

Workforce Participation

Washington State High School Graduates, 2008-09

The Washington State Education Research & Data Center (ERDC) is charged with conducting analyses of early learning, K-12, and higher education programs and education issues across the P-20 system. ERDC focuses on longitudinal education studies, particularly those that involve transitions across education sectors and those that involve workforce-education connections. This study focuses on the overlap between enrollment and employment during high school years and at the transitions that occur at high school graduation.

PURPOSE

Two fundamental questions concerning students and employment have been posed to ERDC:

- What are the employment patterns of recent high school graduates during the year after graduation?
- How many high school students are employed while in high school?

To address these questions, ERDC has examined workforce participation by students enrolled in their last two years of high school and the characteristics of workforce participation of high school graduates in the year after leaving high school for the high school graduates of 2008-09.

In addition to responding to these two questions, the findings presented here demonstrate a variety of possibilities of linking education and employment data in P-20 studies. This study is exploratory in nature and is not intended to be an all-encompassing or an in-depth study.

This study also serves as the deliverable in section (b)(1) of Washington's State Fiscal Stabilization Funding plan (America COMPETES Element 12): "other information determined necessary to address alignment and adequate preparation for success in postsecondary education."

DATA SOURCES

Postsecondary participation by 2008-09 Washington public high school graduates has been examined in an earlier ERDC research brief and a discussion of related data elements is included in Appendix A.¹ Data used in that study included:

- High school graduate data from the Office of Superintendent of Public Instruction (OSPI);
- Enrollment data for the state's community and technical colleges (public 2-year colleges) from the State Board for Community and Technical Colleges (SBCTC);
- Enrollment data for Washington public baccalaureate ("4-year") institutions from the Public Centralized Higher Education Enrollment System (PCHEES) established in the Office of Financial Management (OFM); and
- Enrollment data for private institutions in Washington and all out-of-state institutions from the National Student Clearinghouse (NSC).²

This study incorporates administrative data from the Washington State Employment Security Department (ESD) to assess employment status of the 2008-09 graduates during high school and in the first year after high school graduation. For individuals employed by employers participating in the Unemployment Insurance (UI) program, these data provide information about the industry of the employer, total earnings and hours worked for each calendar quarter. This data source does not capture self-employment earnings in jobs such as babysitting and lawn care, which are commonly held by high school students, however. A description of the Unemployment Insurance program, including data availability and timing, is included in Appendix B.

Of the 61,685 2008-09 high school graduates leaving high school during 2009, workforce participation for 45,077 (73 percent) could be assessed, based upon the availability of social security number in students' P-20 records.³ The discussion that follows is limited to this subset of all graduates.

Table 1 shows the correspondence between calendar quarters (for which UI wage data is available) and the corresponding school enrollment time periods. Employment during the fourth quarter of 2007 through the second quarter of 2008 was considered employment during the student's junior year. Employment during the fourth quarter of 2008 through the second quarter of 2009 was considered employment during the student's senior year. If a student was employed during July-September of 2008 and not employed during the fourth calendar quarter or the first calendar quarter in either the junior or senior years of high school, the student's employment was considered as

¹ "Participation in Postsecondary Education: Washington State High School Graduates, 2008-09," ERDC, December 2009. <<http://www.erd.c.wa.gov/briefs/pdf/201005.pdf>>

² Funding for NSC data acquisition was provided by U.S. Department of Education, American Recovery and Reinvestment Act (ARRA) Statewide Longitudinal Data Systems (SLDS) Grant Program.

³ Social security number is required for linkage to employment records in Washington state. So that the timing of employment after high school graduation could be evaluated consistently, 2008-09 high school graduates exiting high school during summer and fall 2008 were excluded from this study.

“summer-only” employment. In some cases the summer-only employees had earnings in the second quarter, probably in the weeks following the end of the school year in early June.

Table 1: Relationship between calendar years and quarters and school/academic terms

Calendar Year	2007	2008				2009				2010	
Quarter	4	1	2	3	4	1	2	3	4	1	2
Months	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
Enrollment	High School							Post-High School			
	High School Junior Year			Summer	High School Senior Year			Summer	Post-High School Year		

Enrollment and Employment

Over 75 percent of the graduates had earnings in Washington either during high school or during the post-high school year, or both. Table 2 summarizes the workforce participation by the timing of employment relative to the high school calendar.

Table 2: Summary of employment status of 2008-09 high school graduates

	Count	Percent of Total
Total evaluated for workforce participation	45,077	100%
Total with earnings	34,071	76%
Total with earnings during last two years of high school*	28,159	62%
Earnings during school year (either junior or senior year or both)**	25,638	57%
Earnings during summer 2008 only	2,521	6%
Earnings post-high school (beginning 2nd quarter 2009)*	25,505	57%

*Many students have earnings in both high school and in the post-high school year.

The discussion that follows will focus first on students employed while in high school and then graduates' employment characteristics after leaving high school.

How much do students work while in high school?

Over 56 percent of the graduates were employed during the regular school year in either their junior or senior year or both. To examine the characteristics of employment during high school, students were classified as to the "intensity" of their employment.⁴ State law limits the number of hours a 16- to 17-year-old can work. Generally, a high school student can work no more than 28 hours per

⁴ Employment intensity concepts were patterned after those presented by Robert Bozick in *Student Employment During the Transition to College in the United States*. RTI Press publication No. RR-0001-0802. Research Triangle Park, NC: RTI International. Retrieved January 20, 2011, from <http://www.rti.org/rtipress>.

week in non-agricultural activities.⁵ For this study, students averaging 14 hours per week or more – half of the maximum – through a school year were considered to be employed at a "high intensity" level. Students working less than an average 14 hours per week were considered to be employed at a "low intensity" level. Table 3 shows the classification used to characterize employment characteristics of the study group during the high school years.

Only those students enrolled in public high schools in Washington in both their junior and senior years – 44,612 students – were included in the analysis of employment patterns of high school students.

Table 3: High School Employment Intensity Categories

Category	Description
Steady, high intensity	Employment averaging 14 hours per week or more during both junior and senior school years (summers excluded)
Steady, low intensity	Employment averaging less than 14 hours per week during both junior and senior school years (summers excluded)
Steady, mixed intensity	Employment classified as high intensity in either junior or senior year and low intensity in the other
Senior year only	Students with earnings in the senior year but no earnings in the junior year
Junior year only	Students with earnings in the junior year but no earnings in the senior year
Summer only	Students employed in third quarter with no earnings in either the fourth quarter of the preceding year or the first quarter of the same year. Students in this category may show earnings in the second quarter of the same year since the school year typically ends in June (the last month of the second calendar quarter)

Table 4 shows the distribution of students in the study group by employment intensity. The most common employment pattern was "steady low intensity" – students employed at some point during the school year averaging less than 14 hours per week.

⁵ For additional detail, see Washington Administrative Code (WAC) 296-125: Non-agricultural Employment of Minors <<http://apps.leg.wa.gov/WAC/default.aspx?cite=296-125>>

Table 4: Employment during high school (2007 quarter 4 through 2009 quarter 2)

Category	Count	Percent of study group	Percent of students employed
Total evaluated for workforce participation	44,612	100%	
Total employed	28,008	63%	100%
Steady high intensity	1,776	4%	6%
Steady low intensity	10,505	24%	38%
Mixed			
Mixed intensity	3,468	8%	12%
Senior year only	6,588	15%	24%
Junior year only	3,150	7%	11%
Summer only	2,521	6%	9%

Table 5 shows the quarter-by-quarter counts of students with earnings by employment intensity during high school.

