

From Higher Education To Work In West Virginia 2008

Summary Results For Work Participation And
Wages With Analysis By Residency Status,
Degree, Area of Concentration, Gender, Race,
Academic Achievement, Tuition Assistance,
and Nearby States

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Executive Summary

This study summarizes 2008 West Virginia work participation rates and wages for graduates from state public higher education institutions. We break results down by residency status, degree, area of concentration, gender, race, academic achievement, tuition assistance, and by nearby state. We also analyze time trends in state work participation and wage rates.

Tracking work participation and wages for graduates is important because public higher education institutions are factories which produce critical components of the state's and the nation's human capital. Human capital, in turn, is one crucial driver of the standard of living of the state, the nation, and the world.

Highlights of the study include:

Results By Year And Residency

- In 2008, 47.7 percent of graduates from public higher education institutions during the past 11 years were on the payrolls of establishments located in the state. That translates into 56,831 higher education graduates working in the state, out of the 119,018 graduates during the past 11 years.
- Work participation rates are much higher for recent graduates (56.9 percent for graduates during 2006-2007) compared to graduates during 1996-1997 (at 38.0 percent).
- The West Virginia work participation rate in 2008 was unchanged from 2007. This likely reflects slow state job growth during the year.
- Work participation rates are much higher for in-state graduates (at 60.7 percent) than for out-of-state graduates (at 8.2 percent).
- Graduates working in the state earned \$2.36 billion dollars in 2008, which translates into an annualized wage of \$41,526 per graduate.
- Graduate wages rise strongly with experience. Indeed, graduates during 2006-2007 earned \$30,041, compared to \$51,703 for graduates during 1996-1997.
- Annualized wages earned by graduates working in the state rose by 3.7 percent in 2008, well above the national rate of inflation (0.1 percent) and above national wage growth (2.5 percent).
- Wages for in-state graduates (at \$41,659) exceeded those for out-of-state graduates (at \$39,213)

Results By Degree And Area Of Concentration

- In 2008, state work participation rates were highest for graduates with Associate's degrees (65.7 percent), followed by graduates with Master's, First Professional, Bachelor's, and Doctoral degrees.
- Annualized wages in 2008 were highest for First Professional graduates (\$104,173), followed by Doctoral, Master's, Bachelor's, and Associate's degree graduates.
- Annualized wages tend to rise with experience for all degrees, but we find the biggest increases for First Professional graduates. For these graduates, wages rise from \$59,237 initially to \$162,620 for graduates during 1996-1997. Wages for graduates with Bachelor's degrees are initially below wages for graduates with Associate's degrees, but by the time graduates have 11 years of experience, Bachelor's degree graduates make \$7,920 more.

- Library Science, Science Technologies, Precision Production, Mechanic and Repair Technologies, and Health Professions posted the top five work participation rates in 2008.
- Engineering, Health Professions, Legal Professions, Transportation and Materials Moving, and Engineering Technologies posted to top five annualized wages in 2008.

Results By Gender And Race

- Female graduates posted higher work participation rates than men in 2008, but men earned higher wages (\$12,160 more on average).
- Caucasian graduates posted the highest work participation rates (at 49.9 percent), followed by American Indian, African American, Hispanic, and Asian graduates.
- Asian graduates earned the highest wages in 2008 (\$51,312), followed by Caucasian, Hispanic, American Indian, and African American graduates.

Results By Academic Achievement

- Work participation rates are inversely correlated with academic achievement, measured by ACT scores and college GPA. This suggests that high achieving graduates are less likely to work in the state.
- Annualized wages are positively correlated with academic achievement. Graduates with ACT scores above 22 earned on average \$5,348 more than graduates with ACT scores below 19. Graduates with college GPAs above 3.5 earned \$9,370 more than graduates with college GPAs below 3.0.

Results By Tuition Assistance

- The PROMISE scholarship is contributing to the human capital development of West Virginia. Indeed, the West Virginia work participation rate for PROMISE graduates so far is 62.3 percent. That is well above the rate for all graduates during the past four years, but it is below the rates for Higher Education Grant Program (HEGP) recipients (70.4 percent) and all in-state graduates (67.6 percent). This suggests that PROMISE graduates tend to be relatively mobile.

Results For Nearby States

- Of the 119,018 graduates during the past 11 years, 24,644 worked at establishments in the District of Columbia, Maryland, New Jersey, Ohio, Pennsylvania, or Virginia in 2008. That translates into a work participation rate of 20.7 percent.
- Virginia and Pennsylvania accounted for the largest shares of graduates in 2008, followed by Ohio, Maryland, New Jersey, and the District of Columbia.
- Graduates working in nearby states earned average annualized wages in 2008 of \$54,076, which is 30.2 percent above the West Virginia average of \$41,526.

The Data

The data analyzed in this study come from the matching of demographic information on graduates from West Virginia public institutions of higher education with employment records maintained by Workforce West Virginia, the federal government, and nearby state governments. Graduates reflect the highest degree earned during the 1996-1997 to 2006-2007 period. The self-employed, student workers, most church workers, and unpaid family workers are generally not covered by this data. **For this report, U.S. Postal Service workers are not included in the West Virginia totals, due to data limitations.**

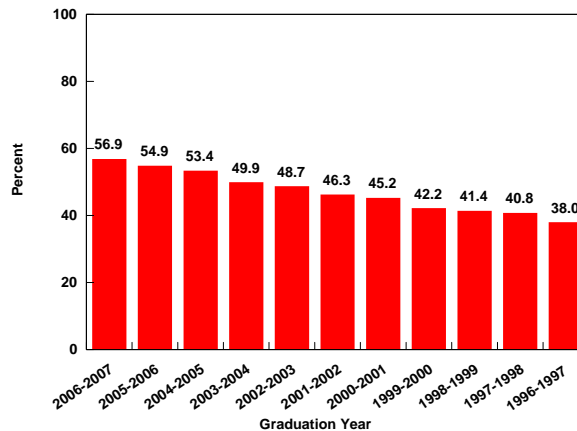
Results By Year And Residency

Work Participation By Year And Residency

In 2008, according to the most recent data provided by the West Virginia Higher Education Policy Commission, 56,831 out of the 119,018 graduates from West Virginia public higher education institutions from 1996-1997 to 2006-2007 were employed and earned wages within the state. This yields an overall work participation rate of 47.7 percent for graduates over the 11 year period.

The most recent graduates show the highest work participation rates, at 56.9 percent for graduates in 2006-2007 and 54.9 percent for graduates in 2005-2006. As time from graduation increases, however, work participation sharply decreases, as illustrated in Figure 1. Graduates from 1996-1997 had a work participation rate of 38.0 percent; 18.9 percentage points lower than the graduates of 2006-2007.

Figure 1
Percent Of Graduates From W.Va. Higher Education Institutions Working In The State In 2008



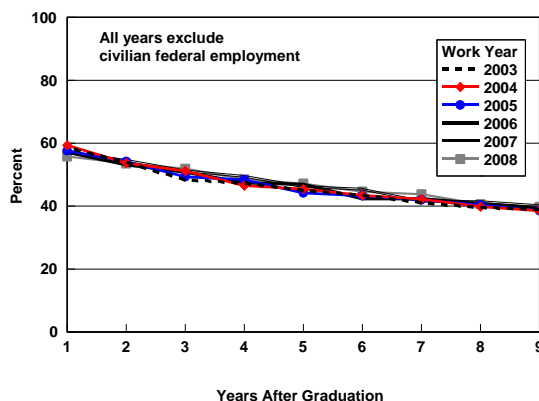
Source: author calculations

There are many reasons why graduates may not be working in West Virginia in 2008. Some graduates decide to continue their education full time, others are self-employed (and thus omitted from our data), some leave the state to work, and some are employed in an industry not covered by the dataset (some federal employees).

Figure 2 shows that work participation rates have been fairly stable during the past five years (all rates exclude federal government employees, for comparability). The nine-year work participation rate rose from 47.2 percent in 2006 to 47.9 percent in 2007, but stalled at 47.9 percent in 2008.¹ This is likely related to the slow overall job growth in West Virginia during 2008. Indeed, state covered job growth (excluding federal government) was just 0.4 percent in 2008.

¹ In order to aid comparability of these calculations, we use a maximum of nine years since graduation.

Figure 2
Percent Of Graduates From W.Va.
Public Higher Education Institutions
Working In The State 2003-2008

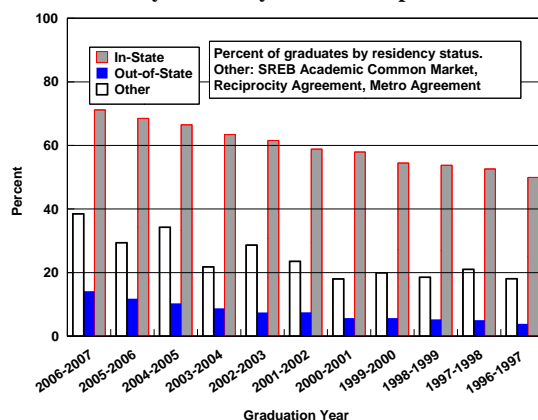


Source: author calculations

Most graduates during the past 11 years were classified as West Virginia residents for fee purposes (74.6 percent of graduates reporting residency status), compared to 22.0 percent classified as out of state. Therefore, it comes as no surprise that West Virginia residents dominated the composition of graduates employed in the state. Of the graduates employed in the state in 2008, 94.4 percent were listed as in state, while 3.7 percent were listed as out of state.

In-state graduates, at 60.7 percent, have a significantly larger work participation rate than graduates listed as out of state, at only 8.2 percent. Figure 3 shows that work participation rates for in-state and out-of-state graduates become a bit more similar over time. As illustrated in Figure 3, graduates from 2006-2007 listed as in-state were 57.0 percentage points more likely to work in the state than out-of-state graduates in the same year, while graduates from 1996-1997 listed as in-state were only 44.9 percentage points more likely to work in the state than graduates listed as out-of-state.

Figure 3
Percent Of State Higher Education Graduates
Working In W.Va. In 2008
By Residency For Fee Purposes



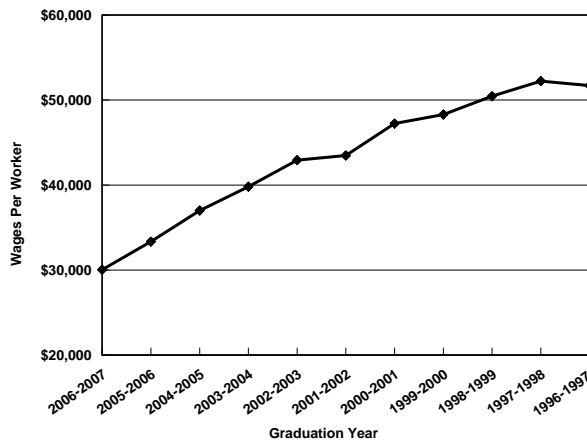
Source: author calculations

Annualized Wage By Year And Residency

In 2008, West Virginia public higher education graduates during the past decade earned an average annualized wage of \$41,526.² This means that graduates from state public higher education institutions made on average \$5,539 more than the average West Virginia employee, with the state average wage at \$35,987, but \$4,037 less than the national average wage of \$45,563.³

The most recent graduates, being the newest to the job market, averaged the lowest average wage, at \$30,041. As job experience increases, wages also rise, reaching \$52,242 for the class of 1997-1998, but wages dip slightly to \$51,703 for the class of 1996-1997, illustrated in Figure 4.

Figure 4
Quarterly Annualized Wages Of Graduates From W.Va.
Higher Education Institutions In 2008



Source: author calculations

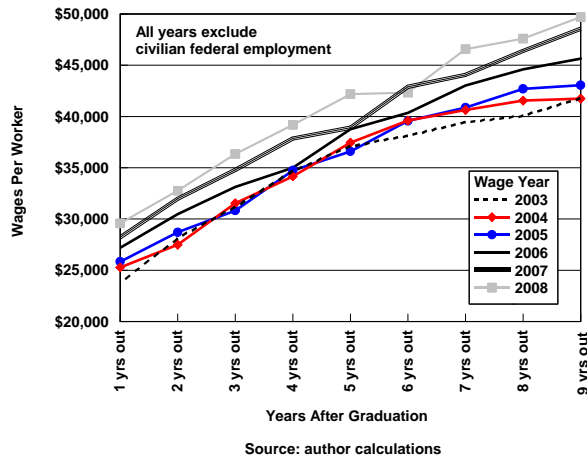
The data also shows that wages for graduates working in the state tend to increase both with experience and over time, as Figure 5 shows (again we exclude federal government employees for comparability over time). Annualized wages for graduates rose to \$39,177 in 2008, up from \$37,786 in 2007.⁴ That translates into a 3.7 percent increase, which outpaces the rate of inflation (0.1 percent). This falls a bit short of the 4.3 percent increase from 2006 to 2007. This also contrasts with accelerating wage growth for all state employees (again excluding federal employees) in 2008, where annual wage growth accelerated from 4.2 percent in 2007 to 5.4 percent in 2008. West Virginia graduates' experience in 2008 was more similar to the national average, where growth decelerated from 4.5 percent in 2007 to 2.5 percent in 2008. One factor driving the trend in West Virginia in 2008 is the energy boom, which supported overall job and wage growth in the state (particularly in the energy-related sectors). If these sectors employ fewer college graduates (or fewer West Virginia graduates) then we could see different trends in wage growth.

