

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 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 tile layers. 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. 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.

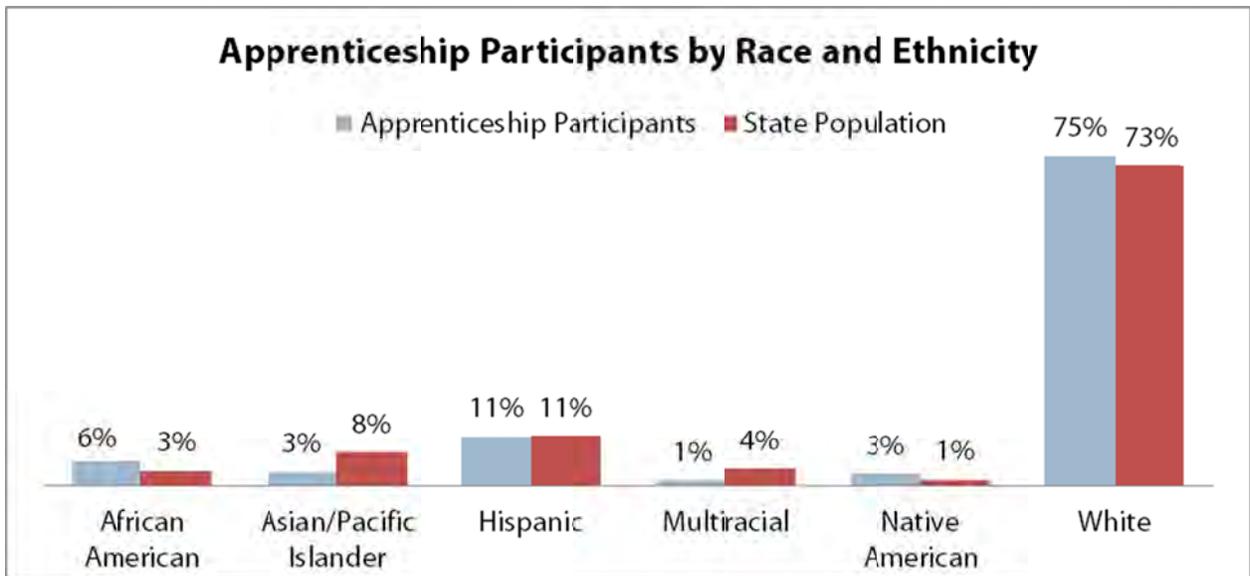
Participant Profile

For this 2012 report, researchers studied the results of 3,994 apprentices who left an apprenticeship program during the most recent reporting year.² Apprentices reflect the racial and ethnic diversity of the state population. Hispanics, African Americans, whites, and Native Americans are represented above their proportions of the state population. However, African Americans, Hispanics and Native Americans do 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. Asian/Pacific Islanders and those with a multi-racial background enroll in apprenticeship programs in lower numbers than their share of the state population.³

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

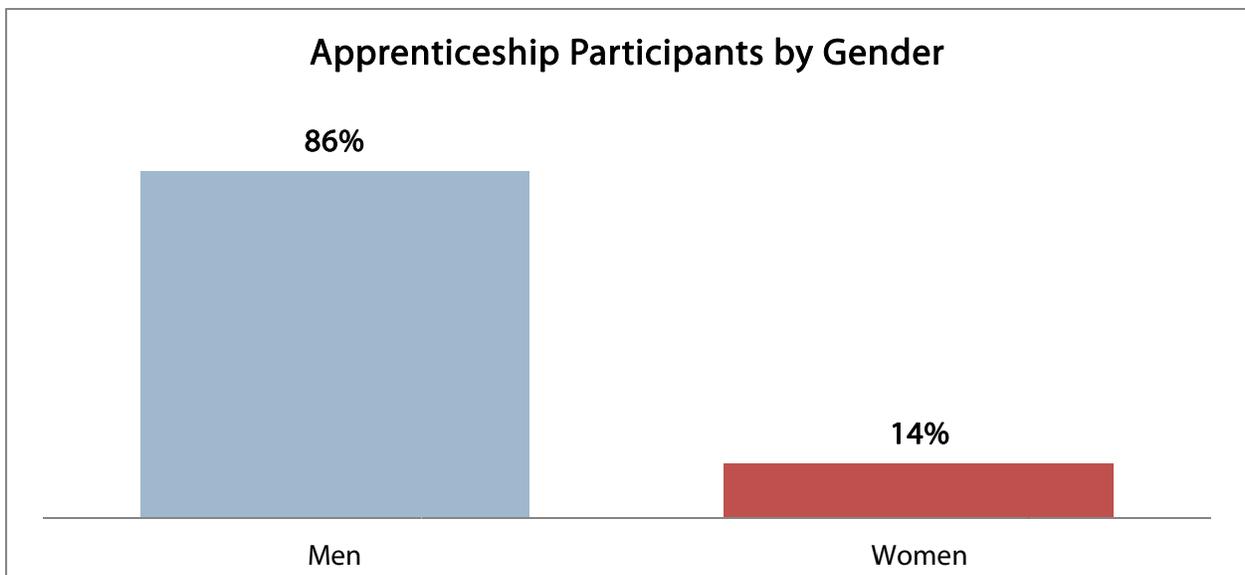
² The 2012 Workforce Training Results reports are based on data observed in 2010-11 for individuals exiting programs during 2009-10.

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/Pacific Islanders (also referred to as Asians/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 2010 U.S. Census Bureau estimates for Washington from the American Community Survey, 73 percent are white; 3 percent are African American; 1 percent are Native American; 8 percent are Asian/Pacific Islander; 4 percent are multiracial; and 11 percent are Hispanic.



Source: 2009-10 Apprenticeship Administrative Data, Department of Labor and Industries, Washington State Office of Financial Management and 2010 U.S. Census Data from the American Community Survey.

Relatively few women enter apprenticeship programs compared to men. Just 14 percent of apprentices were women. However, this is a higher percentage than in any of the last four studies; women comprised 8 percent of apprentices in the 2011 report, 11 percent in 2010 and 12 percent in 2008.



Source: 2009-10 Apprenticeship Administrative Data, Department of Labor and Industries.

The median age at program exit was 30. One quarter of those enrolled in apprenticeship programs were under age 25, and another quarter were age 39 or older.

Completion Rates

Overall, apprentices spent a median of 28 months in their program. This is an increase of 10 months over the prior cohort of apprentices. Among apprenticeship completers, the median program length was 37 months. Among apprentices leaving their program in the most recent program year, slightly more than half (50.5 percent) completed their program, up 13.5 percentage points from the prior report. However, 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.

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 four years to reach journey level status, while those training to become an esthetician require 2,000 hours, or approximately one year, to complete.

Number of Years Apprentices Participated in their Program		
Years in Program	Completers	Non Completers
less than 1	0.0%	0.1%
1-2	17.8%	25.5%
2-3	10.2%	34.7%
3-4	20.9%	19.3%
4-5	22.2%	7.9%
5-6	19.2%	3.7%
6-7	6.8%	1.5%
7-8	1.8%	0.6%
8-9	0.5%	3.8%
9-10	0.1%	1.6%
more than 10	0.6%	1.3%

Source: 2009-2010 Apprenticeship Administrative Data, Department of Labor and Industries.

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. These non-completers still tend to show wage gains in subsequent quarters due, most likely, to the skills acquired while in the apprenticeship program.

State Core Measures: 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?

Data Comes From State Wage Files & Employer Survey

The 2012 Workforce Training Results includes information obtained from Employment Security Department wage files in Washington, Idaho, and Oregon, and federal employment records for 2010-11. 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, this year's report includes a comprehensive Net Impact Study. To assess both short- and long-term employment and earnings trends, data on participant experiences through 2009 is used in the 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.

Turn to page 20 for the Net Impact Study. Conducted every four years, this in-depth report adds extra value to the 2012 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.