Table 5: Employment by quarter during high school (2007 quarter 4 through 2009 quarter 2)

High School Employment Category	Junior Year		Summer		Senior Year		
	2007		2008		2009		
	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter
Total graduates evaluated	44,612	44,612	44,612	44,612	44,612	44,612	44,612
Total employed	13,165	13,466	16,496	20,670	17,935	16,849	19,424
Steady high intensity	1,755	1,768	1,771	1,762	1,769	1,766	1,765
Steady low intensity	6,643	6,991	9,043	9,166	8,636	7,752	8,508
Mixed	4,767	4,707	5,092	7,853	7,530	7,331	8,415
Summer only	--	--	590	1,889	--	--	736
Percent employed	30%	30%	37%	46%	40%	38%	44%

Note: Employment in the second quarter shown for the "summer only" employed students is assumed to be associated with summer employment starting in June.

In what industries do high school students work?

The UI wage data include information about the industry classification of employers using the North American Industry Classification System (NAICS).⁶ While the industry of an establishment does not explicitly indicate the job that a person holds, it can provide useful information as to the nature of the work being done. Two industry sectors account for over half of high school students employed: Trade, Transportation, and Utilities, which includes Retail Trade; and Leisure and Hospitality, which includes Accommodation and Food Services. Employment of high school students by industry supersector is shown in Table 6.

⁶ See Appendix C for a discussion of NAICS.

Table 6: Employment by Industry Supersector, high school students with earnings

Industry supersector	Total	Employment during school year		Share of total employment		
		Summer only		Total	During school year	Summer only
All industries	28,008	25,487	2,521	100%	100%	100%
Natural resources and mining	903	633	270	3%	2%	11%
Construction	539	415	124	2%	2%	5%
Manufacturing	550	476	74	2%	2%	3%
Trade, transportation, and utilities	8,179	7,748	431	29%	30%	17%
Information	639	594	45	2%	2%	2%
Financial activities	500	462	38	2%	2%	2%
Professional and business services	1,231	1,071	160	4%	4%	6%
Education and health services	2,816	2,507	309	10%	10%	12%
Leisure and hospitality	10,703	9,944	759	38%	39%	30%
Other services and public administration	1,948	1,637	311	7%	6%	12%

How many different jobs do high school students have?

It is not possible to determine the number of jobs held by students, since neither job title nor occupation information is included in the UI wage record. It is possible to find the number of different employers a student has had over the course of employment during high school. On average, the graduates who were employed during the school year had 1.67 employers during their last two years of high school. The number of employers varied by the level of employment intensity, as shown in Table 7.

Table 7: Number of employers by high school employment intensity

Employment intensity	Number of employers					
	1		2		3 or more	
Total employed during high school	16,313	(58%)	7,739	(28%)	3,956	(14%)
Steady high intensity	871	(49%)	522	(29%)	383	(22%)
Steady low intensity	4,330	(41%)	3,899	(37%)	2,276	(22%)
Mixed						
Mixed intensity	1,346	(39%)	1,194	(34%)	928	(27%)
Senior year only	5,115	(78%)	1,248	(19%)	225	(3%)
Junior year only	2,394	(76%)	642	(20%)	114	(4%)
Summer only	2,257	(90%)	234	(9%)	30	(1%)

How do high school employment patterns vary by student characteristics?

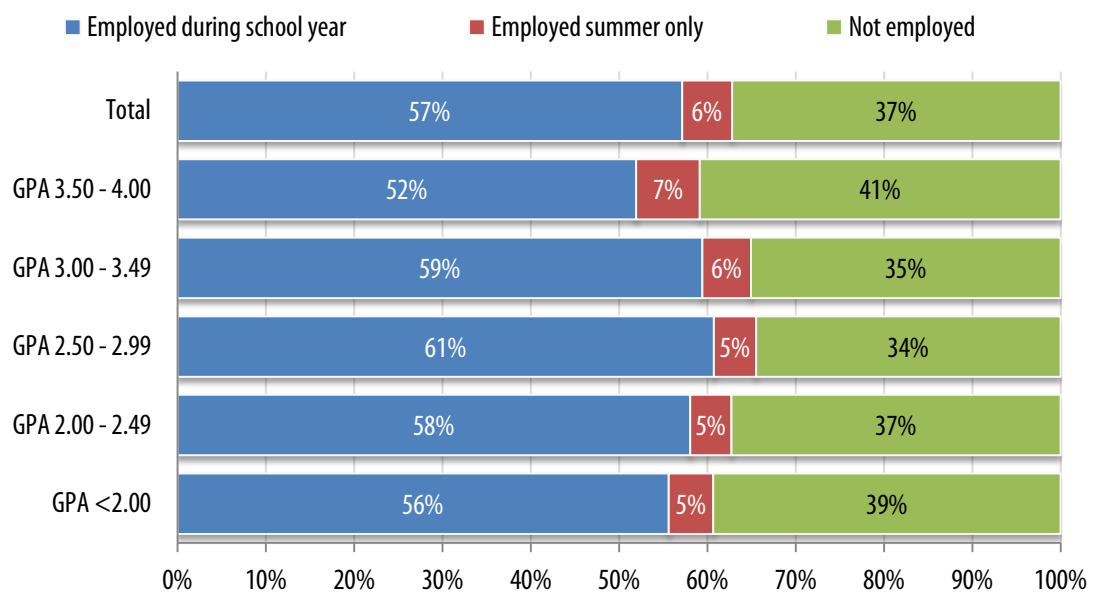
High school employment status was studied as it related to high school grade point average (GPA), income status, gender, and subsequent postsecondary enrollment status. Since the set of graduates

analyzed here contains a disproportionate share of students subsequently enrolling in postsecondary education, some of the conclusions drawn from this examination may bear further investigation. High school employment status broken out by student characteristics is shown in Figures 1 through 4. These relationships suggest the following points regarding student employment rates during the school year: Each of these observations is statistically significant at the 5 percent level.

HIGH SCHOOL GRADE POINT AVERAGE

Students in the highest GPA category (3.5 or higher) are less likely to be employed while in high school than are students in the GPA range 2.5 to 3.5.

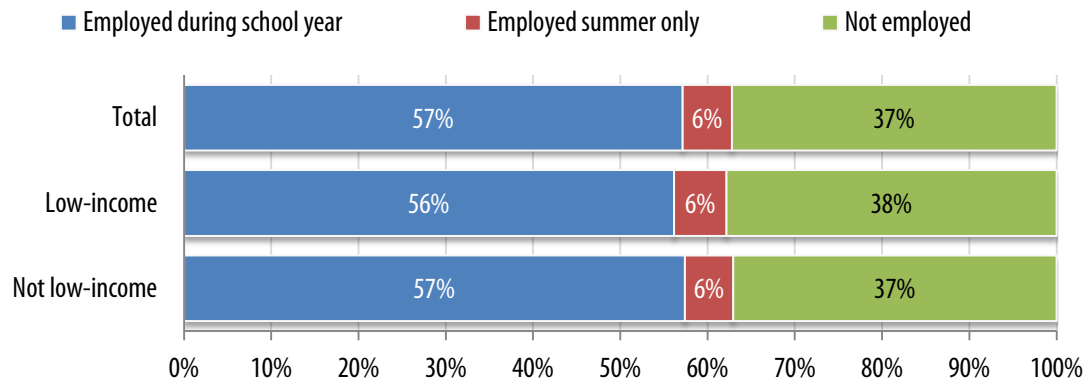
Figure 1: Employment status during high school by student grade point average (GPA)



HIGH SCHOOL STUDENT’S LOW-INCOME STATUS

There is a less dramatic, but statistically significant difference between students classified as low-income based on free and reduced-price lunch eligibility and those who are not. Students classified as low-income participate in the workforce at lower rates than the non-low-income students. Students are classified as low-income if they are eligible for free or reduced-priced lunch.