² The adjustment is to divide a worker's total wages for the year by the number of quarters worked. The resulting quarterly wage is then 'annualized' by multiplying by four. Thus, a worker with total wages of \$33,000 for the year, with three quarters worked, will have an average annualized wage of \$44,000 ($=(\$33,000/3)*4$).

³ West Virginia and U.S. annual wages are from the U.S. Bureau of Labor Statistics.

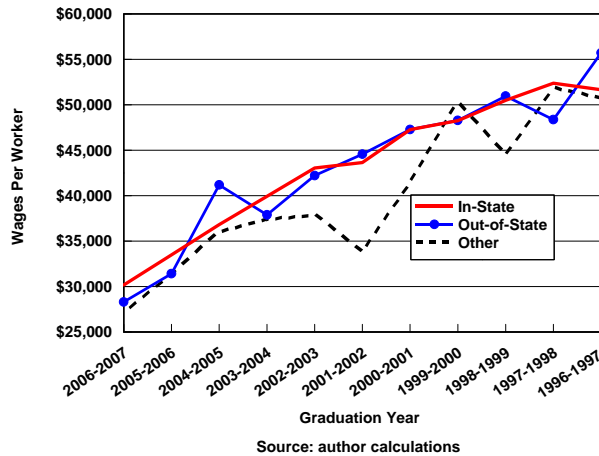
⁴ For comparability across years, annualized wages in this calculation focus on graduates during the past nine years, excluding federal government employees.

Figure 5
Annualized Wages Of Graduates From W.Va. Higher Education Institutions 2003-2008



Like work participation, annual average wage also varies by residency status. Overall, in-state graduates earned a higher wage than out-of-state graduates, \$41,659 compared to \$39,213. Figure 6 shows that for the first two years in the workplace, in-state graduates earn more than out-of-state graduates, but as work experience increases, out-of-state graduates start to earn wages similar to their in-state counterparts.

Figure 6
Annualized Wages Of Graduates From W.Va. Higher Education Institutions In 2008 By Residency



Results By Degree And Area Of Concentration

Work Participation And Wages By Degree

A major determinant of work participation and wage is the graduates' degree. Table 1 shows that graduates earning an Associate's degree were the most likely to be employed in West Virginia, with a work participation rate of 65.7 percent, while graduates earning a Doctoral degree were the least likely to work in the state, with a work participation rate of 24.6 percent. Master's degree recipients has the second highest work participation rate, at 50.3 percent, followed by First Professional degree recipients, at 44.3 percent, and then graduates earning a Bachelor's degree, at 42.6 percent.

Table 1 also shows the work participation rates of graduates earning specific degrees by graduation year. Graduates earning a Bachelor's degree, the most popular degree earned (58.0 percent of all degrees awarded), had the second highest participation rate for 2006-2007 class, at 53.1 percent, but saw the largest drop in work participation over time, 21.1 percent points, as the graduates in 1996-1997 had a participation rate of only 32.0 percent. On the other hand, graduates earning a Master's degree, the second most degrees earned (20.3 percent of all degrees awarded), had the most stable work participation rates, dropping only 10.4 percentage points from the 2005-2006 graduates, who had the highest participation rate at 53.0 percent, to the 1996-1997 graduates, who had the lowest participation rates at 42.6 percent.

Table 1
Work Participation And Average Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions In 2008 By Degree and Graduation Year

Graduation Year	Degree									
	Associate's		Bachelor's		Master's		First Professional		Doctoral	
	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages
1996-1997	55.5%	\$39,721	32.0%	\$47,641	42.6%	\$56,748	33.5%	\$162,620	23.8%	\$70,304
1997-1998	59.9%	\$38,253	34.6%	\$48,376	45.0%	\$58,022	37.5%	\$155,462	17.8%	\$70,706
1998-1999	56.7%	\$38,185	34.9%	\$46,907	49.3%	\$54,592	38.0%	\$138,893	27.3%	\$70,425
1999-2000	58.4%	\$38,702	37.0%	\$43,148	47.3%	\$56,651	36.3%	\$129,402	17.2%	\$72,330
2000-2001	63.1%	\$36,256	39.1%	\$41,163	51.4%	\$54,098	44.0%	\$137,167	22.1%	\$69,333
2001-2002	64.7%	\$35,489	41.2%	\$38,778	51.6%	\$51,778	40.1%	\$108,856	26.0%	\$62,756
2002-2003	67.8%	\$34,645	43.1%	\$37,362	52.1%	\$51,311	52.0%	\$103,708	21.9%	\$66,950
2003-2004	66.8%	\$33,499	45.2%	\$34,647	52.6%	\$48,869	45.4%	\$91,731	23.8%	\$68,867
2004-2005	72.1%	\$31,280	48.3%	\$32,669	52.6%	\$48,620	53.0%	\$77,660	24.9%	\$66,465
2005-2006	72.5%	\$29,636	50.7%	\$29,099	54.0%	\$44,243	51.4%	\$66,643	27.9%	\$58,637
2006-2007	74.2%	\$27,874	53.1%	\$25,347	53.0%	\$42,282	48.8%	\$59,237	34.9%	\$62,192
Total	65.7%	\$33,829	42.6%	\$36,567	50.3%	\$51,021	44.3%	\$104,173	24.6%	\$66,326

Source: Authors' calculation.

Graduates receiving First Professional degrees averaged the highest wages in 2008, at \$104,173, followed by Doctoral graduates, who averaged \$66,326. Associate's degree recipients averaged the lowest annualized wage at \$33,829, with Bachelor's degree recipients earning slightly more on average, at \$36,567.

Experience and time spent in the workplace also provide different returns depending on degree. Associate's degree recipients see a ten-year increase of \$10,379, from \$27,874 for the graduates of 2006-2007 to \$38,253 for the graduates of 1997-1998. This translates into a 37.2 percent pay increase over the decade. However, over the same time span, Bachelor's degree recipients saw a pay increase of \$23,029, 90.9 percent, and First Professional degree recipients saw an increase of \$96,225, 162.4 percent. Thus, while annualized wages for Associate's degree graduates are

initially above those for Bachelor's degree graduates, a Bachelor's degree premium emerges after two years and hits \$7,920 by the 11th year after graduation.

Work Participation And Wages By Area Of Concentration

Along with the degree a graduate earns, the field in which he or she may work may play a significant a role in determining if they stay to work in West Virginia and how much they earn. Table 2 shows the number of degrees earned in each area of concentration. The most popular areas of concentration were Business, Management, and Marketing with 19,730 graduates; Education with 18,643 graduates; and Health Profession with 17,537 graduates.

Table 2
Graduates By Area Of Concentration From West Virginia Public Higher Education Institutions
During 1996-1997 To 2006-2007

Area of Concentration	Total Number of Graduates From 1996-1997 to 2006-2007	Degree			
		Number of Graduates with Associate's	Number of Graduates with Bachelor's	Number of Graduates with Master's	Number of Graduates with Doctoral
Agriculture, Agriculture Operations	1,173	56	845	240	32
Architecture and Related Services	280	n/a	280	n/a	n/a
Biological and Biomedical Sciences	3,206	n/a	2,553	418	235
Business, Management, Marketing, and Related	19,730	3,541	12,899	3,032	53
Communication, Journalism, and Related Programs	4,890	94	3,641	1,154	n/d
Communications Technologies	341	164	177	n/a	n/a
Computer and Information Sciences	1,834	426	940	431	21
Education	18,643	118	8,757	9,142	484
Engineering	5,253	32	3,391	1,590	240
Engineering Technologies/Technicians	2,885	1,281	1,161	429	n/a
English Language and Literature/Letters	1,722	n/a	1,303	389	30
Family and Consumer Sciences/Human Sciences	1,583	165	1,308	110	n/a
Foreign Languages, Literatures, and Linguistics	700	74	273	344	n/a
Health Professions and Related Clinical Sciences	17,537	6,263	4,893	2,734	58
History	1,318	n/a	1,131	138	49
Legal Professions and Studies	1,811	360	n/a	22	n/a
Liberal Arts and Sci., Gen. Std., and Humanities	10,851	2,704	8,054	66	n/a
Library Science	n/d	n/a	n/a	n/d	n/a
Mathematics and Statistics	567	n/a	322	216	29
Mechanic and Repair Technologies/Technicians	225	210	n/a	n/a	n/a
Multi/interdisciplinary Studies	1,834	789	888	155	n/d
Natural Resources and Conservation	1,198	148	772	210	68
Parks, Recreation, Leisure and Fitness Studies	1,876	n/a	1,676	200	n/a
Personal and Culinary Services	183	172	n/a	n/a	n/a
Philosophy and Religious Studies	70	n/a	70	n/a	n/a
Physical Sciences	1,335	n/d	986	239	105
Precision Production	221	189	n/a	n/a	n/a
Psychology	3,875	n/a	3,069	499	200
Public Administration and Social Service Prof	2,618	195	1,083	1,331	n/a
Science Technologies/Technicians	426	254	n/a	n/a	n/a
Security and Protective Services	3,768	967	2,517	254	n/a
Social Sciences	4,412	n/a	3,951	415	46
Transportation and Materials Moving	n/d	n/d	n/a	n/a	n/a
Visual and Performing Arts	2,645	102	2,101	396	46
Total	119,018	18,315	69,041	24,155	1,698

n/a: no data available for this area of concentration

n/d: data not disclosed

The Business, Management, and Marketing concentration was most popular with graduates earning a Bachelor's degree, with 12,899 degrees earned (65.4 percent of all Business graduates). Education saw the highest portion of its degrees come from Master's degree recipients, with 9,142 graduates (49.0 percent of Education graduates). With 9,142 graduates earning their Master's degree in Education out of 24,155 total graduates earning Master's degrees, Education Master's degree recipients make up 37.8 percent of all Master's degree recipients, by far the most of any area of concentration. Therefore, their work participation and average wage will heavily influence the averages and totals of Master's recipients.

The Health Professions area of concentration saw its highest proportion of graduates come from those earning an Associate's degree, with 6,263 graduates (35.7 percent of all Health Professions

graduates). Similar to Education and total Master's degrees, Health Professions degree recipients made up more than one third of all Associate's degrees earned and will, likewise, have a large effect on the work participation and average wage totals of Associate's recipients.

Table 3 shows the ten highest and lowest work participation rates for given areas of concentration. The area of concentration with the highest percentage of its graduates employed in the state in 2008 was Library Science, but due to confidentiality, the exact numbers are not published. Note that both Health Professions, at 57.8 percent, and Education, at 57.7 percent, are among the top ten areas with the highest work participation rates, driving the relatively high work participation rates we see for Associate's degrees and Master's degrees. Architecture, at 9.3 percent, had the lowest work participation rate, followed by Trade and Materials Moving.

Table 3
Graduates From W.Va. Public Higher Education Institutions
By Degree And Area Of Concentration In 2008
Ranked By Work Participation In 2008

Area Of Concentration	All Degrees		Degree			
	Work Participation	Annualized Wages Per Worker	Associate's	Bachelor's	Master's	Doctoral
Top Ten						
Library Science	n/d	n/d	n/a	n/a	n/d	n/a
Science Technologies/Technicians	79.1%	\$31,996	77.6%	n/a	n/a	n/a
Precision Production	78.7%	\$44,737	79.9%	n/a	n/a	n/a
Mechanic and Repair Technologies/Technicians	69.3%	\$46,243	70.5%	n/a	n/a	n/a
Health Professions and Related Clinical Sciences	57.8%	\$56,569	68.6%	56.6%	55.1%	25.9%
Education	57.7%	\$38,358	50.8%	52.7%	63.1%	44.0%
Legal Professions and Studies	56.4%	\$54,778	64.4%	n/a	59.1%	n/a
Security and Protective Services	56.1%	\$33,203	70.9%	52.4%	33.1%	n/a
Multi/Interdisciplinary Studies	55.5%	\$34,647	67.0%	44.8%	57.4%	n/d
Personal and Culinary Services	54.6%	\$22,760	52.9%	n/a	n/a	n/a
Bottom Ten						
Architecture and Related Services	9.3%	\$45,301	n/a	9.3%	n/a	n/a
Transportation and Materials Moving	n/d	n/d	n/d	n/a	n/a	n/a
Foreign Languages, Literatures, and Linguistics	23.3%	\$22,342	70.3%	23.8%	11.6%	n/a
Philosophy and Religious Studies	24.3%	\$28,218	n/a	24.3%	n/a	n/a
Parks, Recreation, Leisure and Fitness Studies	25.1%	\$33,179	n/a	24.2%	32.5%	n/a
Mathematics and Statistics	25.9%	\$42,787	n/a	30.4%	19.9%	n/d
Visual and Performing Arts	28.7%	\$24,554	51.0%	28.0%	28.0%	n/d
Engineering	29.2%	\$67,713	59.4%	32.4%	23.7%	16.3%
Family and Consumer Sciences/Human Sciences	30.3%	\$24,862	63.6%	25.3%	40.0%	n/a
Physical Sciences	33.3%	\$45,025	n/d	36.6%	26.4%	16.2%

n/a: no data available for this area of concentration.

n/d: data not disclosed.

Though it has one of the lowest work participation rates, at 29.2 percent, Engineering graduates averaged the highest wage, at \$67,713, followed by Health Professions, at \$56,569, and Legal Professions, at \$54,778, as illustrated in Table 4. Concentrations in Physical Sciences and Architecture also all appear on both the bottom ten table in work participation and the top ten table in average wage.