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

To find out about the apprentices' post-program employment and earnings, participant records were matched with Employment Security Department wage files from Washington and neighboring states.⁴ Labor market outcomes for apprenticeships are higher than for any other program the Workforce Board studies. In addition to the quality of apprenticeship training and the wage levels in these occupations, this result may be due to the relatively long length of the program.

Record matches found 65 percent of apprentices had reported employment during the third quarter after they left the program. This is 5 percentage points above that observed on the last report. Their median wage was \$28.46 per hour—up \$3.01 from \$25.45 the prior year—and annualized earnings were \$47,637, an increase of \$7,800 from the 2011 Workforce Training Report.⁵ The median wage of apprentices is high, but there is considerable variation in wages, as the table below depicts. Limiting analysis to just those apprentices who completed their program, the outcomes are even better. The median earnings of completers was \$58,907. These results highlight the value of completing an apprenticeship program.

Distribution of Hourly Wages of Apprentices in the Third Quarter After Leaving Program who are not in Higher Education	
Quartile	Hourly Wage
Highest	Above \$37.18
Third	\$28.46-37.17
Second	\$18.47-\$28.45
Lowest	Below \$18.46

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 2011 dollars.

Employment and Earnings for Apprentices, 2012

Performance Measure	Results
Employment Rate* (State Records)	65%
Employment Rate* Completers (State Records)	81%
Full Time Employment **	64
Median Quarterly Hours	468
Median Hourly Wage***	\$28.46
Median Annualized Earnings***	\$47,637

** 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 2011 dollars in order to account for inflation.*

Earnings of Apprenticeship Participants

To better gauge the financial effectiveness of Washington's workforce programs, it helps to frame income levels. One common yardstick is the federal poverty level. In 2011, the federal poverty level for one person was \$10,890 per year.⁶

In 2012, Apprenticeship participants were able to support a median 10.6 people at the poverty level—meaning they could support themselves plus 9 and a half other people. They could support 4.4 people, including themselves, at double the poverty level.

⁶ Poverty levels from 2011 were used in this edition of Workforce Training Results to measure the results of workforce programs on participants observed in 2010-11. The federal poverty level is determined by the Department of Health and Human Services. The level varies according to family size. The number is adjusted for inflation and reported annually in the form of poverty guidelines. Public assistance programs typically define eligibility income limits as some percentage of the federal poverty level.

Number of People Supported at Poverty Level by Participant Income

	2004		2006		2008		2010		2011		2012	
	Completers	All										
Number of people supported at poverty level	14.2	7.8	12.2	7.9	13.6	9.4	14.4	9.5	13.2	8.3	13.6	10.6
Number of people supported at 200 percent poverty	6.1	2.9	5.2	3.0	5.9	3.7	6.2	3.8	5.7	3.2	5.9	4.4

Apprentices Receiving Benefits from Employers

Performance Measure	2004	2006	2008	2010*	2011	2012*
Self-Reported Medical Benefits from Employer	87%	83%	81%	N/A	85%	N/A
Self-Reported Retirement Benefits from Employer	80%	82%	68%	N/A	81%	N/A

* Due to budget limitations, the Workforce Board's Participant Survey was not conducted in 2010 or 2012.

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

Employment and Earnings Trends for Apprentices

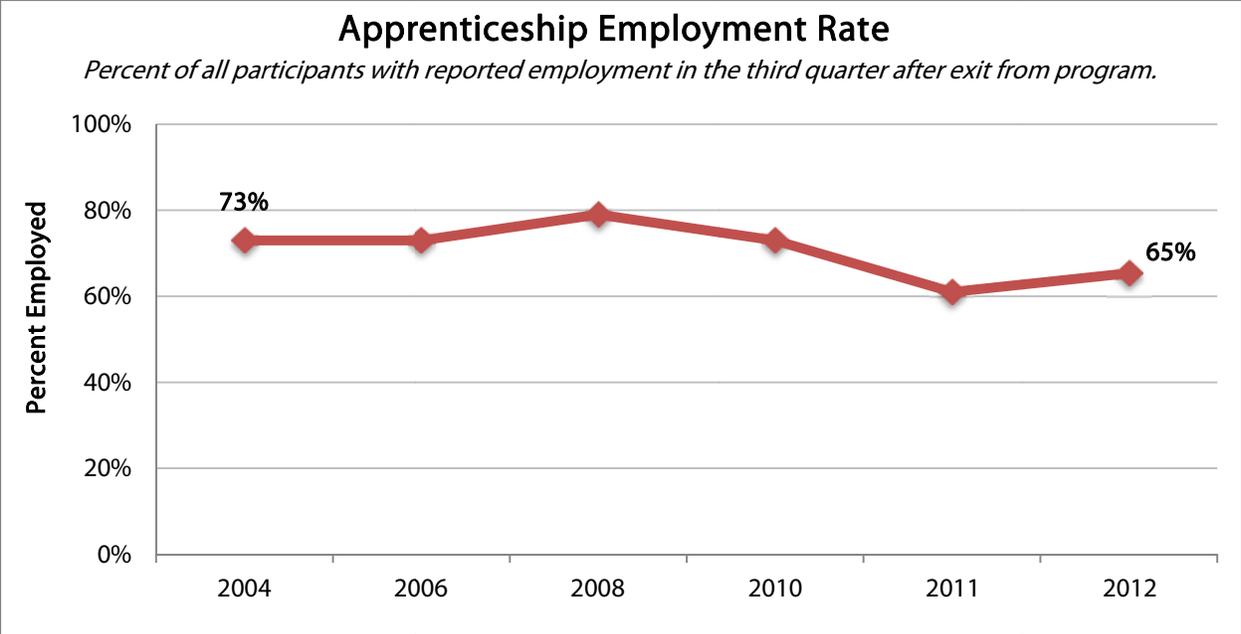
Performance Measure	2004	2006	2008	2010	2011	2012
Employment Rate (Self-Reported)	87%	87%	91%	N/A	78%	N/A
Employment Rate* (State Records)	73%	73%	79%	73%	61%	65%
Full Time Employment**	60%	61%	69%	65%	59%	64%
Median Quarterly Hours	442	451	476	465	444	468
Median Hourly Wage***	\$25.11	\$25.33	\$25.82	\$26.25	\$25.45	\$28.46
Median Annualized Earnings***	\$37,681	\$38,334	\$43,857	\$44,549	\$39,844	\$47,637

**These figures apply to those with employment reported to ESD 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.*

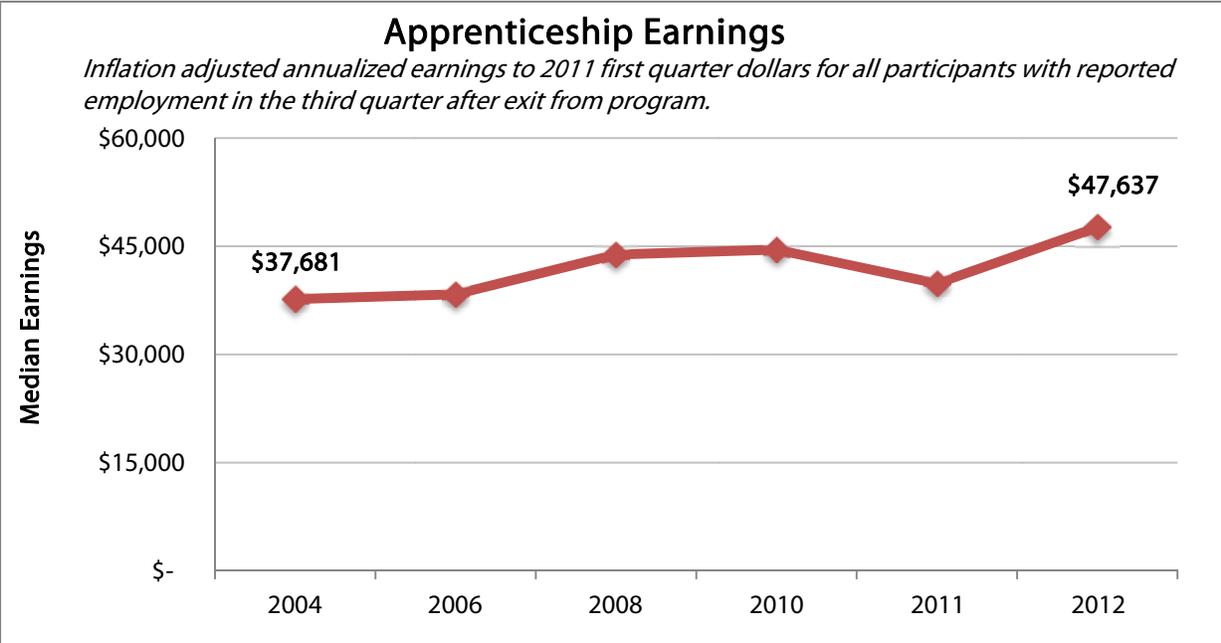
***Full-time employment averages 30 or more hours per week.*