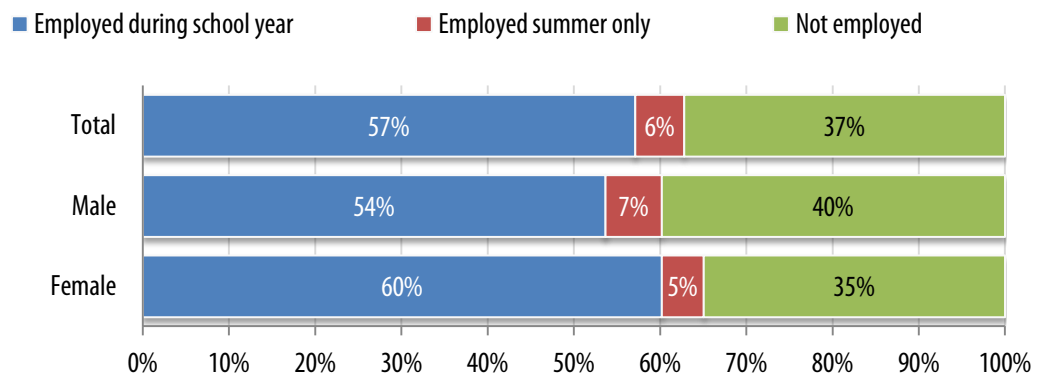
Figure 2: Employment status during high school by student low-income status



GENDER

Female high school students participate in the workforce at higher levels than male high school students.

Figure 3: Employment status during high school by student gender

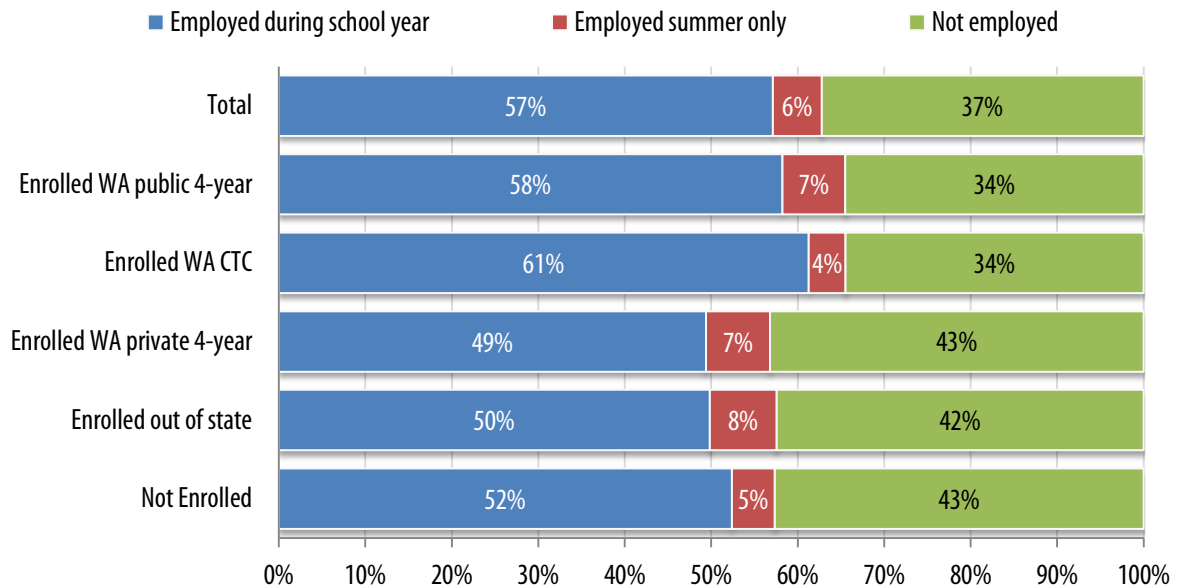


SUBSEQUENT POSTSECONDARY ENROLLMENT STATUS

Students who subsequently enroll in public higher education in Washington – both public 4-year institutions and community and technical colleges – participate in the workforce at higher rates than those who subsequently enroll in private institutions in Washington or out-of state institutions.

They also participate at levels higher than those who do not enroll in higher education in the first post-high school year.

Figure 4: Employment status during high school by student post-high school enrollment status (enrollment in 2009-10)



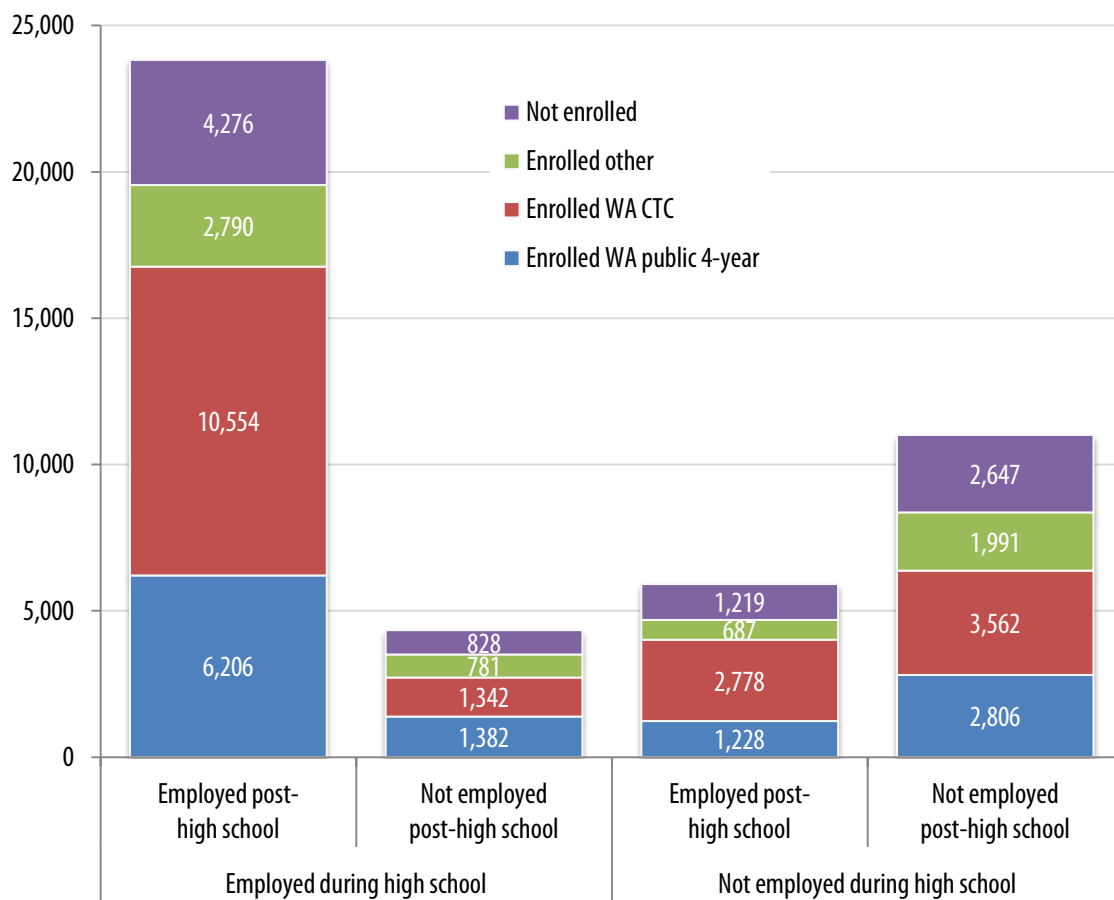
Appendix Table E-1 contains data related to Figures 1 through 4.

