From Higher Education To Work In West Virginia 2010

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

December 2011

Prepared for the
West Virginia Higher Education Policy Commission

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Funding for this research was provided by the West Virginia Higher Education Policy Commission. The opinions herein are those of the authors and do not necessarily reflect those of the West Virginia Higher Education Policy Commission, or the West Virginia University Board of Governors.

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Executive Summary

Productivity growth is a key channel by which economies generate a rising standard of living. Thus, economic growth depends not just on the accumulation of labor and physical capital, but on improvements in the way labor and capital are combined to produce goods and services. There are many factors that influence productivity growth, but one of the most important is human capital. Since colleges and universities are a key part of the infrastructure which produces human capital, that makes the work participation and migration decisions of college graduates a critical concern.

This report provides a comprehensive summary of the employment and wages of state public higher education graduates working in West Virginia in 2010. The results are disaggregated across a wide variety of socio-economic characteristics, including workplace experience, residency for fee purposes, summary degree, area of concentration, gender, race, academic achievement, tuition assistance, nearby states, industry, and county.

Selected highlights of this report include:

Overall Results

- In 2010, 45.2 percent of the 142,047 public higher education graduates during the past 13 years worked in West Virginia. That means that 64,272 graduates worked at an establishment located in the state during at least one quarter in 2010.
- West Virginia public higher education graduates working in the state in 2010 earned annualized wages of $2.7 billion in 2010, excluding fringe benefits. That translated into an average annualized wage of $42,247 per worker.

Results By Experience, Residency, And Degree

- Recent graduates are much more likely to work in the state than are graduates with more experience. Indeed, the work participation rate for graduates during 2008-2009 was 55.7 percent in 2010. In contrast, the work participation rate for graduates with 13 years of experience was 36.4 percent.
- Annualized wages rose with experience, from $28,820 for graduates during 2008-2009 to $55,116 for graduates with 13 years of experience. That translated into an average increase of $2,023 per additional year of experience.
- In-state graduates were more likely to work in West Virginia in 2010 than were out-of-state graduates. In 2010, 58.0 percent of in-state graduates during the past 13 years worked in the state, compared to 8.1 percent of out-of-state graduates.
- Annualized wages for in-state graduates hit $42,482 in 2010, compared to $38,825 for out-of-state graduates.
- Work participation rates were highest in 2010 for graduates with an Associate's degree, at 62.5 percent, followed by graduates with a Master's degree, at 47.6 percent, a First Professional degree, at 41.7 percent, a Bachelor's degree, at 40.3 percent, and a Doctoral degree, at 24.5 percent.
- Associate's degree graduates earned the lowest wages in 2010, at $34,215. Wages were higher for Bachelor's degree graduates, at $36,906, Master's graduates, at $51,418, Doctoral graduates, at $66,383, and First Professional graduates, at $113,365.
- Annualized wages rose most quickly with experience for First Professional graduates, followed by Bachelor's, Master's, Doctoral, and Associate's graduates.

Results By Area Of Concentration, Gender, And Race

- Business, Management, and Marketing; Education; Health Professions; Liberal Arts; and Engineering areas of concentration accounted for 60.4 percent of graduates during the past 13 years.
- Work participation rates were highest for areas of concentration with large shares of Associate's degree graduates, which included Precision Production; Science Technologies; and Mechanic and Repair Technologies.
- Work participation rates tended to be lower for graduates in Architecture; Transportation and Materials Moving; Foreign Languages; Mathematics and Statistics; and Parks, Recreation, Leisure, and Fitness.
- In 2010, the highest annualized wages were earned by graduates in Engineering; Health Professions; Legal Professions; Engineering Technologies; and Transportation and Materials Moving.
- Annualized wages were lowest in Philosophy and Religious Studies; Personal and Culinary Studies; Foreign Languages; Visual and Performing Arts; and Family and Consumer Sciences.
- Of graduates during the past 13 years, 56.7 percent were female and 43.3 percent were male. Females tended to be more concentrated in a few areas of concentration than were male graduates. Health Professions; Education; and Business, Management, and Marketing accounted for 54.1 percent of female graduates during the past 13 years.
- Work participation rates in 2010 were higher for female graduates, at 49.5 percent, than for male graduates, at 39.7 percent.
- Work participation rates were highest for female graduates in Science Technologies; Education; and Health Professions. Work participation rates were highest for males in Precision Production; Science Technologies; and Mechanic and Repair Technologies.
- Annualized wages in 2010 were higher for male graduates, at $49,865, than for female graduates, at $37,589. Thus, male annualized wages were 32.6 percent higher than female wages.
- Most graduates during the past 13 years were Caucasian, at 91.2 percent of all graduates.
- Caucasian graduates posted the highest work participation rate in 2010, at 47.3 percent. Asian graduates posted the lowest rate, at 11.7 percent.
- Annualized wages were highest in 2010 for Asian graduates, at $48,597, followed by Caucasian graduates, at $42,528, and Hispanic graduates, at $42,229.

Results By Academic Achievement And Tuition Assistance

- Graduates with higher levels of academic achievement were less likely to work in the state in 2010 than graduates with lower levels of achievement. Thus, graduates with higher ACT scores and higher college GPAs were less likely to remain in the state to work.
- In contrast, annualized wages in 2010 tended to rise with academic achievement, so that graduates with higher ACT scores and higher college GPAs tended to earn higher wages.
- The work participation rate for PROMISE recipients that graduated during the 2003-2009 period was 60.1 percent. That was above the work participation rate for all graduates during the period, of 50.5 percent.
- PROMISE graduates during the 2003-2009 period were less likely to work in the state in 2010 than Higher Education Grant Program (HEGP) recipients.
- Annualized wages in 2010 for PROMISE graduates tended to be lower than those for HEGP graduates, in part because PROMISE graduates tended to have less work experience.

