

Field Report:

Apprenticeship Program Registration

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Executive Summary

Government sanctioned apprenticeship programs in the US must register with either the US Department of Labor's Office of Apprenticeship (OA) or with a state apprenticeship agency (SAA). In this registered apprenticeship system, *program sponsors* are responsible for gaining approval for their programs with the relevant agency and assuring that participating employers and training organizations follow the overseeing the registering wishing to train registered apprentices must secure registration of their program. Apprenticeship sponsors can be an employer, groups of employers, joint union-management committees, a community college, a workforce board, a private training company or an industry association. *Apprenticeship programs* are a sponsor-occupation combination; thus, a sponsor may oversee several programs.

Many people or businesses that wish to create programs report that the registration process is a significant barrier, especially to programs in non-traditional occupations. The purpose of this paper is twofold: first, to enhance our understanding of the registration process, hearing what elements work well and work poorly; and second, to identify potential changes that could streamline registration without compromising the quality of apprenticeship programs.

A fundamental source of complexity is the allocation of responsibility for approving registrations. OA has staff and offices in some states or regions, while in other states an SAA is the responsible agency. Some SAA states give apprenticeship councils final approval authority, which can be another barrier. Although OA has simplified registration, regulations, procedures, policies and paperwork in recent years, the process can be daunting for the uninitiated, as are procedures, staff, policies, paperwork, and even terminology.

A key aspect of the registration process is the program sponsor's description of the skills and competencies apprentices will learn, though ironically the application format relegates the proposed skills to an Appendix. The lists and priority of skills can vary from one sponsor to another, even within the same occupation. Each sponsor must come up with its own specification of skills or *work process standards*. The OA or SAA will scrutinize each work process standard and will often reject sponsor requests when the potential apprenticeship looks limited.

Countries with robust apprenticeship systems do not require every sponsor to register their own program. Instead, joint bodies design a limited number of programs that sponsors may offer, generally with the option of adding to but not subtracting from the base program. These bodies also provide assistance and oversight. Endpoint assessments are the key to quality control; i.e., apprentices are required to demonstrate that they have mastered the competencies specified for their occupations. Sponsors with too many failing apprentices are subject to remediation efforts; if they do not improve, authorization to train is withdrawn.

Advocates for growing apprenticeship should consider adopting more efficient practices found in some places in the US and in other countries and trying some new ideas as well. These include greater use of shared standards – the core of program registration – so that sponsors can simply adopt an existing program, perhaps with some adaptations. This could be facilitated by establishing an entity to develop and maintain occupational frameworks setting out standards that are then approved in advance. Even simply enforcing existing national regulations would be an improvement; although OA regulations should take precedence, some SAAs reject compliant programs. OA’s list of apprenticeship occupations is outdated. It includes many occupations in which there are few or no apprentices and occupations undergoing rapid change are not updated quickly. A sponsor planning to train in a new or changing occupation must first get it on the list. Streamlining program registration in these and other ways would release resources that could be devoted to assessing program results. Finally, new, and more effective methods are needed to inform and support prospective sponsors.

Overview and Methodology

Employers in the US have grown increasingly vocal about their need for skilled workers, both to replace retirees and to perform the complex tasks that remain as more routine tasks are off-shored or performed by computer-aided machines. Policymakers and the public are increasingly recognizing the value of diversifying routes to careers beyond the “academic only” model of college degrees. Drawing on the lessons of effective apprenticeships in the US and abroad, federal and state political leaders and public policy groups are coming to see the expansion of apprenticeships as dealing effectively with employer needs and strengthening learning for careers.

Formal apprenticeships in the US operate largely through the registered apprenticeship system. Registered programs must comply with specific requirements and gain approval (registration) from a federal or state apprenticeship office. The goals of registration are to assure the quality of the apprenticeship training, protect the apprentice, and enhance equal opportunity. Apprentices who complete a registered program receive formal certification of their competence from a state and/or federal apprenticeship office. This credential is generally recognized by all employers, not just the employer providing the training, making it portable from one job to another. Registration may qualify the program sponsor¹ for funding from the US Department of Labor (DOL) and their state. Registration of programs and of each apprentice enrolled in those programs (a separate process not addressed here) also enables the collection of data needed to track such useful information as the number and types of programs and the characteristics of sponsors and apprentices. Organizations may create apprenticeships that are not registered, and some have created notable unregistered programs, but with no central source of information, little is known about them.

Unfortunately, the complexity of the registration process sometimes conflicts with the goal of expanding apprenticeship. The process can require excessive time and energy that could be better used in developing and strengthening programs. It can sometimes deter employers from creating programs altogether. Employers considering apprenticeship to meet their need for skilled workers may find the registration process so daunting that they abandon the plan. Too often procedures put in place with the goal of assuring quality impede the creation of more apprenticeships in more sectors.

Another questionable aspect of the current registered apprenticeship system relates to portability, transparency, and complexity. Unlike other countries with robust apprenticeship systems, the US does not rely on widely used skill standards. Instead, individual employers or groups of employers each come up with and register a program specifying the skills apprentices are expected to learn (often borrowing from already-registered programs). This approach somewhat reduces the portability of occupational credentials since apprentices trained in one program might learn different skills than apprentices trained in other programs. Requiring sponsors to develop their own skill requirements and curricula is time-

consuming and may exceed their capacity. Neither employers nor their skilled workers are accustomed to thinking about how skills are learned and imparted.

The purpose of this informal study is to identify some of the barriers encountered in registering new apprenticeship programs, to discuss differences between the US and other countries in setting up programs, and to offer some recommendations for improvement. The study was proposed by the Policy and Evaluation Subcommittee of Apprenticeships for America. Several members of that committee described difficulties they had experienced in registering new programs and agreed that those difficulties significantly constrain the creation of new programs.

Asked to speak with people who register programs (applicants) and those who review and approve them (approvers), I conducted 30 remote interviews, exchanged emails, and consulted relevant documents. Respondents' names and affiliations are listed below but, with one exception, names are not associated with specific comments to encourage frankness. Such a small, nonrandom sample can yield testimony about issues but cannot firmly establish their causes, extent, or consequences. Therefore, it is not appropriate to quantify responses or draw strong conclusions. Rather, the findings should be regarded as suggestive. The most rewarding way to test the validity of key findings and recommendations would be to consult with a wider range of informants, then make improvements to the process and monitor the results. The real test is not in the number of people who concur with the ideas expressed but whether apprenticeship quality and quantity can be increased together when the recommendations are acted on.