What are the post-high school employment characteristics of high school graduates?

During the year immediately following high school graduation, some students leave the state for further education or work, including military service. These individuals will not be included in Washington UI wage data and their employment patterns cannot be determined beyond high school at this time. The size of the group enrolling in postsecondary education out of state is known, but the number of students pursuing work or other activities elsewhere is not. Of the 2008-09 high school graduates assessed here, approximately 60 percent were employed in Washington at some point in the post-high school year.

Students employed during their high school years tend to continue employment into the post-high school year, as shown in Figure 5. This is particularly true for students continuing their education in the community and technical colleges. Related data is shown in Appendix Table E-2.

Figure 5: Relationship between employment status in high school and employment status in the post-high school year



Note: Students are classified based primarily on their postsecondary enrollment in Fall 2009. See Appendix A for details.

Graduates were classified as to the intensity of their employment in the post-high school year. Since full-time work is an option for the graduates, employment intensity was classified differently than for high school students. Employment during the fourth quarter of 2009 and the first and second quarters of 2010 was used in the evaluation of post-high school employment intensity during the traditional academic year. Summer-only employment was classified in a manner similar to that for high school students. This classification is described in Table 8.

Table 8: Post-high school employment intensity categories

Category	Description
Steady high intensity	Employment in each of 3 quarters and hours averaging 80% or more of the hours corresponding to full-time, 40-hour work week
Steady low intensity	Employment in each of 3 quarters and hours averaging less than 80% or more of the hours corresponding to full-time, 40-hour work week
Non-steady	Employment during one or two of the 3 quarters
Summer only	Employment during third quarter (July – September 2009) only

Table 9 shows the distribution of the graduates by employment intensity for the post-high school year. The most common employment patterns were "steady low intensity" and "non-steady."

Table 9: Employment during the post-high school year

Category	Count	Percent of study group	Percent of students employed
Total evaluated for workforce participation	45,077	100%	
Not employed	15,339	34%	
Employed	29,738	66%	100%
Steady high intensity	2,003	4%	7%
Steady low intensity	11,839	26%	40%
Non-steady	11,663	26%	39%
Summer only	4,233	9%	14%

In the post-high school year an important distinction to make when assessing employment intensity is whether or not an individual is enrolled in postsecondary education. After that factor is taken into account, an interesting pattern becomes apparent. Over half of students who are primarily community and technical college students fall into the "steady high intensity" employment category, while less than three percent of the Washington public 4-year students are employed at that level. Table 10 shows the distribution of graduates by enrollment status and employment intensity.

Table 10: Postsecondary employment intensity by enrollment status in post-high school year (2009-10)

Category	No earnings		Steady high intensity		Steady low intensity		Non-steady		Summer only	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Total	17,828	100%	2,003	100%	11,839	100%	11,663	100%	1,744	100%
Not enrolled, 2009-10	3,770	21%	889	44%	2,071	17%	2,009	17%	231	13%
Enrolled, 2009-10	14,058	79%	1,114	56%	9,768	83%	9,654	83%	1,513	87%
WA public 4-year	5,398	30%	58	3%	1,854	16%	3,626	31%	686	39%
WA CTC	5,317	30%	1,011	50%	7,421	63%	4,037	35%	450	26%
WA private 4-year	708	4%	17	1%	236	2%	485	4%	90	5%
Enrolled out of state	2,635	15%	28	1%	257	2%	1,506	13%	287	16%

Note: Students are classified based primarily on their postsecondary enrollment in Fall 2009. See Appendix A for details.

In what industries do graduates work after high school?

In the post-high school year, the industry sectors that include Retail Trade (part of the Trade, Transportation, and Utilities supersector) and Accommodations and Food Service (part of the Leisure and Hospitality supersector) continue to account for over 60 percent of the study group graduates who are working in Washington. There are differences between the industry distributions of the graduates enrolled in postsecondary education and those who are not, as shown in Table 11. While both groups show high employment in industry supersectors that include retail sales and food service, the group that is not enrolled in postsecondary education shows higher employment in natural resources and mining, in construction, and in manufacturing – industries that are less likely to offer part-time employment schedules normally sought by students. Non-students are also more likely to be employed by employers providing professional and business services.

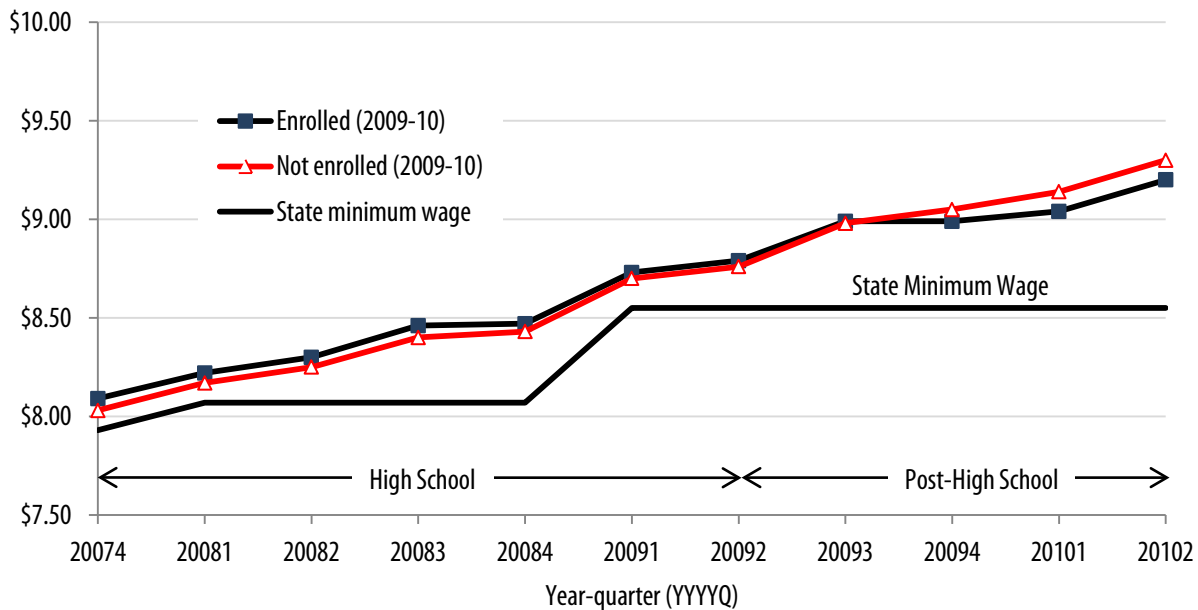
Table 11: Employment in the post-high school year by industry supersector

Industry supersector	Employment			Share of Total Employment		
	Total	Postsecondary Students	Non-students	Total	Postsecondary Students	Non-students
All industries	29,738	24,243	5,495	100%	100%	100%
Natural resources and mining	992	763	229	3%	3%	4%
Construction	828	587	241	3%	2%	4%
Manufacturing	848	599	249	3%	2%	5%
Trade, transportation, and utilities	9,342	7,595	1,747	31%	31%	32%
Information	573	497	76	2%	2%	1%
Financial activities	624	528	96	2%	2%	2%
Professional and business services	2,021	1,561	460	7%	6%	8%
Education and health services	3,019	2,498	521	10%	10%	9%
Leisure and hospitality	9,271	7,751	1,520	31%	32%	28%
Other services and public administration	2,220	1,864	356	7%	8%	6%

What are the earnings of the graduates?

