



Washington State
Workforce Training
And Education
Coordinating Board

Workforce Training Results Report

December 2008

Secondary Career and Technical Education (CTE)

Secondary CTE serves high school age youth in approximately 238 school districts and 10 Skills Centers throughout the state, preparing students for successful roles in families, careers, and communities. Programs are designed to develop the skills, understanding, and attitudes needed by workers in their occupations. Instructional programs organized within career pathways include agriculture, family and consumer sciences, trade and industry, marketing education, business education, diversified occupations, technology education, cosmetology, health education, and others.

Because of data limitations, we restricted our evaluation of this program to students identified by their districts as CTE completers (Districts define a CTE completer as someone who completed a CTE sequence, whether or not the participant earns a diploma).¹ This strategy is different than the other program evaluations included in the study that were not limited to completers only. This study focuses on 16,439 CTE completers who were seniors during the 2005-2006 school year.²

This study includes information from the Office of Superintendent of Public Instruction (OSPI) student records; Employment Security Department (ESD) wage files from Washington, Idaho, and Oregon; and federal employment records. Enrollment data from Washington community and technical colleges, public four-year institutions, and private career schools were analyzed to examine the extent to which CTE completers continued their education. In addition, 610 CTE completers participated in a telephone survey, providing additional information on employment and satisfaction with the

¹ The state defines a student who completes 360 hours of sequenced Career and Technical Education classes as a CTE completer. The designation of who is considered a completer, however, does vary across some school districts. Smaller schools with fewer resources, for example, will offer the most complete sequence they can, but it may be fewer than 360 hours. These schools may still consider the students who finish the sequence to be completers.

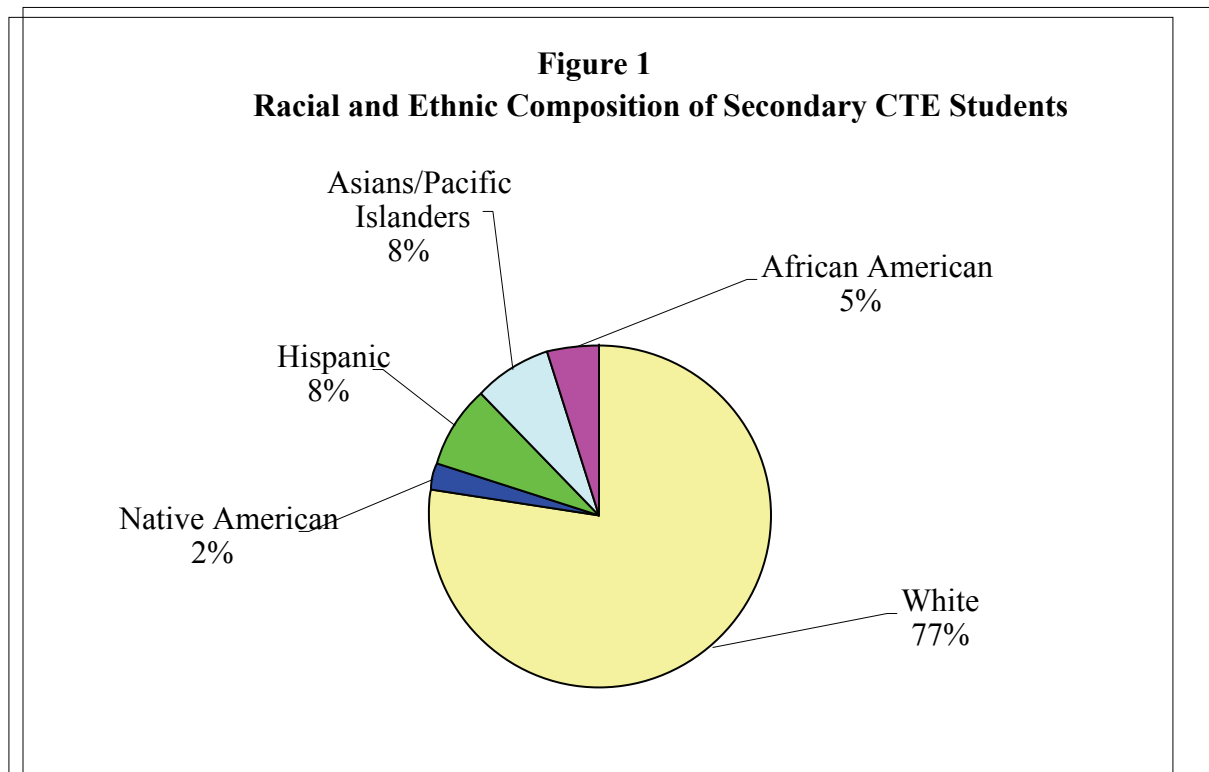
² The Office of Superintendent of Public Instruction provided data on 16,439 seniors who left the system during the 2005-2006 school year and who were CTE completers at any time during their K-12 careers. Most of these students graduated (97 percent); however, some dropped out (2 percent), others left with an unknown status (1 percent). This study focused on the 16,439 who had completed their CTE education program in their sophomore, junior or senior years.

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program. Employer satisfaction information was collected through a survey conducted during the summer of 2007 and included the responses of 311 firms that hired new employees who recently completed a CTE program.

Participant Characteristics

CTE completers are nearly as racially and ethnically diverse as the state's general population of 15- to 19-year-olds. (Figure 1)³ Some 47 percent were female.



