



What Are the Costs of Generating Apprenticeships?

Findings from the American Apprenticeship Initiative Evaluation

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Overview and Key Findings

In 2015, the U.S. Department of Labor (DOL) launched the American Apprenticeship Initiative (AAI) to expand registered apprenticeship in the United States. This brief discusses costs to the AAI grantees of supporting employers and sponsors in their efforts to create apprenticeships. The brief also explores how grantees progressed in setting up apprenticeship programs and how costs varied over time. Practitioners and policymakers, including state and local workforce agencies, can use these findings to plan future public investments in apprenticeship expansion through intermediary organizations like the AAI grantees or direct subsidies to employers.

The AAI grantees began operations in October 2015. Although awarded grants were five years in duration, DOL allowed grantees to apply for an extension to their grants for up to 12 months, through September 30, 2021. Of the 45 grantees in the evaluation, 36 requested and received an extension of 3 to 12 months.

Funding and apprenticeships generated

- AAI grantees varied in their projected costs and target number of apprentices. One group of 25 smaller grantees each receiving \$4 million or less had targets ranging from 300 to 600 apprentices, while a second group of 20 larger grantees each receiving more than \$4 million had targets of over 1,000 apprentices.

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- Larger and smaller grantees increased the number of apprentices registered throughout the grant period. However, larger grantees increased apprenticeships at a faster rate than the smaller grantees so that by the end of the grant period (September 2021), the 20 larger AAI grantees generated an average of 1,105 apprentices, while the 25 smaller AAI grantees generated an average of 315 apprentices.
- Most smaller grantees did not meet their apprenticeship targets by the end of the grant period (14 of 25, or 56 percent). Fewer large grantees failed to do so (7 of 20, or 35 percent).

Variation in costs to grantees to create apprenticeships

- Grantees' actual average cost per apprentice was lower than their estimated cost per apprentice (\$5,171 and \$5,981, respectively). Cost per apprentice declined over time during the grant period, levelling off about two and a half years after the program start. The more apprentices registered by a grantee, the lower the cost was for each apprentice.
- Average weighted cost per apprentice was lower for larger grantees than smaller ones. By the end of the grant period, larger grantees had spent about \$3,876 per apprentice versus \$8,802 per apprentice by smaller grantees.
- The median cost per apprentice for grantees with prior apprenticeship experience (\$4,867) was lower than for grantees without experience (\$8,702).

Implications

- Funding grantees based on the targets they propose is likely to yield a wide variation in the cost per added apprentice.
- Paying only for the apprenticeships generated could increase the number of apprentices for a given budget.



Introduction

Apprenticeship is a workforce-training model where apprentices complete a structured work-based training program that combines related technical instruction (RTI) in a classroom with on-the-job learning (OJL) by a mentor. As designed, apprentices are productively employed during their training and earn progressively higher wages. A registered apprenticeship program is required to have several specific elements (Box 1). It is registered with either the U.S. Department of Labor's (DOL) Office of Apprenticeship or a DOL-approved State Apprenticeship Agency.

Increasing the number of registered apprenticeships offered by employers is difficult but central to any effort at expansion (Lerman 2017, 2019). Once employers start programs, they will pay most or all the apprenticeship program's costs but will typically recoup sufficient benefits to yield a positive return on their apprenticeship investments (Kuehn et al. 2022). Given the benefits of apprenticeship for workers and employers, policymakers are interested in encouraging more employers to create programs and hire apprentices. But how?

Until Fiscal Year 2015, annual federal expenditures on registered apprenticeship were no more than \$30 million. In Fiscal Year 2015, the federal government made a large investment in expanding registered apprenticeship. Using H-1B visa program funds, DOL launched the American Apprenticeship Initiative (AAI). AAI funded 46 grantees with \$175 million over five years (about \$35 million per year) to expand registered apprenticeship to nontraditional occupations (i.e., those outside of construction) and to populations historically underserved by apprenticeship, including women, people of color, and veterans (DOL/ETA 2014).¹ Grantees were State and local workforce development

Box 1: Elements of Registered Apprenticeship

Registered apprenticeships provide training in a specific occupation and develop occupational skills that are recognized and transferable across employers. Registered apprenticeships must last at least one year. They must have several elements:

- **Approval** by DOL's Office of Apprenticeship or a State Apprenticeship Agency, or sometimes both
- **Related technical instruction (RTI)** of at least 144 hours in a physical or virtual classroom
- **On-the-job learning (OJL)** of at least 2,000 hours overseen by a mentor at the employer site
- **Wage increases** over the course of the apprenticeship (wage progression), which can be tied to time in the program or to demonstration of skill competency
- An **industry-recognized credential** upon completion of the apprenticeship
- A **Standards of Apprenticeship** document that formally describes the work process schedule (skill standards) and specifies the RTI, OJL, and wage progression for the registered apprenticeship program
- A **sponsor** to oversee the program and maintain the *Standards of Apprenticeship* and basic data on apprentices; sponsors can be employers, consortia of employers, unions, community colleges, State or local workforce agencies, or nonprofits
- A **written apprenticeship agreement** between an apprentice and either the program sponsor or an apprenticeship committee acting as an agent for the sponsor

Source: Gardiner et al (2021)