Results For Nearby States

- Employment and wage data from the Regional Wage Record Exchange Project (TRADE) provide information on state public higher education graduates that worked in the District of Columbia, Maryland, New Jersey, Pennsylvania, and Virginia in 2010.
- Overall, 16.5 percent of state higher education graduates during the past 13 years worked in one of the participating states in 2010. Pennsylvania employed 6.3 percent of state graduates in 2010, followed by Virginia, at 6.1 percent, Maryland, at 4.5 percent, New Jersey, at 1.3 percent, and the District of Columbia, at 0.7 percent.
- These nearby states attracted a large share of graduates with Bachelor's degrees, at 20.5 percent, followed by Doctoral graduates, at 17.5 percent, Master's graduates, at 13.5 percent, First Professional graduates, at 12.5 percent, and Associate's graduates, at 7.0 percent.
- Participating states posted a higher work participation rates for males, at 19.0 percent, than for females, at 14.5 percent. This reverses the pattern for West Virginia.
- In 2010, 38.5 percent of out-of-state graduates worked in one of the nearby states, compared to 9.6 percent of in-state graduates.
- Work participation rates in nearby states had little tendency to fall with experience, which contrasts with results for work in West Virginia.
- Average annualized wages in 2010 in the nearby states was $56,224, compared to $42,247 in West Virginia. Thus, in 2010 graduate wages earned in the nearby states were 33.1 percent above the West Virginia average.
- Annualized wages in 2010 were highest in New Jersey, at $60,054, followed by the District of Columbia, at $58,351, Virginia, at $53,549, Pennsylvania, at $50,133, and Maryland, at $49,058.
- The difference between graduate wages earned in West Virginia compared to wages earned in the nearby states increased as graduates gained experience. Indeed, the gap increased from 23.2 percent for the most recent graduates to 38.4 percent for graduates with 13 years of experience.

Results By Industry

- Graduates from state higher education institutions contributed to all industries in West Virginia in 2010.
- Educational Services and Health Care attracted by far the most graduates in 2010, together accounting for 49.3 percent of graduate employment by industry during the year.
- Professional, Scientific, and Technical Services; Public Administration; and Retail Trade also attracted large numbers of graduates, with these industries accounting for 21.7 percent of graduate employment in 2010.
- Agriculture, Forestry, Fishing, and Hunting; Management of Companies; Utilities; Transportation and Warehousing; and Real Estate and Leasing attracted fewer graduates in 2010, with each industry accounted for less than 1.0 percent of graduate employment.
- The industry in which a graduate worked was influenced by the degree earned. Indeed, more than one-half of graduates with a Master's degree worked in Educational Services in 2010.
- Male and female graduates tended to work in different industries in 2010. Female graduates accounted for 79.2 percent of graduates working in Health Care, 72.6 percent of graduates working in Educational Services, and 62.0 percent of graduates working in Accommodation and Food Services.
- Males accounted for 80.1 percent of graduates working in Mining, 76.2 percent of graduates working in Utilities, and 75.4 percent of graduates working in Construction.

- Annualized wages were highest in 2010 in Mining, at $68,529, followed by Utilities, at $60,094, Manufacturing, at $54,754, Wholesale Trade, at $55,734, and Management of Companies, at $57,140.
- Annualized wages in 2010 were lowest in Accommodation and Food Services, at $12,256; Arts, Entertainment, and Recreation, at $12,949; Other Services, at $22,857; Administration and Waste Management, at $24,203; and Retail Trade, at $25,362.

Results By County And Region

- West Virginia public higher education graduates also worked in all counties in the state in 2010. However, graduates were not evenly distributed across the state.
- In 2010, 22.1 percent of graduates working in West Virginia worked in Kanawha County, followed by Monongalia County, with 12.6 percent, Cabell County, with 9.4 percent, Harrison County, with 4.8 percent, and Wood County, with 4.0 percent.
- Counties with the smallest shares of graduates in 2010 were Doddridge County, Wirt County, Pendleton County, Summers County, Tucker County, Pleasants County, and Webster County, each with 0.2 percent of graduates.
- Counties with more jobs and residents, often metropolitan or micropolitan counties, attracted the most graduates in 2010. Monongalia and Cabell counties also attracted graduates because of the presence of West Virginia University and Marshall University, respectively.
- Most graduates working in the state in 2010 worked in metropolitan counties, with 67.3 percent. Micropolitan counties accounted for 17.2 percent of graduates working in the state, followed by nonmetropolitan counties, with 15.5 percent.
- The Charleston MSA had the largest share of graduates working in the state in 2010, with 26.0 percent, followed by the Morgantown MSA, with 13.4 percent, and the Huntington MSA, with 10.6 percent.
- Boone County had the highest annualized wages in 2010, at $48,332, followed by Kanawha County, at $41,093, and Putnam County, at $40,954. Annualized wages in Boone County likely reflect the large concentration of coal mining jobs in the county, which tended to pay relatively high wages.
- Graduate wages were lowest in Gilmer County, at $24,694, Mineral County, at $27,066, and Tucker County, at $27,477.
- Annualized wages in 2010 were highest in metropolitan counties, at $38,465, followed by micropolitan counties, at $35,638, and nonmetropolitan counties, at $33,770. Thus, the larger labor markets tended to attract more graduates and graduates tended to earn higher wages in those areas.

The Data

The data analyzed in this study came from the matching of demographic information on graduates from West Virginia public institutions of higher education with employment records maintained by Workforce West Virginia and nearby state governments. Graduates reflect the highest degree earned during the 1996-1997 to 2008-2009 period. The self-employed, student workers, most church workers, and unpaid family workers are generally not covered by this data. For this report, we do not include civilian federal government employment and wages due to recent administrative problems with the FEDES match.