Table 4
Graduates From W.Va. Public Higher Education Institutions
By Degree And Area Of Concentration In 2008
Ranked By Annualized Wages In 2008

Area Of Concentration	All Degrees		Degree			
	Work Participation	Annualized Wages Per Worker	Associate's	Bachelor's	Master's	Doctoral
Top Ten						
Engineering	29.2%	\$67,713	\$16,884	\$64,979	\$77,278	\$77,036
Health Professions and Related Clinical Sciences	57.8%	\$56,569	\$40,569	\$49,130	\$64,059	\$99,616
Legal Professions and Studies	56.4%	\$54,778	\$25,891	n/a	\$47,459	n/a
Transportation and Materials Moving	n/d	n/d	n/d	n/a	n/a	n/a
Engineering Technologies/Technicians	53.7%	\$50,439	\$45,136	\$54,620	\$65,276	n/a
Computer and Information Sciences	44.7%	\$46,823	\$30,457	\$51,022	\$66,866	n/d
Mechanic and Repair Technologies/Technicians	69.3%	\$46,243	\$47,554	n/a	n/a	n/a
Architecture and Related Services	9.3%	\$45,301	n/a	\$45,301	n/a	n/a
Physical Sciences	33.3%	\$45,025	n/d	\$41,128	\$65,083	\$60,219
Precision Production	78.7%	\$44,737	\$45,791	n/a	n/a	n/a
Bottom Ten						
Foreign Languages, Literatures, and Linguistics	23.3%	\$22,342	\$17,934	\$23,437	\$27,836	n/a
Personal and Culinary Services	54.6%	\$22,760	\$22,400	n/a	n/a	n/a
Visual and Performing Arts	28.7%	\$24,554	\$17,539	\$23,038	\$35,016	n/d
Family and Consumer Sciences/Human Sciences	30.3%	\$24,862	\$17,186	\$25,256	\$40,218	n/a
English Language and Literature/Letters	36.0%	\$25,936	n/a	\$23,382	\$33,742	n/d
History	35.7%	\$27,013	n/a	\$26,051	\$31,756	\$36,031
Communications Technologies	50.4%	\$27,927	\$23,848	\$33,329	n/a	n/a
Philosophy and Religious Studies	24.3%	\$28,218	n/a	\$28,218	n/a	n/a
Psychology	42.2%	\$28,610	n/a	\$25,969	\$36,084	\$61,712
Social Sciences	36.4%	\$29,561	n/a	\$28,306	\$39,277	\$52,411

n/a: no data available for this area of concentration.

n/d: data not disclosed.

The lowest annualized average wage earned was by graduates in Foreign Languages, Literature, and Linguistics, making only \$22,342, followed by Personal and Culinary Services, at \$22,760, and Visual and Performing Arts, at \$24,554. In total, the bottom ten concentrations all averaged below \$30,000 annually.

Finally, Table 5 shows work participation rates by area of concentration and degree earned. The common trend can be easily seen here again; wages increase and work participation falls with additional education. Engineers, for example, see the biggest pay jump, \$60,152, between earning an Associate's degree and a Doctorate, and thus see work participation rates plummet more than 43.0 percentage points, from 59.4 percent to 16.3 percent. Similar results can be seen in both Health Professions and Related Clinical Science and Natural Resource and Conservation, as wages surge and work participation rates plunge.

Table 5
Work Participation And Wages In 2008 Of Graduates From West Virginia Public Higher Education Institutions
By Degree And Area Of Concentration*

Area of Concentration	Degree							
	Associate's		Bachelor's		Master's		Doctoral	
	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker
Agriculture, Agriculture Operations	64.3%	\$21,627	34.4%	\$36,426	37.1%	\$42,511	n/d	n/d
Architecture and Related Services	n/a	n/a	9.3%	\$45,301	n/a	n/a	n/a	n/a
Biological and Biomedical Sciences	n/a	n/a	36.3%	\$35,281	33.7%	\$52,990	17.9%	\$71,226
Business, Management, and Marketing	65.3%	\$26,979	44.1%	\$39,873	43.9%	\$72,888	n/d	n/d
Communications and Journalism	58.5%	\$17,333	29.1%	\$28,901	59.5%	\$49,508	n/d	n/d
Communications Technologies	59.8%	\$23,848	41.8%	\$33,329	n/a	n/a	n/a	n/a
Computer and Information Sciences	62.0%	\$30,457	42.8%	\$51,022	32.7%	\$66,866	n/d	n/d
Education	50.8%	\$15,981	52.7%	\$30,402	63.1%	\$43,567	44.0%	\$66,926
Engineering	59.4%	\$16,884	32.4%	\$64,979	23.7%	\$77,278	16.3%	\$77,036
Engineering Technologies	65.5%	\$45,136	48.3%	\$54,620	32.9%	\$65,276	n/a	n/a
English Language and Literature	n/a	n/a	36.5%	\$23,382	35.5%	\$33,742	n/d	n/d
Family and Consumer Sciences	63.6%	\$17,186	25.3%	\$25,256	40.0%	\$40,218	n/a	n/a
Foreign Languages, Lit., and Ling.	70.3%	\$17,934	23.8%	\$23,437	11.6%	\$27,836	n/a	n/a
Health Professions	68.6%	\$40,569	56.6%	\$49,130	55.1%	\$64,059	25.9%	\$99,616
History	n/a	n/a	35.5%	\$26,051	38.4%	\$31,756	30.6%	\$36,031
Legal Professions and Studies	64.4%	\$25,891	n/a	n/a	59.1%	\$47,459	n/a	n/a
Liberal Arts	58.8%	\$25,960	47.3%	\$35,615	65.2%	\$41,824	n/a	n/a
Library Science	n/a	n/a	n/a	n/a	n/d	n/d	n/a	n/a
Mathematics and Statistics	n/a	n/a	30.4%	\$41,312	19.9%	\$44,703	n/d	n/d
Mechanic and Repair Technologies	70.5%	\$47,554	n/a	n/a	n/a	n/a	n/a	n/a
Multi/Interdisciplinary Studies	67.0%	\$32,233	44.8%	\$32,096	57.4%	\$60,553	n/d	n/d
Natural Resources and Conservation	77.0%	\$37,340	41.5%	\$35,406	38.1%	\$51,433	20.6%	\$75,058
Parks, Recreation, Leisure	n/a	n/a	24.2%	\$30,853	32.5%	\$47,704	n/a	n/a
Personal and Culinary Services	52.9%	\$22,400	n/a	n/a	n/a	n/a	n/a	n/a
Philosophy and Religious Studies	n/a	n/a	24.3%	\$28,218	n/a	n/a	n/a	n/a
Physical Sciences	n/d	n/d	36.6%	\$41,128	26.4%	\$65,083	16.2%	\$60,219
Precision Production	79.9%	\$45,791	n/a	n/a	n/a	n/a	n/a	n/a
Psychology	n/a	n/a	41.8%	\$25,969	56.9%	\$36,084	9.5%	\$61,712
Public Administration	51.8%	\$18,471	50.7%	\$28,039	49.2%	\$42,280	n/a	n/a
Science Technologies	77.6%	\$38,896	n/a	n/a	n/a	n/a	n/a	n/a
Security and Protective Services	70.9%	\$30,968	52.4%	\$33,880	33.1%	\$40,980	n/a	n/a
Social Sciences	n/a	n/a	36.4%	\$28,306	36.9%	\$39,277	30.4%	\$52,411
Transportation & Materials Moving	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a
Visual and Performing Arts	51.0%	\$17,539	28.0%	\$23,038	28.0%	\$35,016	n/d	n/d
Total	65.7%	\$33,829	42.6%	\$36,567	50.3%	\$51,021	24.6%	\$66,326

*Including only the areas of concentration for which there is data available.

n/a: no data available for this area of concentration

n/d: data not disclosed

In concentrations where relative wage jumps are low, work participation rate decreases are similarly relatively low. In History, average wage merely increases \$9,980 from a Bachelor's degree to a Doctoral degree and work participation only falls 4.9 percentage points, from 35.5 percent to 30.6 percent. For the same degrees, Social Science graduates, likewise, observe a wage increase of only \$24,105 and see a participation decrease of 6.0 percentage points.

Results By Gender And Race

Work Participation And Wages By Gender

Of the 119,018 graduates during the 11 year span of data provided by the HEPC, there were many more female graduates (67,622 or 56.8 percent) than male graduates (51,396 or 43.2 percent).

Females were also much more likely to work in the state. In 2008, 35,103 female graduates were included on West Virginia payrolls, translating to a work participation rate of 51.9 percent. Male

graduates, however, had 21,728 graduates working in the state in 2008, giving them a work participation rate of 42.3 percent.

Females had higher participation rates for every degree, illustrated in Table 6. Though graduates earning an Associate's degree or First Professional degree had very similar participation rates from both sexes, (work participation rate difference of 2.0 percentage points or less), graduates earning a Bachelor's, Master's, or Doctoral degree saw a significant difference in participation rates, with females averaging 7.1 to 14.5 percentage points more than males.

Table 6
Work Participation And Average Annualized Wages Of Graduates From W.Va.
Public Higher Education Institutions In 2008 By Degree And Gender

Degree	Males		Females		Total	
	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages
Associate's	64.9%	\$40,955	66.1%	\$30,434	65.7%	\$33,829
Bachelor's	38.8%	\$42,046	45.9%	\$32,415	42.6%	\$36,567
Master's	41.2%	\$60,971	55.7%	\$46,572	50.3%	\$51,021
First Professional	43.4%	\$119,207	45.4%	\$87,137	44.3%	\$104,173
Doctoral	19.9%	\$66,345	30.7%	\$66,310	24.6%	\$66,326
All Degrees	42.3%	\$49,037	51.9%	\$36,877	47.7%	\$41,526

While females outnumbered and out-participated males, male graduates earned a substantially higher wage than female graduates. In 2008, male graduates, earning \$49,037, averaged \$12,160 more than females, who earned \$36,877. Table 6 shows this varying wage gap by degree. Female graduates earning a Doctoral degree averaged a mere \$35 less annually than male Doctoral graduates. For the other summary degrees males out-earning females by a much larger margin, from a \$9,631 difference in Bachelor's recipients, to a \$32,070 difference in First Professional recipients.

Like the varying gender participation rates and wages seen when disaggregated by degree, varying trends can also be seen when broken down by area of concentration. Females out-participated males in 20 of the 28 areas of concentration in which both sexes had enough graduates to disclose the results, shown in Table 7.

Females had the largest gap over males in Education and Business, Management, and Marketing, with a work participation rate 11.4 percentage points higher than males. The female work participation rate was also much higher in Liberal Arts, with a gap of 9.5 percent. There were, however, concentrations in which males earning a degree were much more likely to work in West Virginia than females. Males posted the largest gap over females in Natural Resources and Conservation, with a work participation rate 11.0 percentage points higher than females; followed by Agriculture, with a gap of 8.4 percentage points; and Engineering Technologies, with a gap of 7.4 percent.

Table 7
Work Participation And Annualized Wages By Gender For Graduates From W.Va.
Public Higher Education Institutions Working In The State In 2008

Area of Concentration	Males			Females		
	Total Graduates From 1996-1997 To 2006-2007	Work Participation	Annualized Wages Per Worker	Total Graduates From 1996-1997 To 2006-2007	Work Participation	Annualized Wages Per Worker
Agriculture, Agriculture Operations	624	39.9%	\$41,268	549	31.5%	\$29,731
Architecture and Related Services	224	8.0%	\$52,532	56	n/d	n/d
Biological and Biomedical Sciences	1,468	34.1%	\$45,395	1,738	35.0%	\$33,536
Business, Management, and Marketing	9,697	42.1%	\$49,506	10,033	53.5%	\$34,724
Communications and Journalism	1,933	33.1%	\$36,357	2,957	39.4%	\$36,423
Communications Technologies	198	49.5%	\$32,365	143	51.7%	\$22,050
Computer and Information Sciences	1,405	45.4%	\$48,447	429	42.4%	\$41,129
Education	5,435	49.6%	\$41,691	13,208	61.1%	\$37,242
Engineering	4,422	30.1%	\$68,922	831	24.4%	\$59,783
Engineering Technologies	2,506	54.6%	\$52,259	379	47.2%	\$36,520
English Language and Literature	601	36.8%	\$27,406	1,121	35.6%	\$25,122
Family and Consumer Sciences	85	31.8%	\$37,843	1,498	30.2%	\$24,088
Foreign Languages, Lit., and Ling.	190	17.4%	\$33,046	510	25.5%	\$19,625
Health Professions	3,913	50.5%	\$89,160	13,624	60.0%	\$48,684
History	882	33.9%	\$28,874	436	39.2%	\$23,759
Legal Professions and Studies	804	53.6%	\$65,325	1,007	58.7%	\$47,087
Liberal Arts	4,917	45.1%	\$39,179	5,934	54.7%	\$28,405
Library Science	n/a	n/a	n/a	n/d	n/d	n/d
Mathematics and Statistics	313	26.8%	\$46,477	254	24.8%	\$37,867
Mechanic and Repair Technologies	217	68.7%	\$45,742	n/d	n/d	n/d
Multi/Interdisciplinary Studies	861	50.5%	\$45,666	973	59.8%	\$26,411
Natural Resources and Conservation	960	46.3%	\$40,445	238	35.3%	\$33,269
Parks, Recreation, Leisure	1,182	22.5%	\$35,802	694	29.5%	\$29,776
Personal and Culinary Services	86	53.5%	\$23,429	97	55.7%	\$22,190
Philosophy and Religious Studies	53	26.4%	\$28,449	17	n/d	n/d
Physical Sciences	862	31.2%	\$47,075	473	37.0%	\$41,873
Precision Production	216	80.1%	\$44,915	n/d	n/d	n/d
Psychology	1,043	40.3%	\$30,896	2,832	42.9%	\$27,819
Public Administration	488	45.3%	\$40,949	2,130	51.2%	\$33,021
Science Technologies	171	77.8%	\$46,634	255	80.0%	\$22,452
Security and Protective Services	2,102	55.8%	\$38,751	1,666	56.4%	\$26,273
Social Sciences	2,383	32.4%	\$33,360	2,029	41.2%	\$26,048
Transportation & Materials Moving	n/d	n/d	n/d	n/a	n/a	n/a
Visual and Performing Arts	1,149	25.6%	\$29,116	1,496	31.0%	\$21,664
Total	51,396	42.3%	\$49,037	67,622	51.9%	\$36,877

n/d: data not disclosed

n/a: no data available for this area of concentration

While females often posted higher work participation rates than males, their wages were lower than males for all but one area of concentration: Communications and Journalism (by \$66). In every other area of concentration in which both sexes had data which could be disclosed, males out-earned females, by vast amounts in certain areas. Health Professions saw the largest gap, with men out-earning women by \$40,476 annually, followed by Science Technology, where men earned wages more than double women, with a gap of \$24,183.