¹ In 2020, DOL announced that grantees could apply for an extension of up to 12 months to their five-year grants, through September 30, 2021. Of the 36 grantees that requested an extension, most (27) extended their grants through September 30, 2021. One extended through January 1, 2021; four extended through March 31, 2021; and four extended through June 30, 2021. Nine grantees did not extend their grants.

agencies, colleges, nonprofit organizations, and sector-based organizations including industry associations and labor organizations, or joint labor-management committees. With these funds, the 46 AAI grantees collectively proposed in their grant applications to generate approximately 2,000 registered apprenticeship programs and to register almost 29,000 apprentices (Fumia, Griffith, and Copson 2022). Grantees could propose to expand apprenticeship by registering new apprenticeship programs, converting work-based learning programs or internship models with educational components into registered apprenticeship programs, or growing existing registered apprenticeship programs (Gardiner et al. 2021). AAI funded grantees to conduct outreach to employers to encourage and help them create apprenticeship programs and offer apprenticeships. Individual AAI grantees received allocations of \$3 million to \$5 million dollars to generate new apprenticeships using whatever tools they chose, including payments to employers for mentor time, related technical instruction, and costs of registering programs. Grant funds could not reimburse employers for wages paid to apprentices.²

This brief is part of the DOL-funded evaluation of AAI. It examines the government costs of funding grantees to promote and help facilitate registered apprenticeships. Drawing on the AAI experience, the brief focuses on the government cost per added apprentice resulting from AAI grantees' efforts through September 2021.

The main research questions (RQ) are:

1. How well did AAI grantees perform in generating registered apprenticeships relative to the targets they articulated in their grant applications? What share reached their target numbers?
2. What was the cost to AAI grantees per added apprentice for all grantees?
3. How did the cost per apprentice vary across AAI grantees and over time?

This grantee cost analysis offers suggestive evidence on the cost to the federal government of using intermediaries—in this case the AAI grantees—to achieve levels of growth in apprenticeships. The information may be useful to policymakers and funders when considering the amount of funding needed to generate an expansion of registered apprenticeship in the United States.

The next sections describe the data sources and answer the research questions about the cost per apprentice and how they vary across grantees and over time.



² For the details, see the AAI Funding Opportunity Announcement <https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf>.

Overview of AAI Grantee Funding Levels, Data Sources, and Data Analysis

This section provides an overview of the AAI grant funding levels, describes the data sources used for the analysis in this brief, and summarizes the cost calculation used.

Grantee funding levels. As specified by the AAI Funding Opportunity Announcement (FOA), grantees could apply for one of three grant levels or tiers, depending on the expected scale of their projects (also see footnote 2). The FOA defined each tier's budget range and a target number of apprentices registered through the grant. Exhibit 1 shows the grant-defined tiers, their funding ranges, and the minimum target number of apprentices to be registered in each. It also shows the number of grantees funded in each tier. Of the 45 grantees included in the evaluation,³ 19 were Tier 1 according to their approved budget, 6 were Tier 2, and 20 were Tier 3. To simplify and because Tier 2 had only six grantees, the evaluation team classified the grantees into two groups. The first group combines Tiers 1 and 2 and includes 25 grantees ("smaller" grantees). The second group includes the 20 Tier 3 grantees ("larger" grantees).

Exhibit 1: AAI Grant Tiers and Classification of Grantees for Brief

Tier	Grant Funding Range	Minimum Target Number of Apprentices Registered	Number of Grantees in Tier	Classification for Brief
1	\$2.5 million to \$3 million	300	19	"Smaller" grantees
2	\$3.01 million to \$3.99 million	600	6	
3	\$4 million or more	1,000	20	"Larger" grantees

Source: AAI Funding Opportunity Announcement and Apprenticeship Quarterly Performance Report.

Data sources. The primary source of data for this brief is the Apprenticeship Quarterly Performance Report (Apprenticeship QPR) data provided by grantees to DOL. The AAI grantees began operating in October 2015. The Apprenticeship QPR data cover grantee costs and performance indicators through September 30, 2021. The Apprenticeship QPR tracks a range of performance measures, but the three principal measures used in this brief to characterize the cost of apprenticeship expansion are:

- **Grantee costs through September 2021**, a cumulative measure of invoiced grant funds on all activities, including costs on grant staff, incentive payments to employers, payments to partners or subgrantees, and supportive services.
- **Total apprentices registered by September 2021**, a cumulative measure of participants supported by grant funds who register as apprentices. Not all participants register as apprentices, so grant funds may be used to serve individuals in pre-apprenticeship programs.