Median average hourly wage for the employed graduates through their high school junior year through one post-high school year are shown in Figure 6. In the chart a distinction is made between those enrolled in postsecondary education during the post-high school year and those who are not. The Washington state minimum hourly wage is also shown, since jobs held by students and by recent graduates often start at minimum wage. Related data is shown in Appendix Table E-3.

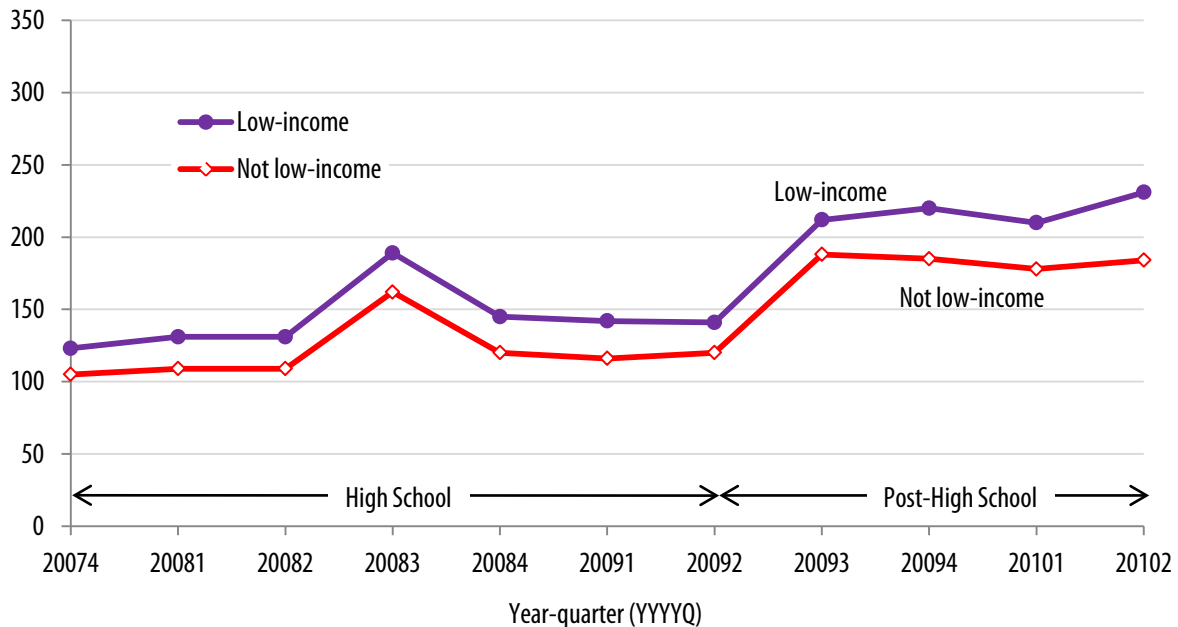
Figure 6: Median hourly wage by post-high school enrollment status



Note: Hourly wage values shown here have not been inflation-adjusted. The state minimum wage is adjusted for cost of living annually based on the federal Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).

Hours worked by the employed graduates varied by postsecondary status and by low-income status in the K-12 system. Although the percent of low-income high school students employed was less than that of students not classified as low-income, the low-income students tended to be employed for more hours per quarter. This is illustrated in Figure 7; related data are shown in Appendix Table E-4.

Figure 7: Median hours worked by high school low-income status



Related data are shown in Appendix Table E-4.

Employed students not enrolled in postsecondary education in the post-high school year worked more hours during high school and during the post-high school year than those enrolled.

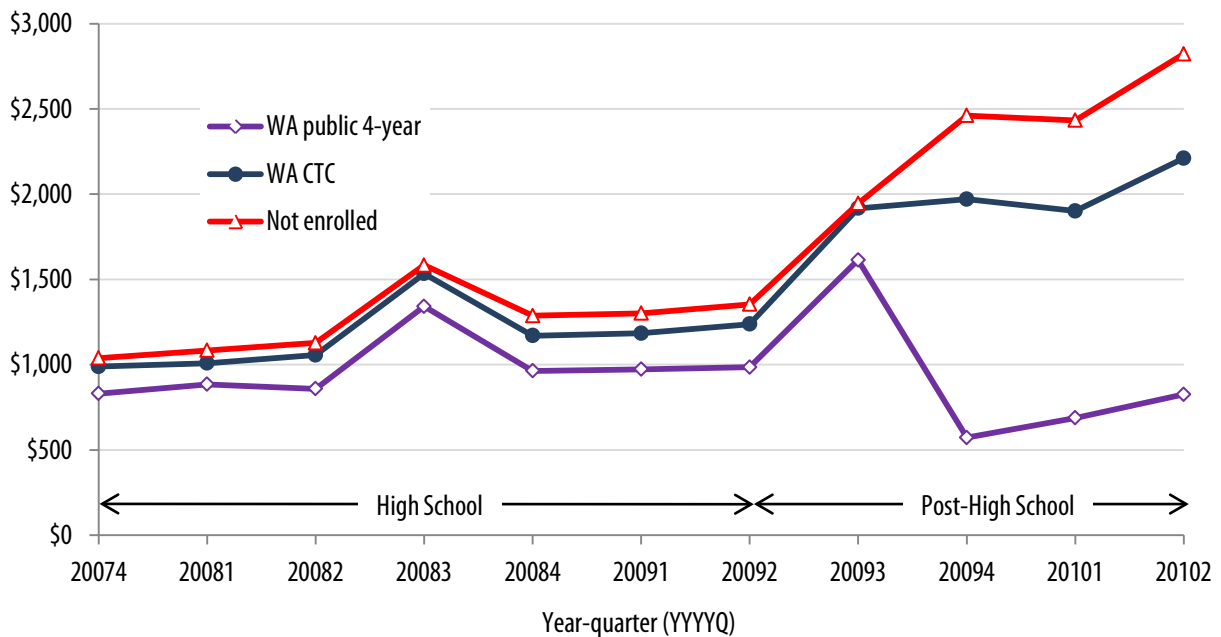
Median hours worked per quarter differed dramatically for students enrolled in postsecondary education depending on the type of institution attended. Students enrolled in community and technical colleges worked more hours per quarter than students attending public four-year institutions.

Post-high school earnings reflect the number of hours worked, so – as expected – quarterly earnings are highest for those not enrolled in postsecondary education. For enrolled students, earnings by community and technical college students are significantly higher than those of students enrolled in the state's public 4-year institutions.⁷ Figure 8 shows the earnings pattern for students not enrolled

⁷ Although not shown here, earnings by students enrolled in private institutions in Washington and in out-of-state institutions follow a pattern similar to those of the public 4-year students.

in postsecondary education and those enrolled in Washington public higher education institutions. Related data are shown in Appendix Table E-5.

Figure 8: Median earnings by quarter by post-high school enrollment status



Summary

The majority of Washington high school graduates are employed at some point during their high school years, many of them during the regular high school year.

