



Workforce Training and Education Coordinating Board

2015 Workforce Training Results

Apprenticeship

Program Details

Apprenticeship combines classroom studies with extensive on-the-job training under the supervision of a journey-level craft person or trade professional. Apprentices receive progressively increasing wages and may receive health, pension, and other benefits while learning occupational skills. This “earn while you learn” model has proven successful across a range of industries—from asbestos workers to certified medical assistants. Apprenticeships require applicants be at least 16 years old (18 for construction trades), and most require at least a high school diploma or GED for entrance. Registered apprenticeship in Washington is governed by the Washington State Apprenticeship and Training Council and administered by the Department of Labor and Industries.¹

Every year, the Workforce Board measures the performance of key workforce programs. In this report, you’ll find out more about the program and who is served, the metrics used to measure performance, and how the program performed.

Participant Profile

For this 2015 report, researchers studied the results of 3,181 apprentices who exited an apprenticeship program during the most recent reporting year.² Apprenticeship programs reflect the racial and ethnic diversity of the state population. African Americans, whites, and Native Americans are represented above their proportions of the state population. Asians, Hispanics, and those with a multiracial background enroll in apprenticeship programs in lower numbers than their share of the state population.³ African Americans and Hispanics do

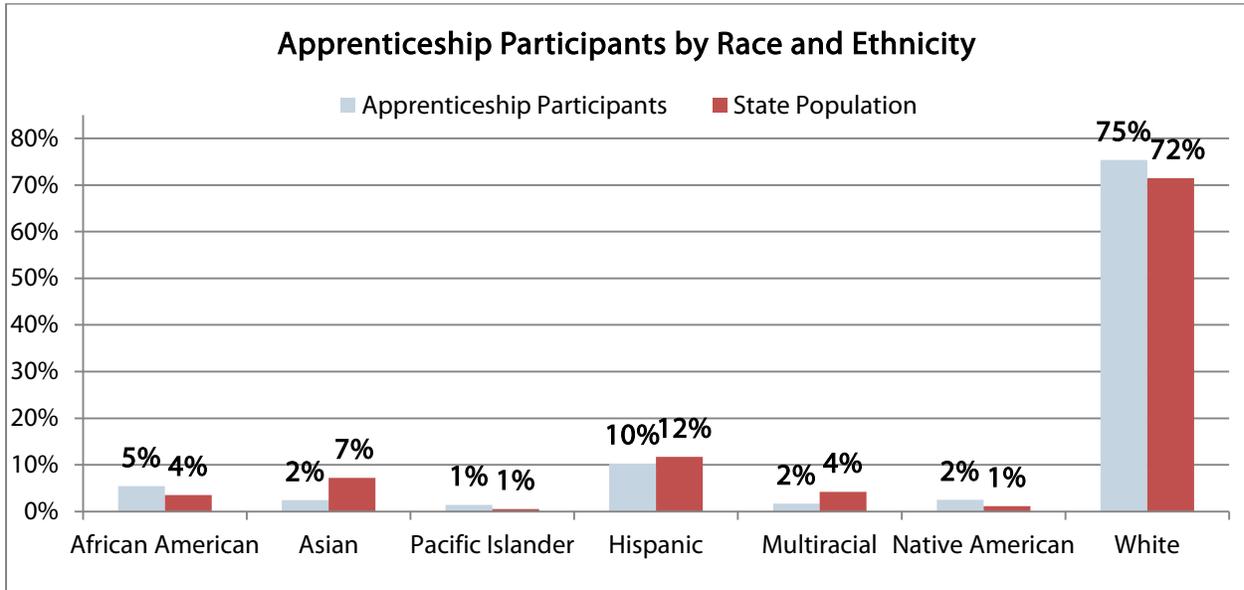
¹ This report focuses solely on Washington apprenticeships. More information at the federal level is available at www.doleta.gov/oa/.

² The 2015 Workforce Training Results reports are based on data observed as recently as 2013-2014 for individuals exiting programs during fiscal year July 1, 2012 through June 30, 2013.

³ In this report, unless otherwise stated, racial and ethnic minority groups are mutually exclusive; that is, an individual belongs to one group only. The groups include the following: Hispanics of any race (also referred to as Hispanics); non-Hispanic African Americans (also referred to as African Americans); non-Hispanic Asians (also referred to as Asians); non-Hispanic Pacific Islanders (also referred to as Pacific Islanders); non-Hispanic Native Americans and Alaskan Natives (also referred to as Native Americans); non-Hispanic multiracial (also referred to as multiracial); and non-Hispanic whites (also referred to as whites). According to the 2012 U.S. Census Bureau estimates for Washington from the American Community Survey, 72 percent of state residents are white; 4 percent are African American; 1 percent are Native American; 7 percent are Asian; 1 percent are Pacific Islander; 4 percent are multiracial; and 12 percent are Hispanic.

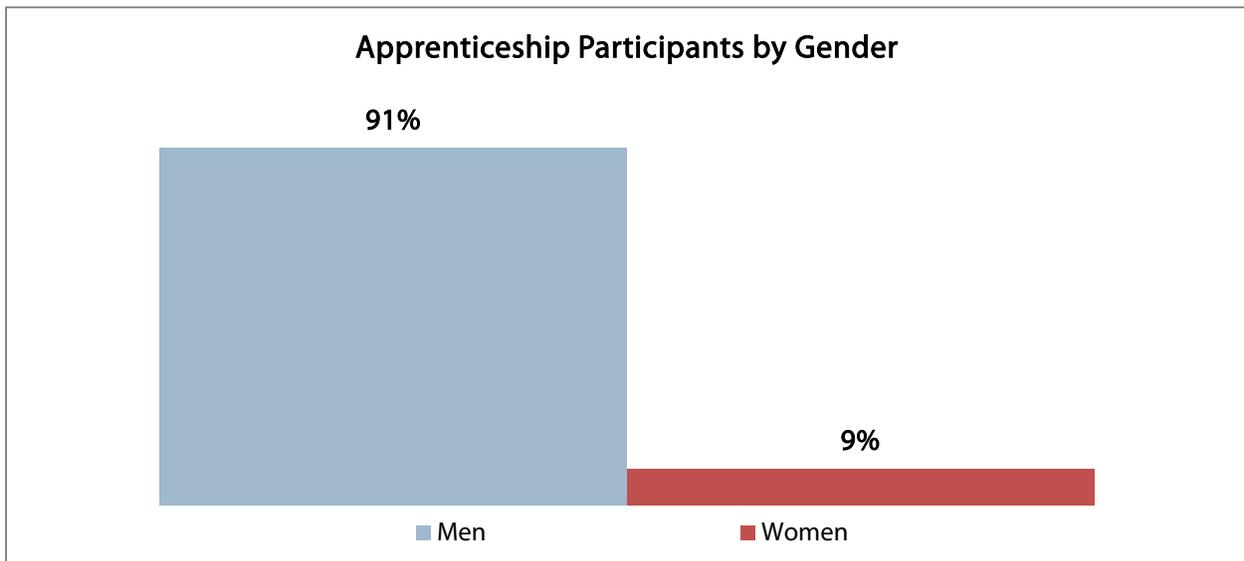


not complete the apprenticeship programs at the same rates as they enroll, with relatively fewer reaching the finish line in their apprenticeships than those of other backgrounds.



Source: 2012-13 Apprenticeship Administrative Data, Department of Labor and Industries, Washington State Office of Financial Management and 2012 U.S. Census Data from the American Community Survey.

Relatively few women enter apprenticeship programs compared to men. Some 9 percent of apprentices were women in the current study. This represented a decline from last year’s study when women comprised 15 percent of apprentices.



Source: 2012-13 Apprenticeship Administrative Data, Department of Labor and Industries.

The median age at program entrance was 27, while the median age at exit was 30.



Completion Rates

Overall, apprentices spent a median of 39 months in their program. This is an increase of 9 months over the 2014 cohort of apprentices. The median program length was 56 months for Apprenticeship completers. Among apprentices leaving their program in the most recent program year, slightly a little over half (54 percent) completed their program, three percentage points less than on the prior report. The length of participation varied widely. The number of years spent in apprenticeship programs is reflected in the following table, comparing those who completed with those who did not complete.

Number of Years Apprentices Participated in their Program		
Years in Program	Completers	Non Completers
less than 1	0%	0%
1-2	12%	45%
2-3	7%	19%
3-4	9%	9%
4-5	11%	5%
5-6	23%	9%
6-7	27%	8%
7-8	9%	3%
8-9	2%	1%
9-10	0%	1%
more than 10	1%	1%

Source: 2012-13 Apprenticeship Administrative Data, Department of Labor and Industries.

It's worth noting that apprenticeship programs cover a broad array of occupations, from construction trades and early learning to dispensing optician and cosmetologist. Not only are apprenticeship occupations wide-ranging, the length of time it takes to complete a program varies considerably. For example, a Washington resident training to become a construction electrician can expect an apprenticeship to last at least five years to reach journey-level status, while those training to become an esthetician require 2,000 hours, or approximately one year, to complete.

Because apprenticeship programs can last many years, a significant number of people do not reach the finish line. However, even those who exit early still show wage gains from the skills they acquired.



Tracking Apprenticeship Progress

The Workforce Board routinely measures the performance of our state's largest workforce programs. As a customer-focused advocate for Washington's workers and employers, the Workforce Board strives to provide performance accountability, verifying whether worker education and training programs provide a return on investment for participants and taxpayers.