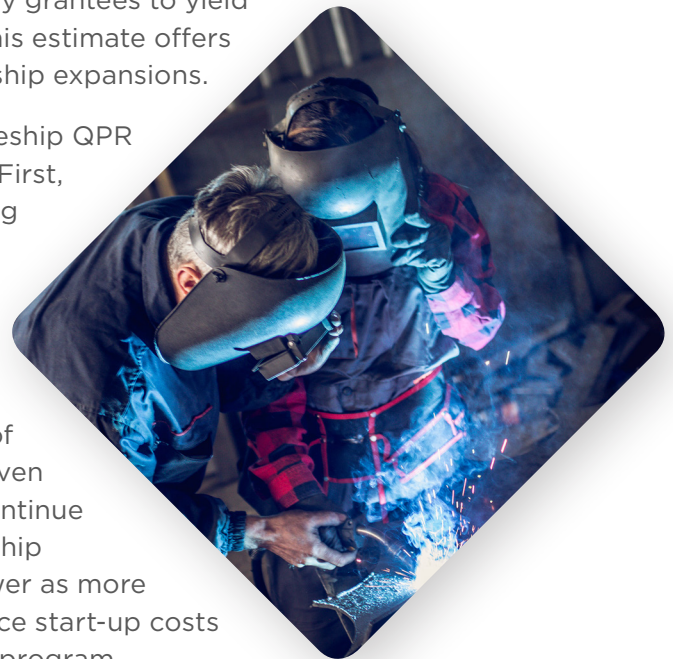
³ One AAI grant ended prior to the start of data collection for the evaluation.

- **Total apprenticeship programs registered by September 2021**, a cumulative measure of apprenticeship programs registered under the grant. Program registration can be time and resource intensive, so grant costs used for this purpose are relevant to estimating the costs of expansion of registered apprenticeship. Since some apprenticeship programs (group programs) include multiple employers, the number of programs registered is not the same as the number of employers assisted by grantees supported under the AAI grant.⁴

These quarterly cost and outcomes data are supplemented with information from the **AAI Grantee Survey** to understand how the costs of apprenticeship expansion vary with grantee characteristics. The AAI Grantee Survey was completed by AAI grant staff in the summer of 2019 (four years into the five-year grant) to inform the AAI implementation study, so the data does not reflect changes in grant activities after that time. Nevertheless, it does provide information on key grant activities including outreach to employers, support for pre-apprenticeship programs, and details on supportive services. The AAI Grantee Survey also provides some information on the types of apprenticeship programs that are registered. Gardiner et al. (2021) provides a detailed analysis of findings from the AAI Grantee Survey.

Analysis. This brief reports the government cost per added apprentice resulting from AAI grantees' efforts through September 2021. To arrive at this cost estimate, the evaluation team divided grantees' reported total costs of their AAI grants by the total number of added apprentices generated by grantees to yield the average grantee cost per added apprentice.⁵ This estimate offers a guide to the potential costs of further apprenticeship expansions.

A few caveats are in order regarding the Apprenticeship QPR data and the limitations of the analysis in this brief. First, AAI grantee experiences may be helpful for planning other apprenticeship expansion initiatives, but because these findings are specific to the AAI grants, they may not be generalizable to future expansion efforts that are structured differently or focused on different occupations or target populations. Second, capturing the ongoing costs of generating registered apprenticeships to reach a given scale depends on the extent to which employers continue to hire apprentices into their registered apprenticeship program. Ongoing per-apprentice costs may be lower as more apprentices are registered into a given program since start-up costs are often greater than ongoing maintenance of the program.



⁴ Data on employers involved in registered apprenticeship are difficult to come by. Employers' partners are not tracked in the Apprenticeship QPR data, and the Registered Apprenticeship Partners Information Data System (RAPIDS) also only tracks apprenticeship programs, not employers. RAPIDS contains data on registered apprentices in 25 states with federally administered registered apprenticeship programs and 18 states with federally recognized State Apprenticeship Agencies (<https://www.apprenticeship.gov/help/what-rapids>). The AAI evaluation team surveyed 68 AAI employers as a part of its return-on-investment study (Kuehn et al., 2022), and the AAI grantee survey included a series of employer-specific questions. However, neither of these data sources provide complete data on all AAI employers, nor were they randomly or representatively sampled.

⁵ In some cases, the study team cleaned errors in the Apprenticeship QPR data. For example, in cases where grantees were missing a report or had implausibly high values that reverted to a prior trend, the data for that quarter were linearly interpolated.