Source: Community and Technical Colleges administrative records 2005-2006

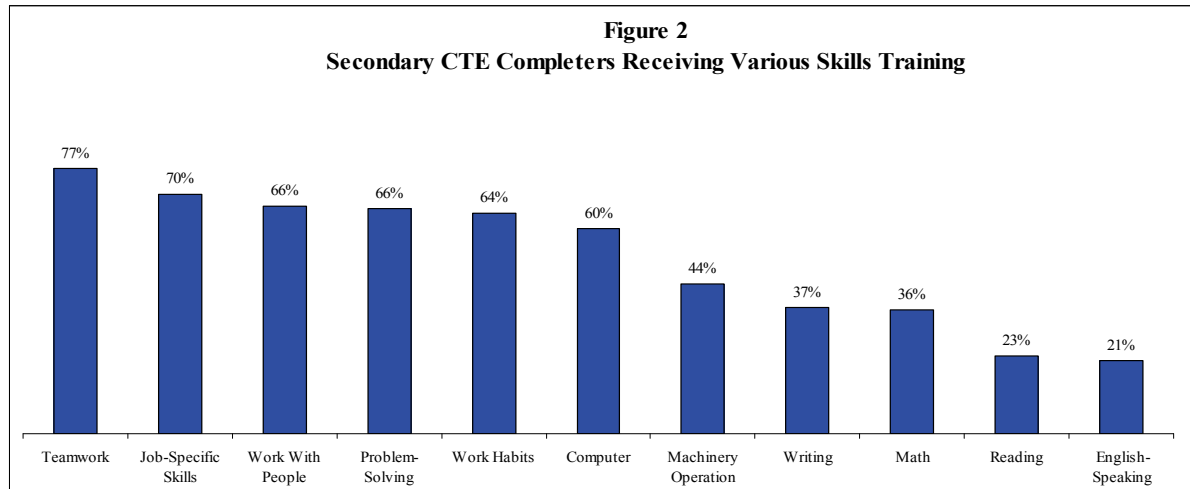
Competency Gains

According to the survey, 65 percent of CTE completers enrolled to gain skills for a job. The highest percentages indicated personal improvement and to make school more interesting (91 percent and 81 percent, respectively) as their reasons for enrolling in CTE. Students who completed CTE received training in many different skill areas. In

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 2006 *U.S. Census Estimates of those 15-19 years old*, 73 percent are whites; 4 percent are African Americans; 2 percent are Native Americans; 6 percent are Asians/Pacific Islanders; and 11 percent are Hispanics.

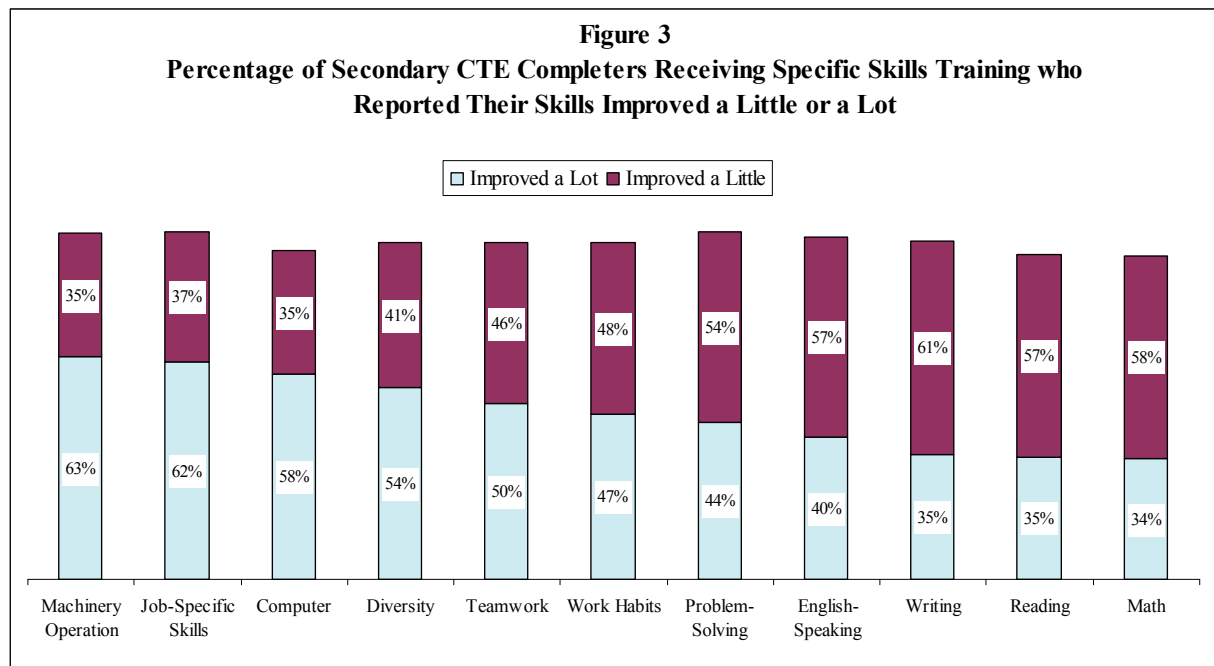
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addition to job-specific skills, the greatest percentage indicated teamwork, working with people and problem solving (Figure 2).



Source: Participant Satisfaction Survey 2005-2006

Most completers said their skills improved as a result of taking CTE classes (Figure 3). Similar to completers from 2003-2004, higher percentages indicated “a lot” of improvement in technical and general workplace skills than so reported for basic skills.



Source: Participant Satisfaction Survey 2005-2006

Among completers who were employed, 48 percent said CTE was related to their job, slightly lower than those who so reported two years ago (52 percent).