****Earnings/wages expressed in first quarter 2011 dollars in order to account for inflation.*

Between 2004 and 2008, apprentices experienced increased earnings and employment. However, in 2010 employment decreased, and in 2011 employment decreased while earnings remained relatively stable. In this year's report both earnings and employment have increased compared to last year's findings. Employment rose from 61 percent to 65 percent, and median annualized earnings jumped dramatically from \$39,844 to \$47,637.



Source: Workforce Training Results 2004-12.



Source: Workforce Training Results 2004-12.

Apprenticeship Employment by Industry

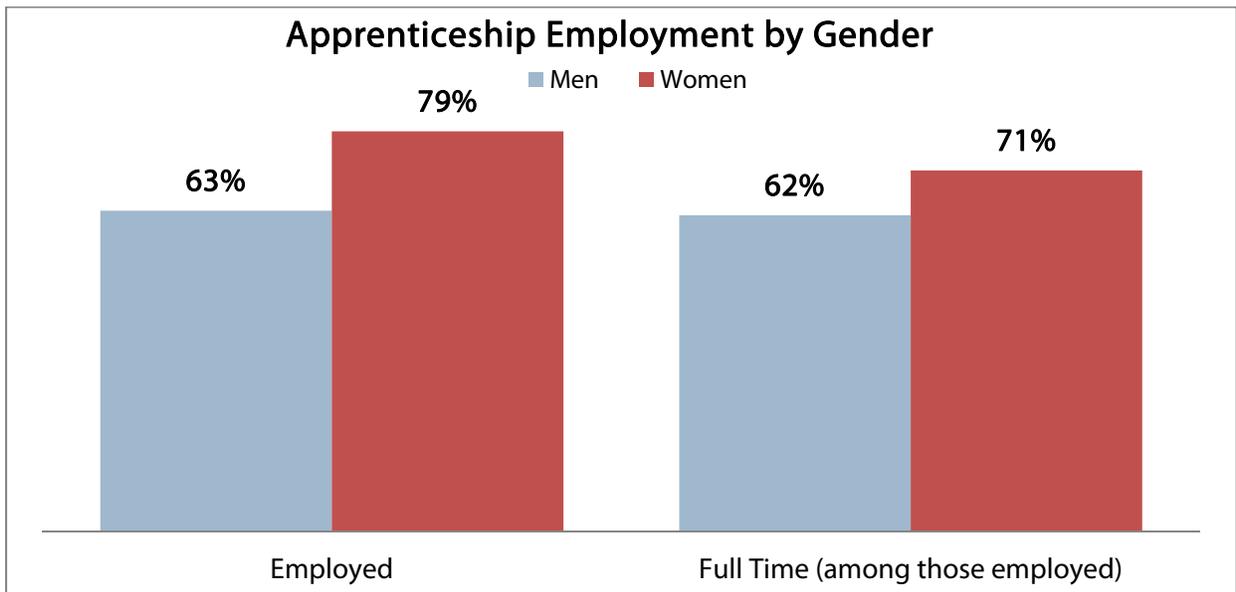
The majority of Apprenticeship program participants who were reported to be employed held jobs in construction (45.4 percent), services (18.6 percent), public administration (18.3 percent) retail trade (4.8 percent), and manufacturing (4.5 percent) industries. The number of Apprentices employed in the construction industry increased 27 percentage points between the 2011 and 2012 reports, following a 30 percentage point drop between 2008 and 2010. Apprentices working in the public administration industry increased 15 percentage points. The number of apprentices working in services dropped from 25.1 percent to 18.6 percent, and those who reported working in manufacturing dropped from 17.1 percent to 4.5 percent.

Industry Group	
45.4%	Construction (See Breakout Below)
18.6%	Services (See Breakout Below)
18.3%	Public Administration
4.8%	Retail Trade
4.5%	Manufacturing
3.9%	Transportation And Warehousing And Utilities
1.9%	Wholesale Trade
1.3%	Financial Services
0.9%	Natural Resources And Mining
0.4%	Information
Breakout of Construction Industry	
17.6%	Building Equipment Contractors
6.8%	Construction Of Buildings
6.4%	Heavy & Civil Engineering Construction
6.1%	Foundation, Structure & Building Exterior Contractors
6.0%	Building Finishing Contractors
2.5%	All Other Specialty Contractors
Breakout of Services Industry	
6.4%	Administrative And Support And Waste Management And Remediation Services
4.8%	Education Services
2.6%	Professional, Scientific, And Technical Services
1.5%	Health Care
1.5%	All Other Services
0.9%	Arts, Entertainment, And Recreation
0.5%	Social Assistance
0.4%	Accommodation And Food Services
<i>Note: Industry groups are based on North American Industry Classification System codes.</i>	

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

Wages and Employment Results Vary by Population

Wages and employment results can vary by gender, race and ethnicity, and disability.⁷ Women were more likely than men to be employed in the third quarter after leaving their apprenticeship (79 percent compared to 63 percent), and were more likely to be employed full-time (71 percent versus 62 percent). Of those employed, women had median hourly wages (\$27.12), which was 92.5 percent of men's wages (\$29.31), an increase of 17.5 percentage points from the prior report. However, women had median annualized earnings that were 106 percent of males (\$49,699 compared to \$46,952). This is a substantial increase over the prior report when female's median annual earnings were 76 percent of men's (\$29,524 compared to \$38,796).



Source: 2009-10 Apprenticeship Administrative Data, Department of Labor and Industries.

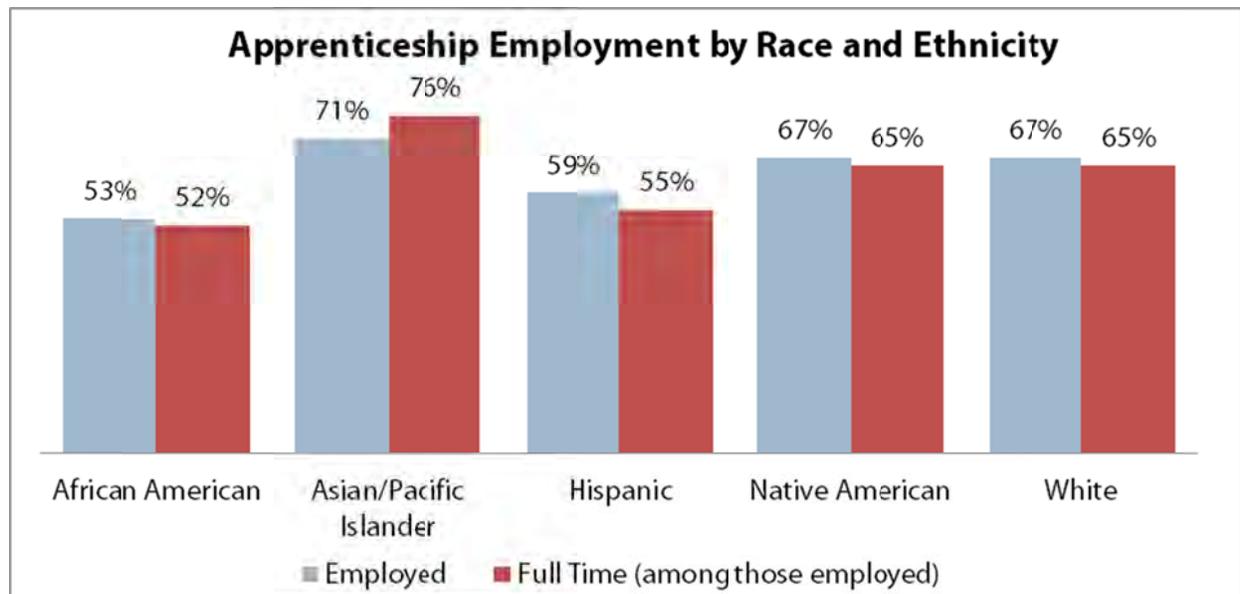
Race/Ethnicity Plays Role

African American apprentices were less likely than others to be employed in the third quarter after leaving their programs (53 percent). This employment rate compares to 67 percent for whites, 59 percent for Hispanics, 67 percent for Native Americans, and 71 percent for Asian Pacific Islanders. However, Asian/Pacific Islanders were more likely to be employed full time at 76 percent, with Native Americans and whites having a full time employment rate of 65 percent, and African Americans and Hispanics at 52 and 55 percent.