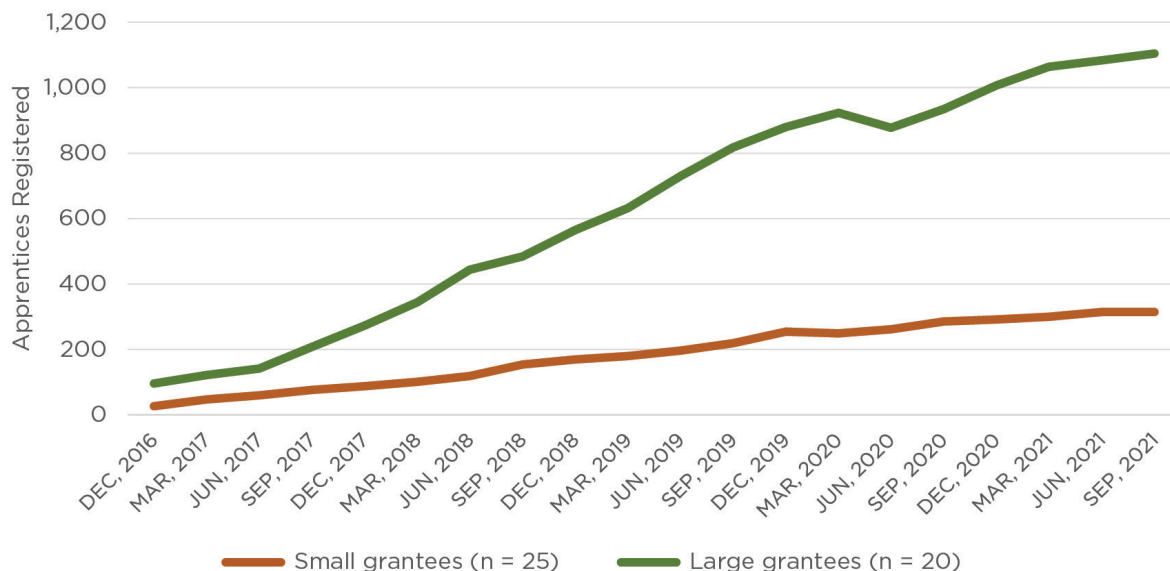
Findings

RQ1. How well did AAI grantees perform in generating registered apprenticeships relative to the targets they articulated in their grant applications? What share reached their target numbers?

- The 20 larger AAI grantees generated an average of 1,105 apprentices by the end of their grants, while the 25 smaller AAI grantees generated an average of 315 apprentices by the end of their grants.

Grantees began registering apprentices early in the grant period, with the average number of AAI apprentices per grantee almost tripling from 57 through December 31, 2016, to 170 through December 31, 2017 (not shown).⁶ The larger AAI grantees achieved a faster pace of apprenticeship expansion relative to the smaller grantees (Exhibit 2). The growth of the larger grantees was particularly steep from the end of June 2017 through the end of March 2020, when the larger grantees expanded their average number of apprentices by 553 percent, compared to a 313 percent increase in the average number of apprentices for smaller grantees during the same period. The sudden economic shock induced by the COVID-19 pandemic in the second quarter of 2020 was associated with a stagnant period in the quarter ending

Exhibit 2: Average Number of AAI Apprentices Registered Cumulatively per Grantee, by Grantee Size: Quarter Ending December 2016 through September 2021



Source: Apprenticeship Quarterly Performance Report.

Notes: Smaller grantees are defined as grantees in Tier 1 (\$2.5 million to \$3 million) or Tier 2 (\$3.01 million to 3.99 million) as described in the [AAI grant announcement](https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf) (see <https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf>). Larger grantees are defined as grantees in Tier 3 (\$4 million or more) as described in the grant announcement. Two of the 45 grantees reported a reduction in their cumulative number of registered apprentices by June 2020. This reduction was not modified for presentation in the exhibit.

⁶ Calculated from the Apprenticeship QPR dashboard.

in June 2020.⁷ Further increases for the larger grantees resumed, beginning in the third quarter of 2020, between July and September. By the end of September 2021, large grantees had registered 1,105 apprentices on average. For the smaller grantees, the expansion was steady over most of the grant period, reaching an average of 315 apprentices per grantee by September 2021.

- **Fourteen of the 25 smaller grantees and seven of the 20 larger grantees did not meet their registered apprentice target.**

Collectively, AAI grantees exceeded their target number of apprentices registered (Fumia, Griffith and Copson 2022). Despite the aggregate success of the AAI grantees at meeting their collective targets, many grantees did not reach their individual targets. Exhibit 3 displays how grantees varied in their ability to meet their apprentice targets. The bottom 10 percent met an average of only 17 percent of their target, while the top 10 percent nearly doubled their target (not shown).

The differentials by size of grant are striking. By September 2021, 14 of the 25 smaller grantees (56 percent) and 7 of the 20 larger grantees (35 percent) created fewer registered apprentices than their target. The 14 smaller grantees that missed their targets generated only about half their combined target number of apprentices (52 percent, data not shown in the exhibit). The median smaller grantee registered 275 apprentices by September 2021. The bottom performing quarter of the smaller grantees registered 132 or fewer apprentices, while the top quarter registered 380 or more apprentices (Exhibit 3). Within the group of larger grantees, the median grantee registered 1,006 apprentices, with the bottom quarter registering only 708 apprentices and the top quarter at 1,471 apprentices.

On a cumulative basis, the 20 larger grantees exceeded their target of 19,502 apprentices by generating a total of 22,095 apprentices, while the 25 smaller grantees fell short of their target by about 1,024 apprentices.

Exhibit 3: AAI Apprentices Registered by Low and High Performing Grantees

Performance Indicators Across Grantees at End of AAI Project (September 30, 2021)	Smaller AAI Grantees	Larger AAI Grantees	All AAI Grantees
Grantees meeting registered apprentice target (%)	44	65	53
Apprentices registered by grantee at the 25th percentile of grantees (#)	132	708	242
Apprentices registered by the median grantee (#)	275	1,006	600
Apprentices registered by grantee at the 75th percentile of grantees (#)	380	1,471	908
Apprentices registered by the highest performing grantee (#)	877	2,165	2,165

Source: Apprenticeship Quarterly Performance Report.

Notes: Smaller grantees are defined as grantees in Tier 1 (\$2.5 million to \$3 million) or Tier 2 (\$3.01 million to 3.99 million) as described in the [AAI grant announcement](https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf) (see <https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf>). Larger grantees are defined as grantees in Tier 3 (\$4 million or more) as described in the grant announcement. Apprentice targets and apprentices registered are both from the Apprenticeship Quarterly Performance Report dashboard.