Work Participation And Wages By Race

Caucasian graduates comprised of an overwhelming majority of all graduates from West Virginia public higher education institutions from 1996-1997 to 2006-2007 with 108,848 of the total 119,018 graduates during that span (91.5 percent), illustrated in Table 8. African-American

graduates were the next most prominent, with 4,443 graduates (3.7 percent), followed by Asian graduates, with 3,818 (3.2 percent).

Table 8
Work Participation And Average Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions In 2008 By Race

Race	Graduates from 1996-1997 to 2006-2007	Work Participation	Average Annualized Wages
Caucasian	108,848	49.9%	\$41,782
African-American	4,443	33.8%	\$31,774
Hispanic	1,098	24.0%	\$38,684
Asian-Pacific or Islander	3,818	11.5%	\$51,312
American-Indian or Alaskan Native	356	47.2%	\$38,600
Other	455	35.8%	\$27,121
Total	119,018	47.7%	\$41,526

Table 8 also shows work participation and annualized wage averages by race. Caucasian graduates were the most likely to work in West Virginia in 2008, with a work participation rate of 49.9 percent. Because Caucasian graduates comprise of 91.5 percent of all graduates in the sample, it is not a surprise that the work participation rate and average wage for all graduates is very similar to the totals for Caucasian graduates. American-Indian or Alaskan Native graduates posted the second highest work participation rate, at 47.2 percent, while Asian graduates had an 11.5 percent work participation rate.

In contrast to their low work participation rate, Asian graduates averaged the highest annualized wage, at \$51,312. Caucasian graduates were second among highest earners, averaging \$41,782, while African-American graduates averaged the lowest wage at \$31,774.

Varying trends appear among races when analyzing participation rates and wages by degree, shown in Table 9. Graduates from all races registered high participation rates for Associate's degree recipients and low participation rates for Doctoral degree recipients. Graduates earning a Bachelor's, Master's, or First Professional degree saw different relative patterns in work participation across race, however. For Caucasian graduates, Master's degree recipients had the second highest work participation rate, followed by First Professional degree recipients and Bachelor's recipients. Asian graduates, in contrast, had the highest work participation rate for First Professional degree recipients and the lowest for graduates earning a Master's degree. African-American graduates, on the other hand, had a much larger participation rate for graduates earning Bachelor's and Master's degrees than for those earning a First Professional degree.

Table 9
Work Participation And Average Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions In 2008 By Degree and Race

Race	Degree									
	Associate's		Bachelor's		Master's		First Professional		Doctoral	
	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages
Caucasian	66.6%	\$34,103	43.9%	\$36,930	54.9%	\$51,170	46.3%	\$104,014	29.7%	\$67,290
African-American	53.5%	\$25,483	30.3%	\$28,721	33.6%	\$45,189	22.5%	\$77,492	22.0%	\$65,404
Hispanic	51.3%	\$28,585	21.8%	\$29,523	21.4%	\$47,971	n/d	n/d	n/d	n/d
Asian-Pacific or Islander	18.5%	\$29,089	13.9%	\$33,135	7.9%	\$54,081	21.9%	\$110,647	9.2%	\$62,063
American-Indian or Alaskan Native	68.3%	\$34,161	37.9%	\$32,922	52.9%	\$39,248	n/d	n/d	n/d	n/d
Other	61.2%	\$20,828	38.5%	\$24,775	21.5%	\$47,738	n/d	n/d	n/d	n/d
Total	65.7%	\$33,829	42.6%	\$36,567	50.3%	\$51,021	44.3%	\$104,173	24.6%	\$66,326

n/d: data not disclosed
n/a: no data available

For all races, the wage data shows that increased education (relative to a Bachelor's degree) results in a higher wage, but the rate at which the wage increases for advanced degrees differs among race. For Caucasian graduates the wage difference between earning an Associate's degree and a First Professional degree is \$69,911. Asian graduates, however, generated a larger increase between an Associate's degree and a First Professional degree (\$81,558). African-American graduates saw a much small increase in wages for earning an advanced degree, as the wage difference between an Associate's degree and a First Professional degree was only \$52,009.

Wages and work participation can obviously be affected by the field in which graduates work, which is heavily influenced by the area of concentration in which graduates earn their degree. Table 10 shows the diversity of work participation rates and wages of graduates that vary by race and by area of concentration in which the graduates' degree was earned.

Table 10
Work Participation And Annualized Wages Graduates From W.Va. Public Higher Education Institutions
Working In The State In 2008 by Race and Area of Concentration

Area of Concentration	Caucasian		African-American		Hispanic		Asian-Pacific or Islander		American-Indian	
	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker
Agriculture, Agriculture Operations	37.4%	\$37,023	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Architecture and Related Services	9.5%	\$45,301	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Biological and Biomedical Sciences	36.1%	\$39,326	27.5%	\$29,645	n/d	n/d	16.1%	\$41,401	n/d	n/d
Business, Management, and Marketing	50.2%	\$41,357	33.6%	\$32,099	23.8%	\$41,025	9.0%	\$49,253	42.6%	\$37,373
Communication and Journalism	38.2%	\$36,861	27.5%	\$27,163	15.2%	\$33,962	14.5%	\$32,965	n/d	n/d
Communications Technologies	52.4%	\$27,743	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Computer and Information Sciences	51.5%	\$46,665	38.2%	\$41,104	n/d	n/d	9.4%	\$55,457	n/d	n/d
Education	58.9%	\$38,460	37.7%	\$36,023	37.6%	\$38,206	22.5%	\$36,061	51.4%	\$39,437
Engineering	36.1%	\$68,070	13.0%	\$60,225	n/d	n/d	5.1%	\$61,578	n/d	n/d
Engineering Technologies/Technicians	54.9%	\$50,702	28.4%	\$42,969	n/d	n/d	n/d	n/d	n/d	n/d
English Language and Literature/Letters	36.3%	\$25,543	35.4%	\$27,890	n/d	n/d	n/d	n/d	n/d	n/d
Family and Consumer Sciences	30.9%	\$24,924	32.7%	\$20,281	n/d	n/d	n/d	n/d	n/d	n/d
Foreign Languages, Lit., and Ling.	26.8%	\$22,278	n/d	n/d	11.9%	\$31,568	n/d	n/d	n/d	n/d
Health Professions	59.2%	\$56,343	42.4%	\$48,511	33.0%	\$75,055	21.5%	\$84,194	56.8%	\$63,371
History	36.9%	\$27,020	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Legal Professions and Studies	57.3%	\$55,633	40.6%	\$29,283	n/d	n/d	n/d	n/d	n/d	n/d
Liberal Arts	51.8%	\$33,255	40.6%	\$27,051	35.5%	\$27,304	18.4%	\$28,777	48.9%	\$23,666
Library Science	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mathematics and Statistics	32.0%	\$42,797	n/d	n/d	n/d	n/d	9.8%	\$52,403	n/d	n/d
Mechanic and Repair Technologies	69.6%	\$46,243	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Multi/Interdisciplinary Studies	57.6%	\$34,845	39.2%	\$31,973	n/d	n/d	n/d	n/d	n/d	n/d
Natural Resources and Conservation	45.2%	\$39,125	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Parks, Recreation, Leisure	26.4%	\$33,395	13.4%	\$29,490	n/d	n/d	n/d	n/d	n/d	n/d
Personal and Culinary Services	54.8%	\$22,960	n/d	n/d	n/d	n/d	n/a	n/a	n/a	n/a
Philosophy and Religious Studies	25.8%	\$26,267	n/d	n/d	n/d	n/d	n/d	n/d	n/a	n/a
Physical Sciences	35.4%	\$45,137	37.0%	\$36,273	n/d	n/d	9.6%	\$57,345	n/d	n/d
Precision Production	78.4%	\$44,955	n/a	n/a	n/d	n/d	n/a	n/a	n/d	n/d
Psychology	43.4%	\$28,862	33.1%	\$26,281	24.4%	\$19,656	13.7%	\$16,217	n/d	n/d
Public Administration	51.5%	\$34,561	33.9%	\$28,567	n/d	n/d	27.0%	\$35,324	n/d	n/d
Science Technologies	79.9%	\$32,460	68.2%	\$22,908	n/a	n/a	n/d	n/d	n/d	n/d
Security and Protective Services	57.6%	\$33,656	37.6%	\$24,070	n/d	n/d	n/d	n/d	n/d	n/d
Social Sciences	38.5%	\$30,022	22.5%	\$24,294	29.2%	\$19,770	n/d	n/d	n/d	n/d
Transportation and Materials Moving	n/d	n/d	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Visual and Performing Arts	30.1%	\$24,515	17.1%	\$21,719	n/d	n/d	8.3%	\$21,371	n/d	n/d
Total	49.9%	\$41,782	33.8%	\$31,774	24.0%	\$38,684	11.5%	\$51,312	47.2%	\$38,600

n/d: data not disclosed

n/a: no data available for this area of concentration

Results By Academic Achievement

Work Participation And Wages By ACT Score

Over the 11 year span of our data, 36,484 graduates reported ACT scores for college admission. We separated graduates into three categories by their ACT score: those scoring a 22 and above, those scoring 19 to 21, and those scoring below 19. The graduates in this sample are similar to the

full sample, with a Bachelor's degree being the most popular degree earned, at 68.0 percent of all degrees earned; females outnumbering males, 59.8 percent to 40.2 percent, Caucasian being the most numerous race among graduates, at 95.3 percent, and in-state residents dictating the origin of graduates, at 91.9 percent.

Of the 36,484 graduates with ACT scores reported, 21,834 were employed for at least one quarter in the state during 2008, resulting in a total work participation rate of 59.8 percent, shown in Table 11. Graduates earning an Associate's degree had the highest participation rate; females out-participated males, 60.9 percent compared to 58.3 percent; Caucasian graduates had the highest work participation rate of all identified races, at 60.3 percent; and in-state graduates were much more likely to remain and work in the state than out of state graduates, with a work percentage of 63.4 percent compared to 14.0 percent.