Results By Year, Experience, Residency, And Degree

Work Participation And Annualized Wages By Year And Experience

According to data provided by the West Virginia Higher Education Policy Commission, there were 142,047 graduates during the 1996-1997 to 2008-2009 period, as Table 1 shows. Of those graduates, 64,272 worked at wage and salary jobs in West Virginia in 2010. That translated into a work participation rate of 45.2 percent.

As the table also shows, graduate work participation rates fell rapidly as the time since graduation increased. Indeed, 55.7 percent of graduates during 2008-2009 worked at establishments located in West Virginia in 2010. However, just 36.4 percent of graduates during the 1996-1997 academic year worked in the state in 2010.

There are a number of factors driving this trend in West Virginia. First, individuals are more likely to become self-employed as they age and gain workplace experience. This contributes to the downward trend in work participation rates because the self-employed are not included in these data. In addition, graduates may be more likely to drop out of the labor force as they age. An example here might be a graduate that quits a job to become a stay-at-home spouse. Finally, as graduates gain experience, they may become more marketable and more informed about job opportunities in other states. This may lead them to accept jobs outside of the state.

Table 1
Work Participation And Average Annualized Wages In 2010
Of Graduates From West Virginia Public Higher Education Institutions

Graduation Year	Graduates	Graduates Working In W.Va.	Work Participation	Average Annualized Wages
1996-1997	9,519	3,466	36.4%	$55,116
1997-1998	9,752	3,641	37.3%	$54,136
1998-1999	9,730	3,687	37.9%	$52,267
1999-2000	9,703	3,757	38.7%	$50,237
2000-2001	9,682	4,010	41.4%	$50,687
2001-2002	9,712	4,106	42.3%	$46,311
2002-2003	10,147	4,443	43.8%	$47,142
2003-2004	10,522	4,763	45.3%	$43,773
2004-2005	11,243	5,397	48.0%	$41,946
2005-2006	11,823	5,778	48.9%	$38,992
2006-2007	12,729	6,407	50.3%	$36,000
2007-2008	13,620	7,096	52.1%	$32,346
2008-2009	13,865	7,721	55.7%	$28,820
Total	142,047	64,272	45.2%	$42,247

West Virginia public higher education graduates earned annualized wages of $2.7 billion in 2010, excluding fringe benefits. As Table 1 shows, that translated into an average of $42,247 per worker. Wages also varied significantly with time since graduation. Indeed, the most recent graduates earned average annualized wages of $28,820 in 2010. In contrast, graduates with 13

years of experience earned $55,116. That translated into an average increase in wages of $2,023 per additional year of experience.[1]

Work Participation And Annualized Wages By Residency

Residency for fee purposes had a large impact on work participation rates in 2010. In-state graduates were more likely to work at establishments in the state than were out-of-state graduates. As Table 2 shows, 58.0 percent of in-state graduates during the previous 13 years worked in West Virginia in 2010. In contrast, 8.1 percent of out-of-state graduates worked in the state.

Table 2
Work Participation And Average Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions In 2010 By Residency And Graduation Year

	Residency Status					
	In State		Out Of State		Other*	
Graduation Year	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages	Work Participation	Average Annualized Wages
1996-1997	47.8%	$55,194	3.6%	$60,665	19.9%	$49,554
1997-1998	48.3%	$54,549	4.4%	$47,164	20.1%	$44,089
1998-1999	49.5%	$52,302	4.6%	$55,463	15.9%	$42,958
1999-2000	50.1%	$50,366	5.4%	$49,576	16.9%	$46,534
2000-2001	53.5%	$50,783	4.4%	$56,474	17.4%	$37,962
2001-2002	54.2%	$46,493	6.4%	$46,733	18.8%	$36,512
2002-2003	56.0%	$47,401	5.6%	$45,227	26.9%	$36,978
2003-2004	58.2%	$43,892	7.2%	$42,553	18.1%	$36,327
2004-2005	60.8%	$41,705	8.0%	$48,594	29.4%	$40,368
2005-2006	62.4%	$38,965	8.8%	$41,869	23.4%	$33,418
2006-2007	64.3%	$36,067	10.2%	$35,726	30.7%	$33,054
2007-2008	66.1%	$32,513	12.2%	$29,737	30.4%	$31,668
2008-2009	70.3%	$29,116	16.5%	$25,208	30.9%	$27,370
Total	**58.0%**	**$42,482**	**8.1%**	**$38,825**	**23.6%**	**$36,665**

*Other: SREB Academic Common Market, Reciprocity Agreement, Metro Agreement.

As Table 2 also shows, both in-state and out-of-state graduates experienced declining work participation rates as time since graduation increased. The pace of decline, however, was faster for out-of-state graduates than for in-state graduates. The in-state work participation rate declined by 32.0 percent measured from graduates during 2008-2009 to graduates during 1996-1997. In contrast, the percentage decline for out-of-state graduates was 78.2 percent. Overall, graduate attachment to jobs in the state declined with experience, but the impact was greater for out-of-state graduates.

Table 2 also shows annualized wages for graduates by residency for fee purposes. In-state graduates during the past 13 years earned an average of $42,482 at establishments located in the state in 2010. That exceeded annualized wages earned by out-of-state graduates, who earned

[1] It is important to keep in mind that time since graduation is not a perfect indicator of experience. For instance, a graduate may have less experience than expected if she endured periods of unemployment after graduation. A graduate may also have more experience than expected if she worked before attending and graduating from college.

$38,825 in 2010. Other graduates for fee purposes earned $36,665 at establishments in the state in 2010.

In-state, out-of-state, and other graduates earned higher wages as time since graduation increased. In-state graduates earned an average of $2,173 more with each additional year of experience. Out-of-state graduates generated a more rapid return to experience during the period, with wages rising an average of $2,955 with each additional year since graduation. Other graduates generated more modest wage increases, at $1,849 per additional year of experience.