⁷ Copson et al. (2021) provide a detailed description of how AAI program activities changed in response to the COVID-19 pandemic. Although some employers were able to continue their apprenticeship programs remotely and others even continued operating on-site, many employers reduced hiring.

- **The 20 larger AAI grantees supported an average of 68 programs, while the 25 smaller AAI grantees supported an average of 30 programs by the end of their AAI grant period.**

Before an apprentice is hired and registered, grantees had to help program sponsors develop and register a new program or partner with an existing registered apprenticeship program. Grantees could also sponsor their own registered apprenticeship programs. Gardiner et al. (2021) found that 41 percent of AAI grantees sponsored at least one program. Developing new programs can take a substantial amount of time and effort (Gardiner et al. 2021) and can delay the hiring of apprentices. By the end of the AAI grant period, the smaller grantees had registered an average of 31 new programs, compared to an average of 68 new programs among larger grantees. The total number of registered apprenticeship programs for all AAI grantees combined was 2,124. Grantees registered half of the new apprenticeship programs within the first two and a half years of the grant, that is, by June 2018. Substantial new program development and registration occurred between the March 2019 and March 2020 as well, with smaller grantees increasing the number of new programs from 19 to 27 and larger grantees increasing from 41 to 64 programs. The pace of new apprenticeship programs registered slowed from March 2020 through June 2021, likely due in part to the onset of the COVID-19 pandemic and partly due to some grants ending. Nine grants ended in September 2020 and another five between January 2021 and March 2021 (Copson et al. 2021).⁸ Dividing overall grant costs by the number of total new programs yields the average cost per program for all AAI grantees of \$73,556. This figure is not restricted to the costs of program development, which are an important part of AAI grantee activities but not the only support provided by grantees. The average cost per program implies that AAI grantees' full range of support for registered apprenticeship programs, including program development and ongoing support of apprentices, was \$73,556.⁹



RQ2. What was the cost to AAI grantees per added apprentice for all grantees?

- **Collectively, AAI grantees registered more than the target number of apprentices stipulated in their grant applications while spending less than the full amount of their grants.**

In their grant applications, AAI grantees specified the target number of apprentices that they intended to register; that target was 28,754 apprentices collectively. AAI grantees also proposed a budget for grant activities, which included a range of pre-apprenticeship and apprenticeship-related activities. Grantees' total collective budget was \$172,035,839.¹⁰ Dividing the grantees' total budget by the target number of registered apprentices yields the expected cost per registered apprentice of the AAI grants of \$5,981 per apprentice.

⁸ Smaller grantees added an average of two registered apprenticeship programs between the quarter ending in March 2020 and the end of September 2021, while larger grantees added an average of four registered apprenticeship programs during this period.

⁹ For a more detailed discussion of AAI grantee performance, see Fumia, Griffith, and Copson (2022), which describes grantee outcomes for the AAI grants.

¹⁰ One AAI grant ended prior to the start of data collection for the evaluation; thus, the total AAI grant budget was less than \$175 million.

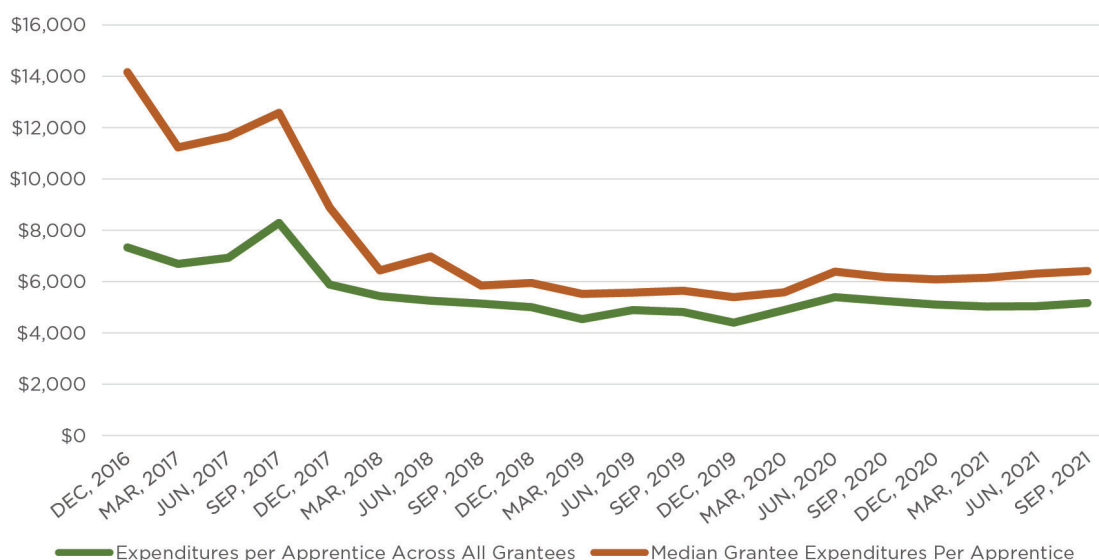
Through September 2021, grantees registered 29,970 apprentices, which was slightly more than their collective target. Grantees spent \$154,972,429, or 90 percent of the collective grant total. Thus, actual cost per apprentice was less than expected.