Table 11
Work Participation And Annualized Wages In 2008 For W.Va. Public Higher Education Graduates By ACT Score

	Work Participation Rates in 2008 (In Percent)				Annualized Wages In 2008			
	All Graduates With ACT Scores	ACT 22+	ACT 19-21	ACT Below 19	All Graduates With ACT Scores	ACT 22+	ACT 19-21	ACT Below 19
Total	59.8%	55.3%	61.8%	64.5%	\$34,186	\$36,680	\$33,830	\$31,332
Degree								
Associate	70.9%	70.3%	71.1%	71.0%	\$31,476	\$33,034	\$33,125	\$29,408
Bachelor	56.0%	51.7%	58.4%	60.7%	\$32,637	\$33,143	\$32,365	\$32,184
Doctoral	40.0%	n/d	n/d	n/a	\$43,767	n/d	n/d	n/a
First Prof	61.5%	61.0%	65.0%	59.1%	\$81,233	\$79,560	\$91,238	\$85,673
Master	62.7%	60.8%	63.9%	66.4%	\$41,577	\$43,511	\$41,231	\$36,878
Gender								
Male	58.3%	54.2%	60.4%	62.4%	\$39,421	\$40,818	\$39,161	\$37,858
Female	60.9%	56.1%	62.7%	66.0%	\$30,811	\$33,924	\$30,588	\$27,046
Race								
Caucasian	60.3%	55.5%	62.2%	65.9%	\$34,468	\$36,850	\$34,074	\$31,691
African American	50.2%	52.9%	54.4%	48.0%	\$26,018	\$32,413	\$25,360	\$24,717
Hispanic	47.0%	42.9%	48.0%	51.0%	\$28,006	\$28,478	\$27,591	\$27,899
Asian	37.3%	35.6%	44.6%	33.8%	\$31,587	\$31,544	\$32,591	\$30,501
American Indian	55.8%	54.3%	44.0%	66.7%	\$35,870	\$34,996	\$35,941	\$36,826
Unknown	68.6%	62.9%	73.3%	71.2%	\$23,283	\$21,749	\$23,179	\$24,991
Residency								
In State	63.4%	58.4%	65.4%	68.7%	\$34,306	\$36,816	\$33,882	\$31,493
Out of State	14.0%	13.2%	13.8%	15.3%	\$28,412	\$28,773	\$32,249	\$24,605
Other	33.0%	30.1%	36.9%	32.8%	\$31,137	\$34,124	\$31,625	\$26,865
Year								
1996-1997*	49.0%	46.4%	42.4%	56.8%	\$33,234	\$33,441	\$35,896	\$31,331
1997-1998*	58.3%	48.6%	62.5%	63.0%	\$36,350	\$38,273	\$36,286	\$35,077
1998-1999*	45.6%	33.7%	52.8%	52.5%	\$39,962	\$46,740	\$39,063	\$35,806
1999-2000	48.1%	44.3%	50.0%	51.3%	\$42,343	\$44,059	\$43,259	\$39,315
2000-2001	53.1%	46.8%	57.5%	55.9%	\$39,500	\$43,658	\$38,652	\$36,307
2001-2002	53.9%	48.4%	55.6%	59.0%	\$39,525	\$44,963	\$37,754	\$35,607
2002-2003	58.1%	55.6%	57.4%	62.2%	\$39,031	\$44,783	\$36,746	\$34,118
2003-2004	58.2%	54.4%	59.1%	62.6%	\$35,926	\$39,094	\$35,420	\$32,489
2004-2005	62.9%	58.6%	63.7%	68.6%	\$34,139	\$36,841	\$34,610	\$30,100
2005-2006	65.0%	59.1%	68.4%	71.3%	\$30,508	\$32,397	\$30,158	\$28,196
2006-2007	68.1%	62.6%	71.8%	74.8%	\$26,742	\$27,867	\$26,704	\$24,910

n/d: not disclosed

*Little or no data for first professional or masters graduates.

W.Va. ACT score (Percentile): 22 (68th), 19 (44th) in 2008.

A clear trend emerges in the data involving ACT scores: as ACT scores increase, work participation falls. The work participation rate for graduates scoring below 19 was 64.5 percent, but falls to 61.8 percent for graduates scoring 19-21 and 55.3 percent for graduates scoring 22 and higher. This same trend is also evident in the majority of degrees earned, by both males and females, and mutually by in state and out of state residents.

While participation rates illustrate an inverse relationship with ACT scores, we find that average wages increase with ACT scores. Indeed, graduates scoring 22 and higher earned on average \$5,348 more than graduates scoring below 19.

Wages increased with ACT scores for graduates receiving a Master's degree or a Bachelor's degree. Wages increased by \$959 for Bachelor's degree graduates with ACT scores of 22 or higher, compared to those with scores below 19. Wages were \$3,626 higher for Associate's degree awardees with the highest scores (22+), compared to the lowest (below 19).

Wages rose with ACT scores for both males and females, but at different rates. For females, the wage gap between those with high ACT scores and low ACT scores was \$6,878, while for males the wage gap was \$2,960.

In-state graduates with the highest ACT scores posted the highest wages, at \$36,816. In contrast, out-of-state graduates with mid-range ACT posted the highest wages, at \$32,249. Caucasian, African-American, and Hispanic graduates with high ACT scores posted the highest wages, while Asian graduates with mid-range ACT scores posted relatively high wages.

Work Participation And Wages By College GPA

Over the 11 years covered by this dataset, 100,339 of the 119,018 graduates reported a college grade point average (GPA). These graduates were divided into three groups, similar to our approach for ACT scores. We classify graduates in to the following groups: those earning a GPA 3.5+, 3.0-3.49, and below 3.0.

The GPA results suggest that academic success improves the likelihood of remaining in the state to work, although the impact is small. Table 12 shows that graduates with a GPA below 3.0 had a work participation rate of 45.7 percent, while graduates with a GPA 3.0-3.49 had a participation rate of 47.2 percent and graduates with a GPA 3.5+ had the highest participation rate, at 49.8 percent. However, regression analysis presented in a previous report, titled *Academic Achievement and Work in West Virginia 2007*, shows that the modest positive correlation observed here is likely due to the crude breakdown used to summarize the data. Regression results suggest a negative correlation between college GPA and work participation, similar to the ACT results.

When disaggregated, this trend does not appear for every descriptive group. Graduates earning Associate's, Doctoral, and Master's degrees generated the highest work participation rates for graduates with GPAs 3.5 or better. Bachelor's degree graduates posted the highest work participation rates for graduates with GPAs between 3.0 and 3.49, while First Professional graduates registered the highest rates for graduates with GPAs below 3.0.

Male graduates with GPAs in the mid-range (between 3.0 and 3.49) generated the highest work participation rates. In contrast, females in the high-range (3.5 and above) posted the highest work participation rates.

Table 12
Work Participation And Annualized Wages In 2008 For W.Va. Public Higher Education Graduates By College GPA

	Work Participation Rates in 2008 (In Percent)				Annualized Wages in 2008			
	All Graduates With College GPA	GPA 3.5+	GPA 3.0-3.49	GPA Below 3.0	All Graduates With College GPA	GPA 3.5+	GPA 3.0-3.49	GPA Below 3.0
Total	47.6%	49.8%	47.2%	45.7%	\$41,216	\$46,033	\$40,323	\$36,663
Degree								
Associate	65.8%	66.3%	65.6%	65.6%	\$34,242	\$33,511	\$34,130	\$34,692
Bachelor	42.7%	43.5%	44.3%	41.3%	\$36,329	\$36,413	\$36,899	\$35,841
Doctoral	24.8%	25.1%	21.7%	n/d	\$66,451	\$66,682	\$63,404	n/a
First Prof	49.8%	48.3%	50.1%	50.4%	\$93,203	\$117,963	\$102,329	\$71,403
Master	50.8%	53.2%	39.5%	33.1%	\$51,001	\$50,777	\$52,802	\$39,239
Gender								
Male	41.9%	41.8%	42.1%	41.8%	\$48,099	\$56,250	\$48,772	\$42,327
Female	51.8%	53.9%	50.6%	50.0%	\$37,130	\$42,005	\$35,514	\$31,417
Race								
White	49.7%	52.5%	48.9%	47.5%	\$41,474	\$46,085	\$40,495	\$37,125
Black	33.4%	37.8%	35.0%	31.3%	\$32,325	\$42,546	\$34,246	\$27,212
Hispanic	24.1%	23.4%	24.7%	24.4%	\$35,569	\$44,632	\$30,366	\$30,725
Asian	10.9%	10.3%	9.6%	14.9%	\$47,430	\$51,323	\$52,406	\$34,799
American Indian	45.7%	51.0%	48.6%	39.3%	\$39,254	\$41,115	\$29,927	\$44,530
Unknown	35.8%	27.6%	45.0%	37.7%	\$27,352	\$33,950	\$25,495	\$23,068
Residency								
In State	60.8%	62.7%	59.7%	59.7%	\$41,379	\$46,206	\$40,407	\$36,894
Out of State	8.2%	9.6%	8.3%	6.9%	\$38,403	\$43,373	\$38,570	\$31,890
Other	25.2%	24.4%	26.4%	24.7%	\$38,503	\$42,151	\$39,706	\$33,790
Year								
1996-1997*	39.0%	42.0%	38.4%	37.1%	\$51,198	\$56,899	\$51,985	\$45,791
1997-1998*	41.1%	44.7%	39.1%	39.3%	\$50,539	\$55,635	\$52,163	\$43,914
1998-1999*	41.7%	46.8%	39.3%	39.0%	\$48,741	\$52,210	\$50,214	\$44,045
1999-2000	42.3%	44.4%	41.2%	41.2%	\$47,044	\$51,570	\$48,606	\$41,405
2000-2001	45.5%	49.5%	42.4%	44.0%	\$45,226	\$51,122	\$44,056	\$39,779
2001-2002	46.6%	48.2%	47.5%	44.2%	\$43,149	\$48,180	\$41,591	\$39,269
2002-2003	47.3%	49.6%	46.8%	45.2%	\$43,338	\$48,014	\$43,521	\$37,717
2003-2004	49.2%	51.9%	47.6%	47.6%	\$40,490	\$45,995	\$39,544	\$34,378
2004-2005	53.2%	53.8%	52.4%	53.2%	\$37,392	\$42,696	\$36,149	\$32,685
2005-2006	54.4%	54.0%	54.8%	54.5%	\$33,406	\$37,968	\$32,629	\$28,598
2006-2007	56.3%	55.5%	57.4%	56.2%	\$30,189	\$34,574	\$28,894	\$26,100

n/d: not disclosed

*Little or no data for first professional or masters graduates.

Wages, as expected, increase significantly with higher college GPAs. The average wage for a graduate earning a GPA 3.5+, at \$46,033, was \$9,370 more than graduate earning a GPA below 3.0, at \$36,663. There is some slight variation again in the disaggregated results, but the overall trend persists.

Bachelor's degree recipients and Master's degree recipients had the highest wages for graduates earning a GPA 3.0-3.49, but wages for graduates earning a GPA 3.5+ were very close. First Professional degree recipients, however, did experience the persistent trend of wages increasing with GPA, but the wages jumped significantly between GPA categories. First Professional graduates earning below a 3.0 earned \$46,560 less than the graduates who earned a 3.5+.

Both males and females registered the highest wages for graduates earning a GPA 3.5 or better. In-state and out-of-state graduates show the same pattern.

Results By Tuition Assistance

Work participation And Wages For HEGP and PROMISE Recipients

This section provides a brief summary of results for Higher Education Grant Program (HEGP) and PROMISE graduates. Full analysis, including results by area of concentration, are included in *Higher Education Tuition Assistance And Work In West Virginia 2008*.

According to the most recent data provided by the West Virginia Higher Education Policy Commission, 3,692 PROMISE scholarship recipients (those that received the scholarship for at least one semester) have graduated from West Virginia public higher education institutions. Of the 3,692 graduates that received the PROMISE scholarship, 3,515 (95.2 percent) graduated in the two most recent years, 2005-2006 and 2006-2007. Therefore, the following results illustrate the early work experience of the first two large waves of PROMISE graduates.

Most PROMISE graduates received Bachelor's degrees (81.2 percent) and Associate's degrees (15.6 percent). There were 66 Master's degree graduates and no Doctoral or First Professional degree graduates in these first PROMISE cohorts. A majority of the PROMISE graduates, 2,314 (62.7 percent), were female, compared to 1,378 (37.3 percent) male. Graduates with Caucasian ethnicity, at 3,544 graduates (96.0 percent), made up the largest share of the sample, followed by those with Asian ethnicity, with 49 graduates (1.3 percent), and African-American ethnicity, with 41 graduates (1.1 percent).

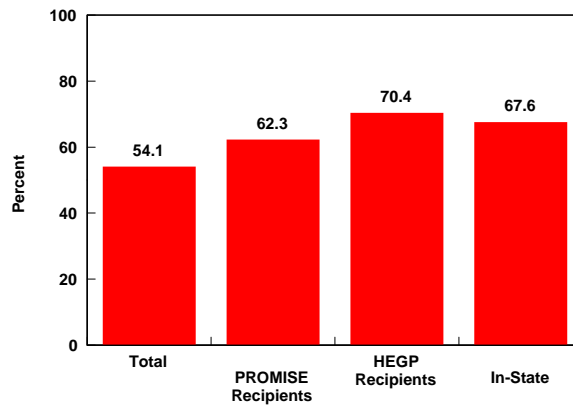
An alternative source of financial aid, for West Virginia residents enrolling in an approved college or university within the state or Pennsylvania is the West Virginia Higher Education Grant Program (HEGP). The grant provides between \$1,300 and \$3,000 per year to students who demonstrate financial need and meet the academic criteria. It is renewable for up to three additional years beyond the initial award.

There were 15,452 graduates from 2003-2004 to 2006-2007 who received an HEGP grant for at least one semester. The characteristics of these graduates are generally similar to the PROMISE recipients, but they made up a much larger share of graduates during the period, accounting for 31.3 percent of graduates during the past four years.

A Bachelor's degree was the most common earned by HEGP recipients, at 59.7 percent. In addition, HEGP recipients with Bachelor's degrees accounted for 32.3 percent of all Bachelor's degree graduates during the period. Female HEGP recipients outnumbered males, 64.7 percent to 35.3 percent, and Caucasian graduates outnumbered all other ethnicities, at 93.7 percent. Note that we have more data for HEGP graduates, since the HEGP has been in existence longer than the PROMISE scholarship.

In 2008, 2,301 of the 3,692 PROMISE graduates earned wages from establishments in West Virginia. This yields a total work participation rate of 62.3 percent, as illustrated in Figure 7 and Table 13. At first glance, the PROMISE scholarship appears to be successful in retaining graduates in West Virginia, as the participation rate of PROMISE graduates is 8.2 percentage points higher than that of all graduates from West Virginia public higher education institutions from 2003-2004 to 2006-2007, at 54.1 percent. However, PROMISE scholar graduates, which, as a prerequisite, must be West Virginia residents, have a 5.3 percentage point lower work participation rate than all in-state resident graduates over the same time period, who had a work participation rate of 67.6 percent, and a 8.1 percentage point lower participation rate than HEGP recipients, who had a participation rate of 70.4 percent.