The Workforce Training Results report seeks to answer five core questions:

- Did participants get the skills they needed?
- Did participants get a job and how much were they paid?
- Were employers satisfied with the preparation workers received?
- Has the program made a difference in the participant's success?
- Did participants and the public receive a return on their investment?

Turn to page 20 for the Net Impact Study. Conducted every four years, this in-depth report adds extra value to the 2015 Workforce Training Results. The study provides a side-by-side comparison of participants vs. similar non-participants, answering the question of whether the program is making a difference.

Data Comes From State Wage Files & Employer Survey

The 2015 Workforce Training Results includes information obtained from Employment Security Department wage files in Washington, Idaho, and Oregon, and federal employment records for 2013-14. Information on employer satisfaction among firms that hired new employees who recently exited an apprenticeship program was assessed through the Workforce Board's 2012 Employer Survey.

Net Impact Study Adds More Insight into Program Performance

In addition, the report includes a comprehensive Net Impact Study. Conducted every four years, this study provides a head-to-head comparison of participants and non-participants to help answer a central question: How much of a workforce participant's success in obtaining a job, or a higher wage, is due to the workforce program? By comparing program participants with similar individuals who did not participate in a workforce training program, the Net Impact Study indicates whether employment and earnings gains are due to the workforce program, or if workers could have made this progress on their own. This research also allows for a more detailed analysis as to whether the participant and the public received a return on their investment in the program.



Did Participants Have a Job and How Much Were They Paid?

To determine the employment rate and earnings of apprenticeship participants, their records were matched with Employment Security Department wage files from Washington and neighboring states.⁴ Labor market outcomes for apprenticeships are significantly higher than for other programs the Workforce Board studies. The quality of apprenticeship training, the higher wage levels of many apprenticeship-related occupations, and the typically long length of training are factors.

Record matches found 75 percent of apprentices had reported employment during the third quarter after they left the program. This was one percentage point up from the 2014 report. The median wage was \$30.47 per hour - down \$1.27 from \$32.74 in the last report and down \$3.90 from the 2013 report. Annualized earnings were \$51,504, an increase of \$6,926 from the 2014 Workforce Training Results report.⁵ Although the median wage of apprentices is high, there is considerable variation in how much apprentices earn, as can be seen in the table below.

Hourly Wages of Apprentices (Quartiles)	
Quartile	Hourly Wage
Highest	Above \$40.46
Third	\$30.17-\$40.46
Second	\$19.56-\$30.16
Lowest	Below \$19.33

Third quarter after exit, this table excludes those enrolled in higher education.

When looking only at those who had completed their apprenticeship program, rather than at all exiters, the outcomes are more positive. The median annualized earnings of completers was \$67,551. The median hourly wage was \$37.12. These results illustrate the value of completing an apprenticeship program.

⁴ These files contain quarterly earnings and hours worked information on those individuals with employment reported for unemployment insurance (UI) benefits purposes (approximately 90 percent of in-state employment, with self-employment, active duty military, and those working for religious nonprofit organizations being the major groups of employers not included).

⁵ Annual earnings are calculated as third quarter earnings multiplied by four. Quarterly earnings are the result of hourly wage rates and the number of hours worked in a calendar quarter. All wages and earnings are stated in first quarter 2014 dollars.



2014 Employment and Earnings for Apprentices

Performance Measure	
Employment Rate*	75%
Employment Rate* (Completers)	86%
Full-Time Employment **	71%
Median Quarterly Hours	481
Median Hourly Wage***	\$30.47
Median Annualized Earnings***	\$51,504
Median Annualized Earnings (Completers)	\$67,551

* These figures apply to those with employment reported to state employment agencies six to nine months after leaving the program. Rate does not include self-employment, employment outside the Northwest, or military service and thus understates total employment by approximately 10 percent.

** Full-time employment averages 30 or more hours per week.

*** Earnings/wages expressed in first quarter 2014 dollars to account for inflation.

Earnings of Apprenticeship Participants

The next table shows employment and earnings information over five study periods.

Employment and Earnings Trends for Apprentices

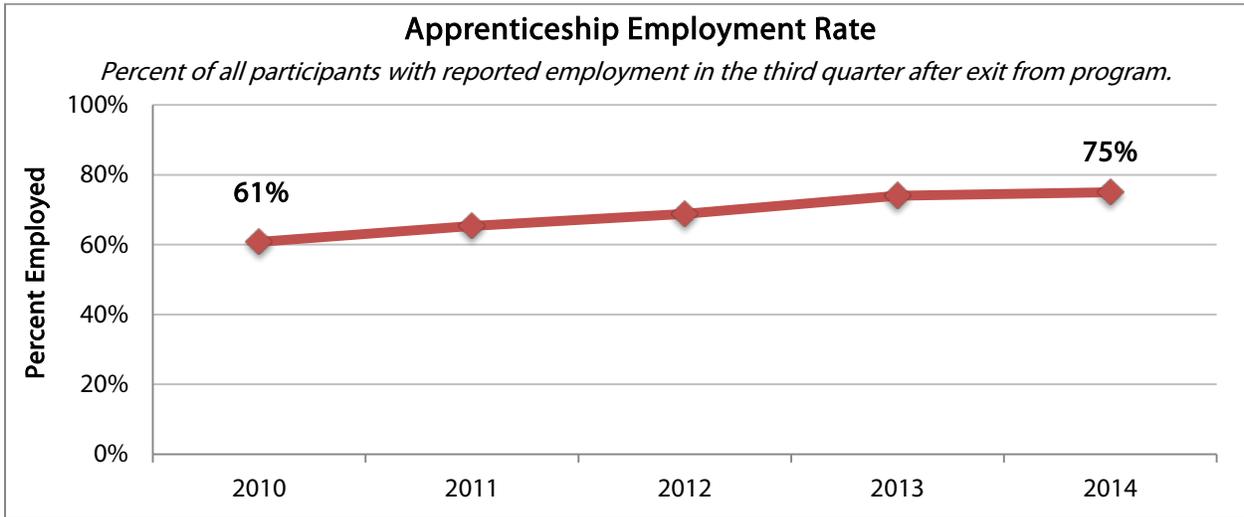
Performance Measure	2010	2011	2012	2013	2014
Employment Rate* (State Records)	61%	65%	69%	74%	75%
Full-Time Employment**	59%	64%	65%	62%	71%
Median Quarterly Hours	444	468	472	460	481
Median Hourly Wage***	\$30.14	\$33.71	\$34.64	\$32.74	\$30.47
Median Annualized Earnings***	\$41,241	\$49,307	\$47,673	\$44,578	\$51,504

* These figures apply to those with employment reported to the state's Employment Security Department six to nine months after leaving program for all Apprenticeship participants, and are not limited to those who completed a program. Rate does not include self-employment, employment outside the Northwest or military service and thus understates total employment by approximately 10 percent.



**Full-time employment averages 30 or more hours per week.

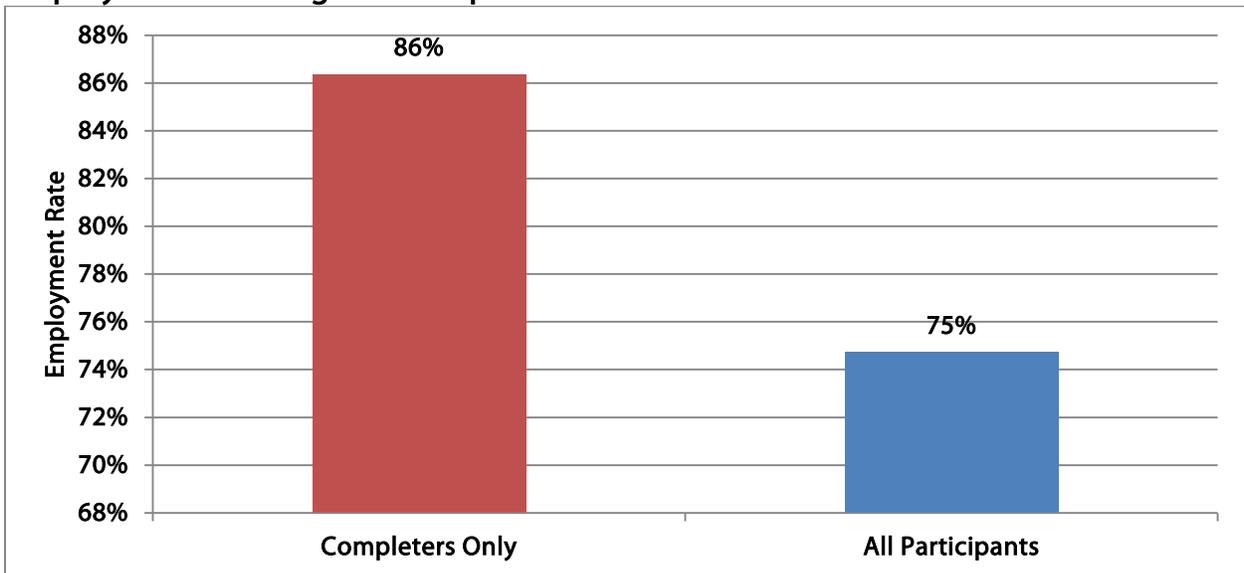
***Earnings/wages expressed in first quarter 2014 dollars to account for inflation.



Note: Rate does not include self-employment, employment outside the Northwest or military service and thus understates total employment by approximately 10 percent.