- **Grant cost per apprentice declined over time. By the end of September 2021, total cost per apprentice was \$5,171, but the median grantee spent about \$6,407 per apprentice.**

As shown in Exhibit 4, the average cost per apprentice and the median cost per apprentice declined over the course of the grant period. Often, program costs are higher at the onset because there are costs associated with start-up. Grantees must pay upfront for office expenses and for new hires before they have time to create apprenticeships. As expected, spending per apprentice declined over time as grantees spread their fixed costs over an increasing number of apprentices and became more experienced in developing and supporting apprenticeship programs.

Spending per apprentice levelled off by December 2018, about two and a half years after the AAI grants began. By the last quarter of the grants (ending September 2021), average cost per apprentice for all grantees declined to \$5,171; for the median grantee, the figure was \$6,407 per apprentice. Since some AAI grant spending offset the costs of pre-apprenticeship programs, these outlays may overstate the costs specific to generating registered apprenticeships, particularly for programs that are not associated with a pre-apprenticeship. However, the extent of the upward bias is not clear because costs associated with pre-apprenticeship are not separately reported.

Exhibit 4: Average and Median Grant Costs per Added Apprentice: Quarter Ending June 2016 through September 2021




Source: Apprenticeship Quarterly Performance Report.

Notes: Cost per apprentice across all AAI grantees is calculated by dividing the total grant costs by the total number of registered AAI apprentices. Median grantee cost per apprentice is calculated by dividing each grantee's costs by their registered apprentices and then identifying the median of the grantees' per-apprentice costs.

RQ3. How did the cost per apprenticeship vary across AAI grantees and over time?

- **Smaller grantees had higher per-apprentice costs than larger grantees. The weighted average cost for smaller grantees through September 2021 was \$8,802, compared to \$3,876 for larger grantees.**

The summary indicators in Exhibit 4 do not capture the wide variations in spending per apprentice between larger and smaller AAI grantees. Grantees with budgets over \$4 million achieved lower cost per apprentice than did smaller grantees. There are two ways to calculate average per-apprentice spending across grantees. The first calculation used in Exhibits 2 and 3—a simple average—calculates the per-apprentice cost by grantee, then takes the average across grantees. The second calculation—a weighted average—calculates the per-apprentice cost by grantee, then weights each grantee by the number of apprentices they register.¹¹ For the set of smaller AAI grantees, the first calculation (a simple average) finds a very high average cost per apprentice, at over \$109,856 by September 2017 (two years after the start of the grant), falling to \$14,424 by the end of September 2021. This average is influenced by a small number of grantees that created very few apprenticeships. For the larger AAI grantees, the unweighted cost per apprentice is still over \$40,000 by March 2018, but then quickly falls to \$5,097 per apprentice by December 2018 and then to \$4,775 by September 2021, the end of the last quarter of the AAI grants.¹²



Weighting each grantee's cost per apprentice by the number of apprentices registered captures the federal government's grant investment to generate a new AAI apprentice.¹³ Weighting reduces the role of grantees that contributed relatively little to apprenticeship expansion in calculating the grantee's average cost per apprentice. The weighted average cost for smaller grantees through September 2021 was \$8,802, compared to \$14,424 per apprentice for the unweighted average costs. For larger grantees, the average weighted cost per apprentice was \$3,876, compared to an unweighted average cost per apprentice of \$4,775.

Larger AAI grantees could be more cost effective than smaller ones for several reasons. Grantees that sought a larger grant might have known they could achieve their target apprenticeship numbers, or larger grants might have been given to grantees with experience in apprenticeship that more efficiently registered apprentices. Alternatively, smaller grantees could have targeted geographies, populations, or occupations that are more challenging and therefore more costly to serve. These possibilities are difficult to determine empirically due to limits on available data and the statistically small sample of grantees.

¹¹ The second approach of using the weighted average sums to the total grant expenditures divided by the total number of apprentices is reported in Exhibit 4.

¹² Calculated from the Apprenticeship QPR dashboard, but not reported in a separate exhibit.

¹³ The cost data do not allow us to distinguish between new apprentices in new apprenticeship programs compared to new apprentices in existing apprenticeship programs.

The data reveal a strong association between experience with apprenticeship and lower cost per registered apprentice. The AAI Grantee Survey asked all grantees whether they had experience working with apprenticeship programs before their AAI grant. The median grantee with prior experience spent about \$4,867, far less than the \$8,702 per apprentice spent by the median grantee with no apprenticeship experience. However, after controlling for the size of the grant, the association between prior experience with apprenticeship and cost per apprentice is not statistically significant, indicating that it was impossible to distinguish any correlation between prior experience and grantees' cost per apprenticeship that was independent of the size of the grant.¹⁴ Another factor is that larger grantees generally supported apprenticeship programs with higher numbers of apprentices. By the end of September 2021, the average apprenticeship program from the group of larger grantees had nearly 60 percent more apprentices than the average apprenticeship program from the group of smaller grantees. At the same time, the group of larger grantees generated 77 percent more programs than the group of smaller grantees.