There is not a large difference in median hourly wage when analyzed by subgroups of students, but there are significant differences in the number of hours worked by various subgroups, and that results in differences in total earnings across the subgroups.

Of particular significance is the difference in hours worked and earnings between students enrolled at community and technical colleges and those enrolled in public 4-year institutions.

Further work will delve into the specifics of the differences, including full-time/part-time status of students enrolled in higher education and student financial aid status.

Appendix A: Enrollment Data Sources & Definitions

Enrollment Data Sources

Enrollment data for this study came from the following sources:

High School Graduates: The 2008-09 annual summary data file (P-210) for high school enrollment and completion from Office of Superintendent of Public Instruction (OSPI). This file identifies regular high school graduates, their graduation date, school district and school, low-income status, gender, grade point average (GPA), and race/ethnicity. The P-210 record for a student is referred to as the student's "graduation record" in the discussion that follows.

Washington Community and Technical College Enrollment: Enrollment data from the State Board for Community & Technical Colleges (SBCTC), which includes student enrollment status by term for the 34 colleges in the state system. Students enrolled in basic skills courses only (Adult Basic Education, English as a Second Language, GED preparation classes) are not treated as postsecondary enrollment for this study. Community and technical college enrollment includes students preparing for both certificates and degrees leading to careers as well as students preparing for transfer to academic programs in four-year institutions.

Washington Public 4-Year Higher Education Enrollment: Enrollment data for the state's six public baccalaureate higher education institutions from the Public Centralized Higher Education Enrollment System (PCHEES) maintained by the Office of Financial Management (OFM).

Enrollment data for private and out-of-state higher education institutions: Enrollment data for institutions other than the Washington public institutions was obtained from the National Student Clearinghouse (NSC). The National Student Clearinghouse captures 92 percent of postsecondary enrollment nationally.⁸ At this time it is the best source of information about postsecondary enrollment in private higher education institutions within Washington and for all out-of-state institutions.

Administrative data from state's Unemployment Insurance (UI) Program: Provided by the Employment Security Department. This data source is described in the main body of the report.

Definitions

A student is included as a **high school graduate** in this analysis if he/she is reported in OSPI's academic year enrollment summary file with student enrollment status indicating "graduated with regular high school diploma." Students who receive General Education Development (GED)

⁸ See "About the National Student Clearinghouse,"
<www.studentclearinghouse.org/about/pdfs/Clearinghouse_profile.pdf>

credentials, students who complete an Individualized Education Program (IEP), and students who are awarded an adult high school diploma (usually by a community or technical college) are not included in this analysis.

In instances where a student is associated with more than one graduation record, that associated with the school primarily responsible for the student is included in this analysis.

The date of student exit from the school and district is the date used for the **date of graduation**. This defines the beginning of the window during which postsecondary enrollment is assessed. The window extends through the summer of 2010.

The graduate cohort is defined by the academic year data file in which they are reported. For the most part this corresponds to the September 1, 2008 – August 31, 2009 school year, but there are some dates slightly outside that range contained in the annual file.⁹

Low-income status for a student is determined by the free/reduced-price eligibility status of the student as contained in the graduation record.

Grade Point Average (GPA) is based on data contained in the student graduation record. GPA is reported for most graduates.

Postsecondary enrollment from the three enrollment data sources (PCHEES, SBCTC, and NSC) is associated with a student if the beginning date of enrollment or the ending date of enrollment falls within the postsecondary enrollment window defined as a function of graduation date. The type of enrollment is characterized as public 2-year, public 4-year, or private for students attending institutions within Washington and out-of-state for students enrolling in out-of-state public or private institutions. If a student enrolls at more than one institution within the window, the institution type associated with the fall term following graduation (Fall 2009) is associated with the student. Otherwise, the first institution attended is considered the primary institution. If this approach results in more than one institution type being associated with a student, the student is classified as a 4-year student if one of the institution types is a 4-year institution.

Enrollment at some private institutions with campuses in Washington may be reported with the parent institution, which may be located in a different state.

⁹ Many of these students completed their high school coursework in the year of record (P-210 year), but their assessment scores for examinations taken late in that year were not recorded until after August 31.

Appendix B: Unemployment Insurance

The Unemployment Insurance (UI) Program is a federal-state program financed by payroll taxes paid by employers. The U.S. Department of Labor sets broad criteria for the eligibility and coverage, but states determine the specifics of the implementation. In Washington, the Employment Security Department is responsible for the administration of the UI Program.

Employers must participate in the UI Program if they pay wages to employees regardless of the dollar amount. Participating employers are called "covered employers." Participation includes registering, reporting wages, and paying unemployment taxes or reimbursing the department for benefits paid for all part-time or full-time employees. There are exceptions to this, including the following:

- Small farm operators – those with payroll less than \$20,000 and fewer than 10 employees – do not cover spouse, children under 18, or student workers.

- Employees performing domestic services in a private home, college club, fraternity or sorority, are not covered if the total wages paid are less than \$1,000 per quarter. If payroll exceeds \$1,000 in any quarter, wages must be reported for the entire year and the following year.

- Non-profit preschool staff if fewer than four staff.

- Business owners are not reported. Sole proprietors do not report their spouses or unmarried children under 18.

- Corporate officers are required to cover themselves for UI unless they opt out by January 15th each year.

There are additional types of employees that an employer may not be required to report, depending upon the circumstances. Those most pertinent to this study include the following:

- Self-employed workers

- Church employees

- Work-study students, as long as the employer is a non-profit 501(c)(3), state government or local government

More complete information regarding the Unemployment Insurance Program in Washington is available from the Employment Security Department.¹⁰

In addition to the above categories, federal civilian employees and both active duty and retired military are not reported in the state-level UI Program administrative records.

Nationally, the UI program includes 98 percent of all employers.¹¹

¹⁰ "Unemployment Insurance Tax Information: A handbook for Washington state employers," January 2011, Employment Security Department. <www.esd.wa.gov/uitax/formsandpubs/tax-handbook.pdf>

Data Elements and Timing

In Washington state, employers file a quarterly wage detail report that includes the following elements:

- Year
- Quarter
- Employer account number
- Employee social security number
- Name
- Wages paid during quarter
- Hours worked during quarter

Employer characteristics can be added to the wage record. These include:

- Industry – North American Industry Classification System (NAICS) code
- Ownership – Private or public (federal, state, local governments)
- Size of firm (monthly)

There is a lag between the time the employer files the report and the time the associated administrative data become available for research use. Both UI tax payments and wage reports are due by the last day of the month following the last day of each quarter. Incorporating the wage data into administrative databases takes the remaining two months of the quarter. Data are ready for use for research purposes early in the subsequent quarter. The process is summarized in Figure A-1.

Figure B-1: Timing of collection and availability of UI wage data

Current Year											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Quarter 1			Quarter 2			Quarter 3			Quarter 4		
Prior year Quarter 4 data submitted by employer and processed by ESD			Current year Quarter 1 data submitted by employer and processed by ESD			Current year Quarter 2 data submitted by employer and processed by ESD			Current year Quarter 3 data submitted by employer and processed by ESD		
Prior year Quarter 3 data available for research			Prior year Quarter 4 data available for research			Current year Quarter 1 data available for research			Current year Quarter 2 data available for research		

Updates to the UI wage data may occur outside the timeframe described here when corrections are submitted by employers and when employers file their reports late.