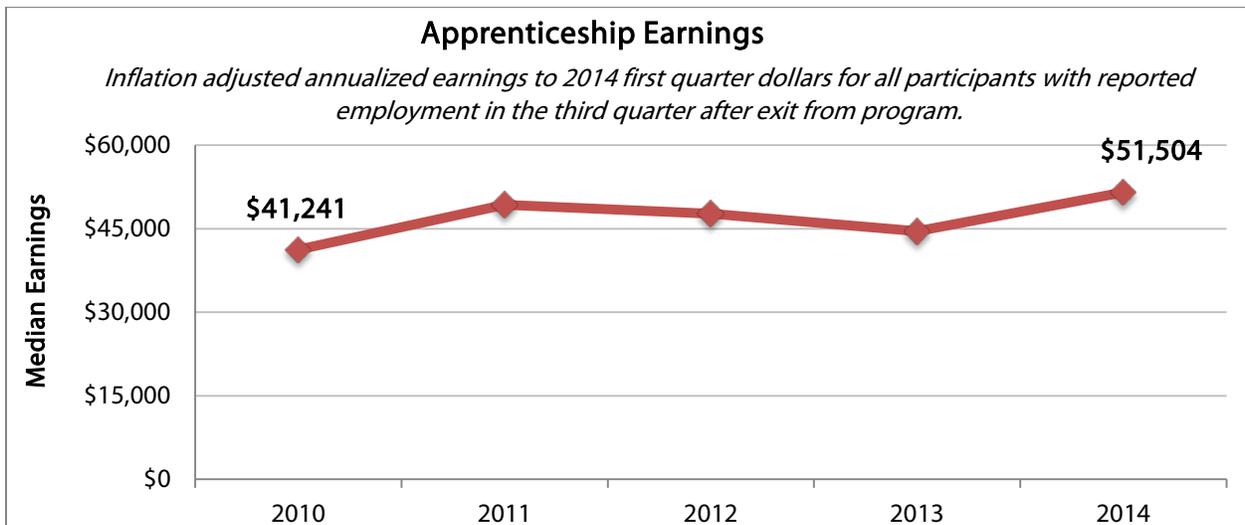
The employment rate trend indicates a steady increase since 2011 – rising 14 percentage points in four years. The chance of gaining employment is somewhat higher (86 percent) for those that completed the program compared to the overall employment rate (75 percent).

Employment for Program Completers



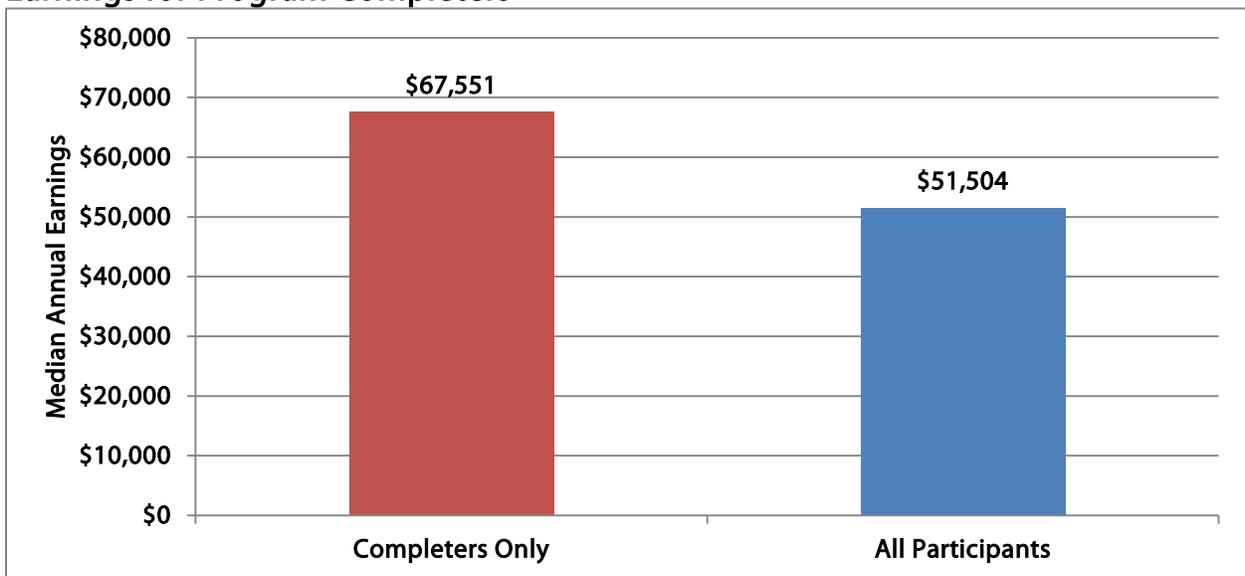
Earnings are also up – rising by 15 percent in one year to reach \$51,504. Annual earnings for those that completed the program were 31 percent higher than for those that did not ((\$67,551 compared to \$51,504).





Note: This chart shows annualized earnings in 2013 first quarter dollars to account for inflation.

Earnings for Program Completers



Apprenticeship Employment by Industry

The majority of Apprenticeship program participants who were reported to be employed, held jobs in construction (52 percent), services (15.9 percent), and manufacturing (8.5 percent). About one-quarter of the construction apprentices were in the “Building Equipment Contractors” sub-industry. Apprentices in the services industry were most likely in the “Administrative, Support, Waste Management, and Remediation Services” sub-industry.



Industry Group	
52.1%	Construction (see breakout below)
15.0%	Services (see breakout below)
12.2%	Public Services
8.5%	Manufacturing
4.6%	Retail Trade
4.4%	Transportation and Warehousing and Utilities
1.4%	Financial Services
0.9%	Natural Resources and Mining
Breakout of Construction Industry	
24.5%	Building Equipment Contractors
7.3%	Foundation, Structure & Building Exterior Contractors
6.4%	Heavy & Civil Engineering Construction
6.2%	Construction of Buildings
5.7%	Building Finishing Contractors
2.1%	All Other Specialty Contractors
Breakout of Services Industry	
6.4%	Administrative and Support and Waste Management and Remediation Services
2.3%	Accommodation and Food Services
1.5%	Education Services
1.5%	All Other Services
1.4%	Professional, Scientific, and Technical Services
0.9%	Social Assistance
0.8%	Arts, Entertainment, and Recreation
0.8%	Health Care
Breakout of Public Services	
5.8%	Justice and Public Safety
5.4%	Government Support
0.7%	Administration of Public Programs
0.2%	Regulation
0.05%	Other Public Service

Source: Matches with Employment Security Department data in third quarter after exiting program. Industry groups based on North American Industry Classification System (NAICS) codes.

Relationship of Training to Employment

In 2013 the Workforce Board surveyed apprentices who exited their program in 2011-12. The survey provided data on employment and participant satisfaction with the training. The survey was conducted by telephone and was completed by 223 participants.

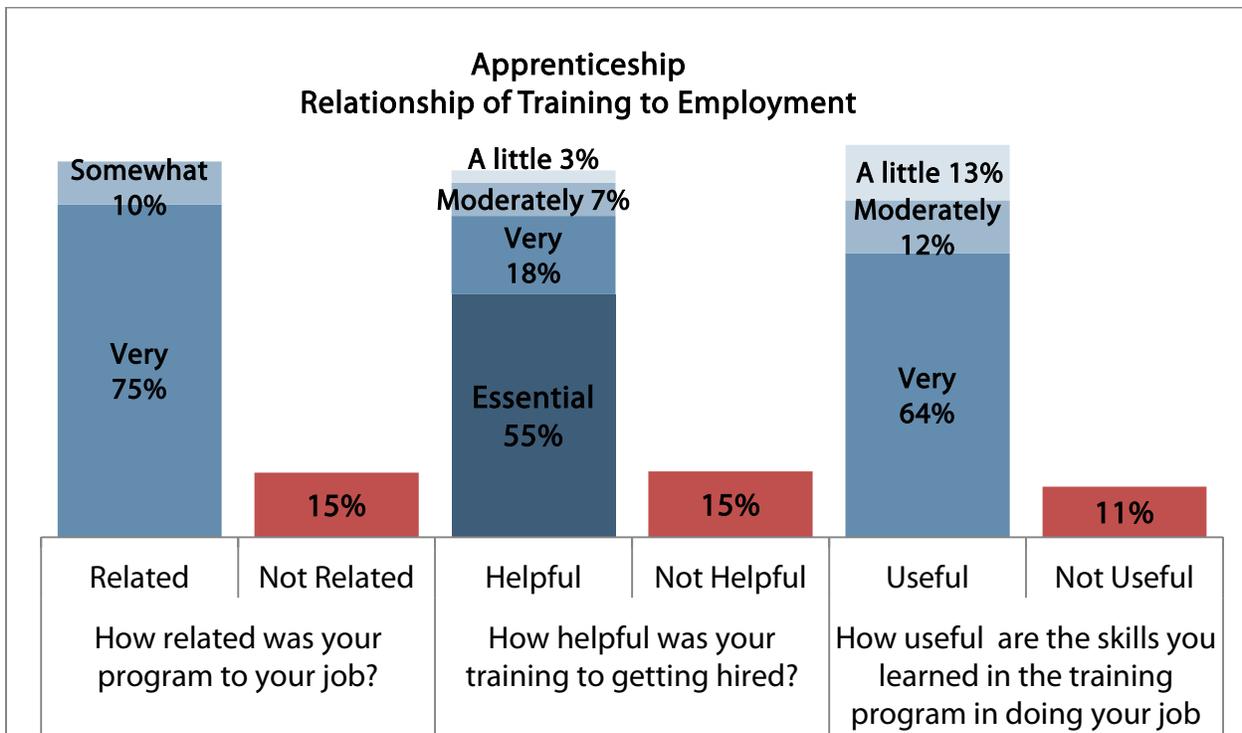
To measure the extent to which a participant's education program and training related to employment, we asked participants three questions:



1. How related was the program to their job?
2. How important was the training in getting hired?
3. Are the skills they learned useful in their job?