- **Grantees with lower expected per-apprentice costs at the beginning of the grant generally were observed to have lower actual per-apprentice costs by September 2021.**

Cost per apprentice can be related to the expected cost per apprentice implied by the grant size divided by the target number of apprentices stated in the grant award. Of the 45 grantees, 18 had actual cost per apprentice that exceeded their expected cost per apprentice. Exhibit 5 compares the expected costs with the actual costs by grantee size and by quartile of expected costs. On average, actual cost per apprentice is lower than expected for the second and third quartile, and higher for the first and fourth quartiles. The cost per added apprentice is less than \$6,000 for all quartiles except for the highest quartile. The variations within quartiles are consistently larger than the average cost per apprentice.

Exhibit 5: Grant Cost per Apprentice Compared to Expected Expenditures per Apprentice

Grantee quartile by expected spending per apprentice	Average expected cost per apprentice	Average weighted cost per apprentice, September, 2021	Median actual cost per apprentice	Standard deviation of the actual cost per apprentice
First quartile of grantees	\$4,336	\$4,491	\$4,770	\$5,741
Second quartile of grantees	\$5,567	\$3,701	\$4,008	\$7,972
Third quartile of grantees	\$8,545	\$6,678	\$6,406	\$6,319
Fourth quartile of grantees	\$10,063	\$11,837	\$10,721	\$17,895

Source: Apprenticeship Quarterly Performance Report.

Notes: Grantees are grouped by quartile based on the grant awards divided by the target number of apprentice. The second column is weighted by the number of apprentices associated with an AAI grantee.

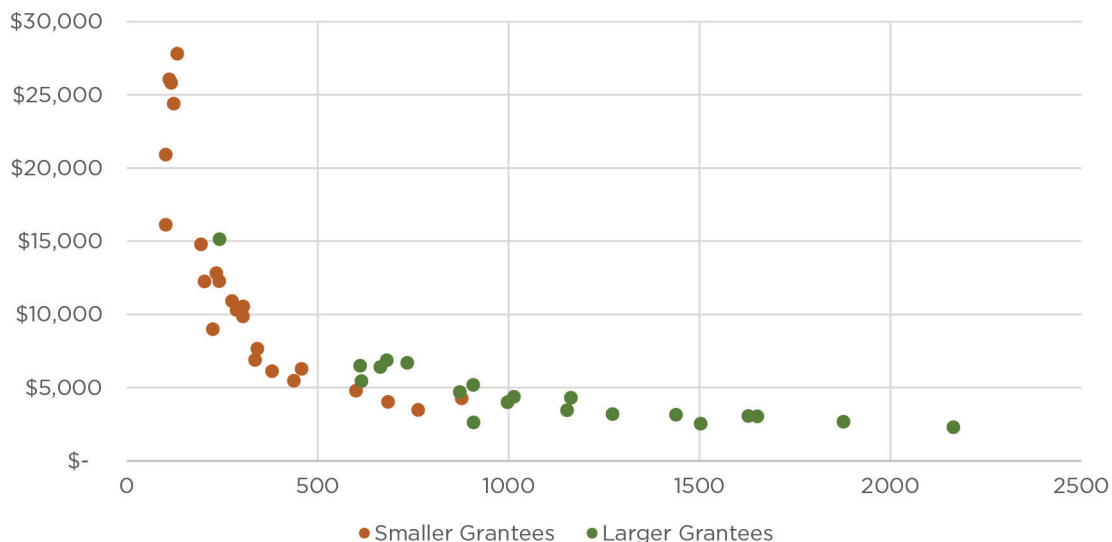
¹⁴ The association between prior experience with apprenticeship and the per-apprentice costs of grantees is estimated using an ordinary least squares regression of per-apprentice costs on an indicator for prior experience from the AAI Grantee Survey and program size. Statistical significance uses a 0.05 p-value threshold. Results are not shown here.

- **The more apprentices registered by a grantee, the lower the cost was for each apprentice.**

Exhibit 6 plots individual AAI grantees' cost per apprentice against the number of apprentices registered as of the end of September 2021. The 25 smaller AAI grantees are plotted in orange, while the 20 larger AAI grantees are green. Exhibit 6 reveals the wide variation in the number of registered apprenticeships created and the cost per apprentice for smaller and larger AAI grantees, respectively, at the end of the grants.¹⁵ Even within the two groups of grantees, the costs per apprentice of individual grantees are lower as grantees generate more apprenticeships. The exhibit highlights the sharply higher costs for the AAI grantees generating the fewest apprentices compared to those that generated more apprentices. Only six of the 25 smaller AAI grantees spent less than \$5,000 per apprentice, while all but six of the 20 larger AAI grantees had costs per apprentice below \$5,000 per apprentice. In fact, most of the larger AAI grantees spent only about \$3,000 per apprentice.