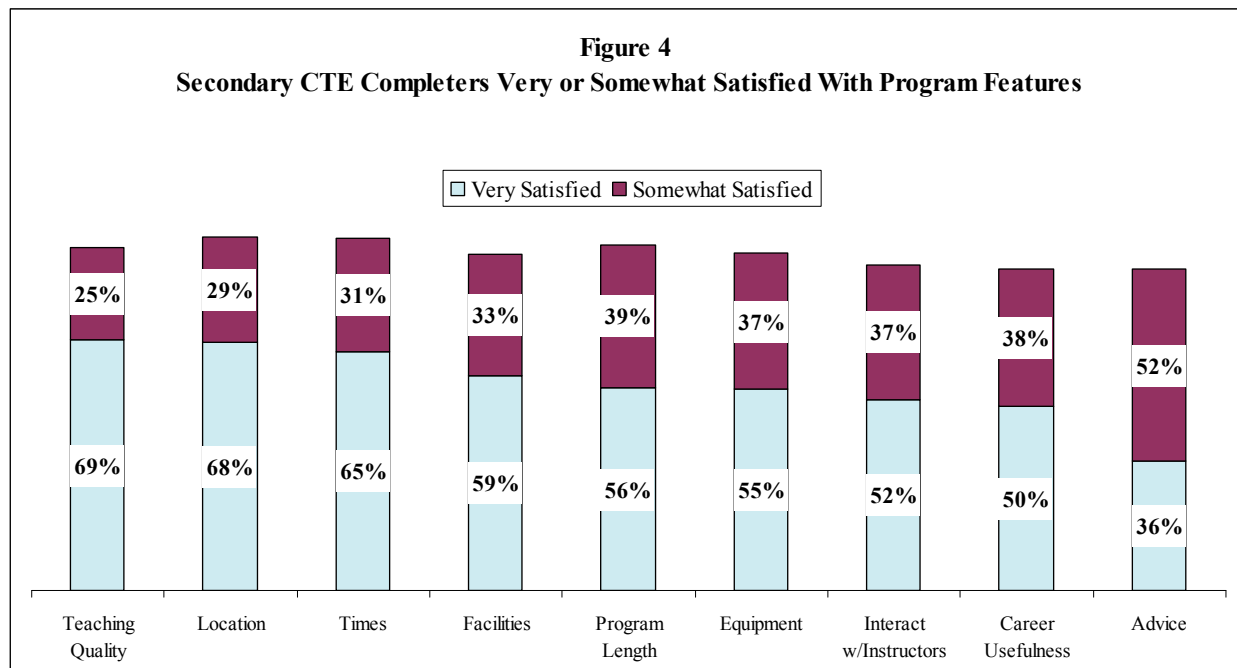
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Many of the completers continued their education at a community or technical college or public four-year university. In the third quarter after completing their program, 40 percent of the completers were enrolled in postsecondary education.⁴

Participant Satisfaction

According to the survey, completers were generally satisfied with their CTE programs. Some 95 percent said the program met their objectives and 96 percent were satisfied with the program overall. These high levels of satisfaction are similar to those reported two years earlier.

Over two-thirds of completers were generally “very satisfied” with the quality of teaching and the location of classes (Figure 4). Satisfaction level was much lower with respect to advice on selecting a program, with just over one-third indicating being “very satisfied.”

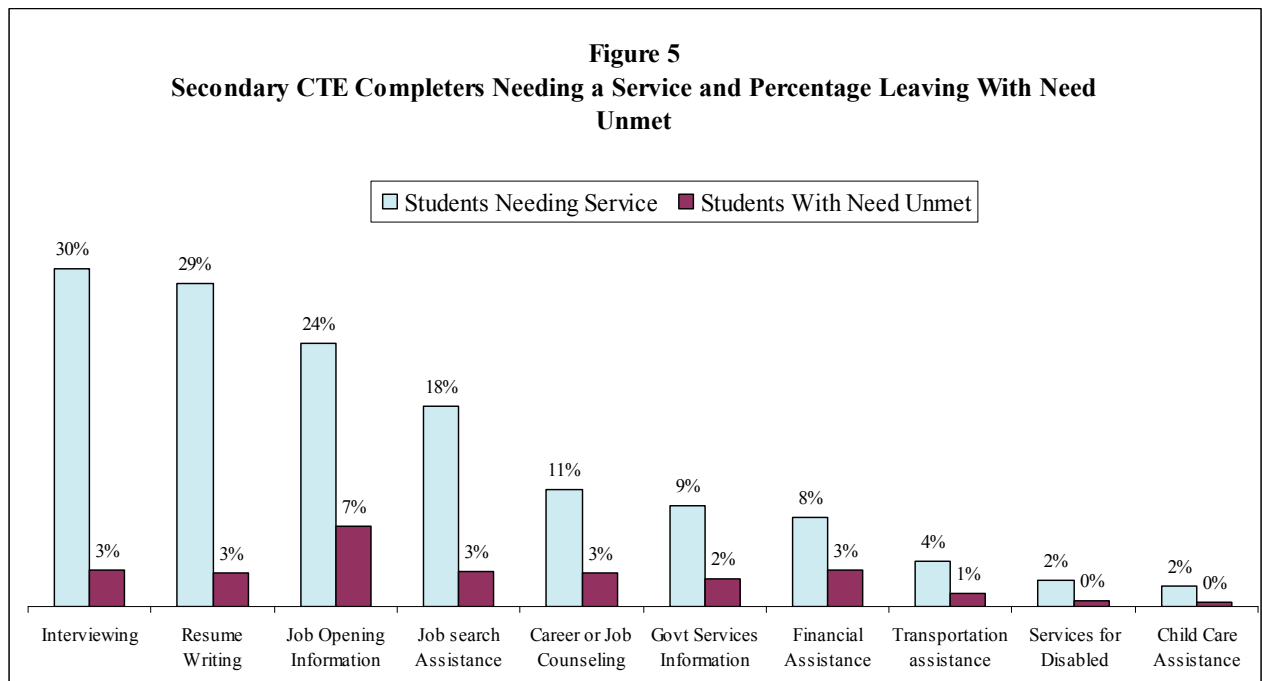


Source: Participant Satisfaction Survey 2005-2006

In general, CTE completers reported needing fewer support services than other groups we studied, and when they did need these services, they generally received them (Figure 5). The services most frequently needed by completers were assistance with job interviewing and resume writing. The highest unmet need was for job opening information.