Asking about the relationship between training and employment in different ways can produce more complete information. For example, some participants said their training was not related to their job, but nevertheless found the skills acquired were useful on the job.

Among apprenticeship participants employed seven to nine months after leaving a program, 75 percent said their training was “very related” to their job. An additional 10 percent reported the training was “somewhat related” to their job. Just 15 percent indicated that the training was not related to their job. In 2011, employed participants reported identical rates of training being very related, but the rate of somewhat related was higher at 13 percent. Overall, the rates have remained very close between the 2011 and 2013 surveys.



Source: Workforce Board’s Participant Satisfaction Survey 2013.

Apprenticeship participants surveyed in 2013 also indicated the training was helpful to them in getting their job. Of those participants, 55 percent indicated their training was an “essential requirement,” another 18 percent indicated it was “very important,” and 7 percent reported it was “moderately important.” Only 15 percent indicated their training was “not important at all” to getting their job.

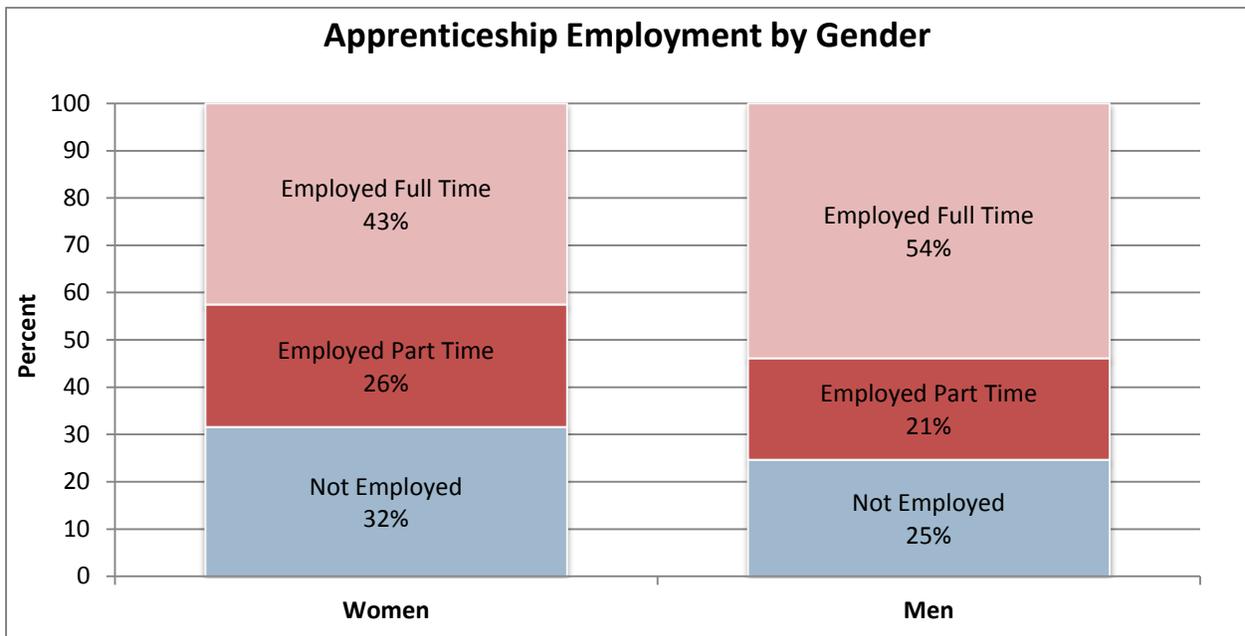
Nearly 90 percent of participants said the skills they learned in their training program were useful in doing their job. Some 64 percent of participants indicated the skills were “very useful,” 12 percent said “moderately useful,” and 13 percent “a little useful.” The remaining 11 percent of participants who were employed indicated the skills were “not useful at all.”



When combining two of the questions about the program’s relationship to the job and about whether the skills acquired were helpful, a small percentage of participants answer negatively to both. Just 4 percent of participants employed the third quarter after exit said the training they received was *neither* helpful in their job nor related to the job they obtained.

Wages and Employment Results Vary by Population

Wages and employment results can vary by gender, race and ethnicity, and disability.⁶ During the third quarter after leaving the program, 51 percent of men worked full time, while 21 percent worked part time to reach an overall employment rate of 75 percent. They were more likely to be employed than women (69 percent) and also more likely to work full time than women (46 percent). Of those employed, women had median hourly wages (\$19.74), which was 63 percent of men’s wages (\$31.20). Women had median annualized earnings that were also 63 percent of males (\$33,427 compared to \$53,384).



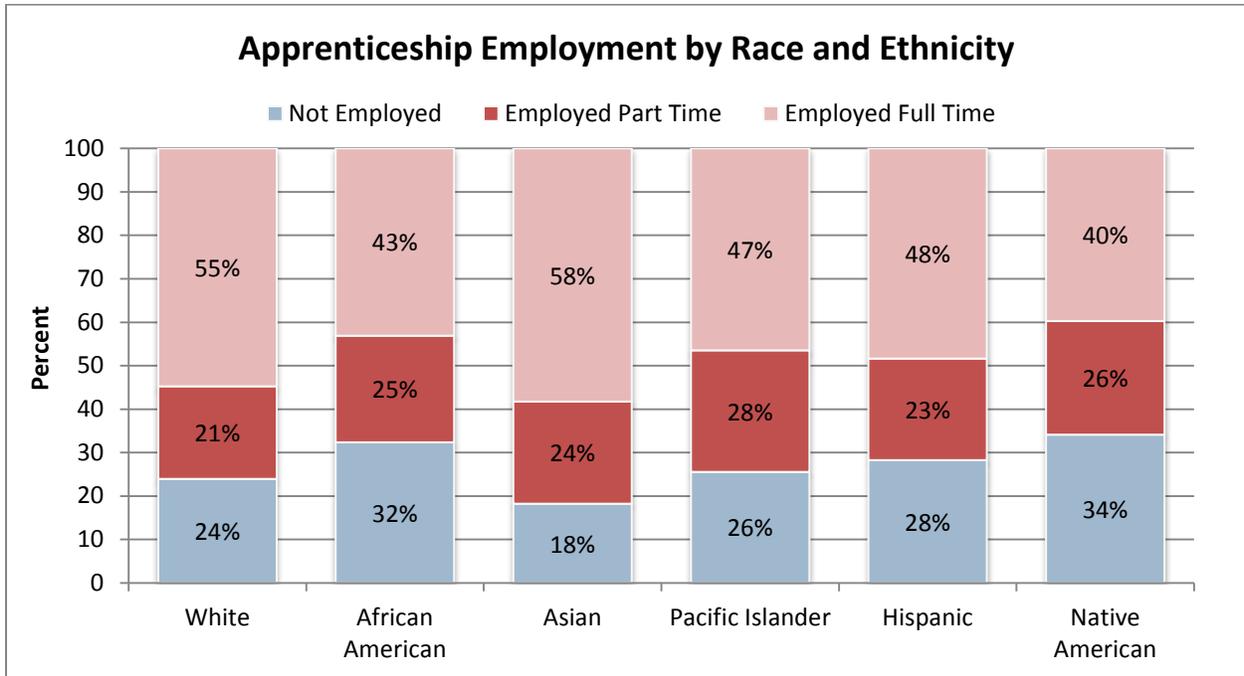
Source: 2012-13 Apprenticeship Administrative Data, Department of Labor and Industries.

⁶ Apprenticeship administrative records do not include information on disability status.



Race/Ethnicity Plays Role

Asians had the highest full time employment rate at 58 percent (part time employment measured 24 percent) and the highest overall employment rate (82 percent). White (76 percent), Pacific Islander (75 percent), and Hispanic (71 percent) apprentices followed closely behind and all had relatively high employment rates in the third quarter after leaving their programs. African American and Native American apprentices were somewhat less likely than others to be employed in the third quarter after leaving their programs (68 percent and 66 percent, respectively).



Source: 2012-13 Apprenticeship Administrative Data, Department of Labor and Industries.

For those employed, whites had the highest median hourly wage at \$31.87, followed by closely by Asians at \$30.82, Pacific Islanders (\$29.76), Native Americans (\$26.93), Hispanics (\$23.89), and African Americans (\$18.55).

In terms of median annualized earnings, Asians earned the most (\$60,776) followed by whites (\$54,469), Pacific Islanders (\$50,229), Hispanics (\$42,071), Native Americans (\$36,269), and African Americans (\$31,297).