Work Participation And Annualized Wages By Degree

Another important determinant of graduate employment and wages in the state is the summary degree awarded to the student. As Table 3 shows, Associate's degree graduates were by far the most likely to work in West Virginia in 2010. Indeed, 62.5 percent of Associate's degree graduates during the past 13 years worked in the state in 2010. In addition, 71.5 percent of the most recent Associate's degree graduates worked in the state last year. Even 13 years after graduation, more than one-half of Associate's degree graduates worked in the state. The focused nature of many Associate's degrees likely means that graduates are well matched with employment opportunities in the state.

Table 3
Work Participation And Average Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions In 2010 By Degree And Graduation Year

	Degree									
	Associate's		Bachelor's		Master's		First Professional		Doctoral	
Graduation Year	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	51.9%	$42,019	31.2%	$50,024	40.7%	$60,103	31.6%	$185,866	23.1%	$79,287
1997-1998	54.8%	$39,685	31.6%	$50,037	41.6%	$58,902	34.1%	$169,624	15.3%	$73,673
1998-1999	52.9%	$40,211	31.7%	$48,975	45.5%	$55,556	34.2%	$146,020	22.3%	$64,290
1999-2000	54.0%	$39,706	33.4%	$44,892	44.5%	$57,569	32.7%	$143,831	17.9%	$73,433
2000-2001	59.1%	$37,111	35.1%	$43,988	47.4%	$56,377	42.9%	$159,855	19.8%	$64,556
2001-2002	59.5%	$37,524	37.1%	$41,162	48.4%	$53,213	39.0%	$125,369	19.2%	$65,831
2002-2003	62.9%	$36,298	37.8%	$40,379	48.3%	$54,303	47.1%	$132,145	17.5%	$70,612
2003-2004	60.0%	$35,585	40.6%	$37,542	48.4%	$52,169	44.5%	$111,576	23.2%	$68,202
2004-2005	65.3%	$34,181	43.2%	$36,953	48.2%	$51,709	48.7%	$104,750	23.1%	$72,614
2005-2006	65.3%	$32,696	45.0%	$34,351	49.5%	$47,446	44.1%	$98,549	24.6%	$63,256
2006-2007	69.2%	$31,093	45.8%	$31,440	49.1%	$47,850	43.9%	$71,941	33.7%	$66,319
2007-2008	70.7%	$28,930	48.0%	$27,949	50.0%	$43,708	46.8%	$65,612	32.6%	$60,535
2008-2009	71.5%	$26,740	51.6%	$24,097	54.9%	$39,651	45.4%	$61,037	36.8%	$59,465
Total	**62.5%**	**$34,215**	**40.3%**	**$36,906**	**47.6%**	**$51,418**	**41.7%**	**$113,365**	**24.5%**	**$66,383**

In contrast, Doctoral graduates posted the lowest work participation rate in 2010, at 24.5 percent. It is common for Doctoral graduates to move on to other institutions (and often other states). In addition, the non-academic demand for Doctoral graduates in West Virginia is likely modest.

Bachelor's degree graduates also posted relatively low work participation rates in 2010. Indeed, 40.3 percent of Bachelor's degree graduates during the past 13 years worked in the state. Bachelor's degree work participation rates also declined rapidly with experience, falling from 51.6 percent for graduates during 2008-2009 to 31.2 percent for graduates during 1996-1997. Bachelor's degree graduates are likely to be the most flexible in terms of career and occupation choice, as well as geographic preference.

The work participation rate for Master's degree graduates was 47.6 percent in 2010. That was higher than any other summary degree, with the exception of Associate's degree graduates. While work participation rates declined with experience for Master's degree graduates, many remained to work in the state. This likely reflects the fact that many Master's degree graduates earned education degrees.

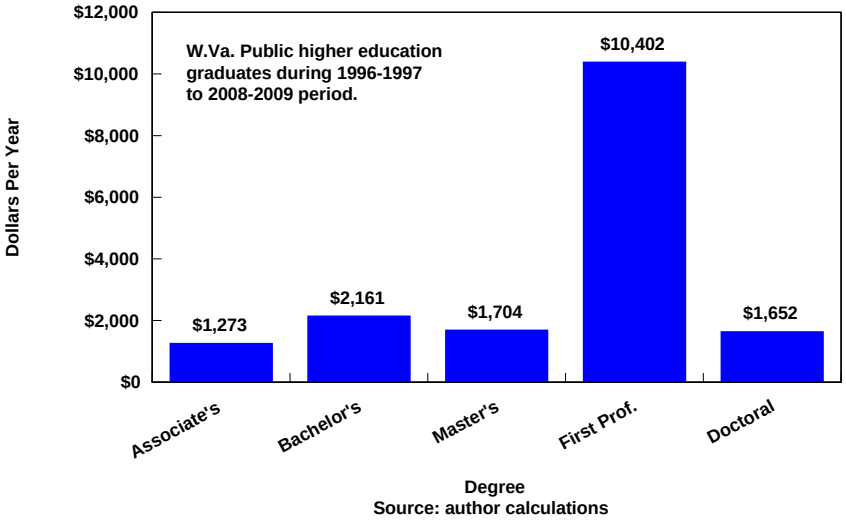
Finally, in 2010 41.7 percent of First Professional degree graduates (lawyers and physicians) worked in West Virginia. The work participation rate declined with experience, falling from 45.4 percent for graduates during 2008-2009 to 31.6 percent for graduates during 1996-1997.

Table 3 also shows annualized wages by summary degree and years of experience. While Associate's degree graduates posted the highest work participation rate in 2010, they also posted the lowest average wages, at $34,215. Annualized wages were higher for Bachelor's degree graduates, at $36,906 in 2010.

Master's graduates earned significantly higher wages than Bachelor's graduates in 2010, at $51,418. Doctoral graduates posted higher wages, at $66,383, while First Professional graduates earned the highest wages at $113,365.