For those employed, whites had the highest median hourly wage at \$28.95. The median hourly wage for African American apprentices was 76 percent of whites (\$22.12), 99 percent for Asian/Pacific Islanders (\$28.78), 98 percent for Native Americans (\$28.40) and 81 percent for Hispanics (\$23.38).

⁷ Apprenticeship administrative records do not include information on disability status.

In terms of annual earnings, Asian/Pacific Islanders earned the most (\$55,996), followed by whites (\$50,195), Native Americans (\$44,975), Hispanics (\$33,729), and African Americans (\$30,868).



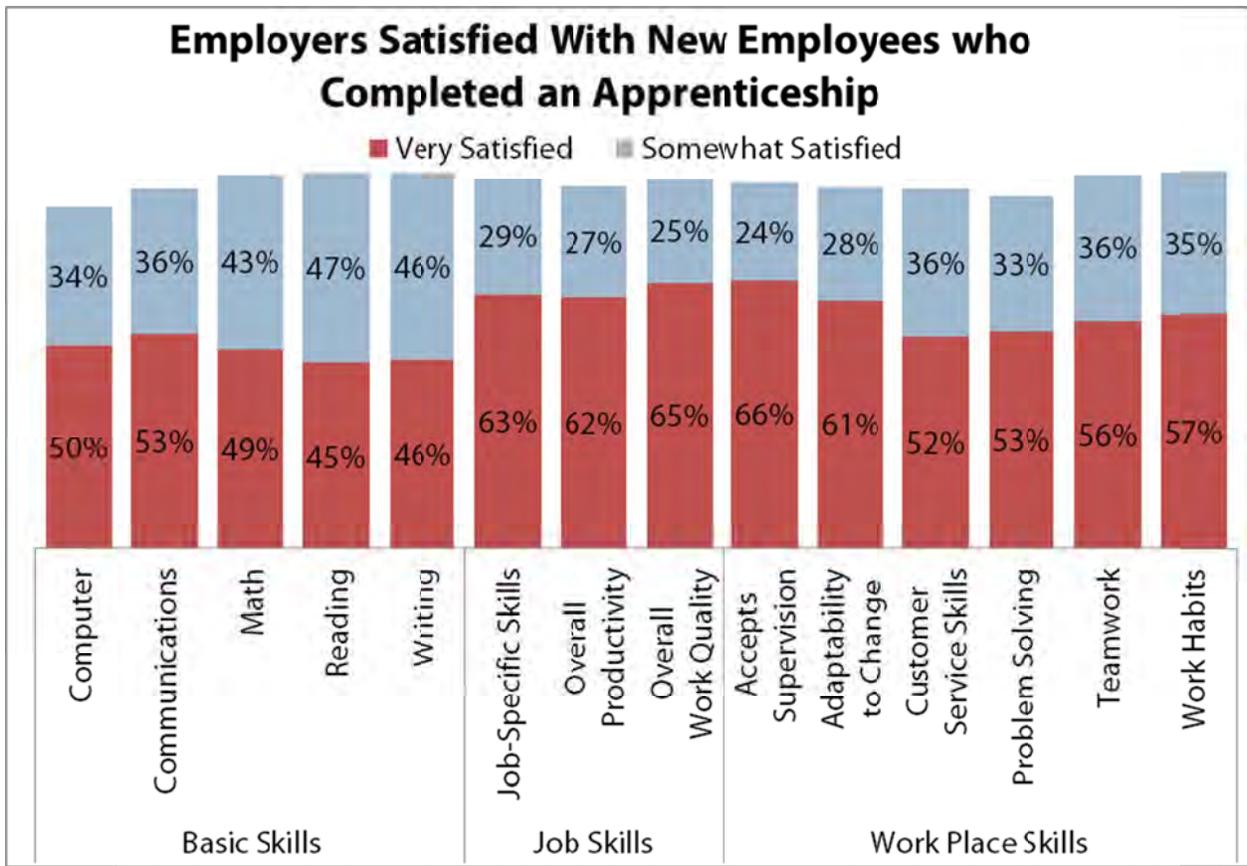
Source: 2009-10 Apprenticeship Administrative Data, Department of Labor and Industries.

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 91 percent of employers said they were either “somewhat satisfied” or “very satisfied” with the overall work quality of these new employees.

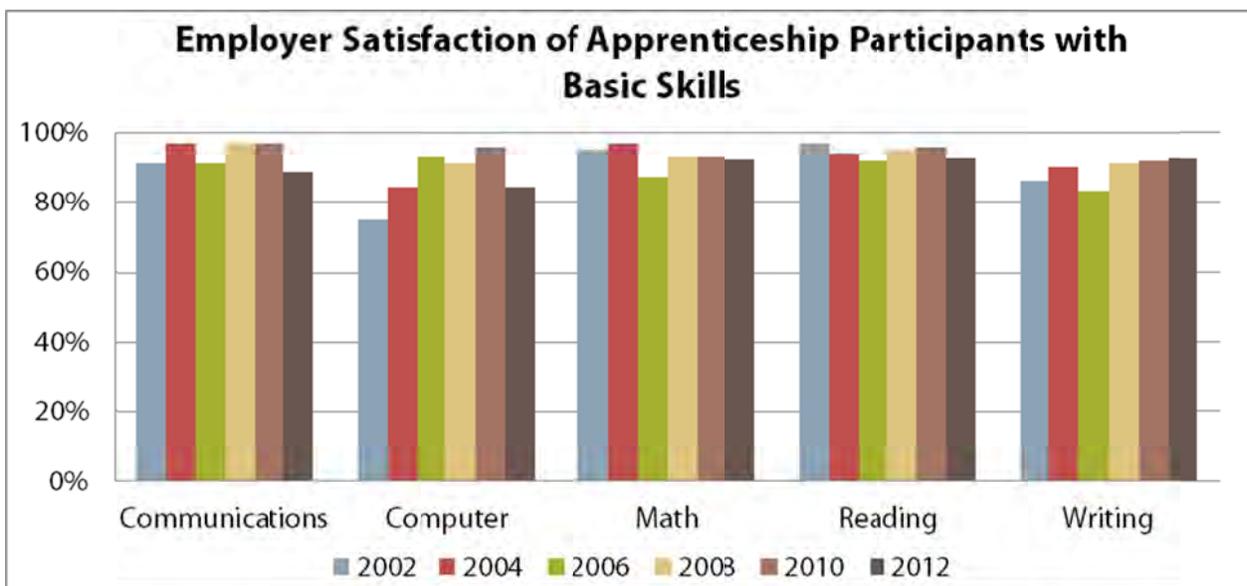
Employer satisfaction is broken down into three categories: Basic Skills, Job Skills and Work Place Skills. Basic skills refer to reading, writing, math, communication and computer skills. Job skills refer to skills specific to the job, as well as overall work quality and productivity. Work place skills 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 having positive work habits and attitudes.