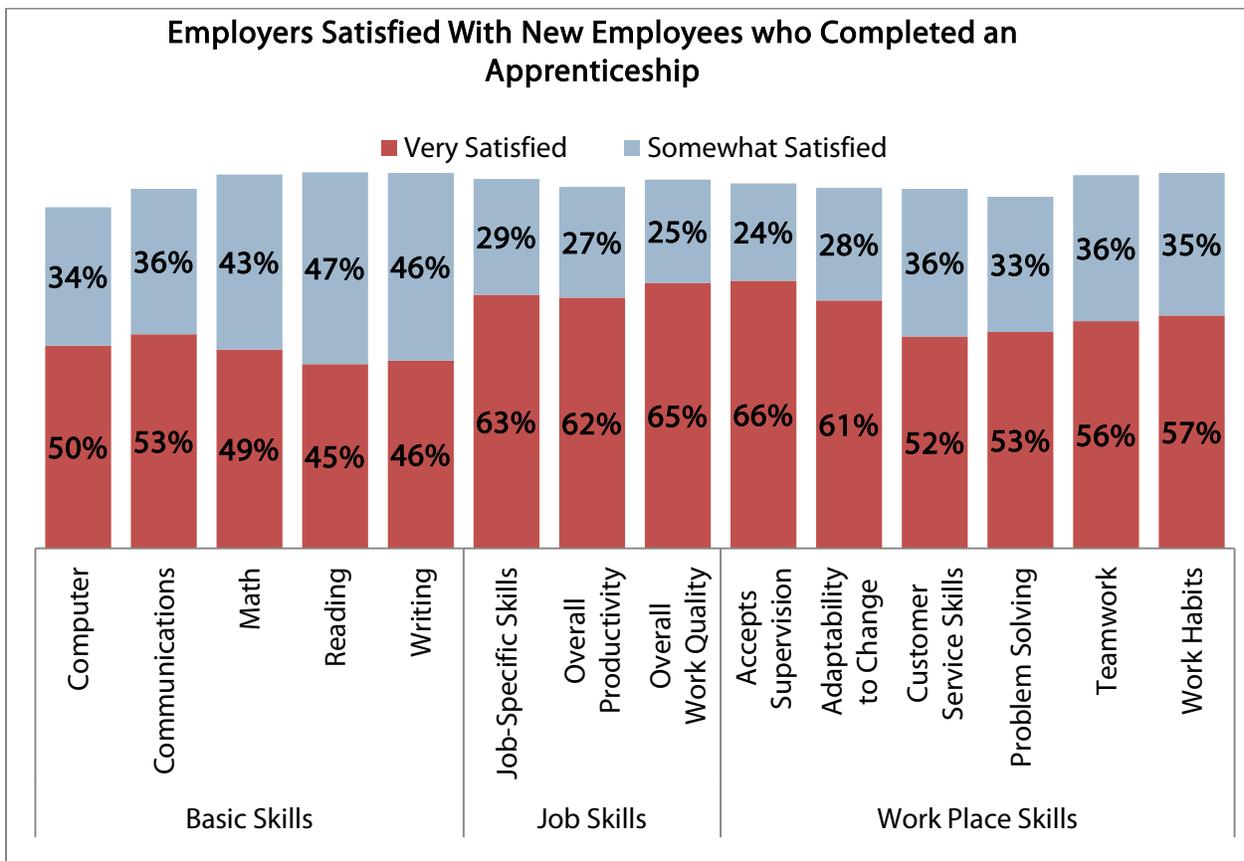
Were Employers Satisfied with the Preparation Workers Received?

The Workforce Board's Employer Survey, administered during 2012, asked firms to evaluate new employees who had recently completed an apprenticeship program. Some 88 percent of employers said they were either "somewhat satisfied" or "very satisfied" with the overall work quality of these new employees.



Employer satisfaction is broken down into three categories: Basic Skills, Job Skills and Work Place Skills. Basic skills refer to reading, writing, math, communication, and computer skills. Job skills refer to skills specific to the job, as well as overall work quality and productivity. Work place skills refer to the skills necessary to get along in the workplace, such as the ability to accept supervision, the ability to adapt to changes in duties and responsibilities, teamwork, customer service, problem solving or critical thinking skills, and positive work habits and attitudes.

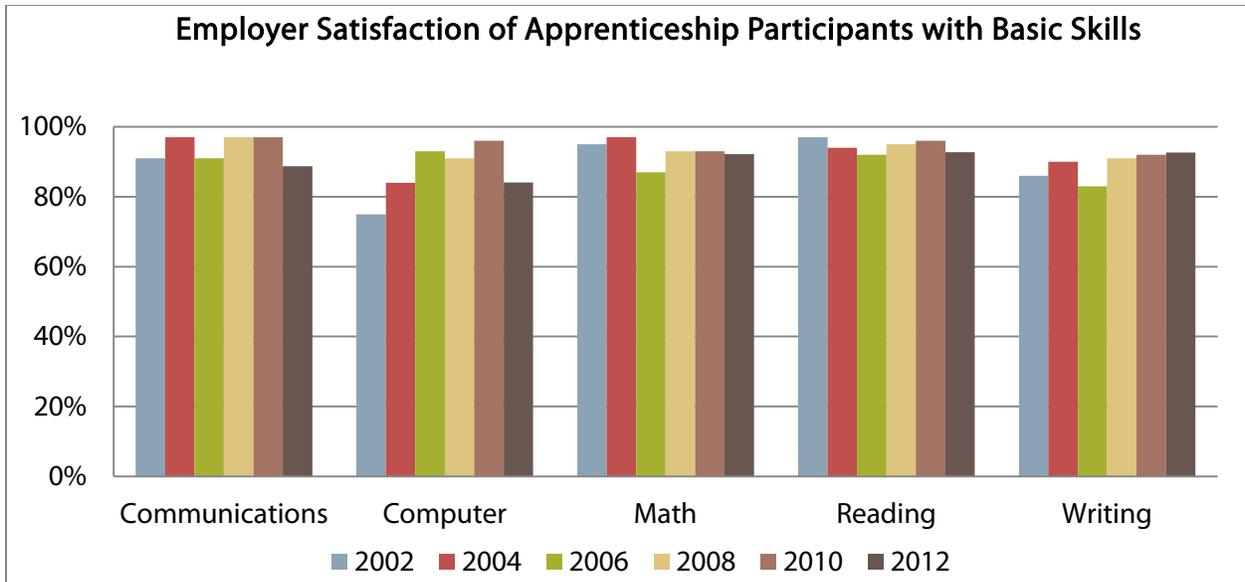
Employers were most likely to report they were very satisfied with the overall work quality, productivity, and job-specific skills of apprentices. Employers were least likely to be very satisfied with the basic skills of reading, writing, and math, although nearly half of employers were very satisfied with the basic skills, and almost all of the remainder were somewhat satisfied.



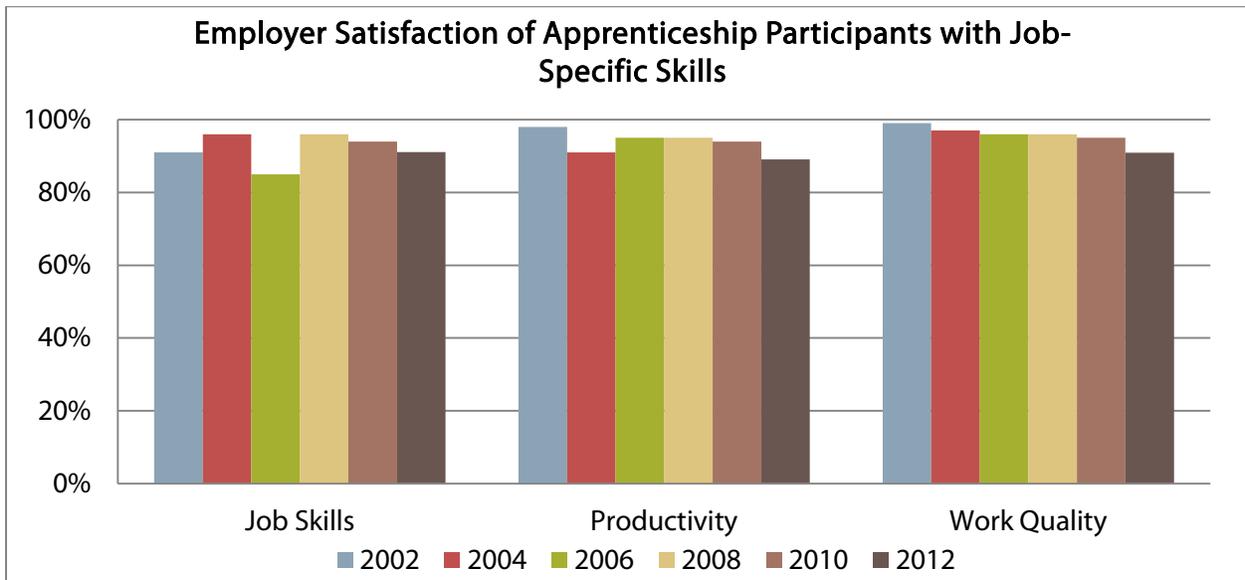
Source: Workforce Board Employer Survey conducted in 2012.

The following three charts show the trends in satisfaction of employers with new employees who recently completed an apprenticeship program.