In general, those who approve programs described their processes as simple, straightforward, and reasonably fast, contrary to the views of many applicants. Their views can be attributed to differences in the pace and urgency of the work people do. Employers strive to minimize costs. Having decided to train apprentices, they expect to get started right away. Large firms in particular have other options for meeting their workforce skill needs. If they are dissatisfied with the pace of registration, they can simply give up on apprenticeship and choose another method or begin to train apprentices without benefit of registration. While registrants are often impatient with the amount of time required, speeding up the process risks allowing low-quality programs to proliferate. This difference in concern for speed versus quality is another example of the ways in which applicants bring different perspectives, needs, and expectations to the process than approvers.

People coming to apprenticeship for the first time are especially susceptible to confusion and frustration when they encounter the registration process, including a new language filled with acronyms, documents they were unaware of, and some procedures they learn about after they are well along.

Positive Comments

Consistent with its origins, this report is mostly about difficulties people have encountered in registering programs, but respondents offered complimentary accounts too. Following are some of their positive observations.

- Staff working for both the Office of Apprenticeship (OA, in DOL's Employment and Training Administration) and State Apprenticeship Agencies (SAAs) were frequently praised for their accessibility, knowledge, and commitment to facilitating registration.
- Several respondents said the new OA web-based Standards Builder² is a useful tool, both because it makes needed forms and documents accessible and because registrations can be filed electronically and quickly revised if needed.
- Good coordination between SAAs and their regional OA was described as very helpful in some states.
- Respondents named various intermediary organizations as giving expert assistance in planning and registering programs. DOL has promoted the growth of intermediaries.

Barriers

Respondents were more voluble about barriers they had encountered. These mainly arose from the complexity and opacity of the process and from inconsistency and sometimes arbitrariness.

OA, SAA, and State Councils

A fundamental source of complexity is that new programs may be registered directly by OA or by an SAA acting as an agent of OA. Direct registration with OA is similar in different states, whereas SAAs may differ considerably in their requirements and procedures. Some SAAs were described as very efficient and easy to work with. After Florida's SAA streamlined their approval process, the number of new program registrations increased from an average of 7-9/year to 27 in 2021-22 and the average time to approval fell from 9-12 months to four weeks.³ Others were sharply criticized for reasons described below. Potential applicants must first identify the appropriate approving agency for their state, then learn that agency's guidelines and procedures, and, ideally, begin to develop a working relationship with people in that agency. Applicants operating in multiple states must do the same in each one.

Apprenticeship Council Approval

SAA states have councils that participate in the registration process. According to both applicants and approvers, states with advisory councils are much easier to work with

A Case Study

A national apprenticeship expert described one state that put serious barriers in the way of registering a new program for youth development workers. SAA staff took six months to review the program and forward it to the Council, which then took another four months and required appearances by the applicants at three separate meetings. As the expert describes it, Council members' concerns were not about whether the program conformed to regulations but whether the sponsor deserved to have the program.

Other respondents gave their own accounts of difficulties in the state. A person working with an intermediary reported that their organization sought to register eight new programs at the same time, but the council was unable to act on all of them simultaneously. Some were approved quickly but they had to wait for the others. When a person with more than a decade of experience in apprenticeship informed the SAA that they planned to register a new program, they were required to watch an hour-long video on "what is apprenticeship" before talking with anyone there. The Council rejects most applications at the first meeting when they are considered. As a result, in 2021 the state approved only about two dozen new apprenticeship programs and has a total of just under 900 registered programs, while Virginia approved 340 in the same year and, even with a smaller population, has more programs in total.

than those with councils having decision-making authority. Those councils meet monthly at the most frequent and often quarterly to consider applications that agency staff have reviewed and approved. In at least one state, getting on the agenda takes a month, extending the wait time to six months. A staff review can take three months and the resulting nine-month lag is further extended if the council asks for revisions. In some councils, a single member can raise objections that block a program. Even a minor revision can lead to major delays.

Another person acting as an intermediary worked with a community college and all the major manufacturers in their region to plan an apprenticeship in industrial maintenance using a competency-based occupational framework⁴ previously approved by OA. The SAA staff approved it but their council did not. One member said they hadn't read the application because the program lasted only 18 months and was competency-based, and it should last four years.

"Overlap" between the competencies required in a new occupation and those in an existing apprenticeship can also generate opposition, either delaying or blocking a new program. For example, an application to register a new program for an occupation that partially draws on skills employed by a union program might be met with objections because some of the competencies are included in their existing program. This is already making it difficult for companies that install large-scale solar panel arrays to mount the apprenticeship programs they are

required to offer to qualify for subsidies through the Inflation Reduction Act. In at least one state, a single objection to a pending application for a new program is sufficient to kill it. The result is the stifling of apprenticeships in “non-traditional” occupations. Not incidentally, this also impedes implementation of the Inflation Reduction Act because sustainable energy companies are prevented or hampered from taking on the apprentices to qualify for subsidies.

It is beyond the scope of this report to analyze the sources of this pattern in detail, but a significant element, cited by several respondents, is the predominance of building trade union representatives on state apprenticeship councils. Agency staff as well as council members may only be familiar and comfortable with the building trades model. Many regulations and procedures are based on it. For example, registration of the first youth apprenticeship in one state was delayed because regulations made no provision for apprentices who are still enrolled full-time in high school. Representatives from the building trades are prominent on councils for a reason. Few people outside of the industry have equivalent experience and expertise in apprenticeship. Those in the industry are heavily invested in apprenticeship and in principle they have important contributions to make to expanding the practice. However, experience can also obscure their view of what apprenticeship can be. They can take the position that, “We’ve always done it this way,” and resist innovations such as competency-based apprenticeships and shorter programs in “non-traditional” occupations such as IT and healthcare.

Union representatives and other apprenticeship council members argue that they want to assure that new practitioners are highly competent. Incompetence in both occupations endangers health and safety and erodes public trust. But ensuring competence can sometimes lead to inappropriately controlling entry of new apprenticeship programs. Concern about deskilling – identifying new occupations with a narrow range of skills – may be valid; however, opposing new registrations that overlap impedes the expansion of apprenticeship in emerging industries.

Complex Regulations and Procedures

Because apprenticeship has largely operated within the building trades, the regulations and procedures have frequently been provisions tailored to construction and may simply not fit other industries. Because construction apprenticeship programs are well established and numerous, new applicants pursuing program registration are most likely to come from other fields. An employer in construction wishing to train apprentices need only sign on to an approved program. After struggling with the tensions between people representing traditional and non-traditional apprenticeships, California separated construction and firefighting, with those programs approved by a council, from all other industries, whose programs are approved by the state apprenticeship director with guidance from an Interagency Advisory Committee on Apprenticeship. California programs may be registered with the state’s Division of Apprenticeship Standards (DAS), which is not a standard SAA, or the regional OA office, or both. DAS can quickly approve a nationally

registered program and the two agencies generally work well together. However, even with these innovations, regulations and procedures can get in the way. For example, California requires every program to have a letter of agreement with a Local Education Agency (LEA) to connect apprenticeship with the education system, which poses a problem for programs that rely on other providers of off-the-job instruction (Related or Related Technical Instruction).

