are currently accumulating. For instance, DOL has implemented numerous initiatives to increase awareness and help reach its goal of 1 million annually served RAP participants by 2025:

- DOL oversees annual National Apprenticeship and Youth Apprenticeship Weeks. DOL launched these week-long initiatives in 2015 and 2024, respectively, to bring together stakeholders across the RAP system to help publicize and boost RAP participation.
- In 2021, DOL launched the Apprenticeship Ambassador Initiative, a national network that includes employers and industry organizations, labor organizations, and community-based organizations representing RAPs across over 40 in-demand industries.
- In 2023, DOL launched the Apprentice Trailblazer Initiative to promote Registered Apprenticeship through a national network of apprentices and graduates who share their experiences and the benefits of Registered Apprenticeship with career seekers.
- DOL contracts with industry intermediaries to serve as RAP sponsors, which can reduce the administrative burden on individual employers. As sponsors, intermediaries may provide related instruction, register the RAP on behalf of the employer, and report data on apprentices to DOL or its State Apprenticeship Agencies.

In addition, stakeholders cited specific funding available to assist workers facing specific barriers or to offset employer costs for earn-and-learn opportunities. Due to the voluntary, industry-led nature of RAPs, RAP participants generally do not receive any federal or state funding toward their program. For instance, DOL RAP-related grant funding helped fund about 3 percent of RAP participants during fiscal year 2024. Examples of federal and state funding available for earn and learn include:

- Officials from the construction industry said they sometimes used DOL funding to help pay for transportation assistance for apprentices who faced economic hardship.
- WIOA funding can also provide supportive services necessary to enable individuals to successfully participate in apprenticeship programs, such as tools, books, and uniforms. However, DOL officials said that WIOA is the dollar of last resort and will be applied only after other funding sources have been used and according to established priorities.
- Many states have made tax credits for hiring apprentices and tuition support for RAPs available. DOL's apprenticeship website includes links to these resources in 37 states.
- Employers can use the Work Opportunity Tax Credit to offset costs of earn-and-learn opportunities for qualified employees who have faced barriers to employment.²⁵ The Joint Committee on Taxation estimates that in 2024, employers used approximately \$2.2 billion in Work Opportunity Tax Credits.

Given the variety of federal, state, and local programs that can support earn-and-learn opportunities, employers or sponsors may be able to access funding from

multiple programs. However, some workforce agency and apprenticeship sponsor stakeholders said accessing this funding can be challenging, which they attributed to the different eligibility and reporting requirements of each program. DOL officials also noted that a small percentage of WIOA funding goes toward training services, which could include earn-and-earn opportunities. In 2022, DOL issued technical assistance on how to manage multiple funding streams for earn-and-learn participants.

Stakeholders also told us about additional strategies that can help build successful earn-and-learn opportunities.

- Some apprenticeship sponsors told us they fund apprenticeship through joint-labor management structures, wherein employers and unions jointly fund costs of apprenticeships. Officials in the construction trades said this is the mechanism by which their RAPs are funded.
- Some employers may recoup education-related costs if apprentices leave the program before completion. In addition, one RAP sponsor told us that participants eligible for federal student aid, such as Pell grants, could use that funding toward their program and lower the amount they would potentially owe in the event they left early.
- Some stakeholders highlighted the value of locational networks, wherein employers can pool needs and build programs together that tap into existing local resources, such as community colleges. For instance, a consortium of companies, workforce organizations, and education partners in Chicago built a network to support apprenticeships. Employer officials told us the consortium had combined to create about 2,000 registered and nonregistered apprenticeship positions and had launched similar consortia in nine other locations.

Several stakeholders also pointed to lessons learned from other countries that rely to a greater extent on apprenticeship and earn and learn to build their workforces. These include frequent coordination between industry stakeholders and educational systems about skills needed to build the workforce; earlier pathways to vocational education, especially at the high school level; and emphasis on the viability of earn and learn as an alternative or supplement to higher education.

Agency Comments

We provided a draft of this report to the Departments of Commerce, Defense, Education, Labor, and Veterans Affairs for comment and review. Four agencies provided technical comments, which we incorporated as appropriate. The Department of Veterans Affairs had no comments.