Figure 7
Work Participation In 2008 Of Graduates From West Virginia Public Higher Education Institutions During 2003-2004 To 2006-2007



Source: author calculations

As Table 13 also shows, PROMISE graduates earning an Associate’s degree had the highest work participation rate, at 80.6 percent, followed by graduates earning a Master’s degree, at 60.6 percent, and finally by graduates earning a Bachelor’s degree, at 58.4 percent. Females were more likely to work in the state than males, 63.8 percent to 59.8 percent respectively. Those having Black ethnicity had the highest work participation rate at 63.4 percent, just ahead of those with White ethnicity, at 62.7 percent, and Hispanic ethnicity, at 61.1 percent.

We find similar trends in the data for HEGP graduates, with Associate’s degree recipients posting the highest work participation rate (76.4 percent), followed by Master’s, Bachelor’s, First Professional, and Doctoral degree recipients. Female recipients post higher work participation rates than males (72.6 percent versus 66.4 percent). White recipients post high work participation rates (70.8 percent) and work participation rates fall time since graduation increases.

Note that work participation rates for Associate’s degree graduates are higher for PROMISE graduates than for HEGP graduates, but that for all other degrees HEGP graduates post higher work participation rates. We also note that work participation rates rise a bit with experience for PROMISE graduates, which breaks the normal pattern for all graduates. This may be due to the relatively low numbers of PROMISE graduates during the 2003-2004 to 2004-2005 period, because the more recent PROMISE cohorts show the more normal declining pattern.

Table 13
Work Participation And Wages In 2008 For W.Va. Public Higher Education Graduates
Receiving PROMISE And HEGP Assistance

	PROMISE Recipients		W.Va. HEGP Recipients		All Graduates	
	Work Participation Rates in 2008 (In Percent)	Annualized Wages In 2008	Work Participation Rates in 2008 (In Percent)	Annualized Wages In 2008	Work Participation Rates in 2008 (In Percent)	Annualized Wages In 2008
Total	62.3%	\$24,805	70.4%	\$32,052	54.1%	\$34,573
Residency						
In-state	--	--	--	--	67.6%	\$34,678
Out-of-state	--	--	--	--	11.5%	\$33,449
Other	--	--	--	--	31.4%	\$32,226
Degree						
Associate	80.6%	\$27,556	76.4%	\$27,370	72.0%	\$30,183
Bachelor	58.4%	\$23,947	67.7%	\$29,121	49.7%	\$29,918
Master	60.6%	\$35,998	72.9%	\$42,981	53.4%	\$45,919
Doctoral	--	--	63.8%	\$64,308	28.0%	\$63,592
First Professional	--	--	65.6%	\$78,073	49.6%	\$72,601
Gender						
Male	59.8%	\$27,185	66.4%	\$35,675	48.0%	\$38,452
Female	63.8%	\$23,478	72.6%	\$30,249	58.6%	\$32,264
Race						
White	62.7%	\$25,010	70.8%	\$32,428	56.5%	\$34,872
Black	63.4%	\$18,976	64.2%	\$24,984	43.4%	\$26,574
Hispanic	61.1%	\$20,789	66.7%	\$25,192	29.8%	\$29,127
Asian	32.7%	\$19,054	55.0%	\$34,867	15.1%	\$40,681
American Indian	n/d	n/d	75.0%	\$32,713	49.3%	\$31,332
Unknown	61.3%	\$16,344	70.8%	\$22,489	36.2%	\$26,792
Year						
2003-2004	80.9%	\$31,014	65.8%	\$36,498	50.2%	\$39,806
2004-2005	70.8%	\$27,316	69.5%	\$34,465	53.4%	\$36,971
2005-2006	59.7%	\$26,707	71.9%	\$30,819	55.0%	\$33,353
2006-2007	62.9%	\$23,487	73.6%	\$27,876	57.0%	\$30,007

n/d: not disclosed

The average annualized wage for graduates receiving a PROMISE scholarship and employed in West Virginia in 2008 was \$24,805, as Table 13 shows. This wage is substantially lower than the average wage for HEGP recipients, whose average wage in 2008 was \$32,052, and all West Virginia public higher education graduates during the period, at \$34,573. The difference is even larger when PROMISE graduates are compared with the average of all fellow in-state graduates, whose wage averaged \$34,678.

For PROMISE graduates, Master's degree recipients averaged the highest wage, at \$35,998, followed by graduates earning an Associate's degree, at \$27,556, and then graduates earning a Bachelor's degree, at \$23,947. Though being outnumbered and out participated by females, male PROMISE graduates averaged \$3,707 more than female PROMISE graduates. White graduates averaged the highest wage, at \$25,010, followed by graduates having Hispanic ethnicity, at \$20,789, and Asian ethnicity, at \$19,054. The more time a worker spends in the labor market, the more experience he/she has and the higher wage the worker should expect. It comes as no surprise that the graduates of 2003-2004, the earliest graduating class with disclosed data, had the

highest wage, averaging \$31,014, and the most recent graduates, those of 2006-2007, had the lowest wage, averaging only \$23,487.

For HEGP graduates, wages are highest for First Professional degrees (\$78,073) and Doctoral degrees (\$64,308), followed by Master's (\$42,981), Bachelor's (\$29,121), and Associate's degrees (\$27,370). In addition, males posted higher wages than females (\$35,675 versus \$30,249) and Asian graduates posted the highest wages (\$34,867) across race. We find that wages rise with experience, as expected.

Average annualized wages were lower for PROMISE graduates than for either HEGP graduates or all graduates during the period. These results arise in part because the vast majority of PROMISE graduates to date received Associate's and Bachelor's degrees, which tend to be associated with lower wage employment (than Master's, First Professional, and Doctoral degrees).

Annualized wages for PROMISE graduates with Bachelor's degrees, are closer to wages earned by HEGP Bachelor's graduates (and all Bachelor's graduates), but remain about \$5,000 lower. The difference can partly explained by differing levels of experience, because most PROMISE recipients graduated during the 2005-2006 to 2006-2007 period, while HEGP graduates (and all graduates) tend to have more experience. It is likely that as data for more PROMISE cohorts become available, wages will become more similar.

Results For Nearby States

This section summarizes work participation and wages for West Virginia public higher education graduates that worked at establishments located in six nearby states (for simplicity we refer to the District of Columbia as a state). These states include Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and the District of Columbia (see Figure 8). Each of these states participates in the Regional Wage Record Exchange Project (TRADE), which facilitates the analysis of employment characteristics for participating states.

Figure 8
W.Va. Public Higher Education Graduates (1996-97 to 2006-07)
Working In 2008
Regional Wage Record Exchange Project Participating States

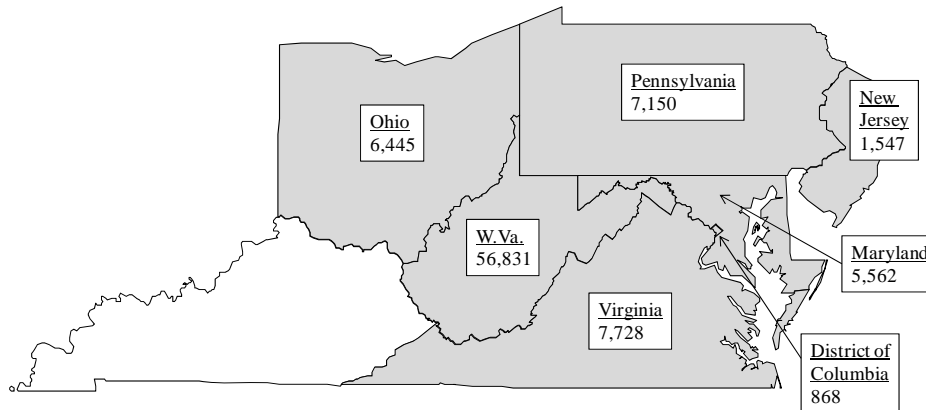


Figure 8 shows the participating states and the number of state graduates working in each state in 2008. Note that we find the most graduates working in Virginia and Pennsylvania, followed by Ohio, Maryland, New Jersey, and the District of Columbia. The employment totals in the figure reflect graduates working at jobs located in each state. It is important to keep in mind that individuals may work at establishments located in more than one state during the calendar year. In Figure 8, these individuals are counted in each state in which they worked.

Table 14 disaggregates the number of graduates working in each state by degree, gender, race, residency, and graduation year. Each of the individual state totals includes graduates that worked in more than one state during the year. The column labeled “Total Six States” accounts for multi-state work, counting each graduate only once (thus it is less than the sum of individual states). Graduates working at establishments in West Virginia are included in the state total. Thus, of the 119,018 graduates during the past 11 years, 56,831 were working at establishments located in West Virginia and 24,644 were working at establishments in one of the six surrounding states. That leaves 37,543 graduates that are either working at covered jobs in other states, or self-employed (perhaps in West Virginia), or have dropped out of the labor market altogether.

Table 14
W.Va. Public Higher Education Graduates Working In 2008 By Participating State

	Graduates Working In 2008							Total Six States**	West Virginia
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*			
Total	868	5,562	1,547	6,445	7,150	7,728	24,644	56,831	
Degree									
Associate	33	437	19	1,175	549	747	2,164	12,033	
Bachelor	655	4,101	1,261	3,548	4,813	5,402	16,911	29,378	
Doctoral	n/d	84	24	92	165	56	386	417	
First Prof	35	74	13	219	273	214	706	1,986	
Master	134	840	230	1,278	1,312	1,253	4,311	12,139	
Gender									
Male	438	2,609	899	2,769	3,574	3,785	11,940	21,728	
Female	430	2,953	648	3,676	3,576	3,943	12,704	35,103	
Race									
Caucasian	630	4,975	1,310	6,008	6,668	6,883	22,207	54,297	
African American	141	341	80	252	208	421	1,211	1,501	
Hispanic	27	62	36	51	54	93	283	263	
Asian	57	144	106	110	174	280	794	439	
American Indian	n/d	22	n/d	14	15	25	67	168	
Unknown	n/d	18	n/d	n/d	31	26	82	163	
Residency									
In State	383	2,508	210	3,786	3,167	4,792	11,405	53,398	
Out of State	455	2,586	1,310	1,671	3,806	2,612	11,482	2,121	
Other	22	422	n/d	923	125	254	1,514	1,044	
Year									
1996-1997	51	404	127	503	519	579	1,976	3,641	
1997-1998	65	442	168	586	538	586	2,121	4,005	
1998-1999	62	454	179	585	606	598	2,228	4,061	
1999-2000	72	490	149	569	554	655	2,181	4,153	
2000-2001	57	429	138	579	581	583	2,061	4,453	
2001-2002	66	485	98	566	608	633	2,108	4,582	
2002-2003	69	493	163	564	601	673	2,156	5,111	
2003-2004	93	537	125	565	674	769	2,319	5,507	
2004-2005	110	544	124	603	752	824	2,353	6,437	
2005-2006	115	602	136	662	805	869	2,528	7,085	
2006-2007	108	682	140	663	912	959	2,613	7,796	

*Multi-state workers are included in each state where they earned wages in 2008.

**Total counts each worker once and excludes W.Va. workers with wages one or more of the six nearby states.

n/d: data not disclosed

Table 15 shows work participation rates for the six nearby states and West Virginia, disaggregated by degree, gender, race, residency, and graduation year. As the table shows, 6.5 percent of state graduates during the past 11 years worked in Virginia in 2008, the largest share of any participating state (except West Virginia). Pennsylvania posted the second largest share (at 6.0 percent), followed by Ohio, Maryland, New Jersey, and the District of Columbia. Finally, 20.7 percent of state graduates worked in one of the six nearby states in 2008.