Wages generally increase as workers gain experience and that pattern was clear in the data. Wages for Associate's degree graduates rose relatively slowly with experience, increasing on average by $1,273 per year, as Figure 1 shows. Wages for Bachelor's graduates rose more quickly with experience, rising by an average of $2,161 per year. However, note also from Table 3 that wages for the most recent Associate's graduates were actually higher than wages for Bachelor's graduates. This pattern reversed once graduates each have three years of experience, so that a Bachelor's premium eventually emerged.

Figure 1
Average Increase In Wages Per Year Of Experience
By Degree



Source: author calculations

As Figure 1 also shows, wages for both Master's and Doctoral graduates increased with experience at a slower rate than for Bachelor's graduates. This arises from the concentration of Master's and Doctoral graduates in teaching professions, where wage increases tended to be more modest. In contrast, First Professional graduates earned the largest wage increases with experience, at $10,402 per year.

Results By Area Of Concentration, Gender, And Race

Area Of Concentration

The area of study that a graduate pursues has a large impact on work participation and wages in West Virginia. Table 4 summarizes state public higher education graduates during the past 13 year by area of concentration.[2]

Table 4
Number Of Graduates By Area Of Concentration From West Virginia Public Higher Education Institutions During 1996-1997 To 2008-2009

		Degree			
Area of Concentration	**Total Number of Graduates From 1996-1997 to 2008-2009**	**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	1,481	72	1,063	308	38
Architecture and Related Services	341	n/a	341	n/a	n/a
Biological and Biomedical Sciences	3,848	n/a	3,087	490	271
Business, Management, Marketing, and Related	23,322	3,991	15,274	3,806	70
Communication, Journalism, and Related Programs	6,019	115	4,513	1,388	n/a
Communications Technologies	370	148	220	n/a	n/a
Computer and Information Sciences	2,345	570	1,112	572	28
Education	21,692	152	9,882	10,964	553
Engineering	6,178	32	4,024	1,826	296
Engineering Technologies/Technicians	3,200	1,369	1,370	446	n/a
English Language and Literature/Letters	2,020	n/a	1,515	467	38
Family and Consumer Sciences/Human Sciences	1,842	203	1,527	112	n/a
Foreign Languages, Literatures, and Linguistics	815	85	329	394	n/a
Health Professions and Related Clinical Sciences	21,350	7,644	5,900	3,249	138
History	1,630	n/a	1,408	166	56
Legal Professions and Studies	2,135	387	n/a	33	n/a
Liberal Arts and Sci., Gen. Std., and Humanities	13,213	3,448	9,667	70	n/a
Library Science	n/a	n/a	n/a	n/a	n/a
Mathematics and Statistics	675	n/a	381	260	34
Mechanic and Repair Technologies/Technicians	264	245	n/a	n/a	n/a
Multi/Interdisciplinary Studies	2,273	905	1,288	78	n/a
Natural Resources and Conservation	1,468	152	971	259	86
Parks, Recreation, Leisure and Fitness Studies	2,277	n/a	2,030	237	n/a
Personal and Culinary Services	225	211	n/a	n/a	n/a
Philosophy and Religious Studies	92	n/a	92	n/a	n/a
Physical Sciences	1,611	n/a	1,179	289	136
Precision Production	241	209	n/a	n/a	n/a
Psychology	4,442	n/a	3,505	571	240
Public Administration and Social Service Prof	3,081	220	1,210	1,642	n/a
Science Technologies/Technicians	556	355	n/a	n/a	n/a
Security and Protective Services	4,496	1,117	2,957	318	n/a
Social Sciences	5,311	n/a	4,765	484	62
Transportation and Materials Moving	n/a	n/a	n/a	n/a	n/a
Visual and Performing Arts	3,224	122	2,572	469	61
Total	**142,047**	**21,765**	**82,182**	**28,899**	**2,120**

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

[2] Areas of concentration are defined by Classification of Instructional Program (CIP) codes and correspond to groups of individual majors. Areas of concentration are defined by two-digit CIP codes.

As Table 4 shows, Business, Management, and Marketing posted the largest number of graduates during the period, with 23,322, followed by Education, with 21,692, and Health Professions, with 21,350, Liberal Arts, with 13,213, and Engineering, with 6,178. Indeed, these top five areas of concentration accounted for 60.4 percent of total graduates during the past 13 years.

The area of concentration pursued by graduates varied significantly by degree. For instance, Health Professions accounted for the largest number of Associate's graduates, while Business, Management, and Marketing was the most popular area of concentration for Bachelor's graduates. Master's graduates were very concentrated in Education, which alone accounted for 37.9 percent all Master's graduates during the past 13 years. Doctoral graduates were also likely to choose an Education degree and these graduates accounted for 26.1 percent of all Doctoral graduates.

Table 5 shows West Virginia work participation rates and annualized wages in 2010 for graduates during the past 13 years by area of concentration. Work participation rates were highest for graduates in Library Science, an area of concentration with relatively few graduates.[3] Precision Production, with 74.7 percent, Science Technologies, with 71.8 percent, Mechanic and Repair Technologies, with 67.8 percent, and Education, with 56.3 percent, also posted high work participation rates in 2010. Note from Table 4 that most graduates in Precision Production, Science Technologies, Mechanic and Repair Technologies earned Associate's degrees.

Work participation rates in 2010 were much lower for graduates in Architecture, with 13.8 percent, Transportation and Materials Moving, the rate is not published in order to preserve confidentiality, Foreign Languages, with 23.9 percent, Mathematics and Statistics, with 24.0 percent, and Parks, Recreation, Leisure, and Fitness, with 24.0 percent. Low work participation rates in these areas of concentration likely reflect modest demand in the state for graduates with these skills.

Table 5 also provides information on annualized wages earned by graduates in 2010 by area of concentration. In 2010, the highest wages were earned by graduates in Engineering, with $68,413, Health Professions, with $58,122, Legal Professions, with $57,743, Engineering Technologies, with $52,048, and Transportation and Materials Moving, data not disclosed.