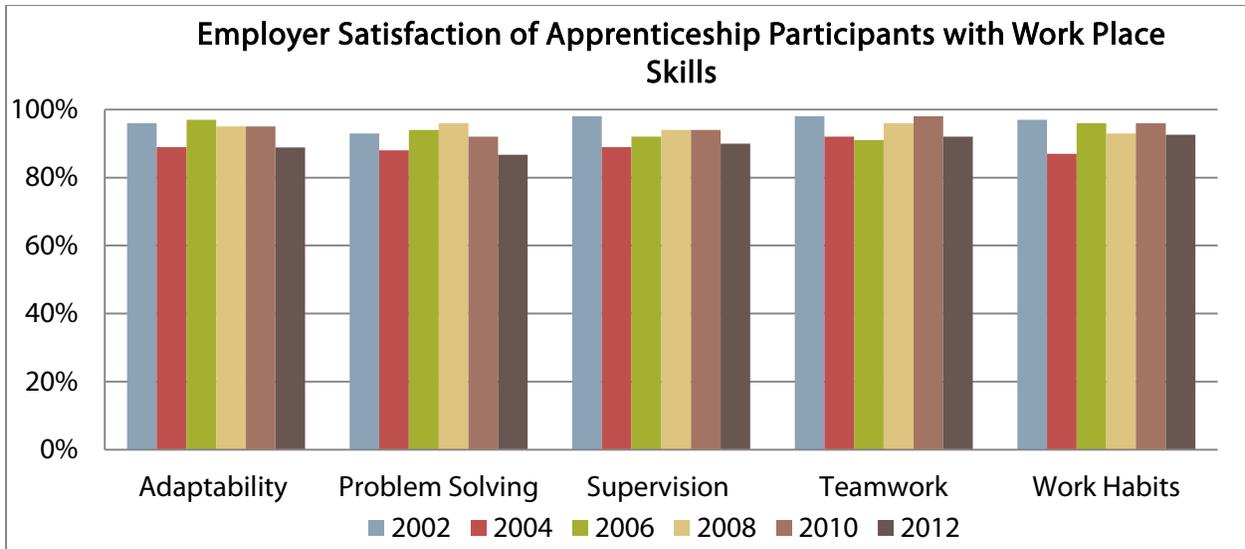


Source: Workforce Board's biennial Employer Surveys from 2002 through 2012.



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Source: Workforce Board's biennial Employer Surveys from 2002 through 2012.

Participant Survey - Did Participants Get the Skills They Needed?

Of the apprentices leaving their program who answered questions for the 2013 Participant Survey, 73 percent completed their apprentice program, which is an increase of one percentage point from the previous survey conducted in 2011.

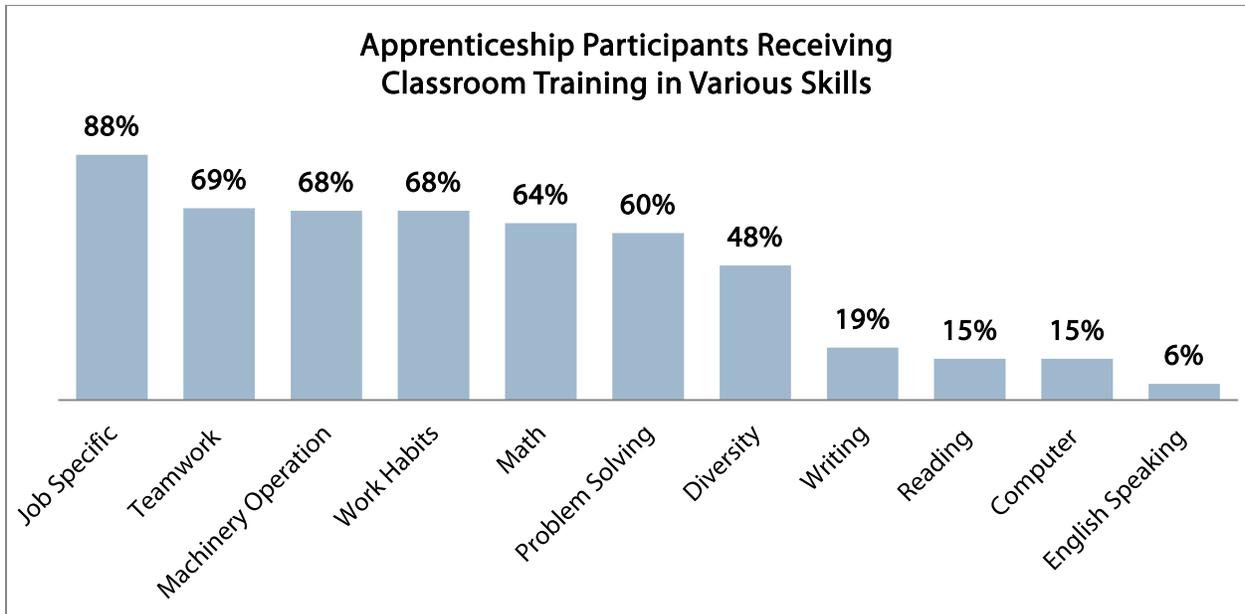
By definition, people enter an apprenticeship program to acquire occupation or industry-specific training. As they gain these skills, they are paid to work and hold down jobs that both bolster their resume and pay the bills. Many apprentices also receive training in general workplace skills such as teamwork and problem solving.

Classroom Training

Apprentices receive various skills training⁷, both in the classroom and during on-the-job training. During classroom training, apprentices were least likely to receive basic skills training such as English speaking, reading, and writing skills. One exception is the 64 percent of apprentices who received math skills training. Apprentices were most likely to receive training in job-specific skills (88 percent). These results are similar to surveys completed in previous years.

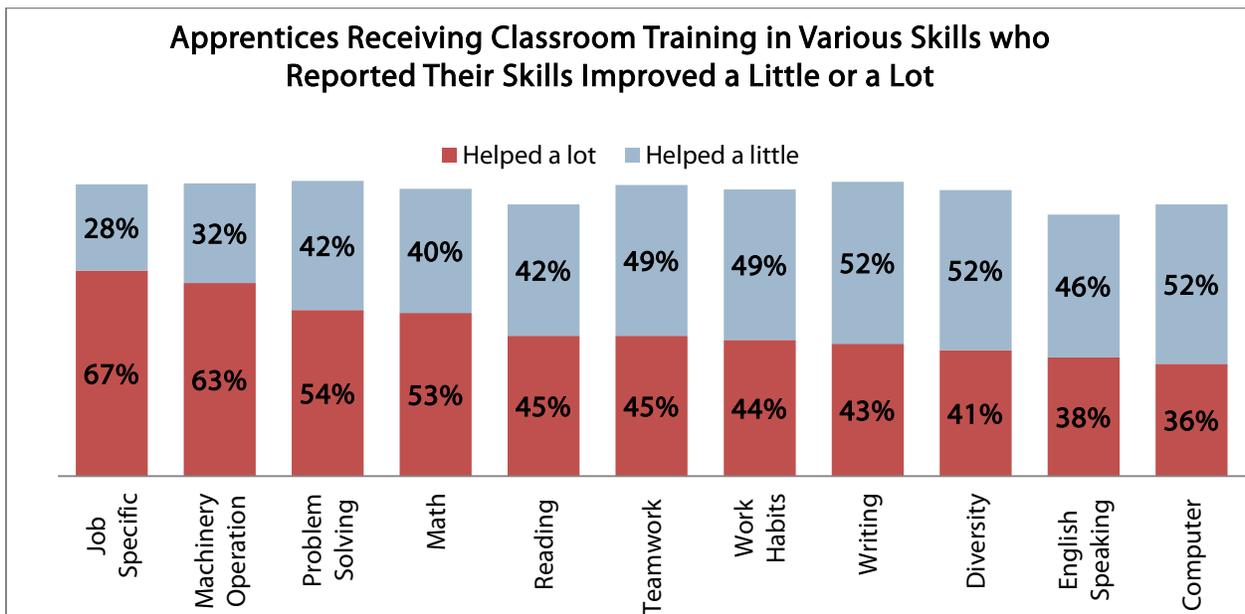
⁷ Apprentices are required to participate in at least 144 hours of classroom training annually.





Source: Workforce Board's Participant Satisfaction Survey 2013.

In both the previous and current studies, apprentices reported their skills in many areas improved as a result of classroom training. The apprentices from the 2013 survey indicated similar levels of improvement overall when compared with apprentices from 2011. Compared to 2011, more apprentices reported skill improvement after these job-specific trainings: machinery operation, problem solving, and math skills. More respondents received work habits, math, and reading training in 2013 than in 2011.

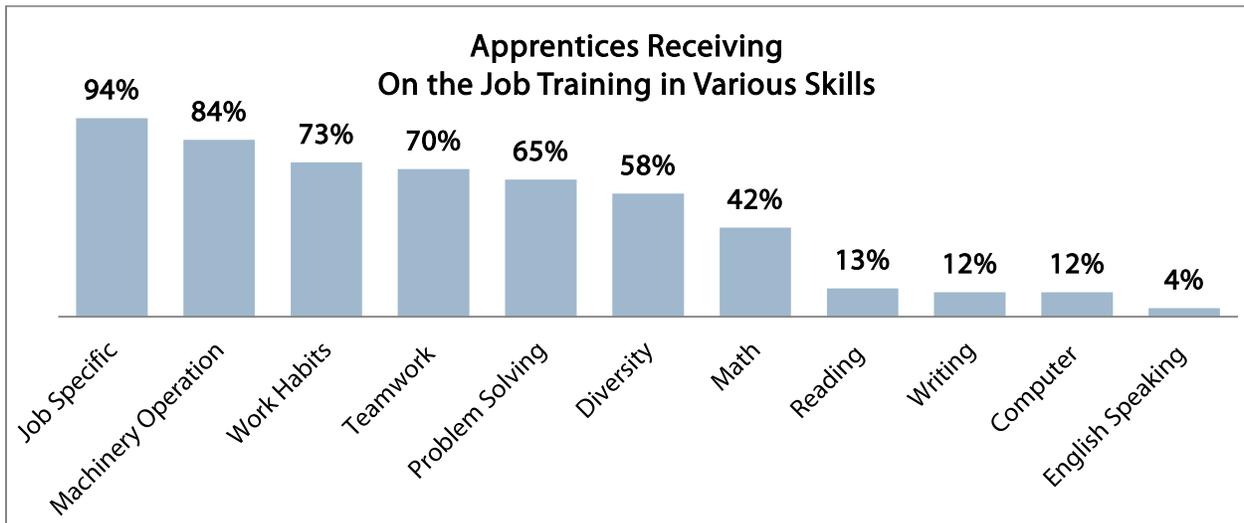


Source: Workforce Board's Participant Satisfaction Survey 2013.