Table 15
Work Participation Rates in 2008 For W.Va. Public Higher Education Graduates By Participating State

	Work Participation Rates in 2008 (In Percent)							West Virginia
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Six States**	
Total	0.7%	4.7%	1.3%	5.4%	6.0%	6.5%	20.7%	47.7%
Degree								
Associate	0.2%	2.4%	0.1%	6.4%	3.0%	4.1%	11.8%	65.7%
Bachelor	0.9%	5.9%	1.8%	5.1%	7.0%	7.8%	24.5%	42.6%
Doctoral	n/d	4.9%	1.4%	5.4%	9.7%	3.3%	22.7%	24.6%
First Prof	0.8%	1.7%	0.3%	4.9%	6.1%	4.8%	15.8%	44.3%
Master	0.6%	3.5%	1.0%	5.3%	5.4%	5.2%	17.8%	50.3%
Gender								
Male	0.9%	5.1%	1.7%	5.4%	7.0%	7.4%	23.2%	42.3%
Female	0.6%	4.4%	1.0%	5.4%	5.3%	5.8%	18.8%	51.9%
Race								
Caucasian	0.6%	4.6%	1.2%	5.5%	6.1%	6.3%	20.4%	49.9%
African American	3.2%	7.7%	1.8%	5.7%	4.7%	9.5%	27.3%	33.8%
Hispanic	2.5%	5.6%	3.3%	4.6%	4.9%	8.5%	25.8%	24.0%
Asian	1.5%	3.8%	2.8%	2.9%	4.6%	7.3%	20.8%	11.5%
American Indian	n/d	6.2%	n/d	3.9%	4.2%	7.0%	18.8%	47.2%
Unknown	n/d	4.0%	n/d	n/d	6.8%	5.7%	18.0%	35.8%
Residency								
In State	0.4%	2.9%	0.2%	4.3%	3.6%	5.4%	13.0%	60.7%
Out of State	1.8%	10.0%	5.1%	6.5%	14.7%	10.1%	44.3%	8.2%
Other	0.5%	10.3%	n/d	22.4%	3.0%	6.2%	36.8%	25.4%
Year								
1996-1997	0.5%	4.2%	1.3%	5.2%	5.4%	6.0%	20.6%	38.0%
1997-1998	0.7%	4.5%	1.7%	6.0%	5.5%	6.0%	21.6%	40.8%
1998-1999	0.6%	4.6%	1.8%	6.0%	6.2%	6.1%	22.7%	41.4%
1999-2000	0.7%	5.0%	1.5%	5.8%	5.6%	6.7%	22.2%	42.2%
2000-2001	0.6%	4.4%	1.4%	5.9%	5.9%	5.9%	20.9%	45.2%
2001-2002	0.7%	4.9%	1.0%	5.7%	6.1%	6.4%	21.3%	46.3%
2002-2003	0.7%	4.7%	1.6%	5.4%	5.7%	6.4%	20.6%	48.7%
2003-2004	0.8%	4.9%	1.1%	5.1%	6.1%	7.0%	21.0%	49.9%
2004-2005	0.9%	4.5%	1.0%	5.0%	6.2%	6.8%	19.5%	53.4%
2005-2006	0.9%	4.7%	1.1%	5.1%	6.2%	6.7%	19.6%	54.9%
2006-2007	0.8%	5.0%	1.0%	4.8%	6.7%	7.0%	19.1%	56.9%

*Multi-state workers are included in each state where they earned wages in 2008.

**Total counts each worker once and excludes W.Va. workers with wages one or more nearby states.

Thus, it does not equal the sum of state rates.

n/d: data not disclosed

In 2008, 24.5 percent of Bachelor's degree graduates worked in one of the six nearby states, with Virginia again accounting for the largest share. Doctoral graduates posted the second largest share (22.7 percent) working in nearby states, with the largest share in Pennsylvania. For Master's graduates, 17.8 percent worked in one of the nearby states, with roughly equal shares in Ohio, Pennsylvania, and Virginia. For First Professional graduates, 15.8 percent worked in nearby states, with Pennsylvania registering the largest share. Finally, 11.8 percent of Associate's degree graduates working in nearby states, with Ohio capturing the largest share.

Work participation rates in nearby states differed by gender and race as well, with more male graduates (23.2 percent) working in nearby states than female graduates (18.8 percent). Virginia posted the highest work participation rate for both male and female graduates. African-American graduates posted the highest work participation rate in nearby states in 2008, followed by Hispanic, Asian, Caucasian, and American-Indian graduates.

As expected, work participation rates in nearby states are highest for out-of-state graduates (at 44.3 percent), compared to 13.0 percent for in-state graduates.

As Figure 9 shows, the work participation rate for nearby states tends to be more stable over time, compared to the West Virginia rate. Indeed, the work participation rate for nearby states rises from 19.1 percent for the most recent graduates to 20.6 percent for graduates in 1996-1997. This contrasts with the decline in the state rate from 56.9 percent to 38.0 percent and suggests that state graduates may be migrating to nearby states after gaining initial experience in West Virginia.

Figure 9
Percent Of Graduates From W.Va. Public Higher Education Institutions Working In Participating States In 2008

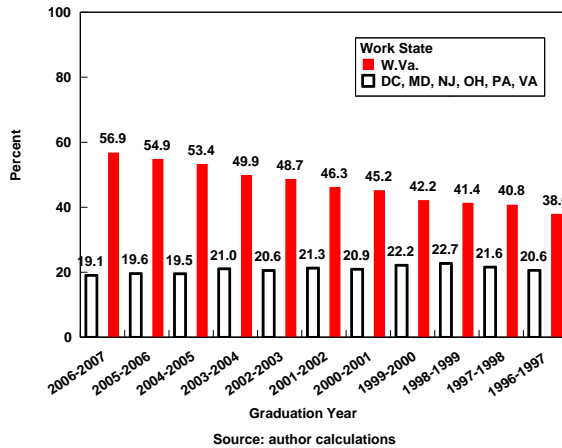
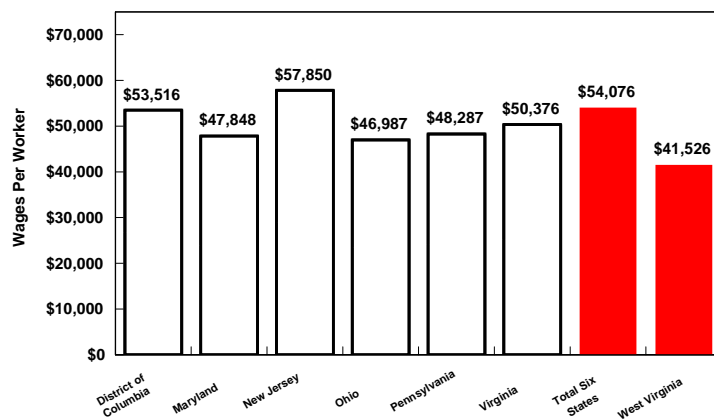


Figure 10 (and Table 16) contain annualized wages by participation state. As Figure 10 shows, wages earned by graduates tend to be significantly lower in West Virginia (\$41,526) than in nearby states (\$54,076). Indeed, in 2008, the gap is 30.2 percent. The highest wages earned by graduates were in New Jersey (\$57,850), followed by the District of Columbia (\$53,516), Virginia (\$50,376), Pennsylvania (\$48,287), Maryland (\$47,848), and Ohio (\$46,987).

Figure 10
Annualized Wages In 2008 Of Graduates From W.Va.
Public Higher Education Institutions By Participating State



Source: author calculations

As Table 16 shows, wages earned by graduates are higher on average in nearby states for all summary degrees, with the largest difference for First Professional graduates (at \$21,302), followed by Bachelor's, Master's, Doctoral, and Associate's graduates. Bachelor's degree graduates generate by far the largest percentage gap, with graduates working in West Virginia earning 27.6 percent less.

Annualized wages are lower for female graduates working in nearby states than for males. The percentage gap between male and female graduates is the same as the gap in West Virginia, with male graduates earning 33.0 percent more. Wages earned in nearby states were highest for Asian graduates, followed Caucasian, Hispanic, American-Indian, and African-American. This ranking is the same as that in West Virginia.

Wages for in-state graduates working in nearby states are higher than wages for out-of-state graduates, which is the same pattern we observe in West Virginia.

Finally, wages rise with experience for graduates working in nearby states. In 2008, the most recent graduates working in nearby states earned \$37,825, compared to \$68,462 for graduates during 1996-1997. That translates into an increase in wages of 81.0 percent, which is a higher average rate of return to experience than we find for West Virginia graduates (72.1 percent).

Table 16
Annualized Wages In 2008 For W.Va. Public Higher Education Graduates By Participating State

	Work Participation Rates in 2008 (In Percent)							West Virginia
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Six States**	
Total	\$53,516	\$47,848	\$57,850	\$46,987	\$48,287	\$50,376	\$54,076	\$41,526
Degree								
Associate	\$38,870	\$33,415	\$53,009	\$35,518	\$37,764	\$37,450	\$40,971	\$33,829
Bachelor	\$50,467	\$46,066	\$53,911	\$41,851	\$44,316	\$47,893	\$50,529	\$36,567
Doctoral	n/d	\$71,834	\$81,115	\$66,788	\$69,960	\$66,778	\$74,700	\$66,326
First Prof	\$93,229	\$118,170	\$126,952	\$144,760	\$100,782	\$110,473	\$125,475	\$104,173
Master	\$62,341	\$55,978	\$73,514	\$55,194	\$54,262	\$58,628	\$61,708	\$51,021
Gender								
Male	\$56,922	\$54,017	\$63,310	\$56,306	\$55,704	\$56,938	\$62,002	\$49,037
Female	\$50,046	\$42,397	\$50,276	\$39,968	\$40,874	\$44,077	\$46,627	\$36,877
Race								
Caucasian	\$56,302	\$48,082	\$56,930	\$46,109	\$48,220	\$50,002	\$53,614	\$41,782
African American	\$41,016	\$40,496	\$48,597	\$50,329	\$40,560	\$38,887	\$48,056	\$31,774
Hispanic	\$44,435	\$38,199	\$50,041	\$48,612	\$46,441	\$52,772	\$51,596	\$38,684
Asian	\$63,345	\$63,413	\$79,028	\$86,392	\$64,435	\$78,228	\$78,723	\$51,312
American Indian	n/d	\$45,204	n/d	\$50,716	\$41,790	\$38,535	\$49,234	\$38,600
Unknown	n/d	\$34,359	n/d	n/d	\$30,189	\$38,499	\$42,156	\$27,121
Residency								
In State	\$54,883	\$46,121	\$58,859	\$48,134	\$48,627	\$49,455	\$55,532	\$41,659
Out of State	\$52,341	\$50,020	\$57,856	\$47,111	\$47,927	\$52,292	\$53,549	\$39,213
Other	\$45,747	\$43,681	n/d	\$41,127	\$45,268	\$46,802	\$45,987	\$37,894
Year								
1996-1997	\$70,639	\$64,377	\$79,624	\$61,139	\$64,522	\$62,968	\$68,462	\$51,703
1997-1998	\$65,435	\$60,980	\$74,568	\$60,773	\$65,534	\$66,187	\$69,338	\$52,242
1998-1999	\$68,754	\$60,030	\$64,973	\$61,721	\$62,305	\$63,459	\$66,337	\$50,459
1999-2000	\$64,492	\$58,631	\$67,582	\$48,011	\$57,816	\$59,294	\$61,345	\$48,306
2000-2001	\$61,619	\$50,060	\$60,966	\$50,230	\$51,974	\$56,511	\$57,033	\$47,240
2001-2002	\$64,661	\$50,152	\$61,304	\$46,497	\$48,796	\$51,590	\$54,056	\$43,486
2002-2003	\$56,439	\$43,476	\$52,868	\$49,814	\$47,340	\$47,808	\$51,705	\$42,939
2003-2004	\$56,891	\$43,506	\$50,868	\$40,299	\$44,138	\$47,296	\$48,801	\$39,808
2004-2005	\$45,224	\$41,567	\$46,882	\$37,422	\$39,363	\$42,177	\$45,676	\$37,005
2005-2006	\$35,646	\$38,397	\$39,210	\$33,651	\$37,048	\$39,812	\$42,035	\$33,346
2006-2007	\$33,801	\$30,590	\$32,938	\$33,082	\$32,048	\$35,225	\$37,825	\$30,041

*Multi-state workers are included in each state where they earned wages in 2008.

**Total counts each worker once and excludes W.Va. workers with wages one or more nearby states.

n/d: data not disclosed

Conclusion And Directions For Future Research

This study shows the extent to which public higher education graduates during the past 11 years remain in West Virginia (and in nearby states) for work and the wages that they earn. The results show that the state retains a significant share of graduates, indeed, the majority of recent graduates remain in the state to work. Further, these graduates earn wages which translate into spending and tax revenues at the state and local level.

In addition to continuing to track these trends, there are opportunities to expand the research in new directions. For instance, using this dataset it is possible to analyze the distribution of graduates' employment across the state's counties. Thus, it would be useful to describe where graduates work and the wages they earn there. This could be broken down by demographic characteristics (particularly degree and area of concentration).

The dataset also provides the opportunity to match the degree and area of concentration of the graduate with the industry in which they work. For instance, this analysis would provide information on the training of graduates that work in the natural resources and mining; construction; manufacturing; trade, transportation, and utilities; information; financial activities; professional and business services; education and health care; leisure and hospitality; other services; and government sectors.

Further, it is important to explore ways to track graduates that leave the state to work across all U.S. states. This may be possible by matching data on West Virginia graduates with Internal Revenue Service data extracted from tax returns. If this match is possible, it would allow research to explore not only the destinations of graduates across all U.S. states, but also to analyze the type of income earned (wage and salary versus self-employment).

Appendix I: Detailed Description Of Employment Data

The West Virginia data analyzed in this study come from the matching of demographic information on graduates from West Virginia institutions of higher education (compiled by the HEPC⁵) with employment records maintained by Workforce West Virginia and the federal government. Graduates reflect the highest degree earned at the time of measurement (during the 1996-1997 to 2006-2007 period).

The bulk of the employment data used is gathered from West Virginia unemployment compensation records. This is a well-known dataset which measures employment by place of work. It covers jobs and wages reported by firms participating in the West Virginia Unemployment Compensation system. As a general rule, any firm which employs one or more workers for some part of a day in at least 20 different weeks of a calendar year is required to contribute to the state's unemployment insurance system. Major exceptions are railroad companies and the federal government, which contribute to separate systems. The self-employed, student workers, most church workers, and unpaid family workers are also generally not covered.

We include civilian federal government employment and wages through the Federal Employment Data Exchange System at the Jacob France Institute at the University of Baltimore. The Jacob France Institute facilitates the matching of graduates with civilian government employment. **The West Virginia data analyzed in this report do not include U.S. Postal Service workers.**

Also included in this study are results from a match of West Virginia graduates with covered employment (including federal employment) at establishments located in five nearby states (and the District of Columbia). These include Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and the District of Columbia. These states participate in the Regional Wage Record Exchange Project (TRADE).