How GAO Did This Study

To analyze federal support for earn and learn and the extent to which it supports high-paying and high-growth occupations, we chose to focus on Commerce, DOD, DOL, Education, and VA because either those agencies' missions or programs contained clear earn-and-learn components. We sent a questionnaire to officials at these agencies asking them to identify which programs can support earn-and-learn opportunities, and how and to whom they could provide that support. In addition, we interviewed program officials at these agencies and collected related documentation about the ways in which their programs coordinated with each other and with industry in support of earn and learn. Our examination of coordination was descriptive and not intended to support conclusions about coordination across the 26 programs.

To describe participation in earn-and-learn activities, we searched for survey data and, finding little directly relevant information, analyzed data on participation in RAPs. Specifically, we analyzed fiscal year 2024 data from DOL's Registered Apprenticeship Partners Information Database System. To establish participation in RAPs during fiscal year 2024, we included participants whose start date began in fiscal year 2019 or later and (1) were in active status as of September 30, 2024, or (2) had completed or cancelled their program during fiscal year 2024. To determine the reliability of these data, we interviewed agency officials, reviewed the data dictionary, and performed data reliability testing. We found these data to be sufficiently reliable for our reporting on RAP participants, including their occupational and demographic data. In addition, we analyzed data from BLS on 2023 employment levels and wages and 2033 job projections to assess the extent to which RAP participants were in high-paying and high-growth occupations. We found these data to be sufficiently reliable for reporting on characteristics of the most common RAP occupations.

To compare the experiences of apprentices with those of participants in a related pathway to technical occupations, we also analyzed the most recent publicly available data from the National Postsecondary Student Aid Survey (NPSAS), a 2020 nationally representative survey of college students from Education. We used NPSAS to create estimates of the number of students enrolled in CTE fields who expected to graduate with an associate's degree or certificate, as well as characteristics of those students, such as their federal student aid and their occupational status. We also analyzed 2022 data from the Perkins Information Management System, which collects data on participation in the Education's Perkins V CTE program, which funds CTE at the high school and college levels. These were the most recent available data on Perkins V CTE at the time we performed our analysis. To determine the reliability of these data, we reviewed related documentation and performed data reliability testing. We found these data to be sufficiently reliable for reporting on the number and characteristics of CTE students.

To determine what is known about the benefits and challenges of earn and learn, we reviewed studies published from 2014 to 2024 on the benefits and challenges of earn and learn and apprenticeship. We identified these studies through a literature search and through interviews with agency officials and earn-and-learn stakeholders. The available literature and evidence largely concern RAPs. Therefore, we were unable to determine the extent to which findings relating to RAPs generalize to other types of earn-and-learn opportunities, such as nonregistered apprenticeship programs. We assessed these studies based on the scope of their findings and sufficiency of

methodology. We believe the evidence is sound because these findings reflect RAPs across a diverse set of locations and industries.

We also selected a judgmental sample of earn-and-learn stakeholders and used a snowball approach to identify and interview additional stakeholders regarding their experience with earn-and-learn opportunities. We initially selected stakeholders with experience in various types of earn-and-learn opportunities, including both registered and nonregistered apprenticeship, as well as variety across industry and location. When interviewing them, we asked for suggestions of other key stakeholders to interview. In total, we conducted interviews about earn-and-learn opportunities with officials at the five federal agencies and three state agencies, 13 other workforce organizations, nine employers with a variety of earn-and-learn opportunities, four DOL industry intermediary contractors, three unions or joint labor-management organizations, and six education providers. When discussing stakeholder views, we refer to them by the following categories: "some" (two through four) and "several" (five or more). We also interviewed 11 participants and graduates from five earn-and-learn opportunities about their respective experiences in earn-and-learn opportunities in the construction, health care, hospitality, and business services industries. The results of our interviews are nongeneralizable.

We conducted this performance audit from August 2023 to April 2025 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

List of Addressees

The Honorable Tim Walberg
Chairman
Committee on Education and Workforce
House of Representatives

The Honorable Virginia Foxx
House of Representatives

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees and the Secretaries of Commerce, Defense, Education, Labor, and Veterans Affairs. In addition, the report will be available at no charge on the GAO website at <https://www.gao.gov>.