Employers, employers' associations, and intermediaries operating in multiple states struggle the most with variations among SAA states and between them and OA states, slowing or stalling their applications. OA offers national registration as a means of avoiding such variation when a sponsor plans to implement the same program in three or more states and enrolls at least 20 apprentices within two years. In principle, they can register with OA and then operate in any state. However, despite DOL requiring SAAs to defer to OA, some demand revisions in nationally registered programs to comply with their own distinct regulations and data needs and to qualify for state subsidies. A small software firm in an SAA state abandoned their effort to register a competency-based apprenticeship because the state refused to accept any program that is not strictly time-based unless there is a "national evaluator," a provision that is vaguely defined and costly. DOL specifies that nationally registered programs may be time-based, competency-based, or hybrid (i.e., including both a minimum time and demonstrated competencies), but several states require programs to specify at least as many hours of on-the-job learning and related technical instruction as previously approved time-based programs, essentially ignoring the competency-based aspect. Some states require in-state employers to commit to hiring a specified number of apprentices before they will register a nationally registered program, regardless of how many employers and apprentices are involved in the program in other states.

Before an apprenticeship program application can be reviewed, the occupation in question must be apprenticeable. OA has a list of "apprenticeship occupations," currently numbering 1036, about half the number before a concentrated reduction effort, but still including many occupations that are no longer practiced or have so few apprentices that they "clog up the system," in the words of one respondent. Technology has altered many occupations and the descriptions, titles, and competencies of occupations continue to change more rapidly than OA's list and associated description. One person who works in a field that has changed rapidly as a result of new technology found great discrepancies between the way OA described the occupations for which they planned to develop programs and what people in the field actually do. Not only must an applicant wait for months before a new occupation is added to the list but in this case, programs designed by people in the industry are still awaiting approval while programs submitted by intermediaries using outdated information supplied by OA were quickly approved, despite those intermediaries being out of touch with the industry.

As noted, respondents have expressed appreciation for aid from intermediaries, especially in navigating the complexities of registration. If the program registration process were simpler, intermediaries could focus their assistance on other issues, such as designing, implementing, and promoting programs.

Policies and Paperwork

Applicants must comply with the policies of the approving agency. Notification of policy changes sometimes lags. As a result, an application may be returned for revision because it doesn't comport with policies the applicant didn't know about. Perhaps the applicant failed to keep up with announced changes, but it also happens that changes are not quickly incorporated into the agency's website and even agency staff may not be up to date. This is challenging for people in a single state but is a much more serious problem for national organizations. A respondent working with an intermediary is proud of keeping up with changes in regulations and said they have had to inform approvers of changes made by their own agency that the approvers had not known about. They even had to correct a state director's belief that an apprentice can't be younger than 18. Another person working for a national intermediary pointed out that having adequate staff to keep up with current policies in every state would consume resources their organization could use more productively for other purposes and would make their organization larger, more unwieldy, and more bureaucratic. Testimony that potential sponsors can feel overwhelmed by how much they are expected to learn is a warning that keeping everyone apprised of every change could drown prospective sponsors in a flood of information. They need help finding what they really need to know.

Many respondents have levelled criticism about some SAAs' excessive paperwork demands. OA has trimmed registration paperwork to seven pages from 35-40. OA's web-based tool, Standards Builder, not only accepts program registration applications but guides applicants step-by-step through the process. It asks for basic information and populates the form, introducing "boilerplate" material as appropriate (i.e., information that is uniform for all apprenticeships or the occupation). Several respondents praised this tool, though one was unable to enter the site and eventually had to send or dictate the required information to the OA Apprenticeship Training Representatives (ATR), who entered it on their behalf. Another commented that the forms still require applicants to enter the same information repeatedly. Another criticism was that applicants only learn after their program is registered about all the paperwork required to maintain their program: program review, EEO plan, registration of individual apprentices, etc.

Terminology

Like many other endeavors, apprenticeship has its own language, terms used in a specific way that is not obvious to outsiders and are often abbreviated as indecipherable acronyms (RTI, RI, OJL, etc.). OA, SAA, ATR, sponsor, and intermediary have already been noted, as have time-based, competency-based, and hybrid. Even "registration" applies both to programs and to individual apprentices. The term "standards" refers both to the fixed requirements that every apprenticeship program must adhere to and to the standards adopted for a specific program. Fair Labor Standards introduce yet another use of the same term. The Work Process Schedule (Appendix A), the section of a program plan section that

details the competencies an apprentice will have to acquire, is also included in the program's standards, though it is not labelled that way.

"Mentor" for DOL means the skilled worker(s) who will work alongside and teach the apprentice. However, in health care, this role is called preceptor. In some programs, the person designated as a mentor is not employed in the workplace but visits regularly to meet with one or more apprentices and perhaps the managers as an advisor, mediator, and problem-solver, not a teacher. Registration includes a specific ratio of journeyworkers – another unfamiliar term – to apprentices. An applicant's justification for a ratio must explain how they will assure adequate supervision and training of apprentices and both their safety and that of their mentor(s).⁵ "Indenture" is perhaps the most problematic term in the apprenticeship lexicon. For centuries apprentices and/or their parents have signed a contract of indenture with their employer stating the terms of their employment and training. But to many people's ears it sounds like indentured servitude. Parents in the South are especially likely to recoil from it because of its association with slavery.

SAA and OA Staff

Some respondents reported that approvers made idiosyncratic decisions based on their personal preferences rather than on regulations. Regional OA directors have been known to send back standards that employers have already accepted to get spelling errors corrected. Sometimes an idiosyncratic staff decision can reflect the same resistance to innovation displayed by councils. A competency-based construction program was rejected by OA because the approver said, incorrectly, that competency-based programs were not allowed in construction. One person tried for many years to get a program registered, only to be turned down by the state director, who insisted that the national intermediary must have a physical presence in the state. After that director retired, the new director approved the program right away. In this case, staff turnover cleared the way. But staff turnover can slow the process as applicants are forced to re-start an application with a new staff member who lacks knowledge of the proposed program and perhaps of regulations as well. Some staff members act much more quickly than others. Those who are new to apprenticeship and just learning the ropes cannot be nimble. Others who have been involved for many years may be reluctant to accept programs that deviate from what they know.