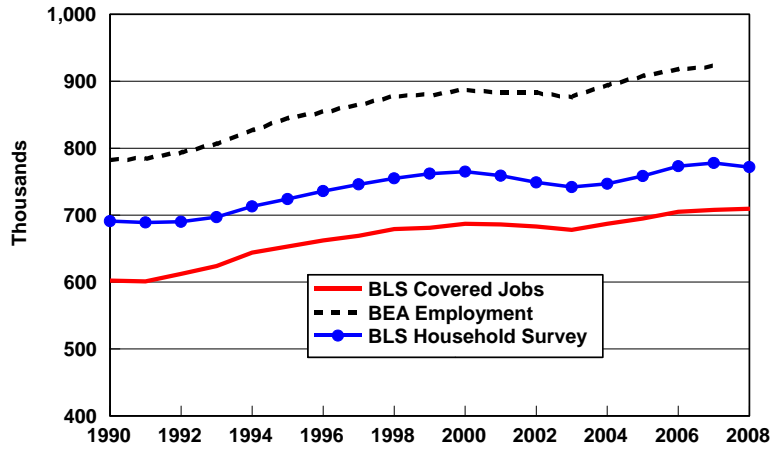
Covered employment counts 709,575 jobs at establishments in West Virginia in 2008.⁶ As Figure 11 shows, this measure of employment is lower than two other major measures of employment: employment measured by the U.S. Bureau of Economic Analysis (BEA) and employment measured by the U.S. Bureau of Labor Statistics (BLS) household survey. Differences arise because of the treatment of the self-employed, who are excluded from covered jobs but are included in the BEA measure and in the BLS household survey, as well as the exclusion of student workers, most church workers, and unpaid family members from the measure of covered jobs. Further, BLS household employment is measured by place of residence, which includes state residents working out of state.

Finally, the wages documented in the report are an important source of compensation, but they are not the only source. Data on wage income is readily available, well understood, and is useful in the evaluation of returns to work of state higher education graduates. However, wage data does not include fringe benefits provided by firms, particularly employer-paid pension and health insurance. This source of income has accounted for an increasing share of work compensation during the last 30 years. Indeed, the share of other labor income to gross earnings by place of work has risen from 6.3 percent in 1969 to 13.3 percent by 2007 for West Virginia.

⁵ We would like to thank Rob Anderson and Larry Ponder of the WVHEPC for providing the bulk of the data used in this study.

⁶ Federal government jobs are added in separately for completeness.

Figure 11
Three Measures Of West Virginia Employment



Appendix II: List Of Institutions, Degrees, And Areas Of Concentration

Public Higher Education Institutions

Bluefield State College
Community and Technical College at WVU Tech
Community and Technical College of Shepherd
Concord University
Fairmont State University
Eastern West Virginia Community and Technical College
Fairmont State Community and Technical College
Glenville State College
Marshall Community and Technical College
Marshall University
New River Community and Technical College
Potomac State College of West Virginia University
Shepherd University
Southern West Virginia Community & Tech College
West Liberty State College
West Virginia Northern Community College
West Virginia School of Osteopathic Medicine
West Virginia State Community and Technical
West Virginia State University
West Virginia University
West Virginia University Institute of Technology
West Virginia University at Parkersburg

Degrees

Undergraduate Certificate
Associate's Degree
Bachelor's Degree
First Professional
Master's Degree
Post-Master's Certificate
Doctoral Degree

Areas Of Concentration And Majors

Agriculture, Agriculture Operations, and Related Sciences

Agricultural Economics
Agriculture, Agriculture Operations, and Related Sciences, Other.
Agriculture, General
Animal Sciences, General.
Aquaculture
Plant Sciences, Other.

Architecture and Related Services

Landscape Architecture

Biological and Biomedical Sciences

Anatomy
Biochemistry
Biochemistry, Biophysics and Molecular Biology, Other
Biological and Biomedical Sciences, Other.
Biology/Biological Sciences, General
Botany/Plant Biology
Exercise Physiology
Genetics, General.
Medical Microbiology and Bacteriology
Microbiological Sciences and Immunology, Other.
Pharmacology and Toxicology
Physiology, General
Reproductive Biology
Zoology/Animal Biology

Business, Management, Marketing, and Related Support Services

Accounting
Accounting Technology/Technician and Bookkeeping
Administrative Assistant and Secretarial Science, General
Business Administration and Management, General
Business Administration, Management and Operations, Other
Business, Management, Marketing, and Related Support Services, Other
Business/Commerce, General
Business/Managerial Economics
Business/Office Automation/Technology/Data Entry
Entrepreneurship/Entrepreneurial Studies
Executive Assistant/Executive Secretary
Fashion Merchandising
Finance, General
Hospitality Administration/Management, General
Hospitality Administration/Management, Other
Hotel/Motel Administration/Management
Information Resources Management/CIO Training.
Labor and Industrial Relations
Management Information Systems, General
Marketing/Marketing Management, General
Office Management and Supervision
Operations Management and Supervision
Retailing and Retail Operations.
Sales, Distribution, and Marketing Operations, General
Tourism and Travel Services Marketing

Communication, Journalism, and Related Programs

Communication Studies/Speech Communication and Rhetoric.

Communication, Journalism, and Related Programs, Other.

Journalism

Communications Technologies/Technicians and Support Services

Graphic and Printing Equipment Operator, General Production.

Printing Press Operator.

Graphic Communications, Other.

Communications Technologies/Technicians and Support Services, Other

Computer and Information Sciences and Support

Computer and Information Sciences and Support Services, Other.

Computer and Information Sciences,

Computer and Information Sciences, General.

Computer Programming, Specific Applications.

Computer Programming/Programmer, General.

Computer Science.

Information Science/Studies.

Education

Adult and Continuing Education and Teaching

Agricultural Teacher Education.

Business Teacher Education

Counselor Education/School Counseling and Guidance Services.

Curriculum and Instruction.

Early Childhood Education and Teaching.

Education, General.

Educational Administration and Supervision, Other.

Educational Leadership and Administration, General.

Educational Psychology. (Moved, Report Under 42.18 series)

Educational/Instructional Media Design.

Elementary Education and Teaching

Junior High/Intermediate/Middle School Education and Teaching

Kindergarten/Preschool Education and Teaching

Physical Education Teaching and Coaching

Reading Teacher Education

Secondary Education and Teaching

Special Education and Teaching, General

Teacher Assistant/Aide.

Teacher Education and Professional Development, Specific Levels and Methods, Other

Technical Teacher Education.

Trade and Industrial Teacher Education

Engineering

Aerospace, Aeronautical and Astronautical Engineering
Chemical Engineering.
Civil Engineering, General
Computer Engineering, General.
Computer Software Engineering.
Electrical, Electronics and Communications Engineering
Engineering Physics
Engineering Science
Engineering, General.
Engineering, Other
Environmental/Environmental Health Engineering
Industrial Engineering.
Mechanical Engineering.
Mining and Mineral Engineering
Petroleum Engineering.
Systems Engineering.

Engineering Technologies/Technicians

Aeronautical/Aerospace Engineering Technology/Technician
Architectural Drafting and Architectural CAD/CADD
Architectural Engineering Technology/Technician
Automotive Engineering Technology/Technician
Civil Engineering Technology/Technician
Computer Engineering Technology/Technician
Computer Technology/Computer Systems Technology
Drafting and Design Technology/Technician, General
Electrical, Electronic and Communications Engineering Technology/Technician
Electromechanical Technology/Electromechanical Engineering Technology
Energy Management and Systems Technology/Technician
Engineering Technologies/Technicians, Other
Engineering/Industrial Management
Environmental Engineering Technology/Environmental Technology
Industrial Production Technologies/Technicians, Other
Industrial Technology/Technician
Manufacturing Technology/Technician
Mechanical Drafting and Mechanical Drafting CAD/CADD.
Mechanical Engineering Related Technologies/Technicians, Other
Mechanical Engineering/Mechanical Technology/Technician
Mining Technology/Technician.
Occupational Safety and Health Technology/Technician
Petroleum Technology/Technician
Surveying Technology/Surveying.

English Language and Literature/Letters

Creative Writing.
English Language and Literature, General.
Speech and Rhetorical Studies.

Family and Consumer Sciences/Human Sciences

Child Care and Support Services Management.
Family and Consumer Sciences/Human Sciences, General
Housing and Human Environments, Other.

Foreign Languages, Literatures, and Linguistics

Foreign Languages and Literatures, General
French Language and Literature.
Sign Language Interpretation and Translation.

Health Professions and Related Clinical Sciences

Athletic Training/Trainer
Audiology/Audiologist and Speech-Language Pathology/Pathologist.
Clinical Laboratory Science/Medical Technology/Technologist
Clinical/Medical Laboratory Science and Allied Professions, Other
Clinical/Medical Laboratory Technician
Community Health Services/Liaison/Counseling
Cytotechnology/Cytotechnologist
Dental Clinical Sciences, General
Dental Hygiene/Hygienist
Dental Laboratory Technology/Technician
Dentistry (DDS, DMD).
Dietetics/Dietitian (RD).
Emergency Medical Technology/Technician (EMT Paramedic).
Health Information/Medical Records Technology/Technician
Health Professions and Related Clinical Sciences, Other
Health/Health Care Administration/Management
Medical Administrative/Executive Assistant and Medical Secretary
Medical Radiologic Technology/Science – Radiation Therapist
Medical Transcription/Transcriptionist
Medical/Clinical Assistant
Medicine (MD).
Nuclear Medical Technology/Technologist
Nurse/Nursing Assistant/Aide and Patient Care Assistant
Nursing, Other
Nursing/Registered Nurse (RN, ASN, BSN, MSN)
Occupational Therapy/Therapist
Osteopathic Medicine/Osteopathy (DO).
Pharmaceutics and Drug Design.

Pharmacy (PharmD [USA], PharmD or BS/BPharm [Canada])
Pharmacy Technician/Assistant
Physical Therapist Assistant
Physical Therapy/Therapist
Psychiatric/Mental Health Services Technician
Public Health, General (MPH, DPH).
Respiratory Care Therapy/Therapist
Speech-Language Pathology/Pathologist
Surgical Technology/Technologist
Veterinary/Animal Health Technology/Technician and Veterinary Assistant
Vocational Rehabilitation Counseling/Counselor

History

History, General

Legal Professions and Studies

Law (LL.B., J.D.).
Legal Administrative Assistant/Secretary.
Legal Assistant/Paralegal.
Legal Professions and Studies, Other.

Liberal Arts and Sciences, General Studies and Humanities

General Studies
Humanities/Humanistic Studies.
Liberal Arts and Sciences, General Studies and Humanities, Other
Liberal Arts and Sciences/Liberal Studies

Library Science

Library Science/Librarianship

Mathematics and Statistics

Mathematics, General.
Statistics, General

Mechanic and Repair Technologies/Technicians

Avionics Maintenance Technology/Technician
Heating, Ventilation, AC and Refrigeration Maintenance Technology (HAC(R), HVAC(R)).
Heavy/Industrial Equipment Maintenance Technologies, Other
Mechanic and Repair Technologies/Technicians, Other

Multi/Interdisciplinary Studies

Biological and Physical Sciences
Gerontology
Multi-/Interdisciplinary Studies, Other
Science, Technology and Society
Systems Science and Theory

Natural Resources and Conservation

Environmental Studies.

Forest Management/Forest Resources Management.
Forest Sciences and Biology.
Forest Technology/Technician.
Forestry, General.
Natural Resource Economics.
Natural Resources Management and Policy, Other.
Wildlife and Wildlands Science and Management.
Wood Science and Wood Products/Pulp and Paper Technology.

Parks, Recreation, Leisure and Fitness Studies

Health and Physical Education, General
Kinesiology and Exercise Science
Parks, Recreation and Leisure Facilities Management
Parks, Recreation and Leisure Studies

Personal and Culinary Services

Culinary Arts/Chef Training.
Food Preparation/Professional Cooking/Kitchen Assistant.
Institutional Food Workers
Restaurant, Culinary, and Catering Management/Manager

Philosophy and Religious Studies

Philosophy

Physical Sciences

Chemistry, General.
Geology/Earth Science, General
Physical Sciences.
Physics, General.

Precision Production

Machine Shop Technology/Assistant
Welding Technology/Welder
Precision Metal Working, Other

Psychology

Counseling Psychology
Educational Psychology
Psychology, General
School Psychology

Public Administration and Social Service Prof

Community Organization and Advocacy
Public Administration
Social Work

Sciences Technologies/Technicians

Chemical Technology/Technician
Science Technologies/Technicians, Other

Security and Protective Services

Corrections
Criminal Justice/Police Science
Criminal Justice/Safety Studies
Criminalistics and Criminal Science
Fire Protection and Safety Technology/Technician
Forensic Science and Technology
Security and Protective Services, Other

Social Sciences

Economics, General
Geography
International Relations and Affairs
Political Science and Government, General.
Social Sciences, General.
Social Sciences, Other.
Sociology

Visual and Performing Arts

Art/Art Studies, General
Commercial and Advertising Art
Design and Visual Communications, General
Drama and Dramatics/Theatre Arts, General
Drawing
Graphic Design
Interior Design
Music, General
Visual and Performing Arts, General
Visual and Performing Arts, Other