Another way to describe variations in per-apprentice costs is to divide AAI grantees into three groups ranked by their cost per apprentice at the end of the grant period. The 15 AAI grantees with the lowest costs per apprentice accounted for 64 percent of all apprentices registered as part of AAI but spent only 37 percent of total AAI grant funds. The average cost for this group was \$2,560 per apprentice. Twelve of these 15 low-cost grantees were large grantees. The next group of 15 AAI grantees covers a wide range of costs per apprentice, from \$3,820 and \$9,000. This middle group accounted for 28 percent of added apprentices and 33 percent of AAI grant funds, at an average cost per apprentice of \$5,300. The highest cost group of 15 AAI grantees spent 30 percent of AAI grant funds, but only generated 9 percent of AAI apprentice registrations, at an average cost of nearly \$15,000. All but one of these 15 in the high-cost group were small grantees. The middle and high-cost groups served more pre-apprentices than the low-cost group. The use of their grant funds towards pre-apprentice-related costs likely drove up the cost per apprentice.

Exhibit 6: Cost per Apprentice and Number of Apprentices Registered by the end of September 2021, Smaller and Larger Grantees



Source: Apprenticeship Quarterly Performance Report.

Notes: Smaller grantees are defined as grantees in Tier 1 (\$2.5 million to \$3 million) or Tier 2 (\$3.01 million to 3.99 million) as described in the AAI grant announcement (see <https://www.doleta.gov/Grants/pdf/FOA-ETA-15-02.pdf>). Larger grantees are defined as grantees in Tier 3 (\$4 million or more) as described in the grant announcement. The exhibit excludes one grantee with cost per apprentice exceeding \$60,000.

¹⁵ Exhibit 6 excludes one grantee with cost per apprentice exceeding \$60,000, which is a statistical outlier.

Implications for Expanding Registered Apprenticeship through Federal Grant Initiatives

AAI grantees as a whole generated approximately the number of apprentices expected based on the sum of targets grantees specified in their proposals. However, grantee performance varied widely. About half the grantees did not meet their targets for apprenticeships; for these grantees, actual apprenticeships were 60 percent of targeted apprenticeships. On the other hand, the 23 grantees that met their targets created apprenticeships equal to 1.45 times the target number of apprentices. The grantees that met their targets generated apprenticeships at a cost of \$3,866 per apprentice, less than half the \$8,545 cost experienced by the grantees that did not meet their targets.

The evidence suggests that DOL could achieve higher numbers of apprenticeships for the same dollar outlay if the funding were concentrated on the most successful grantees. However, it is not easy to determine in advance how well grantees will perform. Even grantees with a solid record may not be able to replicate high performance in the future. One alternative is to fund grantees based on the apprenticeships they actually generate, not on the number they project. Such a “pay-for-performance” approach could allow the government to achieve apprenticeship expansion for a well-defined cost.

In the case of AAI, the most cost-effective grantees generated apprenticeships at a total cost of less than \$4,000 per added apprentice. Since employers who begin offering apprenticeships generally continue their programs for several years (Lerman, Eyster and Chambers 2009, C-4), intermediary organizations, such as the largest and most cost-effective AAI grantees, are likely to lower their costs of generating new apprenticeships in subsequent years. Larger AAI grant programs had lower per-apprentice costs, which may indicate that economies of scale are important for apprenticeship intermediaries. Moreover, if AAI grantees were subject to revenue constraints linked to the number of apprenticeships they generated, they might have stronger incentives to create more apprenticeships than produced under the AAI grants.

Using the approximate \$5,000 average cost per AAI apprentice, federal or state governments could structure a pay-for-performance system as an incentive to intermediaries to play a major role in scaling registered apprenticeships.¹⁶ It is difficult to predict incentive usage rates, but having a benchmark based on evidence of AAI grantee activities and costs can guide policymakers interested in a cost-effective, low overhead method of scaling apprenticeships in the United States.

The findings from this brief provide a benchmark for potential future pay-for-performance incentives in the registered apprenticeship system, either implemented directly by DOL or as a strategy implemented by future grantees and intermediaries. There may be reasons why some grantees have a higher cost per apprentice that might deserve greater levels of investment. For example, if an AAI grantee had higher per-apprentice costs because it targeted a population that was more difficult to serve, or industries and occupations where training was more costly, this grantee might be penalized under a pay-for-performance system. The experiences of the AAI grantees do not imply that one approach to expanding apprenticeship is appropriate for all cases, but it does provide benchmarks for thinking about the costs incurred by organizations tasked with apprenticeship expansion.

¹⁶ A pay-for-performance system that uses a single incentive payment does not imply that all programs have the same cost structure. Quite the contrary, in recognition of the fact that organizations have different cost structures, a pay-for-performance system rewards programs with lower per-apprentice costs and penalizes programs with higher per-apprentice costs.

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About This Brief

The U.S. Department of Labor (DOL)'s American Apprenticeship Initiative (AAI) focused on expanding registered apprenticeship in the United States. Funded by the H-1B visa program, AAI awarded \$175 million in five-year grants to 46 grantees in 2015 to expand apprenticeship into sectors with few apprenticeships and to populations traditionally underrepresented in apprenticeship. DOL commissioned an evaluation of the AAI grants to build evidence about the effectiveness of registered apprenticeship for apprentices and employers. This brief examines the costs of AAI grantees, along with the number of apprenticeships they helped create, to derive the government cost per added apprentice. Analyzing the average and variations in the cost per added apprentice could be of major relevance to policies that would create incentives for intermediaries to scale U.S. apprenticeship. The key data source is the Apprenticeship Quarterly Performance Reports, or Apprenticeship QPR.

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