In contrast, wages were lowest for Philosophy and Religious Studies, with $23,162, Personal and Culinary Services, with $23,774, Foreign Languages, with $24,265, Visual and Performing Arts, $24,331, and Family and Consumer Sciences, with $24,795.

[3] We do not disclose data for areas of concentration with few graduates.

Table 5
Work Participation And Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions By Area Of Concentration In 2010

Area Of Concentration	Work Participation	Work Participation Rank	Annualized Wages Per Worker	Annualized Wages Rank
Agriculture, Agriculture Operations	35.7%	19	$34,751	17
Architecture and Related Services	13.8%	34	$36,555	15
Biological and Biomedical Sciences	33.7%	22	$39,177	14
Business, Management, Marketing, and Related	44.9%	15	$41,514	10
Communication, Journalism, and Related Programs	34.3%	20	$35,553	16
Communications Technologies	48.9%	11	$27,980	26
Computer and Information Sciences	43.9%	16	$47,360	6
Education	56.3%	5	$39,818	12
Engineering	27.2%	28	$68,413	1
Engineering Technologies/Technicians	50.7%	9	$52,048	4
English Language and Literature/Letters	33.3%	24	$26,786	28
Family and Consumer Sciences/Human Sciences	30.8%	25	$24,795	30
Foreign Languages, Literatures, and Linguistics	23.9%	32	$24,265	32
Health Professions and Related Clinical Sciences	55.0%	6	$58,122	2
History	34.0%	21	$25,884	29
Legal Professions and Studies	52.9%	7	$57,743	3
Liberal Arts and Sci., Gen. Std., and Humanities	47.4%	14	$32,431	21
Library Science	n/a	1	n/a	27
Mathematics and Statistics	24.0%	31	$41,127	11
Mechanic and Repair Technologies/Technicians	67.8%	4	$44,806	8
Multi/Interdisciplinary Studies	47.9%	12	$32,201	22
Natural Resources and Conservation	40.3%	17	$39,593	13
Parks, Recreation, Leisure and Fitness Studies	24.0%	30	$31,771	23
Personal and Culinary Services	50.2%	10	$23,774	33
Philosophy and Religious Studies	27.2%	29	$23,162	34
Physical Sciences	29.4%	26	$46,636	7
Precision Production	74.7%	2	$44,243	9
Psychology	39.1%	18	$29,854	24
Public Administration and Social Service Prof	47.6%	13	$34,134	18
Science Technologies/Technicians	71.8%	3	$34,015	20
Security and Protective Services	51.4%	8	$34,125	19
Social Sciences	33.6%	23	$29,580	25
Transportation and Materials Moving	n/a	33	n/a	5
Visual and Performing Arts	28.8%	27	$24,331	31
Total	**45.2%**	**-**	**$42,247**	**-**

n/a: data not available for this area of concentration

Table 6 summarizes work participation and wages for graduates by area of concentration and degree. For Associate's degree graduates, work participation rates in 2010 were highest for Precision Production; Science Technologies; and Mechanic and Repair Technologies.[4] Work participation rates in each of these areas of concentration were above 69.0 percent. Work participation rates were lowest for Visual and Performing Arts; Engineering; and Personal and Culinary Services. Work participation rates for these areas of concentration were below 49.0 percent.

[4] Rankings are based on published data in Table 4. Data for areas of concentration with fewer than 10 graduates working in the state are not disclosed in order to protect confidentiality. Work participation rates and wages may be higher or lower in areas of concentration with fewer than 10 graduates working in the state.

Wages were highest for Associate's graduates in Engineering Technologies; Mechanic and Repair Technologies; and Precision Production. Associate's graduates in these areas of concentration earned more than $44,000 per year on average in 2010. Wages were lowest for Associate's graduates in Education; Family and Consumer Sciences; and Communication and Journalism. Graduates in these areas of concentration earned less than $18,000 on average in 2010.

Bachelor's degree graduates posted the highest work participation rates in Health Professions; Education; and Communications Technologies, with each above 48.0 percent. Work participation rates were lowest for Architecture; Parks, Recreation, Leisure, and Fitness; and Foreign Languages. Work participation rates for each of these areas of concentration were below 26.0 percent in 2010.

Annualized wages for Bachelor's graduates were highest in Engineering; Engineering Technologies; and Computer and Information Sciences. Graduates in these areas of concentration earned more than $53,000 in 2010. Wages were lowest for graduates in Foreign Languages; Visual and Performing Arts; and Philosophy and Religious Studies. Graduates in these areas of concentration earned less than $24,000 on average in 2010.

For Master's degree graduates, work participation rates were highest in Liberal Arts, with 62.9 percent, Education, with 60.8 percent, and Legal Professions, with 60.6 percent. Work participation rates were lowest for Foreign Languages, with 12.9 percent, Mathematics and Statistics, with 16.5 percent, and Engineering, with 20.6 percent.

Wages in 2010 were highest for Master's graduates in Engineering; Business, Management, and Marketing; and Computer and Information Sciences. Graduates in these areas of concentration earned more than $69,000 on average in 2010. Wages were lowest for graduates in Foreign Languages; History; and Visual and Performing Arts. Graduates in these areas of concentration earned annualized wages below $34,000 on average in 2010.

Doctoral degree graduates in Education and Health Professions were the most likely to work in the state in 2010, with work participation rates of 43.8 percent and 42.0 percent, respectively. Doctoral graduates in Psychology and Engineering where the least likely to work in the state, with work participation rates of 9.6 percent and 14.2 percent, respectively.

Doctoral graduates earned the highest average wages in 2010 in Health Profession, at $76,165, and Biological and Biomedical Services, at $75,155. Graduates earned the lowest average wages in History, at $41,417, and Social Sciences, at $52,713.