In 2012, employers report highest overall satisfaction in the basic skills category with reading, writing, and math. For job skills, their highest overall satisfaction was with job specific skills, and overall work quality. Among work place skills, employers were most satisfied with apprentices’ work habits and teamwork skills.

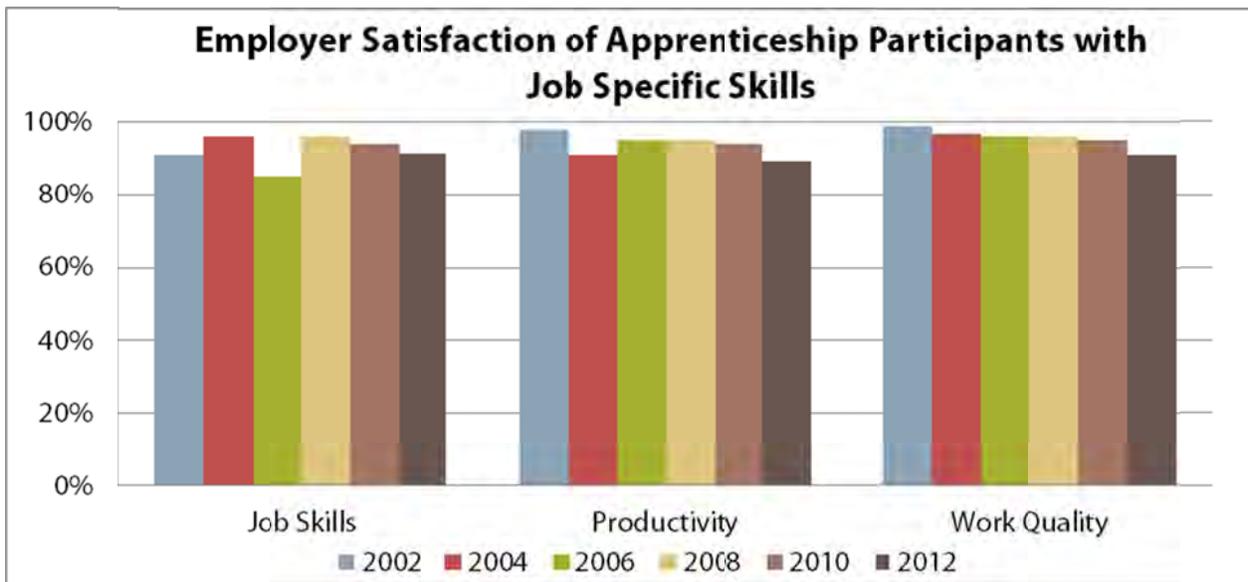


Source: Workforce Board Employer Survey conducted in 2012.

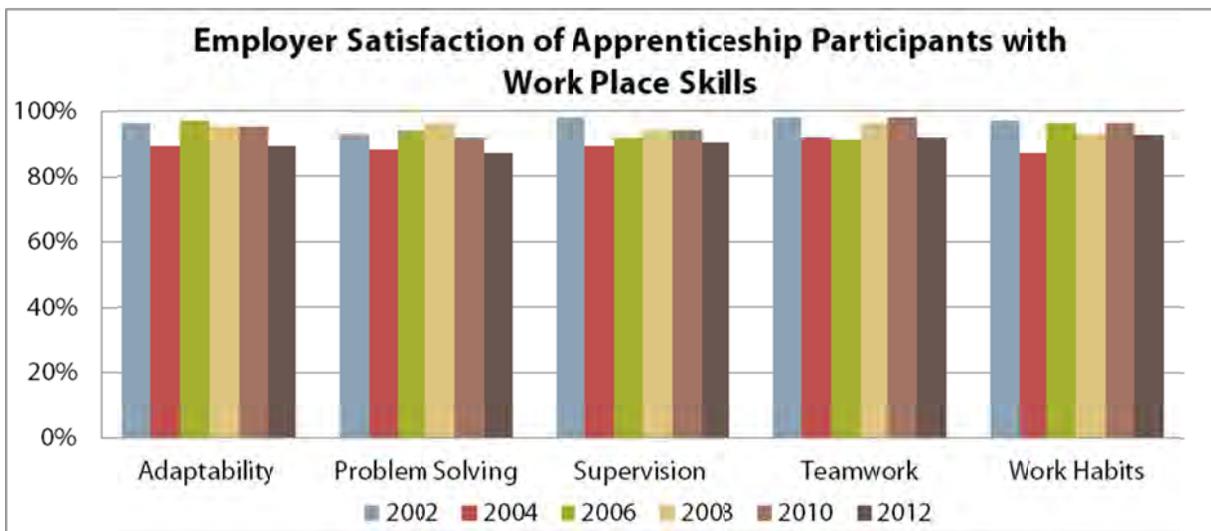
Overall, the levels of employer satisfaction reported in the Workforce Board's 2012 Employer Survey are lower than the previous survey, conducted in 2010. The following three charts show the overall satisfaction of employers with new employees who recently completed an apprenticeship program.



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



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



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

Participant Survey - Did Participants Get the Skills They Needed?

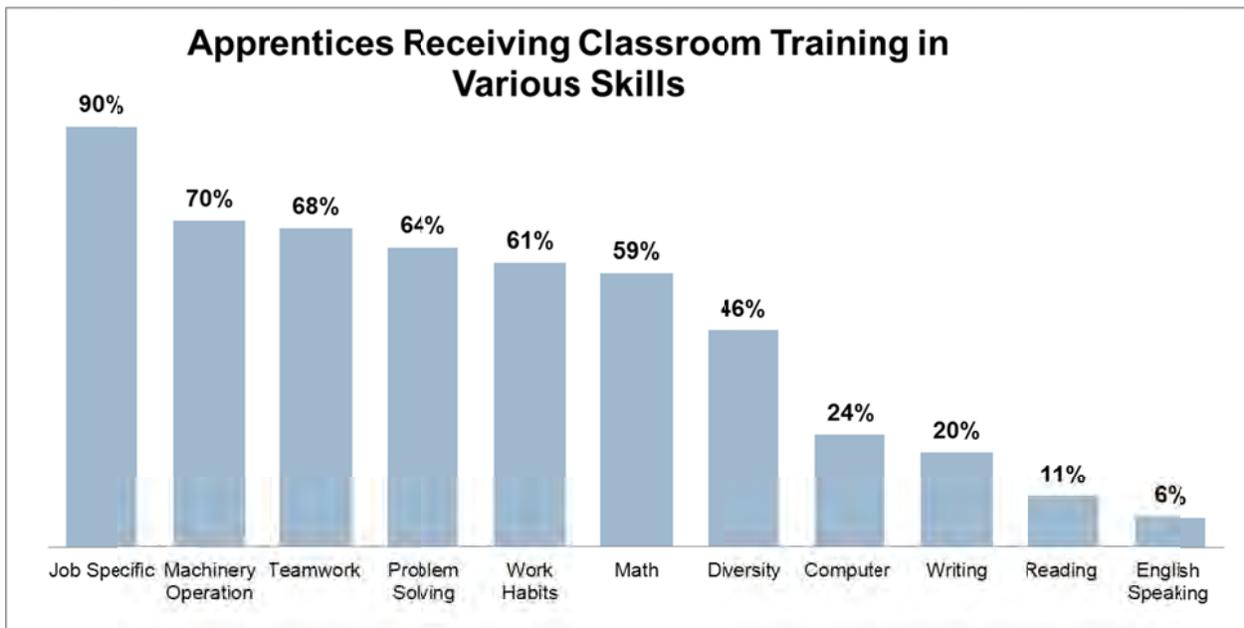
In 2011 the Workforce Board surveyed Apprentices who had left their program in 2009-10. The survey provided data on employment and participant satisfaction with the training. The survey was conducted by telephone and was completed by 317 participants.

Of the apprentices leaving their program who answered questions for the 2011 Participant Survey, 37 percent completed their apprentice program, which is a decrease of 5 percentage points from the previous survey conducted in 2008.