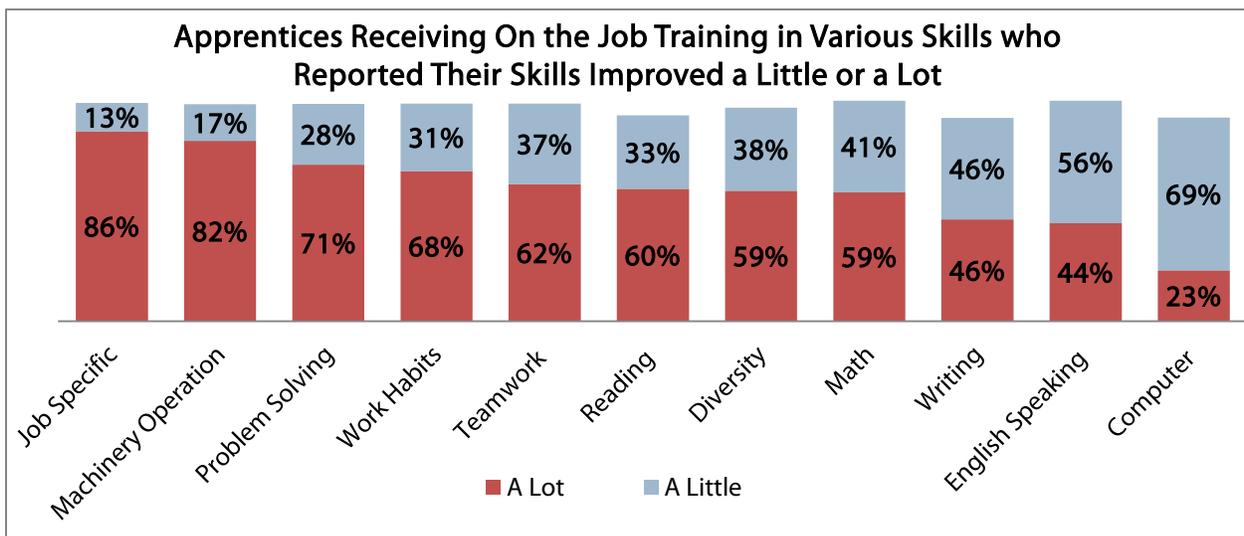
On-the-Job Skills Training

As in the previous survey, high percentages of apprentices reported receiving on-the-job training in job-specific skills, machinery operations, work habits, and teamwork. The percentage of apprentices receiving training in various skills has remained mostly the same between 2011 and 2013. Generally the 2013 participants had slightly higher rates of on-the-job training, with the exception being computer skills.



Source: Workforce Board's Participant Satisfaction Survey 2013.

Apprentices continue to highly rate the skills received from on-the-job training. As expected, the highest percentages indicated "a lot" of improvement in their job-specific and machinery operation skills. Both job-specific and machinery operation skills increased by 3 percentage points in the category "helped a lot" over the 2011 survey. The biggest decrease in helped a lot was in computer skills – falling from 46 percent in 2011 to 23 percent in 2013.

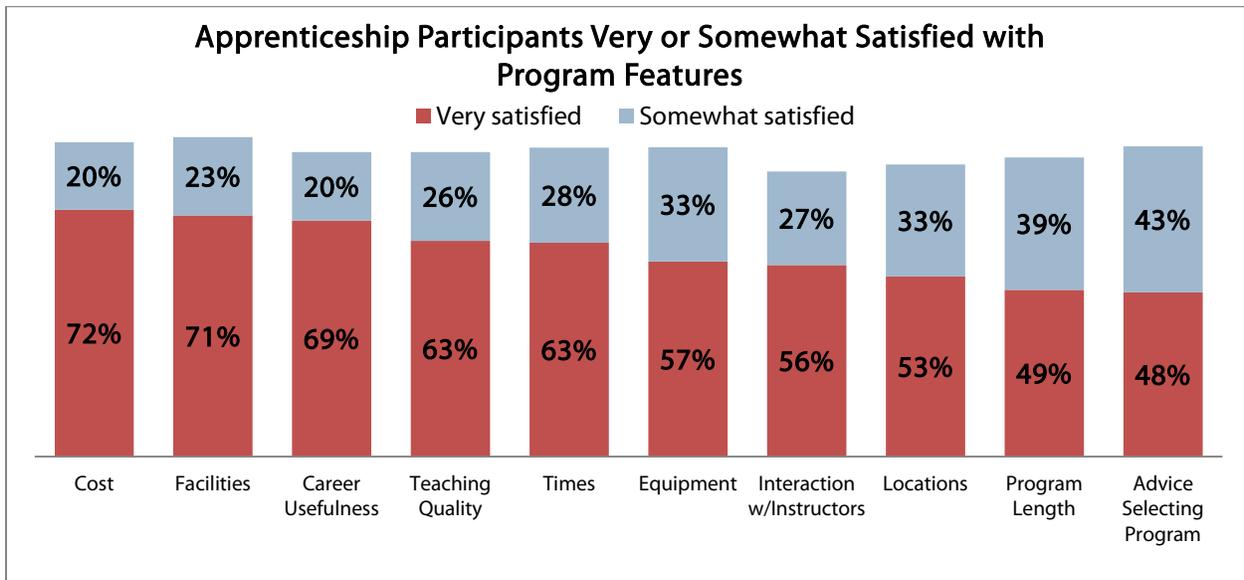


Source: Workforce Board's Participant Satisfaction Survey 2013.



Participant Satisfaction

The apprentices surveyed in 2013 expressed high levels of overall satisfaction that was similar to the previous study: 87 percent expressed that classroom training helped to some degree with their classroom training, and another 89 percent with their on-the-job training. Some 85 percent met their educational objectives by participating in the training – about the same as in the 2011 survey. Satisfaction was down by a small amount in most categories, with the exceptions being career usefulness, teaching quality, times, and advice selecting programs.

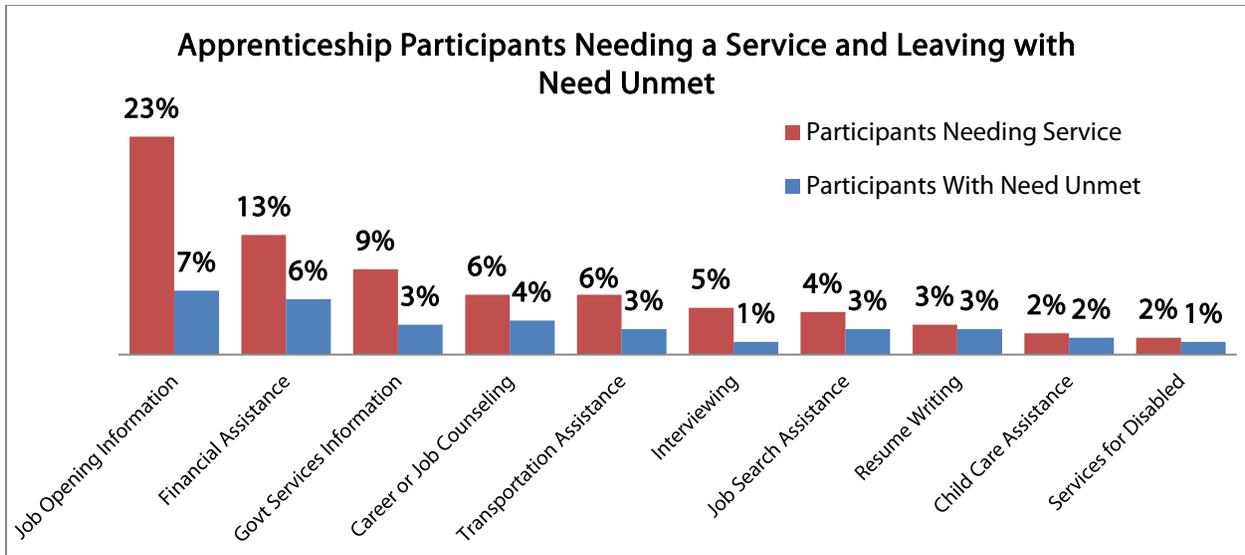


Source: Workforce Board's Participant Satisfaction Survey 2013.

Apprentices reported a much lower need for support services than participants in the other workforce programs included in the survey. As with the 2011 survey, the greatest needs were for information on job openings, financial assistance, and government services information. In some cases their needs were not met. Of apprentices leaving their program, 7 percent left with an unmet need⁸ for job opening information, and 6 percent for financial assistance.