¹¹ "Technical Notes to Establishment Survey Data Published in Employment and Earnings," U.S. Department of Labor, Bureau of Labor Statistics. <www.bls.gov/web/empsit/cestn2.htm>

Data Preparation

Wage data is collected as part of the administration of the state's Unemployment Insurance Program. The link between UI wage data and secondary and postsecondary enrollment data is the social security number. In both cases, the social security number is collected for administrative purposes, and validation procedures are not consistently applied. "Data cleaning" refers to the process of turning data collected from one or more administrative systems into data that can be used for analysis.

EVALUATING MATCHES ON SSN

The first step in data cleaning when combining education records with employment records was the evaluation of the SSN-based linkages. Often the SSN associated with a student in an education data system is actually that of a parent or sibling. In other cases, digits are transposed or extra digits are inserted, offsetting those that follow. It is possible that two records that have the same SSN actually represent different people. The logical first step is an evaluation of name fields contained in the records. Occasionally, more than one name is associated with single SSN-employer-quarter combination or with a single student. More often, the name in the education record is clearly different from that contained in the employment record. Records where the names across datasets were clearly different, even when the SSN matches, were discarded from the study dataset.

Approximately 2 percent of the apparent matches between enrollment and employment developed for this study were discarded because of spurious matches.

IMPUTATION

Once a set of well-matched enrollment and employment records is developed, the next step is the evaluation of the data elements contained in the wage record – hours worked and quarterly earnings. Hours worked can be used to assess intensity of employment – full-time or part-time, for example. Earnings divided by hours worked can be used to determine an average wage for the quarter. Occasionally, a record shows earnings with no hours reported. It is often possible to impute the hours for a quarter based on complete records for the same employer-employee in adjacent quarters. For the remaining records with missing hours, one approach is to assign median working hours based on an individual's industry and earnings class.¹²

ADJUSTING FOR INFLATION

When examining earnings or wage data over time, it is appropriate to adjust or relate the values for inflation. In this study, because so many jobs for teenagers are tied to the minimum wage, the values for median average wage were displayed along with the state minimum wage in effect for each

¹² Hollenbeck, Kevin M. and Wei-Jang Huang, "Net Impact and Benefit-Cost Estimates of the Workforce Development System in Washington State," Upjohn Institute Technical Report No. TR06-020, September 2006. [www.wtb.wa.gov/documents/netimpact2006.pdf]

quarter. The state minimum wage is adjusted annually for inflation based on the federal Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).

Additional Sources of Wage Data and Related Employment Information

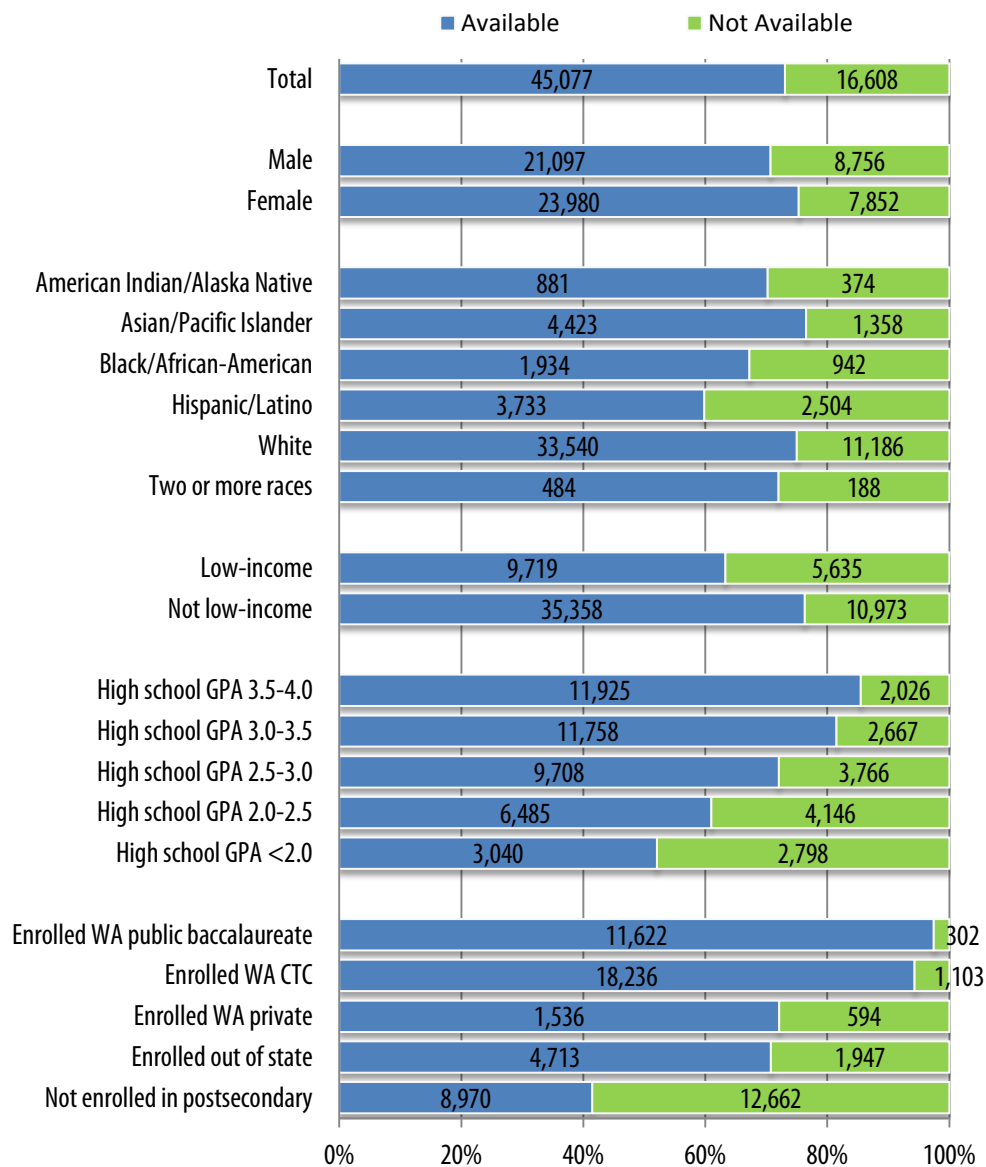
This study has used UI wage data to examine employment patterns of recent high school graduates within the state of Washington. Several data sources exist that provide information beyond that included in this source. These include:

- Federal Employment Data Exchange System (FEDES) – contains federal civilian employees, U.S. Postal Service employees, and Department of Defense active duty personnel. FEDES is operated by the Jacob France Institute at the University of Baltimore.
 - ❖ Website: www.ubalt.edu/jfi/fedes/index.cfm
- Wage Record Interchange System (WRIS) – a multistate collaborative that facilitates the exchange of wage data among participating states.
 - ❖ Website: www.doleta.gov/performance/WRIS.cfm
- Administrative Data Research and Evaluation (ADARE) – a multi-state alliance (currently 9 state partners covering 43 percent of the U.S. civilian labor force) that facilitates access to administrative data for authorized research and evaluation purposes. Managed by the Jacob France Institute at the University of Baltimore.
 - ❖ Website: www.ubalt.edu/jfi/adare/index.cfm
- Local Employment Dynamics (LED) program is a partnership between states and the U.S. Census Bureau that provides summary information on employment and earnings at local level. Website: lehd.did.census.gov/led/led/led.html

Appendix C: Availability of SSN

While over 70 percent of the 2009 graduates could be assessed for workforce participation, some subgroups were better represented than others. The more education sectors in which a student participates, the greater the chance that a social security number (SSN), the required element for matching a student with UI wage data, will be available for that student. As shown in Figure B-1, students who eventually enroll in postsecondary education are those most likely to have the social security number available in P-20 data.