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. They receive both on-the-job training and classroom training.⁸

Classroom Training

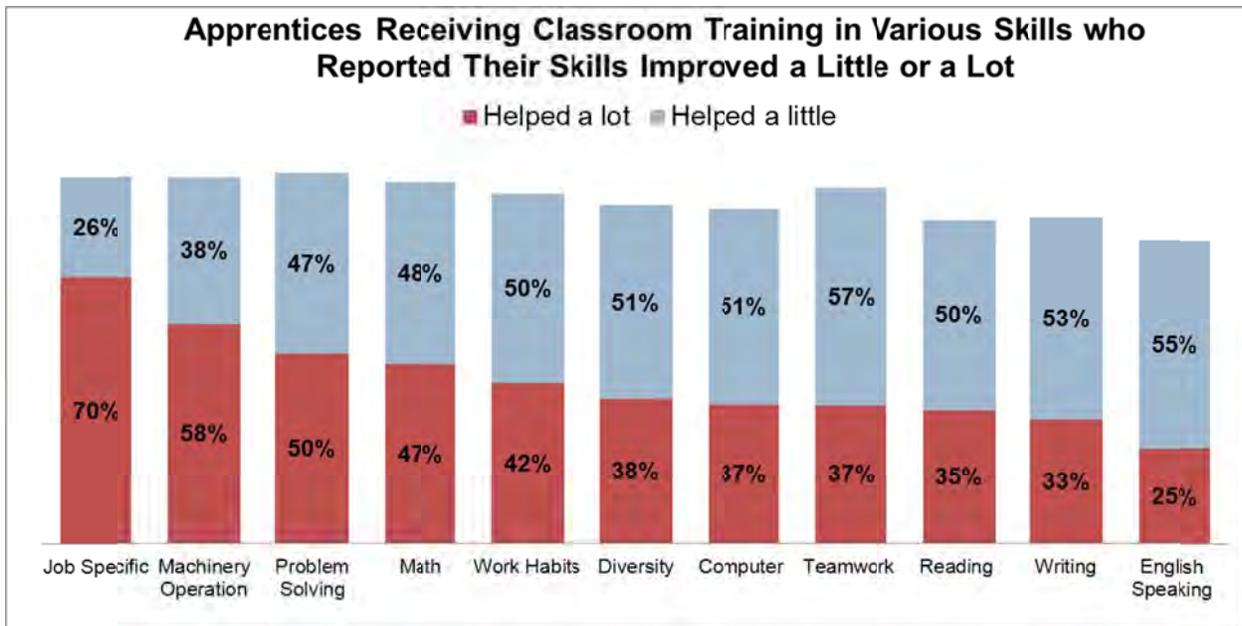
Apprentices receive various skills training, both in the classroom and during on-the-job training. During classroom training, apprentices were least likely to receive basic skills training such as English speaking, reading, and writing skills. One exception is the 59 percent of apprentices who received math skills training. Apprentices were most likely to receive training in job specific skills (90 percent). These results are similar to surveys completed in previous years.



Source: Workforce Board's Participant Satisfaction Survey 2011.

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 2011 survey indicated similar levels of improvement overall when compared with apprentices from 2008. However, compared to 2008, fewer apprentices reported the training they received in problem-solving, math and job specific skills helped "a lot." An increasing number reported that training in those areas helped "a little." One significant drop was in work habits. Apprentices reporting that work habits training helped "a lot" dropped by 9 percentage points.

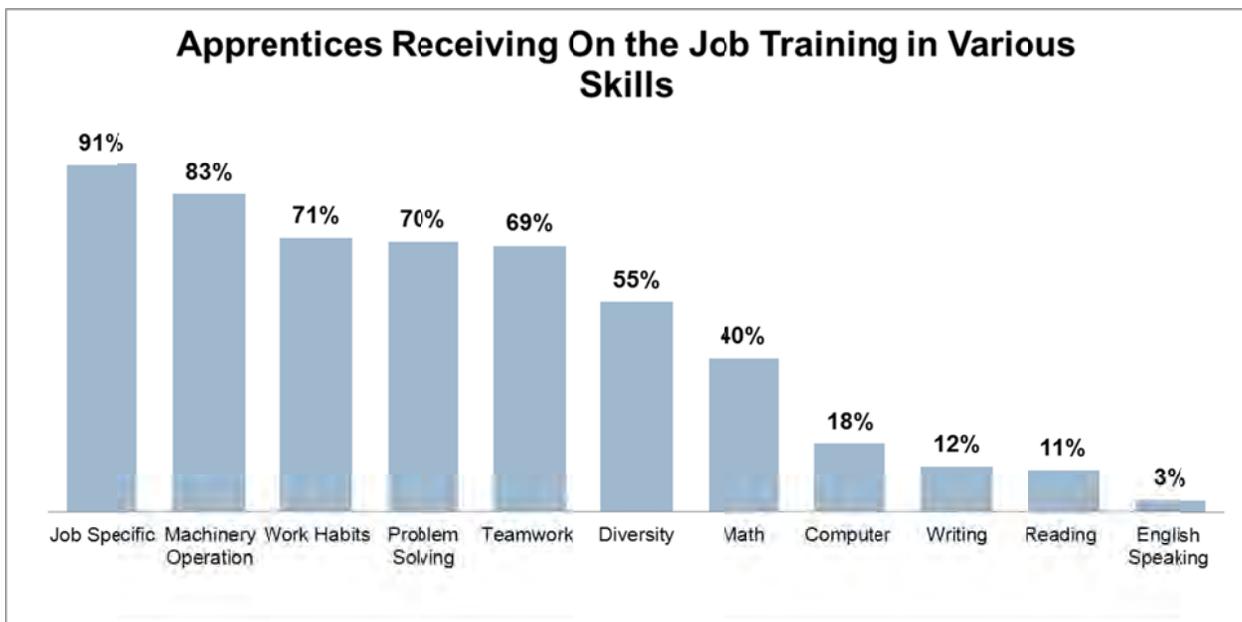
⁸ Apprentices are required to participate in at least 144 hours of classroom training annually.



Source: Workforce Board's Participant Satisfaction Survey 2011.

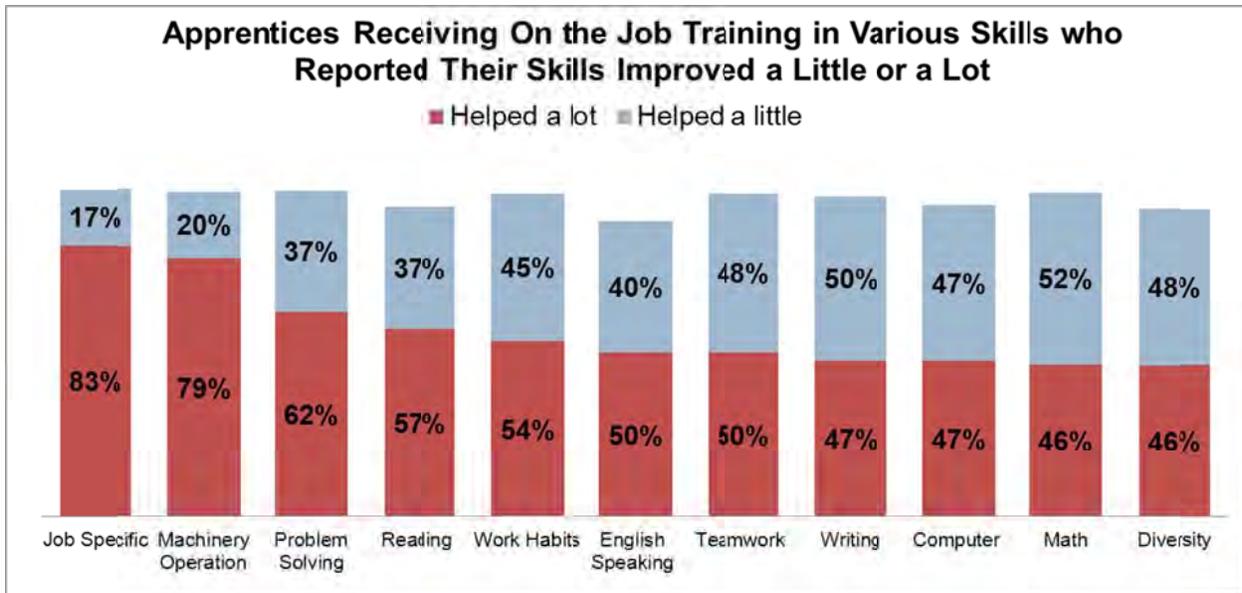
On-the-Job Skills Training

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 2008 and 2011. The exceptions are the level of apprentices receiving training in work habits and math skills, both of which increased 7 and 6 percentage points respectively. However, the level of apprentices receiving training in problem solving skills declined 10 percentage points in the same time period.