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Appendix I: Table of Federal Programs that may Support Earn-and-Learn Opportunities

Program	Program objective	Specific population(s) served	Is the program limited to one or more specific industries?	Who can directly access financial assistance through the program?	Can this program support Registered Apprenticeship Programs?	What components of earn and learn can the program support outside Registered Apprenticeship? (see key at end)
Department of Commerce						
Build Back Better Regional Challenge	The Build Back Better Regional Challenge invests in regions to transform local economies through complementary and integrated projects.	-	No	Workforce boards, educational institutions, others	Yes	OJT, RI, T, SS, R, M
Good Jobs Challenge ^a	To support regional workforce training systems to establish sectoral partnerships that train and place workers in good jobs.	-	No	Workforce boards, educational institutions, others	Yes	OJT, RI, T, E, R, SS, M
Manufacturing Extension Partnership (MEP)	To enhance competitiveness, productivity, and technological performance in U.S. manufacturing.	-	Yes; manufacturing, advanced manufacturing	MEP Centers	Yes	OJT, RI, SS, R
Manufacturing USA	Manufacturing USA connects people, ideas, and technology to solve industry-relevant advanced manufacturing challenges. Its goals are to enhance industrial competitiveness, transition and scale innovative technologies into domestic manufacturing capabilities, develop an advanced manufacturing workforce, and create institutes that support their communities.	Varies	Yes; manufacturing, advanced manufacturing	Manufacturing USA Institutes	Yes	OJT, RI, R, M
STEM Talent Challenge	The STEM Talent Challenge aims to build science, technology, engineering, and math (STEM) talent training systems to strengthen regional innovation economies.	-	No	Workforce boards, educational institutions, others	Yes	OJT, RI, W, T, E, R, SS, M
Department of Defense						
SkillBridge	To connect service members to civilian work experiences and training within the last 180 days of service.	Service members ^b	No	-	Yes	OJT, RI, M
United Services Military Apprenticeship Program	To provide active-duty service members the opportunity to improve their job skills and to complete civilian apprenticeship requirements.	Service members ^b	No	-	Yes	None outside of Registered Apprenticeship

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Department of Education						
American Indian Vocational Rehabilitation	To make grants to the governing bodies of Indian tribes located on federal and state reservations to provide vocational rehabilitation services to American Indians with disabilities who reside on or near such reservations.	Native Americans and Alaska Natives with disabilities	No	Tribes and tribal organizations, eligible individuals, educational institutions	Yes	OJT, RI, W, T, E, R, SS, M
State Vocational Rehabilitation Grants	To assist states in operating programs of vocational rehabilitation that support individuals with disabilities to achieve competitive integrated employment.	Individuals with disabilities	No	Vocational rehabilitation agencies	Yes	OJT, RI, W, T, E, R, SS, M
Carl D. Perkins Career and Technical Education Act (Perkins V)	To develop more fully the academic knowledge and technical and employability skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs and programs of study.	Secondary and postsecondary students	No	Workforce boards, educational institutions	Yes	OJT, RI, T, E, R, SS, M
Title IV Federal Student Aid	To provide loans, grants, and work-study funds from the federal government to vocational, undergraduate, and graduate postsecondary school students and their parents.	Postsecondary students and parents of dependent postsecondary students	No	Employers, eligible individuals, educational institutions	Yes	OJT, RI, W, T, E
Department of Labor						
Employment Service/Wagner-Peyser	To provide job seekers with career services, including labor exchange services, job search assistance, workforce information, referrals to employment, and other assistance.	-	No	Workforce boards	Yes	R, M
H-1B Job Training Grants	To provide training and related activities to workers to assist them in gaining the skills and competencies needed to obtain or upgrade employment in high-growth industries or economic sectors.	Adults	Yes; various ^c	Employers, eligible individuals, workforce boards, educational institutions, others ^d	Yes	OJT, RI, W, T, E, R, SS, M