Figure C-1: Availability of data element required for workforce linking by student characteristics



Appendix D: Industry Classification

The North American Industry Classification System (NAICS) is a hierarchical classification system expressed with 2- through 6-digit codes.¹³ The 2-digit level, shown in Table C-1, is the most general level. For this study the 2-digit categories have been grouped into "supersectors," patterned after those used by the U.S. Bureau of Labor Statistics (BLS) in statistical summaries.¹⁴

Table D-1: North American Industry Classification System

Supersector	NAICS 2-digit code	NAICS description
Natural resources and mining	11	Agriculture, Forestry, Fishing and Hunting
	21	Mining, Quarrying, and Oil and Gas Extraction
Construction	23	Construction
Manufacturing	31-33	Manufacturing
	42	Wholesale Trade
	44-45	Retail Trade
	48-49	Transportation and Warehousing
Trade, transportation, and utilities	22	Utilities
	51	Information
	52	Finance and Insurance
Financial activities	53	Real Estate and Rental and Leasing
	54	Professional, Scientific, and Enterprises
Professional and business services	55	Management of companies and Enterprises
	56	Administrative and Support and Waste Management and Remediation Services
	61	Educational Services
Education and health services	62	Health Care and Social Assistance
	71	Arts, Entertainment, and Recreation
Leisure and hospitality	72	Accommodation and Food Services
	81	Other Services (except Public Administration)
Other services	92	Public Administration

¹³ The U.S. Census Bureau website contains detailed information about the NAICS industry classification system. <<http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007>>

¹⁴ The U.S. Bureau of Labor Statistics (BLS) uses groupings of NAICS sectors called "Supersectors." <<http://www.bls.gov/ces/cessuper.htm>>

Appendix E: Supplemental Tables

Table E-1: Employment status during high school by student characteristics

Student characteristics	Employed		Not employed	Total	Employed		Not employed
	During school year	Summer only			During school year	Summer only	
Total evaluated	25,487	2,521	16,604	44,612	57%	6%	37%
High school GPA							
GPA 3.50 - 4.00	6,149	855	4,836	11,840	52%	7%	41%
GPA 3.00 - 3.49	6,905	644	4,073	11,622	59%	6%	35%
GPA 2.50 - 2.99	5,839	458	3,315	9,612	61%	5%	34%
GPA 2.00 - 2.49	3,721	299	2,390	6,410	58%	5%	37%
GPA <2.00	1,671	152	1,182	3,005	56%	5%	39%
Low-income status							
Low-income	5,384	576	3,627	9,587	56%	6%	38%
Not low-income	20,103	1,945	12,977	35,025	57%	6%	37%
Gender							
Male	11,222	1,363	8,326	20,911	54%	7%	40%
Female	14,265	1,158	8,278	23,701	60%	5%	35%
Enrollment in 2009-10							
Enrolled WA public 4-year	6,726	838	3,984	11,548	58%	7%	34%
Enrolled WA CTC	11,059	771	6,218	18,048	61%	4%	34%
Enrolled WA private 4-year	755	113	660	1,528	49%	7%	43%
Enrolled out of state	2,320	360	1,976	4,656	50%	8%	42%
Not Enrolled	4,627	439	3,766	8,832	52%	5%	43%

Table E-2: Relationship between employment status in high school and employment status during post-high school year

Employment status		Enrolled post-high school			Not enrolled	Total
During high school	Post-high school	WA public 4-year	WA CTC	Other		
Employed	Employed	6,206	10,554	2,790	4,276	23,826
	Not employed	1,382	1,342	781	828	4,333
Not employed	Employed	1,228	2,778	687	1,219	5,912
	Not employed	2,806	3,562	1,991	2,647	11,006

Table E-3: Median hourly wage by post-high school enrollment status, state minimum wage

Year & quarter (YYYYQ)	Postsecondary enrollment status				State minimum wage
	Enrolled		Not enrolled		
	count	hourly wage	count	hourly wage	
20074	10,648	\$8.09	2,518	\$8.03	\$7.93
20081	10,912	\$8.22	2,555	\$8.17	\$8.07
20082	13,396	\$8.30	3,100	\$8.25	\$8.07
20083	17,014	\$8.46	3,717	\$8.40	\$8.07
20084	14,845	\$8.47	3,186	\$8.43	\$8.07
20091	13,977	\$8.73	2,979	\$8.70	\$8.55
20092	16,152	\$8.79	3,400	\$8.76	\$8.55
20093	19,244	\$8.99	4,130	\$8.98	\$8.55
20094	14,326	\$8.99	3,917	\$9.05	\$8.55
20101	13,937	\$9.04	3,752	\$9.14	\$8.55
20102	17,664	\$9.20	4,163	\$9.30	\$8.55

Table E-4: Median hours worked by post-high school enrollment status and by low income status in high school

Year and quarter (YYYYQ)	All employed students		Post-high school enrollment status				Low income status in high school			
			Enrolled		Not enrolled		Low-income		Not low-income	
	count	hours	count	hours	count	hours	count	hours	count	hours
20074	13,161	108	10,644	105	2,517	126	2,688	123	10,473	105
20081	13,465	113	10,910	109	2,555	130	2,721	131	10,744	109
20082	16,493	113	13,394	110	3,099	134	3,472	131	13,021	109
20083	20,730	167	17,013	164	3,717	186	4,364	189	16,366	162
20084	18,028	124	14,843	120	3,185	148	3,728	145	14,300	120
20091	16,953	121	13,974	117	2,979	146	3,435	142	13,518	116
20092	19,552	123	16,152	119	3,400	150	4,052	141	15,500	120
20093	23,370	193	19,241	189	4,129	212	4,968	212	18,402	188
20094	18,238	194	14,320	176	3,918	269	4,231	220	14,007	185
20101	17,682	184	13,931	170	3,751	263	3,970	210	13,712	178
20102	21,825	194	17,663	175	4,162	298	4,630	231	17,195	184

Table E-5: Median earnings by quarter by post-high school enrollment status

Year and quarter (YYYYQ)	Enrolled during post-high school year (2009-10)						Not Enrolled, 2009-10	
	WA public 4-year		WA CTC		Other Institution		count	earnings
	count	earnings	count	earnings	count	earnings		
20074	3,452	\$830	5,705	\$989	1,490	\$718	2,518	\$1,039
20081	3,544	\$885	5,847	\$1,009	1,520	\$713	2,555	\$1,084
20082	4,397	\$859	7,092	\$1,057	1,907	\$695	3,100	\$1,128
20083	5,747	\$1,342	8,737	\$1,534	2,530	\$1,261	3,717	\$1,584
20084	4,854	\$964	7,960	\$1,170	2,031	\$836	3,185	\$1,287
20091	4,606	\$973	7,418	\$1,184	1,953	\$825	2,979	\$1,301
20092	5,391	\$985	8,369	\$1,238	2,393	\$844	3,400	\$1,354
20093	6,185	\$1,614	10,344	\$1,917	2,713	\$1,404	4,130	\$1,945
20094	3,094	\$572	10,321	\$1,970	906	\$547	3,917	\$2,461
20101	2,865	\$688	10,029	\$1,901	1,041	\$689	3,752	\$2,433
20102	4,524	\$826	10,953	\$2,211	2,186	\$848	4,163	\$2,822