A person working with an intermediary that has programs in many states expressed satisfaction with the good relations they had built with SAA and OA staff. Being able to get to know and gain the trust of approvers is obviously beneficial. One of South Carolina's six apprenticeship consultants said that after registering nearly 1,000 programs, they can get a program registered in as little as a day because the OA respects their expertise and has confidence in their work. A less upbeat view of the process was described by an older and perhaps more cynical person in another intermediary as having to "kiss the ring" of the approvers. Turnover, of course, results in having to form new relationships. When an SAA staff person left their position, all the work done to that point on registering an apprenticeship for

people with Downs Syndrome disappeared and had to be re-started, prolonging the process for a year and a quarter.

Competent and dedicated staff cannot act quickly when they are overwhelmed by their workload. This applies to some SAAs, but OA regional offices are especially likely to be understaffed. For example, the state of California, with three times as many apprentices as the state with the next largest number,⁶ has three consultants. Understaffing results from what an OA insider described as a deliberate policy of limiting the size of the federal workforce and sending money instead to states, sponsors, and intermediaries. The result, however, is that more and more programs are supported by the same number of OA staff.

Applicants' Actions and Understanding

Approvers noted some sources of delay that arise from the applicants' side. Sometimes applicants fail to respond quickly after being informed of the need to make revisions, slowing or stalling the process. Some simply don't understand that apprenticeship should be both broad and deep, giving workers the capacity to work productively for different employers and to learn new skills continually. It should deliver training that benefits the individual workers and enhances the quality of the workforce as a whole. Employers sometimes want to limit training to what they see as the minimum required for workers to be able to do a decent job in their own firm. Large IT employers like Google and Cisco Systems have developed formal training and certification programs, as have organizations like CompTIA, and their programs are typically much shorter than a traditional apprenticeship, creating tensions when IT employers seek to register apprenticeships. IT employers also tend to increase wages annually, which conflicts with the requirement that apprentices receive increases based on specific milestones. Negotiating differences like these slows the registration process.

Some applicants' lack of knowledge is so severe that they try to register programs without having employers lined up. A community college in California submitted a cybersecurity program that included no on-the-job learning. An employer who wished to train high school apprentices lacked the skilled workers to train them (i.e., serve as mentors). After being rejected for that reason by the state, they tried to register nationally with OA even though they only operated in one state. Employers have reported inflated numbers of journeyworkers to meet the ratio requirement by counting contract workers, who should be excluded.

A general aversion to any involvement with DOL can keep employers from considering registered apprenticeship at all or interfere with the process. Some employers fear that taking on registered apprentices will open them to further oversight and possible sanctions. Already having to comply with many mandatory DOL regulations, they choose not to voluntarily take on any more. The association of apprenticeship with unions is another deterrent to employers who fear that it will be an entering wedge to unionizing their workers.

Quality vs. Quantity

The issues discussed here arose in the context of growing recognition that: 1) Many employers are unable to find and retain the number of competent workers they need;⁷ 2) Expanding apprenticeship is a promising strategy for meeting this need. No one, including employers who would prefer shorter training periods, advocates low-quality training. The purpose of the registration process is to assure quality, but if it does so by restricting the number of programs, then scope is sacrificed. Regulations and procedures should be designed to maintain quality while also increasing the number and range of apprenticeship programs.

Both OA and some SAAs have already streamlined registration in some significant ways, but further improvements are possible. We must even examine the belief that current registration procedures are an effective means of assuring quality. Can we make registration less onerous while implementing other quality controls, most notably an endpoint assessment of apprentices' competencies? These prospects are discussed below, following a brief survey of some other countries' practices.

Apprenticeship in Five Countries

Some skeptics of building a strong apprenticeship system in the United States have claimed that it is too Germanic for translation to an English-speaking country with a very different culture. The recent growth of apprenticeship in the United Kingdom and Australia disproves that assertion but also reveals some of the challenges. Both countries have seen large fluctuations in the number of apprentices being trained. Subsidies to employers have increased the numbers and helped reduce the slowdown during the Covid pandemic. Australia has been most generous with subsidies and has allowed them to be used for apprentices' wages as well as other expenses. The UK only subsidizes small employers and some of the money comes from the levy on large employers if they fail to use the full amount for their own programs.

Swiss and German apprentices receive their off-the-job training in public schools, but those countries only subsidize the wages of apprentices with special needs such as disabilities and when the number of training positions declined during the Covid pandemic. Otherwise, subsidies there are unnecessary because employers train apprentices as part of their business model. Apprentices' wages are low enough in Switzerland and the training good enough that on average their productivity exceeds their costs by the end of their first year.

All four countries treat apprenticeship as a coherent national system with shared occupational standards and competencies and a centralized governing structure in which employers have a leading role. The equivalents of states collaborate with national governments in Australia, Germany, and Switzerland, especially for apprentices' schooling. None require each employer (or other sponsor) to create their own apprenticeship program.

Employers adopt the national standards and competencies for their chosen occupation(s) but have some flexibility. In addition, they are always free to add competencies to meet their particular needs. As indicated in Table 1, a systemic approach is associated with much larger numbers of apprentices than in the US. It is also notable that those numbers in both Australia and England have greatly increased over a relatively short time, approaching the magnitude of Germany and Switzerland in apprentices as a percentage of the workforce.

Table 1. Apprentices as a percentage of workforce, 2022⁸

Country	Apprentice % of Labor Force
Australia	2.9%
England	2.5%
Germany	3.0%
Switzerland	4.2%
USA	0.3%

The word “system” fits apprenticeship in these four countries far better than in the US. Responsibility for apprenticeship is lodged in one or more national government departments with other stakeholders’ roles specified. Germany and Switzerland have long-standing institutions that support apprenticeship. England and Australia have constructed new institutions for that purpose. All have an organizational infrastructure that makes apprenticeship accessible to employers, connects it to education, and assures a high level of coherence and quality. Government agencies conduct research to determine employers’ needs and assess program effectiveness. School curricula and on-the-job learning plans are based on that research and regularly updated. National and state-equivalent agencies that manage apprenticeship are well staffed with professionals who have extensive training for the job in postsecondary institutions where they are taught by professors who do some of the research.

Skill Standards in Five Countries

Germany’s Federal Institute for Vocational Education and Training (*Bundesinstitut für Berufsbildung* – BIBB) with a staff of about 800 people oversees apprenticeship, conducting research, producing information for the public and policy makers, convening the joint bodies that set and maintain standards for each apprenticeable occupation, and administers the qualifying examinations that every apprentice takes at the end of their training period. Every apprenticeable occupation, currently 320, is guided by a joint body with representatives from guilds, unions, education officials from the states (*Länder*), BIBB, and two federal ministries – for education and research, and for economic affairs and climate action.