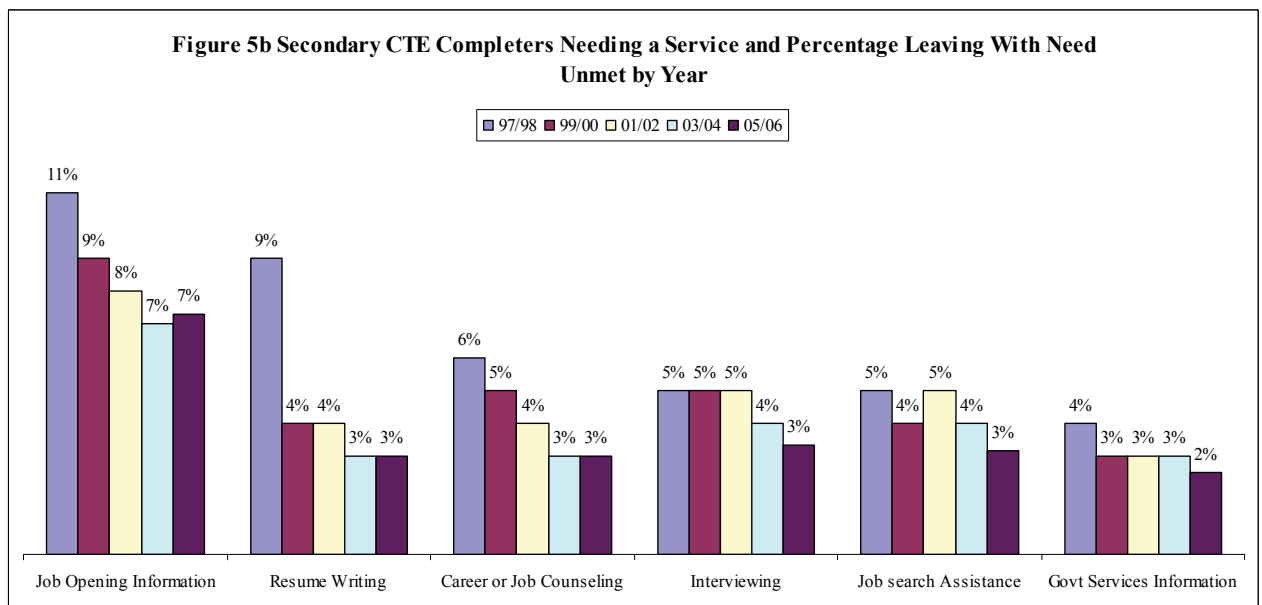
⁴ Matches are made against enrollments at Washington’s community and technical colleges, public four-year institutions, and private career schools and colleges. However, in-state private four-year colleges and universities and out-of-state postsecondary enrollments are not included in the match. Therefore, the percentage enrolled in higher education is understated.

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Source: Participant Satisfaction Survey 2005-2006

In general, the unmet needs reported by CTE students have steadily gone down over the years with the percentage reporting a lack of job opening information rising only slightly from 2003-2004 (Figure 5b).