Table 6
Work Participation And Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions By Degree And Area Of Concentration In 2010

	Degree							
	Associate's		Bachelor's		Master's		Doctoral	
Area of Concentration	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker
Academic And Occupationally-Specific Programs								
Agriculture, Agriculture Operations	59.7%	$22,526	35.1%	$35,209	34.7%	$37,177	n/a	n/a
Architecture and Related Services	n/a	n/a	13.8%	$36,555	n/a	n/a	n/a	n/a
Biological and Biomedical Sciences	n/a	n/a	36.2%	$36,170	27.8%	$51,969	16.6%	$75,155
Business, Management, Marketing, and Related	61.2%	$27,636	41.7%	$39,780	41.0%	$71,744	n/a	n/a
Communication, Journalism, and Related Programs	53.9%	$17,906	27.8%	$29,174	53.9%	$47,733	n/a	n/a
Communications Technologies	49.3%	$27,045	48.2%	$29,048	n/a	n/a	n/a	n/a
Computer and Information Sciences	62.3%	$29,255	40.0%	$53,442	34.1%	$69,716	n/a	n/a
Education	50.7%	$15,324	51.9%	$32,215	60.8%	$44,688	43.8%	$67,890
Engineering	46.9%	$28,124	31.0%	$65,417	20.6%	$79,671	14.2%	$70,776
Engineering Technologies/Technicians	61.9%	$47,513	46.9%	$56,418	27.8%	$61,759	n/a	n/a
English Language and Literature/Letters	n/a	n/a	33.8%	$23,920	32.5%	$35,133	n/a	n/a
Family and Consumer Sciences/Human Sciences	60.6%	$16,590	26.2%	$25,474	39.3%	$41,562	n/a	n/a
Foreign Languages, Literatures, and Linguistics	68.2%	$21,106	25.2%	$22,835	12.9%	$30,322	n/a	n/a
Health Professions and Related Clinical Sciences	66.1%	$40,290	53.3%	$49,363	51.2%	$66,871	42.0%	$76,165
History	n/a	n/a	33.8%	$24,582	39.8%	$32,214	23.2%	$41,417
Legal Professions and Studies	61.0%	$25,223	n/a	n/a	60.6%	$47,571	n/a	n/a
Liberal Arts and Sci., Gen. Std., and Humanities	56.9%	$26,433	43.9%	$35,137	62.9%	$44,515	n/a	n/a
Library Science	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mathematics and Statistics	n/a	n/a	30.2%	$39,814	16.5%	$44,385	n/a	n/a
Mechanic and Repair Technologies/Technicians	69.4%	$45,813	n/a	n/a	n/a	n/a	n/a	n/a
Multi/Interdisciplinary Studies	62.8%	$32,384	37.7%	$30,670	43.6%	$51,375	n/a	n/a
Natural Resources and Conservation	68.4%	$39,220	38.4%	$36,739	36.7%	$48,102	23.3%	$54,337
Parks, Recreation, Leisure and Fitness Studies	n/a	n/a	22.8%	$29,866	33.3%	$42,749	n/a	n/a
Personal and Culinary Services	48.8%	$23,319	n/a	n/a	n/a	n/a	n/a	n/a
Philosophy and Religious Studies	n/a	n/a	27.2%	$23,162	n/a	n/a	n/a	n/a
Physical Sciences	n/a	n/a	32.0%	$41,879	24.6%	$67,103	15.4%	$71,281
Precision Production	76.6%	$44,229	n/a	n/a	n/a	n/a	n/a	n/a
Psychology	n/a	n/a	38.5%	$26,711	54.6%	$38,099	9.6%	$59,775
Public Administration and Social Service Prof	51.8%	$18,468	47.3%	$28,549	47.3%	$40,683	n/a	n/a
Science Technologies/Technicians	70.7%	$40,379	n/a	n/a	n/a	n/a	n/a	n/a
Security and Protective Services	64.3%	$32,840	47.5%	$33,799	30.5%	$40,912	n/a	n/a
Social Sciences	n/a	n/a	34.0%	$28,542	31.4%	$38,348	24.2%	$52,713
Transportation and Materials Moving	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Visual and Performing Arts	45.1%	$19,501	28.4%	$22,930	28.8%	$33,132	n/a	n/a
Total	**62.5%**	**$34,215**	**40.3%**	**$36,906**	**47.6%**	**$51,418**	**24.5%**	**$66,383**

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

Gender

Of the 142,047 public higher education graduates during the past 13 years, 56.7 percent were female and 43.3 percent were male. As Table 7 shows, female graduates were also more likely to work in the state in 2010. Indeed, 49.5 percent of female graduates during the past 13 years worked in West Virginia in 2010, compared to 39.7 percent for males.

Table 7 also breaks down graduates, work participation rates, and annualized wages by gender and area of concentration. As the table shows, the top three areas of concentration for males were Business, Management, and Marketing; Education; and Liberal Arts. These three areas of concentration alone accounted for 38.9 percent of male graduates. The top three areas of concentration for females were Health Professions; Education; and Business, Management, and Marketing. Together, these three areas of concentration accounted for 54.1 percent of female graduates.

This suggests that female graduates tended to be much more focused on a few areas of concentration than were male graduates. In addition, Business, Management, and Marketing attracted a roughly similar number of male and female graduates. However, Education attracted more than twice as many female graduates and Health Professions attracted more than three times as many female graduates during the past 13 years.