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Homeless Veterans' Reintegration Program	To provide services to help veterans experiencing or at risk of homelessness obtain meaningful employment and to stimulate the development of effective service delivery systems to address the complex problems that they face.	Low-income veterans	No	Employers, workforce boards, others ^e	Yes	OJT, RI, W, T, E, SS, M
Job Corps	To provide free career training and education for low-income 16–24-year-olds so students get the experience they need to begin a career or apprenticeship, go on to college, or join the military.	Low-income youth	No	Job Corps centers	No	OJT, RI, W, T, E, R, SS, M
Jobs for Veterans State Grants	To provide federal funding to state workforce agencies to hire dedicated staff to provide individualized career and training-related services to veterans and eligible persons with significant barriers to employment and to assist employers fill their workforce needs with job-seeking veterans.	Veterans with barriers to employment	No	Workforce boards	Yes	None outside of Registered Apprenticeship
Native American Employment and Training	To support employment and training services for Native Americans, Alaska Natives, and Native Hawaiian individuals to develop more fully the academic, occupational, and literacy skills of such individuals; to make such individuals more competitive in the workforce and to equip them with the entrepreneurial skills necessary for successful self-employment; and to promote their economic and social development.	Native Americans, Alaska Natives, and Native Hawaiians	No	Tribes and tribal organizations, educational institutions	Yes	OJT, RI, W, T, E, R, SS, M
Reentry Employment Opportunities	To provide reentry grants focused on serving returning adults and youth-focused grants aimed at youth involved in or at risk of involvement in crime and violence.	Justice-involved individuals	No	workforce boards, educational institutions	Yes	OJT, RI, W, T, E, R, SS, M
Registered Apprenticeship System	To promote, engage, and assist industry in the development, expansion, and improvement of Registered Apprenticeship.	-	No	Employers, eligible individuals, workforce boards, educational institutions, others ^f	Yes	None outside of Registered Apprenticeship

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Workforce Innovation and Opportunity Act (WIOA) - Adult	To enable workers to obtain good jobs by providing them with job search assistance and training opportunities, as well as help employers meet their workforce needs.	Adults ^g	No	Workforce boards	Yes	OJT, RI, T, E, R, SS, M
WIOA Dislocated Worker	To help dislocated workers get back to work as quickly as possible and overcome barriers to employment.	Dislocated workers ^h	No	Workforce boards	Yes	OJT, RI, T, E, R, SS, M
WIOA Youth	To help low-income youth, between the ages of 14 and 24, acquire the educational and occupational skills, training, and support needed to achieve academic and employment success and successfully transition into careers and productive adulthood.	Youth with barriers to employment	No	Workforce boards	Yes	OJT, RI, W, T, E, R, SS, M
YouthBuild	To equip underserved youth with the education and employment skills necessary to achieve economic self-sufficiency.	Youth	No	Workforce boards, educational institutions, others	Yes	RI, W, T, E, R, SS, M
Department of Veterans Affairs						
Compensated Work Therapy	To provide clinical vocational rehabilitation and employment supports to veterans and employers.	Veterans with disabilities	No	-	No	SS
Post-9/11 Veterans Educational Assistance (GI Bill)	To assist beneficiaries in receiving educational benefits and training and to help service members adjust to civilian life after separation from military service.	Veterans, service members	No	Eligible individuals	Yes	OJT, RI, W, T, E, SS, M
Veteran Readiness and Employment	To assist service members and veterans with service-connected disabilities that create barriers to employment prepare for, find, and maintain suitable careers, or maintain a life of independence.	Veterans with service-connected disabilities	No	Eligible individuals	Yes	OJT, RI, W, T, E, SS

Legend: **Abbreviation Key**

OJT	On-the-job training
RI	Classroom-based related instruction
W	Participant wages
T	Supplies or tools
E	Exam fees

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R	Recruitment
SS	Supportive services
M	Mentorship

Source: GAO analysis of federal agency questionnaire responses relating to earn-and-learn opportunities. | GAO-25-107040

Note: GAO did not independently verify the information provided by the agencies or conduct a legal analysis to confirm the descriptions of the programs included in this table. In some cases, the general program objectives provided by agencies were edited for brevity and more standard reporting across programs.

^aGood Jobs Challenge grants were awarded using funding provided for in the American Rescue Plan Act of 2021 and the Consolidated Appropriations Act, 2024.

^bDOD programs supporting earn-and-learn opportunities are internal to the agency and support is only accessible to service members.

^cSome H-1B Job Training Grants funding opportunities specify an industry or occupation. Past industries have included health care and infrastructure.

^dEligible entities vary by funding announcement. DOL officials reported eligible entities could include non-profits, community-based organizations, labor unions, labor-management organizations, worker organizations, workforce development entities, Native American tribal governments, economic development agencies, and municipalities.

^eEligible entities also include local public agencies and non-profit organizations, including faith-based and community-based organizations.

^fOfficials added that Registered Apprenticeship funding could go to municipalities, workforce development organizations, community-based organizations, industry groups, labor-management partnerships, and workforce and apprenticeship intermediaries.

^gDOL officials clarified that while all adults are eligible for WIOA services, workforce boards must prioritize providing individualized career and training services to individuals on public assistance, deficient in basic skills, or low-income

^hWIOA generally defines dislocated workers as those who have been terminated or laid off and are eligible for or have exhausted unemployment benefits or are unlikely to return to their previous industry or occupation.