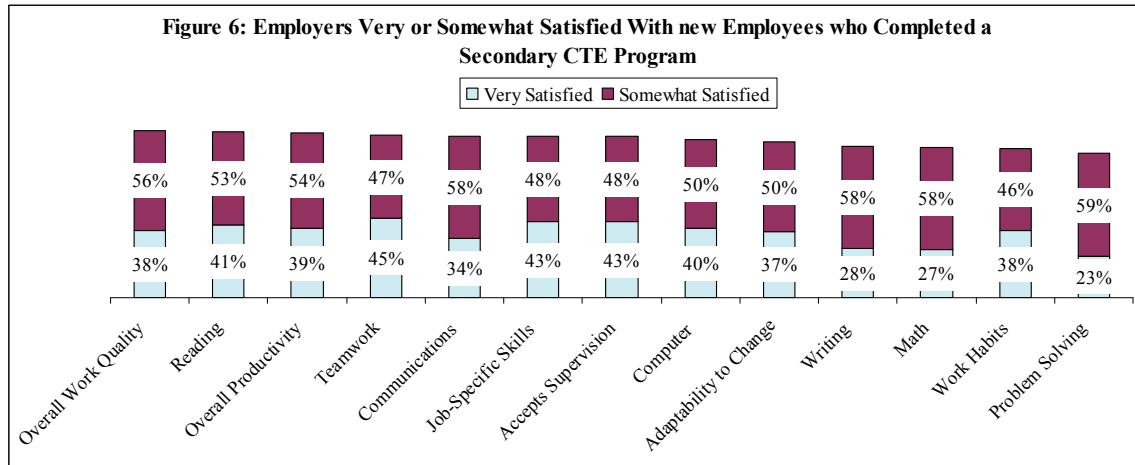


Source: Participant Satisfaction Surveys 1997-2006

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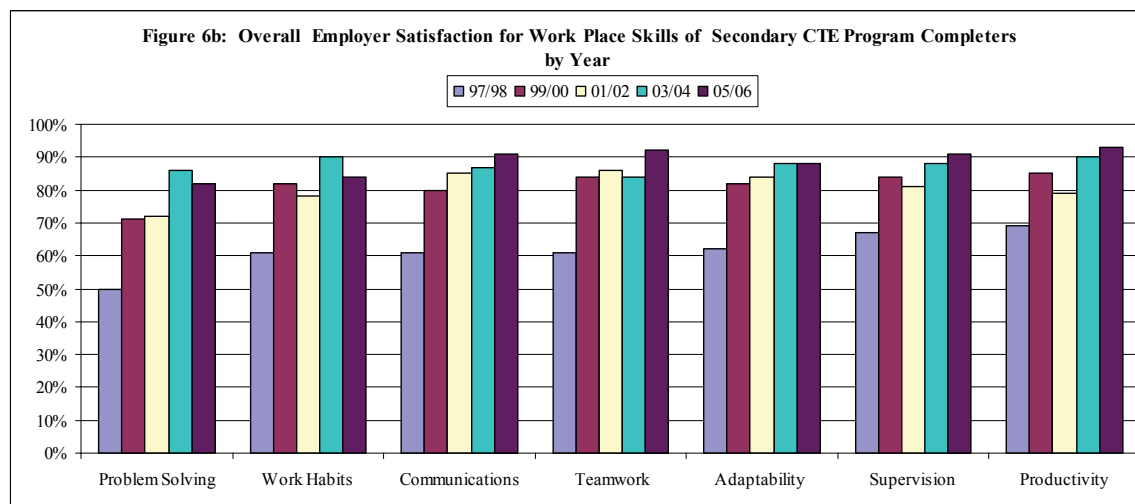
Employer Satisfaction

The employer satisfaction survey asked firms to evaluate new employees who recently completed a CTE program. Across skills areas, similar or higher percentages of employers were at least “somewhat satisfied” compared to the previous survey (Figure 6). While significantly higher percentages were “very satisfied” with their new employees’ teamwork, job-specific skills, and willingness to accept supervision, lower percentages of employers were “very satisfied” with their work habits and problem solving skills.

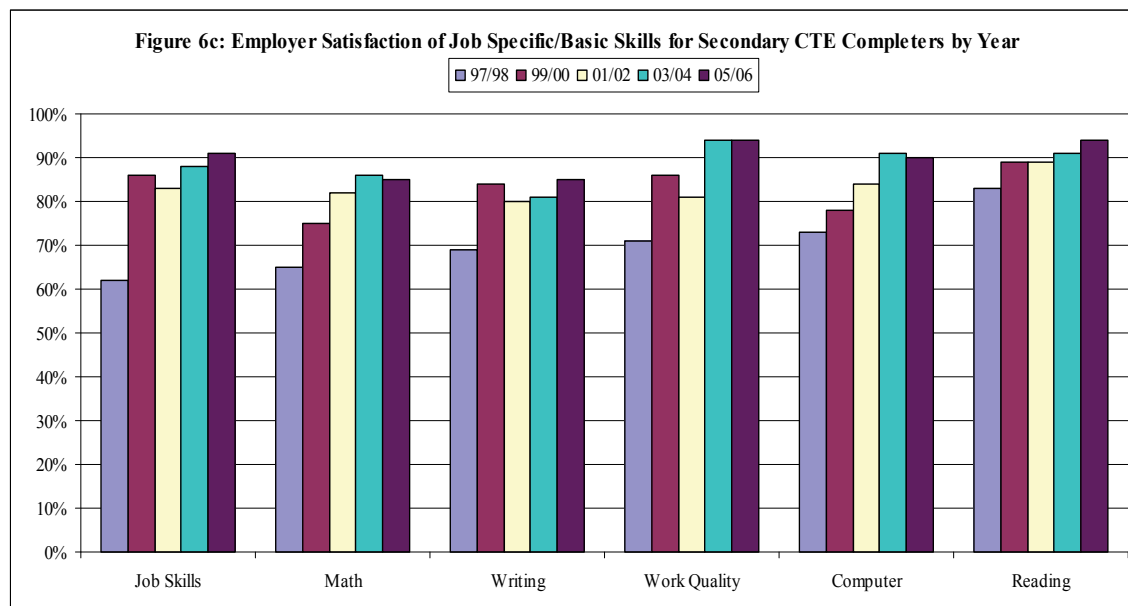


Source: Employer Satisfaction Survey 2005-2006

Over the past 10 years, employers’ overall satisfaction with skills has varied depending on the type of skill. However, in most cases there has been an upward trend. Figures 6b and 6c show the overall satisfaction of employers with work related skills and basic skills of new employees who recently completed secondary CTE.



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Source: Participant Satisfaction Survey 1997-2006

Employment and Earnings

According to the survey, 66 percent of the 2005-2006 CTE completers were employed during the period seven to nine months after leaving school (Figure 7).⁵ To find out more about where completers worked and what they earned, we matched CTE completer records with Employment Security Department wage files from Washington and neighboring states.⁶

Record matches found 58 percent of 2005-2006 CTE completers had reported employment and 76 percent had either employment or were enrolled in higher education during the third quarter after leaving. The median wage⁷ for the class of 2006 CTE completers was \$9.17 per hour. They received \$9,594 in median annualized earnings.⁸

Among those not enrolled in higher education, the wages were \$9.32 an hour, and the annualized earnings were \$11,767 (Figure 7). Though wage and earnings may seem low, it is important to remember these are young, entry-level workers.