BIBB provides research and professional expertise to inform the deliberations of these groups. Every year BIBB “accompanies” 6–10 of them in updating the regulations governing the apprenticeships they are responsible for. When employers identify an emerging

occupation for which there is no apprenticeship, BIBB conducts research on the demand for the occupation, its future prospects, and its suitability for apprenticeship training. If the conclusion is affirmative, a new joint body is convened to work out the definition of the new occupation, the structure and duration of appropriate training, the nature and content of the qualifying examination, and the plans for both work-based and school-based training. Their consensus around these issues is embodied in a new training regulation that is sent to the legislature (*Bundestag*) and upon approval published in the equivalent of the *Federal Register*.⁹

At the local level, the appropriate chamber is responsible for authorizing firms to train apprentices and overseeing their programs. The chamber determines whether an employer is qualified to train apprentices and gives advice to them and to apprentices. Training organizations that do not belong to chambers, such as government agencies and religious organizations are authorized and overseen by state and federal agencies.¹⁰

As in Germany, in Switzerland, apprenticeships with uniform standards and competencies are recognized in a specific set of occupations. Three “partners” oversee the system: World of Work Organizations; Cantons, and the federal government’s Secretariat for Training, Research, and Innovation (SFBI). World of work organizations include voluntary associations of firms and union and non-union associations of employees in the same occupation. Employers are the dominant partner. Union membership is low in Switzerland, on a par with the US. Every apprenticeship has a “commission for occupational development and quality” with representatives of all three partners. The commission specifies the content of the apprenticeship and procedures apprentices’ qualification as skilled workers. Cantons, which coordinate through a national conference, are responsible for school-based learning and the implementation of qualification procedures.¹¹

When an employer would like to begin training apprentices, they contact the cantonal agency for apprenticeship. Someone from that agency then explains what the employer is to do. After the employer agrees, the people who will work directly with apprentices receive a few days of training in how to carry out their responsibilities. The agency then supplies the contract forms that employers and their apprentices sign and the employer is set to bring on apprentices. The time from initial contact to completion is normally no more than two weeks.

New programs are created via a process that is parallel to the five-year review of every apprenticeship to assure that it keeps up with new technologies and economic conditions. Employers’ associations are the leading actors in both processes. They initiate the consideration of a new program, providing information substantiating the need to the SFBI, which determines whether further planning is warranted. Key issues include the employers’ explanation, labor market data, prospective offerings of training places, and the positioning of the new program.¹²

In Australia, the Department of Education, Skills, and Employment funds six independent Skills Service Organizations (SSOs) that convene and assist Industry Reference Committees (IRCs) that develop “training packages” specifying the content of apprenticeship programs (equivalent to what are called the work process schedule in the US). These

packages are uniform nationally but state and territory governments control which apprenticeships are offered. IRCs include representatives of large and small employers and of labor unions, which are strongest in construction and other traditional trades. The Department contracts with seven Apprenticeship Support Network providers who give administrative support and consultation to trainers and extra support for individual apprentices in danger of failing to complete.¹³ An employer who would like to start a program may begin by requesting assistance from their regional support provider, but they may also proceed on their own to recruit and select apprentices. The provider then immediately signs them up and they can begin their training. A firm that has not previously had an apprentice can find a candidate, their support provider can sign up the apprentice the next day, and the apprentice can begin working right away. This simple process, without government authorization or registration, makes apprenticeship easy for employers.

What is known in the US as Related Technical Instruction is provided in Australia by Registered Training Organizations (RTOs), which may be public secondary, postsecondary or further education institutions, private training organizations, employers, professional or employers' associations. They also provide courses for "trainees" who are not apprentices.¹⁴ RTOs are also an employer's first point of contact when they plan to hire apprentices. They work with the employer to develop a training plan that includes the allocation of training components between the employer and the RTO. The RTO is also responsible for assessing the competencies apprentices gain on the job. Group Training Organizations (GTOs) facilitate employers' involvement in apprenticeship. They recruit and select apprentices and act as the employer of record. That is, rather than the training employer hiring and compensating apprentices, GTOs take on those responsibilities and are responsible for the quality of training and for providing whatever supplemental support an apprentice needs to complete, including an external mentor. The approximately 200 GTOs also manage compliance and reporting obligations. When a workplace is unable to provide the full range of learning experiences needed, a GTO will assure breadth by rotating apprentices from one to another. These services are especially valuable to smaller employers lacking the staff to provide them. By working with multiple employers, GTOs can adapt to employers' variable need for new workers, maintaining a coherent program as different employers start and stop training. Employers pay for this service, and government subsidies, described below, go directly to GTOs acting as employers of record.¹⁵

The UK's Institute for Apprenticeships & Technical Education (IfATE), located in the Department of Education and guided by an independent board of employers and business leaders, has the mission to "work with employers to develop, approve, review and revise apprenticeships and technical qualifications."¹⁶ There are currently 600 occupational standards in 15 economic sectors. When employers believe a new apprenticeship is warranted, the Institute convenes a "Pathfinder Committee" comprising employers in the relevant industry, who, with the aid of Institute professionals determine standards and competencies.¹⁷

An employer wishing to train apprentices selects the appropriate program and an "approved training provider" from the IfATE website. The employer and training provider then

train, at work and off-the-job, respectively to the specified standards and are subject to oversight and the use of an end point assessment administered by a different approved organization. The approved training provider is paid by the government. An employer may undertake to become an approved provider of training and assessment, but the costs are prohibitive.

Securing employer participation is a continuing challenge. In addition, the two major political parties have had competing goals. Conservative governments have stressed upskilling the workforce for economic reasons while Labour governments have seen youth unemployment as the most important problem apprenticeship could solve. Accordingly, adult apprentices and high skill standards have been featured in Conservative “schemes” in contrast to inclusion and high wages in Labour’s. Conservative dominance in recent years has meant that most growth has been among adults and in shorter, lower-level apprenticeships. Employers have been unenthusiastic about paying relatively high wages to young apprentices.

The US is an outlier internationally in requiring registration for every new apprenticeship program. Countries with large and well-established apprenticeship systems have a set number of apprenticeable occupations, each with uniform minimum standards and work process schedules set by joint bodies led by employers’ organizations with representatives from government education and labor agencies (and unions in Germany). As a result, employers need not invent their own apprenticeship and have it reviewed and approved. They simply agree to offer the established apprenticeship programs for the occupations of the workers they need. Employers tend to accept these programs because their own associations are centrally involved in developing and updating them. They can add training specific to their firm, but they must always train to the national program specifications. The question for an employer planning to train apprentices is not what should be included in the training but how to implement the established program. Another advantage of this uniformity is that the skilled (journey) worker’s certificate is portable; it is valid anywhere in the country and recognized by all employers. When an applicant has a certificate testifying to their successful completion of an apprenticeship, all employers know what the applicant is competent to do.