Endnotes

¹See National Center for Education Statistics Adult Training and Education Survey of the National Household Education Surveys Program, 2016. At the time of our analysis, this was the most recent survey with available data. Formal education is defined as education provided in the system of schools, colleges, universities, and other formal education institutions. It normally constitutes a continuous ladder of full-time education for children and young adults. Accordingly, youth apprenticeship programs offered to high school students would be considered formal education programs, according to Education officials.

²Batia Katz, Daniel Kuehn, Robert Lerman, and Jessica Shakesprere, *Did Apprentices Achieve Faster Earnings Growth Than Comparable Workers?* (Abt Associates, Urban Institute, 2022). https://www.dol.gov/sites/dolgov/files/ETA/publications/ETAOP2022-41_AAI_Brief-Earnings_Growth_Final_508_9-2022.pdf

³Kevin M. Hollenbeck and Wei-Jang Huang, *Net Impact and Benefit-Cost Estimates of the Workforce Development System in Washington State*, Technical Report 16-033 (W.E. Upjohn Institute for Employment Research, 2016). <https://wtb.wa.gov/wp-content/uploads/2019/07/WA-State-Net-Impact-Study-Dec2016.pdf>

⁴Barbara A. Butrica, Elizabeth Jones, Linda Rosenberg, Samina Sattar, and Veronica Sotelo, *A Review of the Literature on Registered Apprenticeships*, (Urban Institute, 2023). https://www.dol.gov/sites/dolgov/files/ETA/publications/ETAOP_2023_17_ERAI_Literature_Review_Final.pdf

⁵To estimate the total college students in career and technical education programs, we analyzed the 2020 National Postsecondary Student Aid Survey (NPSAS). Survey responses pertain to the 2019–2020 school year, which we refer to as 2020. CTE fields include health professional and related programs; business, management, and marketing; culinary, entertainment, and personal services; computer and information sciences; and mechanic and repair technologies. However, comparisons between these RAP participants and students identified in NPSAS are limited, in part, by NPSAS' methodology. For instance, NPSAS surveys students at a point in time and does not follow up later to determine occupational outcomes. While Education collects and maintains some data on occupational outcomes by field of study, we were unable to use these data to analyze the outcomes of this group of CTE associate's students because of the limitations of the survey data.

⁶We also identified about 2.8 million high school students who concentrated in CTE programs during the 2021–2022 school year. However, due to the limitations of Education's data on these high school students and their younger ages, we have focused primarily on the experience and demographic makeup of college CTE students at the associate's level.

⁷Daniel Münich and George Psacharopoulos, *Education Externalities: What They Are and What We Know*, Analytical Report No. 34 (European Expert Network on Economics of Education, 2018). http://www.education-economics.org/dms/EENEE/Analytical_Reports/EENEE_AR34.pdf and Dani Rodrik and Charles F. Sabel, *Building a Good Jobs Economy*, Faculty Research Working Paper No. RWP20-001 (Harvard Kennedy School, 2019). https://scholar.harvard.edu/files/dani-rodrik/files/building_a_good_jobs_economy_november_2019.pdf

⁸DOL publicly reported that RAP participants who completed their program and retained employment between April 2022 and March 2023 earned an annual starting salary of over \$80,000. This reporting is based on Kansas Department of Commerce (DOC) analysis of wages earned in the second and third quarters after RAP participants completed their program. DOL then doubles those two-quarter earnings to report annual wages. Kansas DOC performed this earnings analysis for all RAP completers whose records included a Social Security Number (SSN) to match with wage records and who were not in Federal Bureau of Prisons apprenticeships. As such, the annual wages for RAP completers are not updated throughout the course of completers' careers and do not include RAP participants who left before program completion or who did not provide their SSNs. Kansas DOC also performed an earnings analysis of all participants who exited a RAP, including those who cancelled their programs and those in Federal Bureau of Prisons apprenticeships, during the same period. Using the same methodology as above, those RAP participants who exited their program between April 2022 and March 2023 earned about \$68,500 in annual wages.

⁹U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Winter 2020–21, Graduation Rates component. See *Digest of Education Statistics 2021*, table [326.20](#).