⁵ In the survey, CTE completers were asked whether they were employed or self-employed. Therefore, in most cases, the percentage who reported being employed will be higher than the percentage of those whose employment was found in Employment Security Department wage records.

⁶ These files contain quarterly earnings and hours-worked information on those individuals with employment reported for unemployment insurance (UI) 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).

⁷ All wages and earnings are stated in 2007 Q1 dollars.

⁸ To derive annualized earnings, third quarter earnings are multiplied by four. Quarterly earnings are the result of hourly wage rates and the number of hours worked in a calendar quarter.

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Compared to all 2005-2006 CTE completers, those who were not in postsecondary education were more likely to work full time, had a higher median wage, and, consequently, higher median annualized earnings. Inflation adjusted earnings and wages, which had been declining, since 1999-2000, increased in 2005-2006 and was roughly equal to wages and earnings in 2000 (Figures 7b and 7c).

Figure 7. Employment and Earnings of Secondary Career and Technical Completers in the Third Quarter After Leaving Program										
	1995-96	1997-98	1999-00		2001-02		2003-04		2005-06	
	All	All	All	Not Enrolled in School	All	Not Enrolled in School	All	Not Enrolled in School	All	Not Enrolled in School
Percentage self-reporting employment during third quarter after leaving program	80	79	75	na	74	na	67	na	66	na
Percentage with employment reported by employers to ESD the third quarter after	68	62	58	na	58	na	55	56	58	58
Percentage with reported employment and/or enrolled in higher education		74	75	na	78	na	73	na	76	na
Median quarterly hours worked, of those working	289	274	259	332	259	320	248	296	282	341
Percentage employed full-time of those working (averaging 30 or more hours/week)	33	29	29	41	28	38	26	35	31	42
Median annualized earnings of those working	\$8,920	\$9,565	\$9,224	\$11,724	\$9,364	\$11,469	\$8,999	\$10,679	\$9,594	\$11,767
Size of household in which median earnings would support at poverty level	0.9	0.9	0.9	1.4	0.9	1.4	0.9	1.1	0.9	1.4
Size of household in which median earnings would support at twice poverty level	0.4	0.5	0.5	0.6	0.5	0.6	0.4	0.5	0.5	0.6
Median hourly wage of those working	\$7.98	\$8.66	\$9.30	\$9.46	\$9.07	\$9.14	\$9.03	\$9.15	\$9.17	\$9.32
Percentage self-reporting receipt of medical benefits from employer	34	35	40	na	35	na	36	na	38	na
Percentage self-reporting receipt of pension benefits from employer	17	17	18	na	16	na	13	na	15	na
Notes: Earnings and wages are expressed in first quarter 2007 dollars. Poverty levels are based on federal poverty guidelines identified by the Department of Health and Human Services for 2007.										

Figure 7b. Percent of Secondary CTE Students With Reported Employment or Enrolled in Higher Education in Third Quarter After Exiting Program

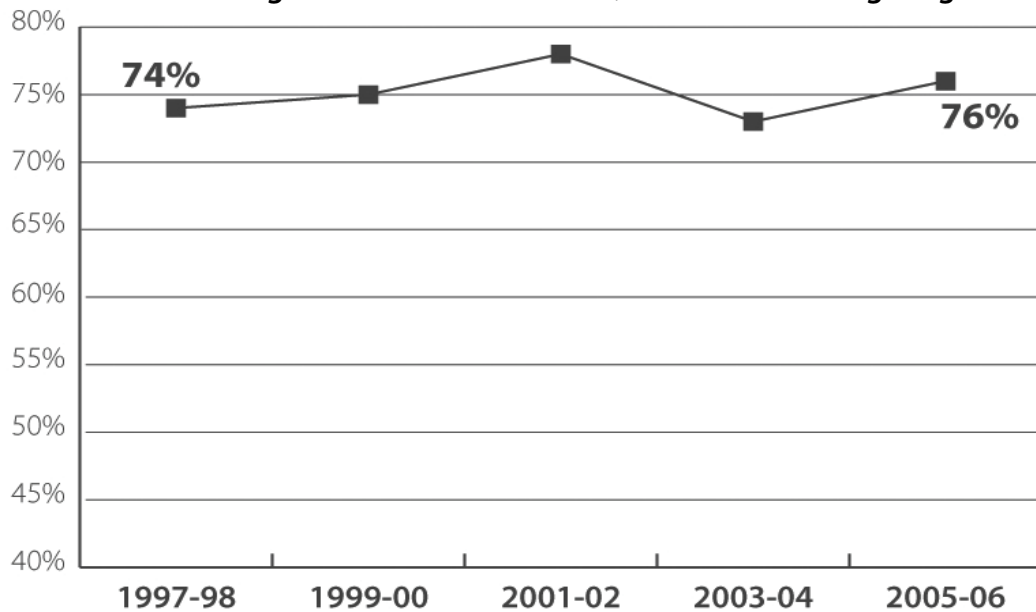
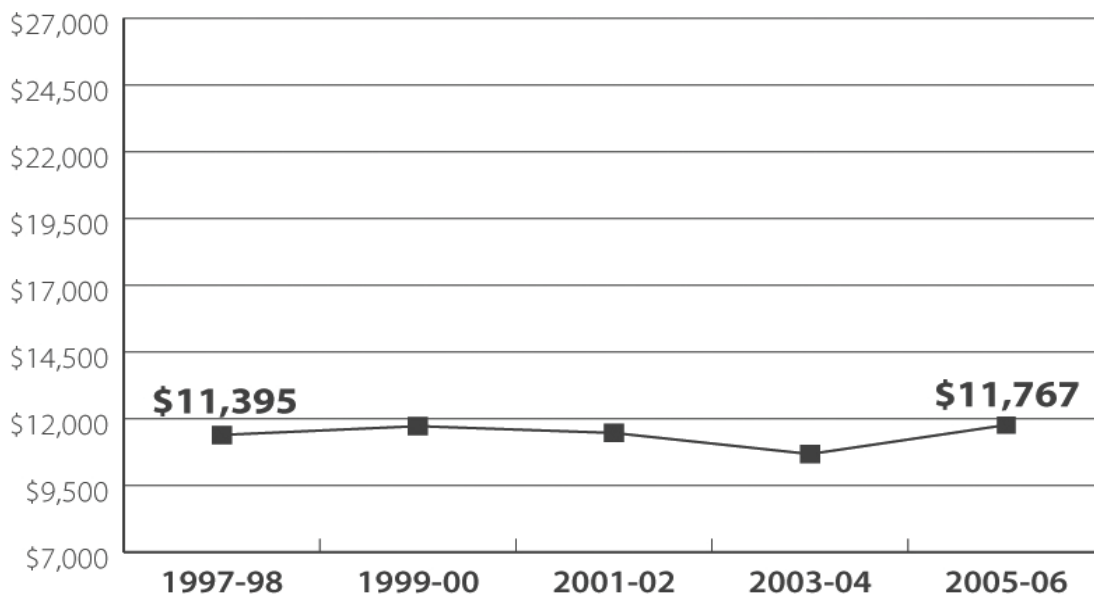