Thus, unlike the US, the four countries examined here have a streamlined approach to the registration of programs and apprentices with the government. Table 2 summarizes the differences between the US registration process and those in Australia, Germany, Switzerland, and England.

Assessments in Meeting Standards

Germany and Switzerland require apprentices to pass examinations with both a written and a practical component at the end of their training to qualify as skilled workers.¹⁸ The written component assesses knowledge, the practical component skill. A manual apprentice might be given a blueprint and tasked with fabricating an object that is then judged by masters. A white-collar apprentice might respond to a series of questions from a

panel of professionals about how they would manage different situations. In Germany, any employer whose apprentices fail the qualification examination at a high rate risks losing their authorization to train apprentices. The UK now requires “end point assessments” of apprentices before certification. The main implication of the international comparison is that apprenticeship is built into the structure of government and the economy. It is not a set of ad hoc arrangements made by different sets of people and organizations in different locations.

In the German-speaking countries, where apprenticeship is most developed, employers understand the value of training apprentices. They also accept training as a social responsibility and, sometimes with government prodding, continue to train apprentices through declines in demand for workers. In such systems the fear of “poaching” – declining to invest in training because a competitor might hire away trained workers – is alleviated because the supply of workers trained by other employers is sufficient that leavers can be replaced.

Table 2: Making Apprenticeship Programs and Apprentices Official by Country

Country	Process for Governmental Approval of Apprenticeship Program
Australia	The Labor Department contracts with seven Australian Apprenticeship Support Network (AASN) providers who give administrative support and consultation to trainers and extra support for individual apprentices in danger of failing to complete. An employer can find an apprentice one day, contact their local AASN and sign-up the next day, while following the skill standards for the relevant occupation.
Germany	Local Chambers are responsible for authorizing firms to train apprentices and overseeing their programs. The chamber determines whether an employer is qualified to train apprentices and gives advice to them and to apprentices. Training organizations that do not belong to chambers, such as government agencies and religious organizations are authorized and overseen by state and federal agencies. All programs follow one of 320 standards established by joint committees of employers, unions, the federal vocational training institute, states, education officials and two Ministries. Employers and apprentices sign contracts that describe the terms of the apprenticeship.
Switzerland	When an employer would like to begin training apprentices, they contact the cantonal agency for apprenticeship. Someone from that agency then explains what the employer is to do. After the employer agrees, the people who will work directly with apprentices receive a few days of training in how to carry out their responsibilities. The agency then supplies the contract forms that employers and their apprentices sign and the employer is set to bring on apprentices. The time from initial contact to completion is normally no more than two weeks. Employers and apprentices sign contracts that describe the terms of the apprenticeship.
England	Training organizations apply to the government to be on the list of approved apprenticeship training providers. The training organizations may be further education colleges (similar to US community colleges), nonprofit entities, or for-profit firms. Once on the list, the training organizations can sign up employers to hire and train apprentices for one of over 500 occupations approved by the Institute for Apprenticeship and Technical Education. Training organizations are subject to inspection every few years by Ofsted. See https://bud.co.uk/articles/what-are-ofsted-inspectors-looking-for . Poor marks on the inspection can disqualify the training organization.
United States	A program sponsor (employer, group of employers, employer-union committee, or other organization) submits a proposal to register a program in an apprenticeable occupation to a state or federal apprenticeship office. The proposal includes entry requirements, skill standards (work process schedules), related instruction plan, wage progression, ratio of journeypersons to apprentices, and plans for assuring equal opportunity. The skills specified for each proposed occupational program are specific to the sponsor and subject to approval by state or federal officials, a process that often takes several months to complete. In cases involving a group sponsor that has already registered an occupation program, new employers can hire and train registered apprentices simply by signing an employer acceptance agreement, stating they will follow the provisions of the sponsor's registration document.

Recommendations for Improvement

If the US adopted an apprenticeship system with uniform standards as found in other countries, the challenges described here of registering new programs would become far less burdensome. Some barriers to new sponsors would surely remain but not many. Such a major change looks unlikely today, partly because many state agencies would resist the loss of their authority and employers would likely resist new federal mandates. Nevertheless, OA and SAAs could make changes to reduce the tension between maintaining quality and increasing the number of programs and apprentices. Following are some recommendations for simplifying the registration of new programs that emerge from the foregoing.

Use Shared Standards and Create More

While uniform national programs are unattainable, it makes sense to increase the use of mechanisms that enable new sponsors to adopt already approved standards and craft new ones.

National Program Registration is one existing mechanism. A sponsor can register a program that should be accepted in all states, meaning entities in different states can offer the same program and need not register as separate programs. This option is used most often by large companies and labor unions, but education and training organizations and consortia are also eligible. Operation in multiple states is the key criterion for national registration but there are some other circumstances that warrant it, including operation in multiple countries and firm plans for expansion. Guidance issued by OA¹⁹ states that “those standards must receive reciprocal approval in all States with a DOL-recognized State Apprenticeship Agency (SAA).”

National Guideline Standards²⁰ are another mechanism, looser than national program registration. They offer guidance to local entities associated with an entity with national scope – an employer, industry association, union, intermediary, or education institution. The guideline standards serve as a template for use in registering a local program. A local program may also incorporate standards that are not in the template, for example, by incorporating state requirements. This flexibility is what distinguishes national guideline standards from national program standards.

Group Registered Apprenticeship Programs allow an employer to join a program already registered by a group sponsor. The employer may sign an employer acceptance agreement or be part of the program’s collective bargaining or project labor agreement.²¹ Joining is simple and obviates the need for program registration: the program has already been registered.

Developing “Safe Harbor Standards” is another option for streamlining registration. If implemented, it would enable a central organization, such as Urban Institute’s Technical Assistance Center for Occupational Standards or the AASI envisioned below, to establish occupational frameworks for registered apprenticeship, subject to OA approval. Once approved, employers and other sponsors would have the option of using these standards for registration that could be approved within 1-2 weeks.

Establish and Fund a Public/Private Entity to Develop and Maintain Apprenticeship Occupational Frameworks

These occupational frameworks should reflect both employer needs and long-term skill requirements. Consensus frameworks are especially important if the public sector provides funding for the general skills component of apprenticeships (i.e., for skills that have value outside the training firm). Employers rarely have the time to develop such frameworks, nor do all employers in the same industry always share a common vision. To ensure that American Apprenticeships remains a quality brand and to simplify the process of implementing apprenticeships, Congress should establish the American Apprenticeship Standards Institute (AASI), which would be tasked with researching, creating, and updating apprenticeship competency frameworks for a broad range of occupations.