¹⁰At the time of our analysis of fiscal year 2024 data on registered apprentices and school year 2020 college students, both datasets used variables representing gender. We used gender for this

analysis because it appeared in both data sets and offered greater accuracy in representing how individuals identified and would be perceived.

¹¹Among fiscal year 2024 RAP participants in the construction industry, about 21 percent did not report their race and 2 percent did not report their gender. Among fiscal year 2024 RAP participants for all industries, about 20 percent did not report their race and 2 percent did not report their gender.

¹²Researchers from the Federal Reserve Bank of St. Louis argued that women receive a higher return on investment from college than men, which may account for some of the disparity in attendance. Relative to men, women saw an additional 5.3% return to getting an associate or a bachelor's degree, according to its analysis of Census data. Oksana Leukhina and Amy Smaldone, "Why Do Women Outnumber Men in College Enrollment?," St. Louis Fed On the Economy (March 15, 2022).

¹³29 C.F.R. § 30.4.

¹⁴We selected Commerce, DOL, and Education because their missions contained elements of earn and learn, and we selected DOD and VA because they had programs with clear support for earn and learn and linkages to the registered apprenticeship system (e.g., DOD's United Services Military Apprenticeship Program or VA's GI Bill Program). Other agencies may have programs that support some elements of earn-and-learn opportunities.

¹⁵Related instruction means an organized and systematic form of instruction designed to provide the apprentice with the knowledge of the theoretical and technical subjects related to the apprentice's occupation. 29 C.F.R. § 29.2. Sometimes referred to as supplemental education, related instruction can be delivered at a college, technical school, or by an employer.

¹⁶Pub. L. No. 117-58, 135 Stat. 429 (2021); Pub. L. No. 117-167, 136 Stat. 1366; Pub. L. No. 117-169, 136 Stat. 1818.

¹⁷Pub. L. No. 113-128, 128 Stat. 1425 (2014) (codified as amended at 29 U.S.C. § 3101 et seq.).

¹⁸In 2022, we recommended that DOD take steps to develop evidence that would allow the Department to assess the effectiveness of its Credentialing Programs, which include USMAP. In response, DOD officials said that the agency has begun collecting baseline data and plans to fully address the recommendation by May 2025. GAO, *Military and Veteran Support: DOD Has Taken Steps to Help Servicemembers Transfer Skills to Civilian Employment but Has Limited Evidence to Determine Program Effectiveness*, GAO-22-105261 (Washington, D.C.: Feb. 17, 2022).

¹⁹Due to the limitations of DOL data, we analyzed occupational data for about 750,000 of the 940,000 RAP participants, as of fiscal year 2024.

²⁰ApprenticeshipNC and North Carolina Department of Commerce's Labor & Economic Analysis Division, *North Carolina Apprenticeship Program Survey Report*, ApprenticeshipNC and North Carolina Department of Commerce's Labor & Economic Analysis Division (2020). https://www.apprenticeshipnc.com/sites/default/files/news-files/nc_apprenticeship_program_survey_report_2020_final.pdf; Siobhan Mills De La Rosa, Daniel Kuehn, Robert Lerman, and Kevin Hollenbeck, *Do Employers Earn Positive Returns to Investments in Apprenticeship?* (Abt Associates, 2022). https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/AAI/AAI_ROI_Final_Report_508_9-2022.pdf; and Jonathan Payne, *The Next-Gen IMT Apprenticeship: A Return on Investment Study*, JFF Center for Apprenticeship & Work-Based Learning (2020). https://www.jff.org/wp-content/uploads/2023/09/IMT_ROI_Study_-_08-12-2020.pdf

²¹*Do Employers Earn Positive Returns to Investments in Apprenticeship?*

²²*Do Employers Earn Positive Returns to Investments in Apprenticeship?*

²³*North Carolina Apprenticeship Program Survey Report*; Susan Helper, David Langdon, Jessica R. Nicholson, and Ryan Noonan, *The Benefits and Costs of Apprenticeships: A Business Perspective* (U.S. Department of Commerce, 2016). <https://www.commerce.gov/sites/default/files/migrated/reports/the-benefits-and-costs-of-apprenticeships-a-business-perspective.pdf>; and *The Next-Gen IMT Apprenticeship: A Return on Investment Study*.

²⁴Rebecca Dunn and Linda Rosenberg, *Registered Apprenticeship: A Descriptive Study of States' Systems and Growth* (Mathematica, 2020).

²⁵26 U.S.C. § 51.