Figure 7c: Inflation Adjusted Annualized Earnings of Secondary CTE Students Not in Higher Education in Third Quarter After Exit



Source: Employment Security Department data matches 1995-2006.

Employment of CTE completers continued to be heavily concentrated in services industries and retail trade (Figure 8). A substantially high percentage of CTE completers were employed in accommodation and food services industries,

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particularly in full- and limited-service restaurants and snack and nonalcoholic beverage bars.

Figure 8. Industry of Employment of Secondary Career and Technical Students in the Third Quarter After Leaving School 2005-2006	
Industry Group	Employment
Natural Resources and Mining	1.3%
Construction	5.5%
Manufacturing	4.9%
Wholesale Trade	2.5%
Retail Trade	32.6%
Motor Vehicle and Parts Dealers	2.7%
Food and Beverage Stores	5.7%
Clothing and Clothing Accessories	5.7%
General Merchandise Stores	7.6%
All Other Retail Trade	10.8%
Transportation and Warehousing and Utilities	2.0%
Information	1.5%
Financial Activities	3.8%
Services	44.5%
Professional, Scientific, and Technical	2.0%
Administrative and Support and Waste Management and Remediation Services	5.0%
Education Services	1.7%
Health Care and Social Assistance	6.3%
Arts, Entertainment, and Recreation	3.2%
Accommodation and Food Services	21.8%
All Other Services	4.5%
Public Administration	1.5%
Total	100.0%

Source: Employment Security Department data matches 2005-2006.

Fewer Differences in Employment and Pay for Males, Females and Minorities

Employment and earnings outcomes between females and males, students with disabilities and students without disabilities, and racial and ethnic minority groups and whites were less likely to be significant than in adult programs. Differences are even less evident when CTE completers who are attending postsecondary education are excluded from the comparisons.⁹

⁹ Of the 2005-2006 CTE completers, the following percentages of each group were enrolled in higher education in the third quarter after exiting the program: Of females, 43 percent; of males, 38 percent; of students with disabilities, 19 percent; of whites, 40 percent; of African Americans, 40 percent; of Asians/Pacific Islanders, 55 percent; of Hispanics, 28 percent; and of Native Americans, 27 percent.

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There were still some differences even with the exclusion of CTE completers who were in higher education in the third quarter after leaving high school. Females were slightly less likely to be employed, but significantly less likely to be working full time than males. Their median annualized earnings were 77 percent of males, down from 85 percent in 2003-04 and their median wage was 89 percent of males down from 92 percent in 2003-04. Compared to whites, all ethnic minorities were less likely to be employed. However, Hispanics and Native Americans were more likely to be working full time. African Americans had median annualized earnings that were 88 percent of whites and Asians/Pacific Islanders earnings were 82 percent of whites. However, Native American annualized earnings were 117 percent of whites. Students with disabilities were slightly more likely to be employed than students without disabilities (60 percent versus 58 percent).

Net Impacts

Every four years the Workforce Training and Education Coordinating Board conducts net impact and cost-benefit analyses of workforce development programs. The most recent net impact study was conducted in 2006 and examined the experience of participants who left programs during the 2003-2004 and 2001-2002 program years. The next net impact study is planned for 2010.

The net impact analysis, conducted by the W.E. Upjohn Institute for Employment Research (Upjohn), attempts to estimate what happens to program participants as compared to what would have happened if they had not participated in a program. The objective is to determine the short-term and longer-term impacts of program participation on employment, hourly wages, hours worked, quarterly earnings, and receipt of UI benefits and public assistance.

In order to estimate these impacts, students who completed a Secondary CTE program were compared to students who had similar characteristics, but who did not participate in any of the programs in the study. The comparison group members were selected from general-track secondary students. *Short-term* net impacts were derived by examining outcomes for students who exited their senior year in fiscal year 2003-2004 and *longer-term* impacts for students who exited in fiscal year 2001-2002.

Secondary CTE has positive net impacts on employment, hourly wage, hours worked, and earnings. CTE completion increases lifetime earning.