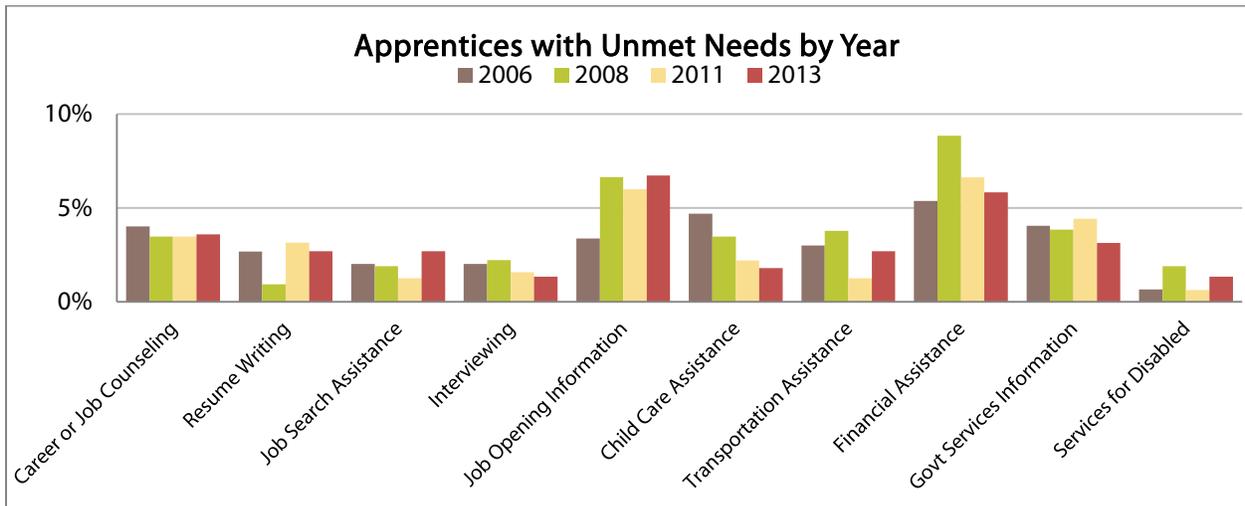
⁸ Unmet need refers to cases where the student reports that either they did not receive the required service or what was provided did not meet their needs.





Source: Workforce Board's Participant Satisfaction Survey 2013.

The percentage of apprentices with unmet needs has dropped in nearly every category since the last survey. However, the percentage reporting unmet needs for job search assistance, transportation assistance, career counseling, and job opening information has increased marginally since 2011.



Source: Workforce Board's Participant Satisfaction Survey 2013.



Net Impact – Did Program Make a Difference in Participant Success

Every four years the Workforce Board conducts net impact and cost-benefit analyses of workforce development programs. This detailed study compares participants and non-participants. The net impact part of this study attempts to measure whether the program made a difference in the participant’s success. Washington is the only state to periodically conduct rigorous net impact evaluations of its workforce programs.

Apprenticeship programs have very large, positive impacts on employment, wages, hours worked, and earning. Training substantially increases the lifetime earnings of apprentices.

The net impact analysis was conducted by the W.E. Upjohn Institute for Employment Research (Upjohn), a national leader in evaluating training programs. To do the analysis, Upjohn studied program participants to see what results they achieved and compared these results with a control group. Individuals who participated in an Apprenticeship program were compared to individuals who had similar demographic characteristics, but who did not participate in any of the programs included in the study. The comparison group members were selected from among those who registered with WorkSource, Washington’s one-stop career center system.

The most recent net impact analyses examined experiences of participants who left the Apprenticeship training program through 2009. The short-term impact (Program Year 2007-08) was observed in 2008-09, while the long-term impact (Program Year 2005-06) was observed from 2006-07 through 2008-09.

Apprenticeship	All Apprenticeship		Completers	
	Short Term [^]	Long Term [^]	Short Term [^]	Long Term [^]
Net Employment Impact*	7.80 percentage points	9.80 percentage points	24.70 percentage points	24.00 percentage points
Net Hourly Wage Impact**	\$8.59	\$9.55	\$14.45	\$15.86
Net Hours Employed per Quarter Impact	46.9	26.4	71.8	43
Net Annualized Earnings Impact**	\$20,201	\$19,257	\$35,275	\$32,860

[^]Short-term is three quarters after program exit; Long-term is average across three years since program exit.

*Percentages listed are employment percentage points above those of the control group of non-participants.

**Wages and earnings, expressed in first quarter 2014 dollars, represent the average difference between Apprenticeship participants who got jobs and those in the control group who were employed.



As seen above, apprenticeship programs had significant positive net impacts on employment, wages, hours worked, and annualized earnings when apprenticeship participants are compared with non-participants. These impressive results get even stronger for those who complete an apprenticeship, yielding nearly twice as much in annualized earnings, hourly wages and employment compared with those apprenticeship program participants who exited a program early. The benefits of not only starting, but completing an apprenticeship program are clear.

Costs and Benefits

The cost-benefit analysis estimates the value of the net impact on earnings, employee benefits (estimated at 25 percent of earnings), UI benefits, and certain taxes.⁹ Program costs include both direct program costs and support payments borne by taxpayers and the tuition paid by participants, as well as the earnings participants would have otherwise received had they continued working.

Benefits and costs are calculated for both the observed period of time and based upon a statistical model that estimated the benefits and costs out to age 65. To compare benefits and costs in terms of net present values, post-program benefits and costs are discounted by 3 percent per year and all figures are stated in 2014 Q1 dollars to control for inflation. The benefits and costs presented here are based on impacts estimated for apprentices leaving programs in 2005-2006 (observed from 2006-07 through 2008-09), because a longer-term follow-up is required for this analysis.

Participant and Public Benefits and Costs per Apprentice

Benefit/Cost	First 2.5 years		Lifetime (until 65)		Sum of Costs and Benefits
	Participant	Public	Participant	Public	
Benefits					
Earnings	\$38,488	\$0	\$329,541	\$0	
Fringe Benefits	\$7,698	\$0	\$65,908	\$0	
Taxes	-\$10,096	\$10,096	-\$86,439	\$86,439	
Transfers					
UI	\$900	-\$900	\$1,610	-\$1,610	
Costs					
Foregone net comp.	\$23,686	\$6,290	\$23,686	\$6,290	
Program costs	-\$1,875	-\$3,646	-\$1,875	-\$3,646	
Benefits	\$36,990	\$9,196	\$310,620	\$84,829	
Costs	\$21,811	\$2,644	\$21,811	\$2,644	
Total (Net)	\$58,801	\$11,840	\$332,432	\$87,472	\$419,904

Note: Benefits and costs are expressed in 2014 first quarter dollars.

⁹ Upjohn estimated the impact of the net change in earnings on Social Security, Medicare, federal income, and state sales taxes.



For each apprentice in training, the public (taxpayer) cost is \$3,646 over the length of their enrollment, and the participant cost is \$1,875 in tuition. By definition, apprentices work during their program participation, and their net earnings during training was \$23,686 higher than those who were not in training. During the course of working life to age 65, the average apprentice will gain about \$353,227 in net earnings (net impact earnings plus earnings while in apprenticeship training) and about \$65,908 in employee benefits.¹⁰ These are net gains compared to the earnings of similar individuals who did not participate in a program included in this study. Including program costs and the net impacts on taxes and unemployment insurance benefits, the total net benefit per participant is \$332,432.

Projected participant net benefits to age 65 far outweigh public investment in apprenticeship training by a ratio of \$91 to 1, or \$332,432 to \$3,646.

From the time of leaving training to age 65, the public is expected to gain about \$86,439 per apprentice in net additional Social Security, Medicare, federal income, and state sales taxes. The estimated lifetime net benefit to taxpayers is \$87,472 per participant.

Projected taxpayer net benefits to age 65 outweigh public costs invested in apprenticeship training by a ratio of \$23 to 1 or \$84,829 to \$3,646.

Summary, Areas for Improvement, and Further Research

Apprenticeship has been proven to be a very successful training program based on both employment and earnings outcomes and cost-benefit analysis. Moreover, public costs are low, as trust funds established by employers and workers cover the majority of the expense. Employers continue to report high levels of satisfaction with the skills of those who completed an apprenticeship program, and participants report they are satisfied with the program.

This evaluation does find some areas that could be stronger. The median age of those leaving apprenticeships is 30. More should be done to enroll younger people and women (9 percent of participants are women) into apprenticeships, especially in higher paying fields. The most recent hourly wages and annual earnings of women are only 63 percent of men's wages. Finally, while Washington's apprenticeship program continues to enroll people of color at rates similar to their population in the state, there continues to be disparities between the post-program wages and earnings for people of color compared to whites. This suggests that minority groups may not be enrolling in the higher paying fields. This issue needs continued attention.

¹⁰ This employee benefits amount does not account for the employee benefits associated with the earnings during participation. If the same benefit percentage (20 percent) were applied to such earnings, the gain in employee benefits in the longer term would be about \$50,000.



A related issue is the high number of apprenticeships in the construction industry. This year over half of those who found work did so in construction. This percent has risen in recent years as construction has recovered from the housing bust. In the 2011 report, only a quarter of apprenticeship employees found work in construction. While the growth in construction is positive, ideally apprenticeships would grow in other industries, which would also help address the gender imbalance.

This year's report also found a strong return for apprenticeship participants who completed training. The employment rate for completers was 11 percentage points higher than for all participants, and earnings were 31 percent higher.

The Apprenticeship Section of the Department of Labor and Industries and the apprenticeship community recognize the importance of recruiting and retaining more women and people of color into high paying apprenticeship programs. They are engaged in activities to make this happen. For example, the Apprenticeship Section is partnering with the state's Department of Transportation to prepare women and people of color for jobs related to highway construction and maintenance. The Apprenticeship Section is also addressing the need to enroll younger participants; for example by establishing culinary arts and early child care programs that begin in middle and high schools. The Washington State Apprenticeship and Training Council has developed and formalized an Apprenticeship Preparation Program recognition process for preparatory or pre-apprenticeship programs. The purpose is to build a recognized pipeline for apprenticeship preparation throughout the state.