Working with industry associations and individual public and private employers, the AASI would produce frameworks with potential job titles, occupational pathways, certification and licensure requirements, salary ranges, and employment opportunities. The frameworks should be limited to about 500–600 occupations in order not to be so narrow as to limit the range of skills apprentices can apply, or so broad as to lack direct relevance to employer demands.

Enforce National Regulations

Currently, some SAAs refuse to accept nationally registered programs or standards approved by OA and some will not register competency-based occupational standards despite OA requiring SAAs to do so. Unfortunately, the behavior of these states limits the expansion of apprenticeship, a goal many elected officials advocate. Those officials and non-governmental advocates for expanding apprenticeship must make the case for DOL to enforce the regulations, possibly by disqualifying these states from using federal state expansion funds.

Update Apprenticeable Occupations

OA can only register a program for an occupation on their list of “apprenticeship occupations.” Adding a new occupation is time consuming. A regular systematic review, as in Switzerland, could reveal prospective new occupations but also eliminate those no longer used and update the standards for others. IT is the best example of an industry in which new occupations emerge and the competencies required for occupations with the same title change rapidly. But technological change also alters standards for the many occupations that make heavy use of technology.

Focus More on Assessing Program Results

Program registration is a method of assuring quality, but it is not adequate. Sponsors may fail to implement programs as they were described for registration. Recognizing this possibility, OA has a very extensive process of program review. It begins with a provisional review one year after a program has been registered. A second review occurs again after the first apprentices have completed their training. Then it is repeated every five years thereafter, sometimes more frequently. The review assesses a program's on-the-job training, related instruction, and equal opportunity provisions. Employers with five or more apprentices are required to submit Equal Employment Opportunity plans and their reviews are "extended" to include compliance with those plans. Apprenticeship Training Representatives (ATRs) who ordinarily conduct these reviews examine data submitted by sponsors, looking especially at completion rates and apprentice demographics in relation to demographics of their regions. ATRs meet with operators and participants, ideally face-to-face but remotely in some cases. SAAs also conduct program reviews.

The prescribed procedures are very thorough. OA provides 12 detailed checklists specifying everything that should be examined. ATRs use these and send them in advance to sponsors to aid their preparations.

Approving program plans does not guarantee quality implementation. Without regular monitoring, which is not currently feasible, programs that start out as specified can deviate over time. Results are a more important indicator. Do apprentices actually master the specified competencies? Employers' testimony is useful, but endpoint assessments provide a more compelling answer to this question. Introducing such assessments and administering them would require very substantial resources. The technology for testing academic knowledge is highly developed but far from perfect. Testing skills is quite different, more straightforward in many ways but far less developed. The greatest challenge is that different tests would be needed for every occupation, another reason to restrict the number of apprenticeable occupations. OA cannot oversee this process without adding staff with appropriate expertise.

Improve Information and Support for Prospective Applicants

As described above, the array of documents and procedures and the vocabulary associated with registration can deter potential sponsors. Intermediaries help sponsors cope with these matters. However, this seems analogous to the proliferation of tax preparation services to help taxpayers deal with the complexities of the IRS. Simplifying registration would enable intermediaries, sponsors, OA and SAAs to focus more resources on the content of apprenticeships.

"Bootcamps" in Missouri and "Build Your Apprenticeship Days" in Kentucky illustrate what might be done more widely. They bring together people considering creating apprenticeship programs for an intensive introduction to the process. Both approvers and experts who can offer continuing support make presentations, introducing themselves and their organizations to participants. In both states most participants in these events submit

program applications soon after attending. The information and support they have received increase the quality of their applications, easing their approval. If problems arise they know people to contact for advice and assistance.

Appendix A: Additional Background on Apprenticeships in Four Countries

Germany

As is true in most countries, nearly all apprentices in Germany are teenagers. The term, “youth apprenticeship,” is only used in English-speaking countries. About half of German youth serve an apprenticeship. The roots of Germany’s system reach back to the Middle Ages when guilds controlled manufacturing and trade, and apprenticeship was both a means of training craftsmen and a pre-requisite for guild membership. Successful apprentices achieved journeyman status (and made actual journeys) and then might proceed to become masters, which qualified them to join the guild, own and operate a shop, and train apprentices.²² Threatened by rapid industrialization, the system was modernized around the turn of the twentieth century because it was seen as important to both the economy and society. Modernization allowed for apprentices to be trained in factories as well as small workshops and in new managerial and technical occupations. Formal schooling in part-time vocational schools (*Berufsschulen*) was added to on-the-job learning. States (Länder) are responsible for these and other schools, but vocational curricula must address each occupation’s specified competencies. Labor unions became one of the “social partners” overseeing apprenticeship in collaboration with the national government and with the “chambers,” sectoral organizations that employers are required to join – the descendants of the guilds.

Switzerland

Switzerland’s system has the same historical roots as Germany’s, and until recently looked similar. Over the past 30 years it has been reformed, principally by connecting it far more comprehensively with postsecondary education, affording apprentices many choices about the amount of formal schooling they receive and the sequence they follow. After this reform participation grew and now about three-quarters of Swiss youth serve an apprenticeship. Swiss apprenticeships are designed to enable people to function productively in the labor market, to have occupational flexibility, be prepared for future occupations, become lifelong learners, and have occupational mobility.

Australia

From low levels, comparable to the US, the number of Australians starting apprenticeships began to grow rapidly in 1995, reaching a high point of 376,800 in 2012, falling rapidly after that until 2020 when numbers rose again, reaching 264,300 in 2020. Completions, though smaller in number, have followed a similar trajectory.²³ The number of apprentices has declined in recent years, spurring the national government to offer quite

generous incentives, an amount that increased during the Covid pandemic. As of July 2022, the incentive amounted to up to \$1,500 per apprentice per quarter for the first two years and up to \$750 per quarter per apprentice for a third year. Special subsidies are available for hiring apprentices with disabilities. Payments and loans are also available for individual apprentices.