Source: Workforce Board's Participant Satisfaction Survey 2011.

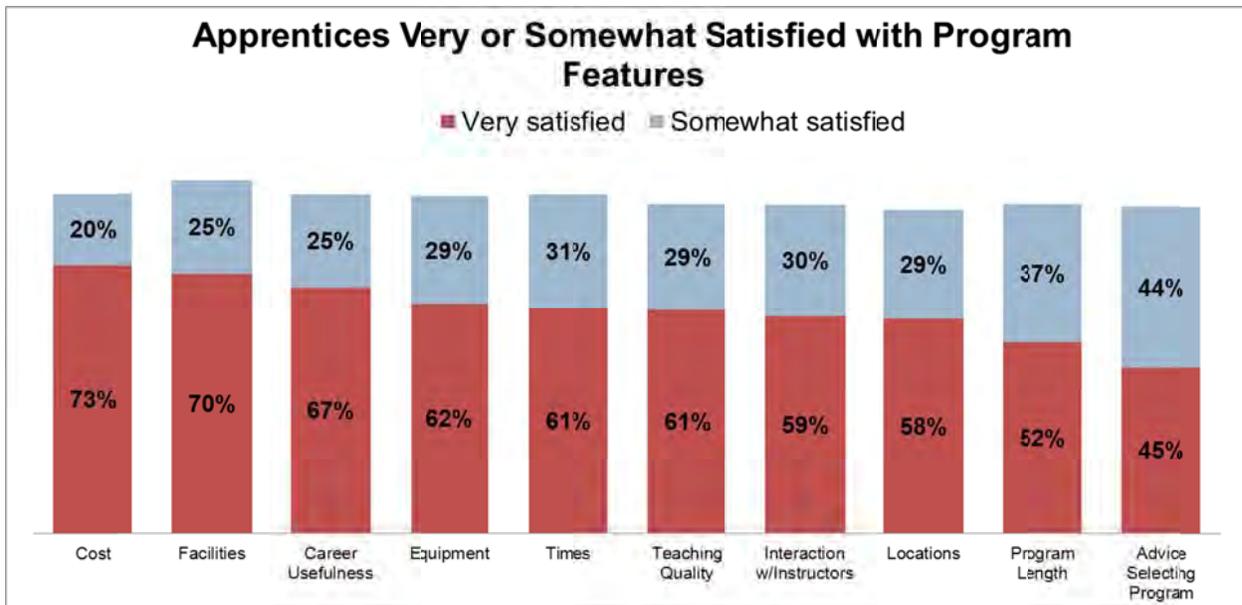
Apprentices continue to highly rate the skills received from on-the-job training. As expected, the highest percentages indicated “a lot” of improvement in their job-specific and machinery operation skills. In fact, the percentage of apprentices who indicated their job-specific skills improved “a lot” increased by 7 percentage points.



Source: Workforce Board’s Participant Satisfaction Survey 2011.

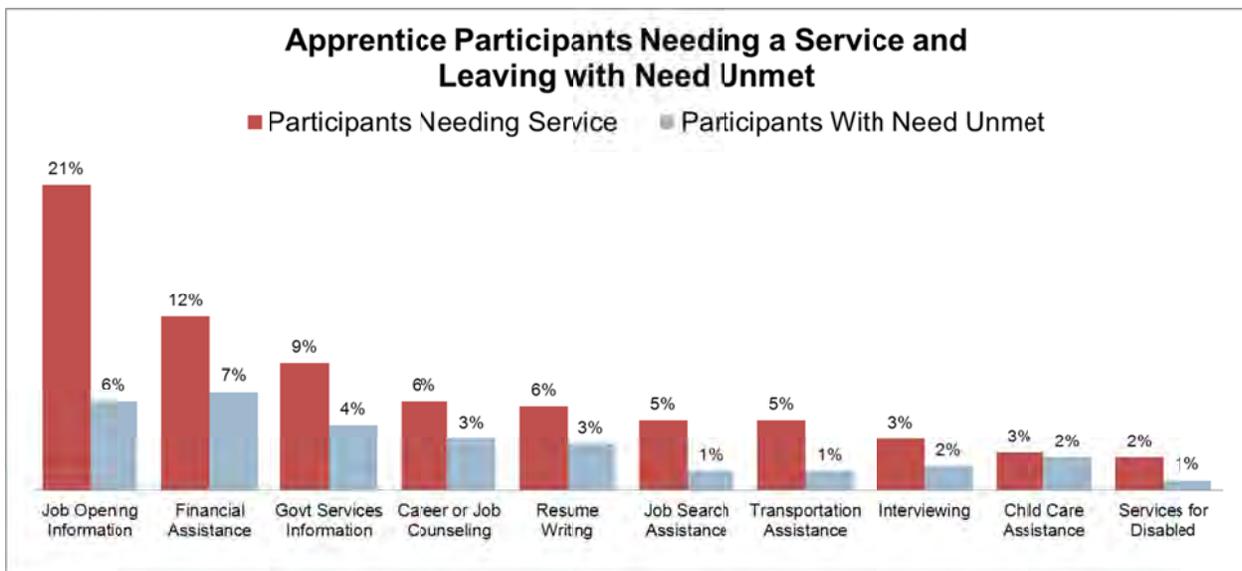
Participant Satisfaction

The apprentices surveyed in 2011 expressed similar high levels of overall satisfaction as in the previous study: 90 percent expressed satisfaction with their classroom training and another 88 percent with their on-the-job training. Some 86 percent met their educational objectives by participating in the training, up from the 75 percent of the apprentices in the 2008 survey. Overall satisfaction with program features has increased in every category. The largest gains in satisfaction have been in cost (“very satisfied” up 15 percentage points) and in location (“very satisfied” up 15 percentage points). However, apprentices reporting that they are “very satisfied” with program facilities and career usefulness has dropped 9 percentage points in both categories.



Source: Workforce Board's Participant Satisfaction Survey 2011.

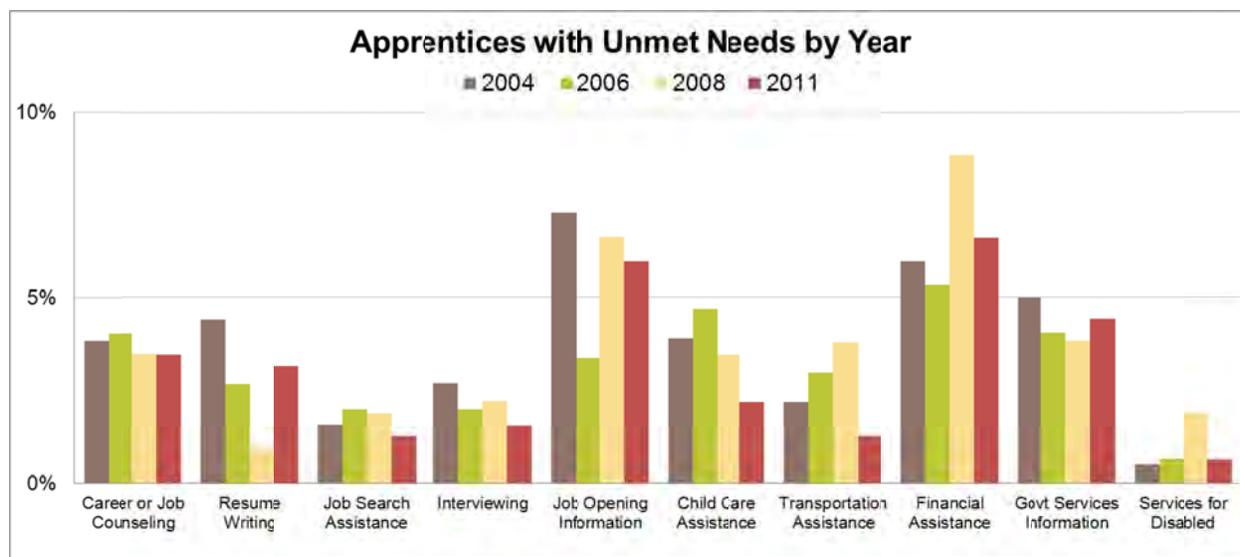
Apprentices reported a much lower need for support services than participants in the other programs included in the survey. Their greatest needs were for information on job openings, financial assistance, and government services information. In some cases their needs were not met. Of apprentices leaving their program, 7 percent left with an unmet need⁹ for financial assistance, and 6 percent left with an unmet need for job opening information.