Figure 9 shows the short-term and longer-term net impacts of completing CTE. During the third quarter after the 2003-2004 completers left school, CTE completion is associated with an increase of 6.7 percentage points in employment as reported to the Employment Security Department, a net impact on hourly wage of \$0.52 per hour, a net impact on hours worked per quarter of 21.8 hours, and a net impact of mean quarterly earnings of \$210.

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The longer-term impacts, observed 9 to 12 quarters after 2001-2002 CTE completers left school, are positive for employment rate, hourly wage, hours worked in the quarter, and quarterly earnings. In the longer term, CTE completion is associated with a decline in the percentage receiving food stamps and a minimal increase in the percentage receiving UI benefits.

Figure 9		
Short-Term Net Impacts Results of Secondary CTE Completers who Exited Senior Year Compared to Non-Participants		
	Short-Term 2003-2004 Exiters	Longer-Term 2001-2002 Exiters
Employment: percentage of additional reported employment due to program participation	6.7	5.4
Difference in Mean Hourly Wage	\$0.52	\$0.65
Difference in Mean Hours Worked Per Quarter	21.8	35.5
Difference in Mean Quarterly Earnings	\$210	\$416
TANF:** percentage receiving aid	0.0*	-0.1*
Food Stamps: percentage receiving	-0.2*	-1.4
Medical Benefits: percentage receiving	0.4*	-0.4*
UI: percentage receiving	0.0*	0.8
Notes: Short-term refers to impacts observed in the third quarter after leaving school. Longer-term refers to impacts observed 9 to 12 quarters after leaving school. Earnings and wages are in 2005 Q1 dollars. Results are for participants in PY 2003-2004. * Not statistically significant at the 0.05 level. ** Temporary Assistance to Needy Families.		

Benefits and Costs

The cost-benefit analysis examines the value of the net impact on earnings, employee benefits (estimated at 20 percent of earnings), social welfare benefits, UI benefits, and certain taxes.¹⁰ Benefits and costs are evaluated for both the observed period of time and based upon a statistical model that estimated the benefits and costs out to the age of 65. In order 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 2005 Q1 dollars. The benefits and costs presented here are based on impacts estimated for participants leaving programs in 2001-2002, because a longer-term follow-up is required for this analysis.

The program cost is the *difference* in the cost of a student completing CTE compared to the cost of a student completing another type of high school program.¹¹ (The difference is primarily due to smaller student/teacher ratios in CTE.) The intent of the

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

¹¹ The marginal cost to the state is reflected by the vocational funding enhancement that school districts receive for each CTE completer: \$774 per full-time equivalent (FTE) student. We add to this the Carl Perkins Vocational and Technical Education funds allocated to CTE in Washington state: \$150 per FTE student.

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cost-benefit evaluation is to analyze the net value of exiting high school having completed a CTE program, rather than exiting high school not having completed a CTE program.

Secondary CTE enhances the lifetime earnings of program completers. Gains in earnings and employee benefits outweigh the costs of CTE to the public.

For each CTE completer, the marginal cost to the public (taxpayer) is roughly \$930 over the length of their enrollment (Figure 10). During the first two and one-half years after leaving school, the average completer will gain \$3,027 in earnings. During the course of their working life to age 65, they will gain about \$38,000 in earnings and \$7,600 in employee benefits. These are net gains compared to the earnings of similar individuals who were not CTE completers.

From the time of leaving the senior year in high school to age 65, the public is forecast to gain about \$6,600 in additional Social Security, Medicare, federal income, and state sales taxes and to save \$905 per participant in total UI benefits and other social welfare costs—greater than the cost of CTE completion.

Figure 10				
Benefits and Costs of Secondary CTE				
	First 2.5 Years After Program		Forecast to Age 65	
	Participant	Public	Participant	Public
Benefit Difference				
Earnings	\$3,027		\$38,041	
Employee Benefits	\$606		\$7,608	
Taxes	-\$522	\$522	-\$6,562	\$6,562
Transfers*	-\$192	\$192	-\$905	\$905
Cost Difference				
Foregone Earnings**	\$31		\$31	
Program Costs	-\$0	-\$924	-\$0	-\$924
TOTAL	\$2,948	-\$210	\$38,213	\$6,543
Notes: Benefits and costs are expressed in 2005 Q1 dollars.				
*Transfers include UI, TANF, food stamps, and medical benefits. TANF benefits reflect the value of cash grants, childcare, and other client support services.				
** Instead of foregone earnings, CTE completers had positive net earnings while enrolled.				

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Progress and Areas for Improvement

The majority of completers were satisfied with the quality of their CTE program. Most were either employed or enrolled in a two- or four-year college during the third quarter after leaving their program.

Although the evaluation results are generally positive, there are areas that could be stronger. Only 23 percent of students reported receiving math instruction as part of CTE. Just 21 percent received reading instruction through CTE. Efforts to expand the integration of basic academic instruction with CTE should continue. While most students reported they were satisfied with CTE, only 36 percent were very satisfied with advice on selecting a program. Guidance in this area needs to be improved.

The completers included in this evaluation are young, entry-level workers. It is not surprising, therefore, that their median hourly wage is relatively low. One potential way of improving wages is to support students in obtaining employment in sectors of the economy other than retail trade, and accommodation and food services, where wages tend to be low. Over half (54 percent) were employed in these two sectors. For more on youth employment and the success indicators, review *Reconnecting Young Adults, 18 -24* available at: www.wtb.wa.gov/documents/reconnecting.

As was found in previous evaluations, the post-program wage rates of female CTE completers were lower than those for males. Secondary CTE should continue to encourage women to enter career pathways that lead to higher paying occupations.

For more study results on other workforce programs, go to www.wtb.wa.gov/wtr2008.asp