England²⁴

The UK government initiated a revival of apprenticeship in 1994 as a means of building workers' skills to improve economic growth and productivity. In 1996–97, 65,000 apprentices started training in England, a number that grew to a peak of 509,000 in 2015–2016 before declining to 349,000 in 2021–2022. Shifts in the financing of apprenticeships and training organizations, along with the introduction of a skills standards regime, probably account for the reduced number of apprenticeship starts. However, the range of occupations and the number of higher-level apprenticeships has increased, suggesting improved quality.²⁵ A targeted wage subsidy introduced to support young people entering work during the Covid pandemic led to a boost of more than 70,000 apprenticeship starts for the under-25-year-olds, but the UK Treasury subsequently chose to end the subsidy.²⁶

Use of the term, “apprentice”, is copyrighted in England, requiring all employers offering apprenticeships to follow uniform skill standards and other regulations. Standards specify the knowledge, skills, and behaviors each apprenticeship requires. Apprenticeships are placed in one of seven levels according to their rigor, keyed to the equivalent levels in secondary and postsecondary education. Every apprentice's achievement of the competencies is assessed at the end of the training period.

The government pays most of the costs for apprenticeships in smaller firms. A “levy-grant scheme” spreads the cost of apprenticeship among large employers. They are not required to train apprentices, but they must contribute to an apprenticeship training fund (called the levy), equal to 0.5% of payroll above 3 million pounds/year. They are able to withdraw money from that fund to defray apprentice training and assessment costs but not apprentices' wages. Unspent funds may be transferred to small employers. The apprenticeship levy pays approved training providers for their off-the-job instruction.

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Endnotes

¹ “Sponsor” has a specific meaning in apprenticeship. It is the organization that has registered a program and is responsible for its compliance with the terms of that registration. Most sponsors are employers but they might also be unions, employers’ associations, or other organizations such as staffing firms. The term as used in this report includes all those possibilities.

² <https://www.apprenticeship.gov/employers/registered-apprenticeship-program/register/standards-builder>

³ <https://www.fldoe.org/core/fileparse.php/9904/urlt/2122ApprenticeshipReport.pdf>

⁴ <https://www.urban.org/policy-centers/center-labor-human-services-and-population/projects/competency-based-occupational-frameworks-registered-apprenticeships>

⁵ US Department of Labor, Employment and Training Administration, Office of Apprenticeship (January 12, 2021), Guidelines for Reviewing Apprenticeship to Journeyworker Ratio Requests. Circular 2021-02. Retrieved from <https://www.apprenticeship.gov/sites/default/files/bulletins/Circular%25202021-02%2520FINAL%25201.12.21.doc>

⁶ <https://www.apprenticeship.gov/data-and-statistics>

⁷ See, for example, the US Chamber of Commerce Foundation’s Talent Pipeline Management resources: <https://www.uschamberfoundation.org/talent-pipeline-management>

⁸ These numbers are indicative but cannot be precise. They are based on data from multiple sources, which can sometimes employ different definitions and methods. Workforce numbers vary seasonally. Australia counts apprentices and trainees together, inflating their percentage somewhat. Numbers of apprentices in England are reported but workforce is for the United Kingdom. The percentage reported subtracts from that number the percentage of population in the other three countries: Northern Ireland, Scotland, and Wales.

Workforce data are from the World Bank: <https://data.worldbank.org/indicator/SL.TLF.TOTL.IN>

Numbers of apprentices are from the following sources:

Australia: <https://www.ncver.edu.au/news-and-events/media-releases/number-of-apprentices-and-trainees-in-training-continues-to-grow>

England: <https://commonslibrary.parliament.uk/research-briefings/sn06113/>

Germany: https://www.destatis.de/EN/Themes/Society-Environment/Education-Research-Culture/Vocational-Training/_node.html

Switzerland: <https://www.bfs.admin.ch/bfs/en/home/statistics/education-science/pupils-students/upper-secondary/vocational-training-apprenticeships.html>

⁹ <https://www.foraus.de/de/themen/wie-neue-berufe-entstehen-169987.php>,

¹⁰ Bundesinstitut für Berufsbildung (2015). *Ausbildungsordnungen und wie sie entstehen*. Bonn. Retrieved from: <https://www.bibb.de/dienst/publikationen/de/8269>

¹¹ A useful overview of the system in English is Graf L. (2014). *The Swiss apprenticeship system: Its institutional specificities and strengths in International perspective*. American German Institute. Retrieved from: <https://americangerman.institute/publication/the-swiss-apprenticeship-system/>

¹² This process is explained in *Handbuch: Prozess der Berufsentwicklung in der beruflichen Grundbildung* (Handbook: Process of occupational development in basic vocational education) (2017). Staatssekretariat für Bildung, Forschung und Innovation. Retrieved from: <https://www.sbf.admin.ch/sbf/de/home/bildung/bwb/bgb/berufsentwicklung.html.html>

Rather than “employers” the term “*Trägerschaft*” is used. A literal translation is not helpful but the equivalent term in US apprenticeship is “sponsors” (as a group).

¹³ <https://www.aisc.net.au/industry-reference-committees/skills-service-organisations>
<https://www.aisc.net.au/industry-reference-committees/industry-reference-committees-0>
<https://www.aisc.net.au/training-packages/all>
<https://www.australianapprenticeships.gov.au/about-aasn>

¹⁴ Trainees are in employment training programs but are not apprentices. <https://www.asqa.gov.au/rto/what-is-an-rto>

¹⁵ <https://www.australianapprenticeships.gov.au/group-training>

¹⁶ <https://www.instituteofapprenticeships.org/about/what-we-do/>

¹⁷ The procedures for developing or modifying an apprenticeship are laid out here:
<https://www.instituteofapprenticeships.org/developing-new-apprenticeships/developing-new-apprenticeship-overview/>

¹⁸ More people participate in examining German apprentices than there are apprentices in the US.

¹⁹ Office of Apprenticeship Circular 2022-01, “Updated Guidance – Minimum National Program Standards for Registered Apprenticeship Programs.”

²⁰ Office of Apprenticeship Circular 2022-02, “Guidance – National Guidelines for Apprenticeship Standards.”

²¹ <https://www.apprenticeship.gov/inflation-reduction-act-apprenticeship-resources>

²² Masters were pillars of the community, making vocational training a key element of social order, a major reason why an industrializing Germany did not abandon apprenticeship.

²³ <https://www.ncver.edu.au/research-and-statistics/infographics/historical-time-series-of-apprenticeships-and-traineeships-in-australia-from-1963-to-2022>
<https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release#employment>

²⁴ Each of the four members of the United Kingdom – England, Wales, Scotland, and Northern Ireland – has a somewhat distinctive apprenticeship system. England’s is by far the largest.

²⁵ <https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf>

²⁶ Bewick T., and Gosling M. (2023) *Running to Stand Still: Why decades of skills reform have failed to shift the dial on UK productivity and investment in training*. London: Federation of Awarding Bodies (ISBN: 978-1-915973-01-6)

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