Source: Workforce Board's Participant Satisfaction Survey 2011.

⁹ 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.

The percentage of apprentices with unmet needs has dropped in nearly every category since the last survey. However, the percentage reporting unmet needs for government services information and resume writing has increased since 2008.



Source: Workforce Board's Participant Satisfaction Survey 2011.

Relationship of Training to Employment

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.

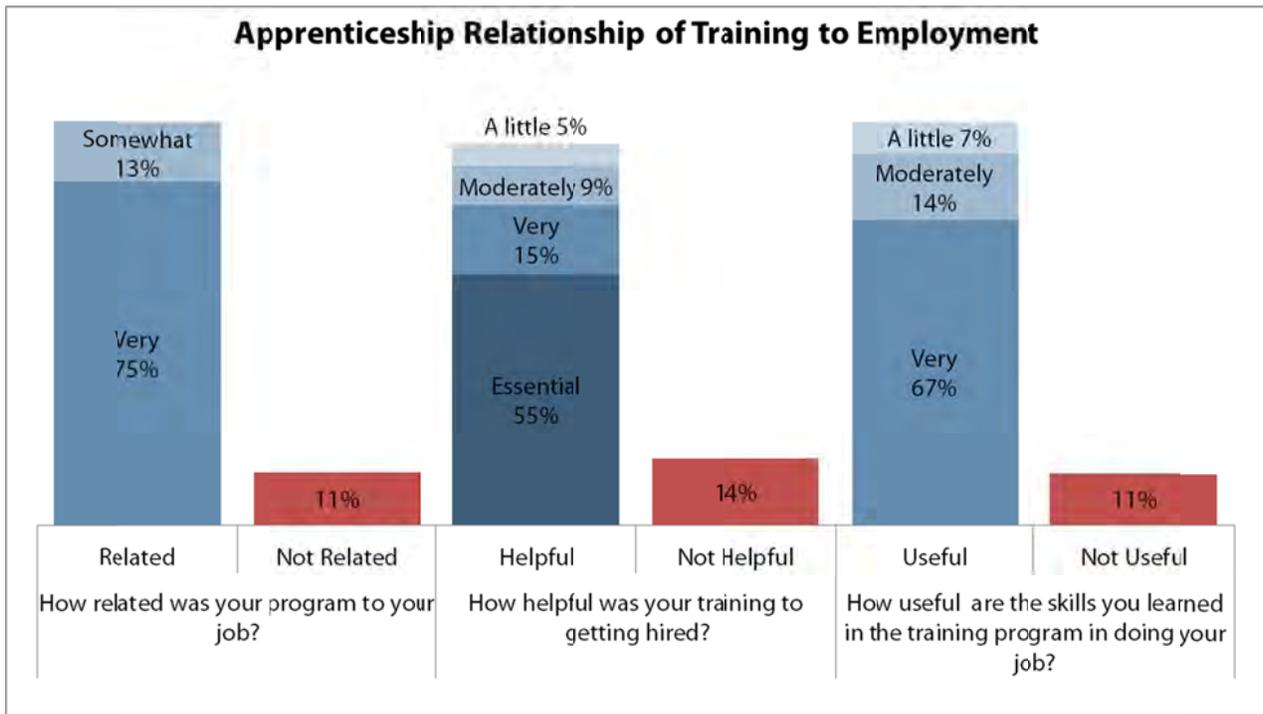
Among apprenticeship participants employed seven to nine months after leaving a program, 75 percent said their training was "very related" to their job. A further 13 percent reported the training was "somewhat related" to their job. Just 11 percent indicated that the training was not related to their job. In 2008, employed participants reported lower rates of training related to employment; only 72 percent indicated their training was either "very" or "somewhat" related to their job.

Apprenticeship participants surveyed in 2011 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 15 percent indicated it was "very important," and 9 percent reported it was "moderately important." Only 14 percent indicated their training was "not important at all" to getting their job.

Nearly 90 percent participants said the skills they learned in their training program were useful in doing their job. Some 67 percent of participants indicated the skills were “very useful,” 14 percent said “moderately useful,” and 7 percent “a little useful.” The remaining 11 percent of participants who were employed indicated the skills were “not useful at all.”

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

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 7 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.



Source: Workforce Board’s Participant Satisfaction Survey 2011.

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.

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**	\$8.20	\$9.12	\$13.80	\$15.15
Net Hours Employed per Quarter Impact	46.9	26.4	71.8	43.0
Net Annualized Earnings Impact**	\$19,299	\$18,397	\$33,700	\$31,393

[^]Short-term is 3 quarters after program exit; Long-term is average across 3 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 2011 dollars, represent the average difference between Apprenticeship participants who got jobs and those in the control group who were employed.

As can be 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 over the longer term. For example, long-term apprenticeship completers earned about \$31,000 more per year than those who did not participate in such a program. Also, it’s clear that completing an apprenticeship yields 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.¹⁰ 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 2011 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	\$36,770	\$0	\$314,829	\$0	
Fringe Benefits	\$7,354	\$0	\$62,966	\$0	
Taxes	-\$9,645	\$9,645	-\$82,580	\$82,580	
Transfers					
UI	\$859	-\$859	\$1,538	-\$1,538	
Costs					
Foregone net comp.	\$22,629	\$6,009	\$22,629	\$6,009	
Program costs	-\$1,791	-\$3,484	-\$1,791	-\$3,484	
Benefits	\$35,338	\$8,786	\$296,753	\$81,042	
Costs	\$20,837	\$2,526	\$20,837	\$2,526	
Total (Net)	\$56,176	\$11,311	\$317,591	\$83,567	\$401,158.39

Note: Benefits and costs are expressed in 2011 first quarter dollars.

For each apprentice in training, the public (taxpayer) cost is \$3,484 over the length of their enrollment, and the participant cost is \$1,791 in tuition. By definition, apprentices work during their program participation and their net earnings during training was \$22,629 higher than those who were not in training. During the course of working life to age 65, the average apprentice will gain about \$337,000 in net earnings (net impact earnings plus earnings while

¹⁰ Upjohn estimated the impact of the net change in earnings on social security, Medicare, federal income, and state sales taxes.

in apprenticeship training) and about \$63,000 in employee benefits.¹¹ 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 \$317,591.

Projected participant net benefits to age 65 far outweigh public investment in apprenticeship training by a ratio of \$91 to 1, or \$317,591 to \$3,484.

From the time of leaving training to age 65, the public is expected to gain about \$82,580 per apprentice in net additional Social Security, Medicare, federal income, and state sales taxes. The estimated lifetime net benefit to taxpayers is \$83,567 per participant.

Projected taxpayer net benefits to age 65 outweigh public costs invested in apprenticeship training by a ratio of \$23 to 1 or \$81,042 to \$3,484.

¹¹ 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 \$48,000.