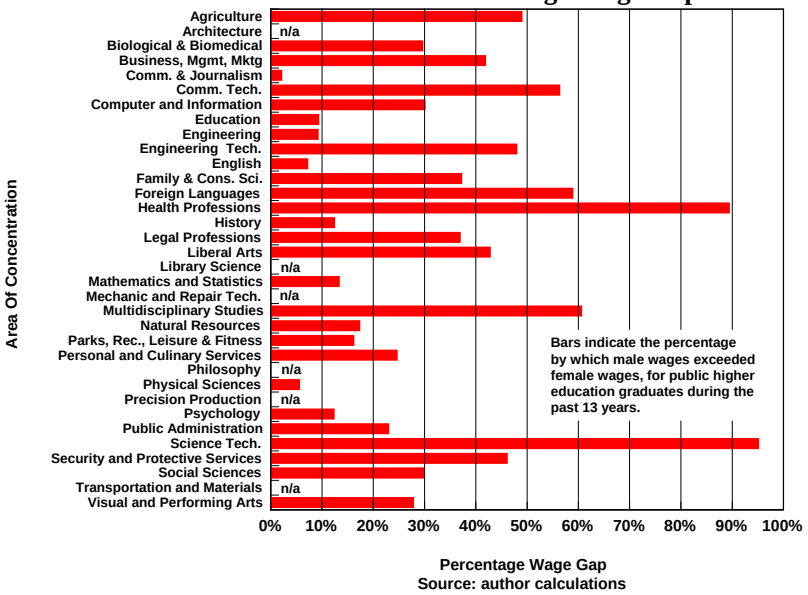
Work participation rates in 2010 were highest for male graduates in Precision Production; Science Technologies; and Mechanic and Repair Technologies. Work participation rates for males in these areas of concentration were above 67.0 percent in 2010. In contrast, work participation rates for male graduates were lowest in Architecture, at 13.6 percent, followed by Foreign Languages, at 17.6 percent, and Parks, Recreation, Leisure and Fitness, at 22.5 percent.

Work participation rates for female graduates were highest in Science Technologies; Education; and Health Professions. Female work participation rates in these areas of concentration were above 57.0 percent in 2010. Work participation rates were lowest in Engineering, at 22.1 percent, Mathematics and Statistics, at 22.6 percent, and Foreign Languages, at 26.3 percent.

In contrast to work participation rates, annualized wages were higher for males than for females in 2010, as shown in Table 7. Female graduates working in the state in 2010 earned annualized wages of $37,589, compared to $49,865 for male graduates. The wage gap of $12,276 means that male graduates earned 32.6 percent more than female graduates in 2010.

As Figure 2 shows, annualized wages were lower for female graduates in all areas of concentration. The percentage wage gap was largest for Science Technologies; Health Professions; and Multidisciplinary Studies. For each of these areas of concentration, the percentage gap was above 60.0 percent. The percentage wage gap was lowest for Communications and Journalism; Physical Sciences; and English, with each percentage gap below 10.0 percent.

Figure 2
Male-Female Percentage Wage Gap In 2010



Male graduate wages were highest in Health Professions; Engineering; and Legal Professions. Wages in these areas of concentration were above $68,000 on average in 2010. Male graduate wages were lowest in Philosophy and Religious Studies, at $25,693, Personal and Culinary Services, at $26,785, and History, at $26,973.

Annualized wages for female graduates were highest in 2010 in Engineering, at $63,229, Legal Professions, at $49,745, and Health Professions, at $49,607. Wages were lowest in 2010 for

female graduates in Communications Technologies, at $21,025, Personal and Culinary Services, at $21,469, and Foreign Languages, at $21,703.

Table 7
Work Participation And Annualized Wages By Gender For Graduates From West Virginia Public Higher Education Institutions Working In The State In 2010

	Males			Females		
Area of Concentration	Total Graduates From 1996-1997 To 2008-2009	Work Participation	Annualized Wages Per Worker	Total Graduates From 1996-1997 To 2008-2009	Work Participation	Annualized Wages Per Worker
Academic And Occupationally-Specific Programs						
Agriculture, Agriculture Operations	759	36.5%	$41,218	722	34.9%	$27,643
Architecture and Related Services	273	13.6%	$40,133	68	n/a	n/a
Biological and Biomedical Sciences	1,750	33.7%	$44,788	2,098	33.8%	$34,515
Business, Management, Marketing, and Related	11,624	40.1%	$49,675	11,698	49.8%	$34,983
Communication, Journalism, and Related Programs	2,337	29.6%	$36,077	3,682	37.3%	$35,289
Communications Technologies	214	49.5%	$32,900	156	48.1%	$21,025
Computer and Information Sciences	1,791	44.2%	$50,041	554	43.0%	$38,439
Education	6,382	47.8%	$42,584	15,310	59.8%	$38,897
Engineering	5,231	28.2%	$69,148	947	22.1%	$63,229
Engineering Technologies/Technicians	2,798	51.7%	$53,959	402	44.0%	$36,433
English Language and Literature/Letters	696	33.5%	$28,036	1,324	33.2%	$26,123
Family and Consumer Sciences/Human Sciences	92	31.5%	$33,416	1,750	30.7%	$24,330
Foreign Languages, Literatures, and Linguistics	221	17.6%	$34,516	594	26.3%	$21,703
Health Professions and Related Clinical Sciences	4,797	46.9%	$94,033	16,553	57.4%	$49,607
History	1,083	32.7%	$26,973	547	36.7%	$23,964
Legal Professions and Studies	971	50.5%	$68,174	1,164	54.9%	$49,745
Liberal Arts and Sci., Gen. Std., and Humanities	5,916	41.6%	$39,664	7,297	52.1%	$27,750
Library Science	n/a	n/a	n/a	n/a	n/a	n/a
Mathematics and Statistics	370	25.1%	$43,318	305	22.6%	$38,174
Mechanic and Repair Technologies/Technicians	256	67.6%	$44,615	n/a	n/a	n/a
Multi/Interdisciplinary Studies	1,132	40.3%	$41,267	1,141	55.5%	$25,670
Natural Resources and Conservation	1,170	43.4%	$40,446	298	28.2%	$34,431
Parks, Recreation, Leisure and Fitness Studies	1,451	22.5%	$33,680	826	26.8%	$28,955
Personal and Culinary Services	101	48.5%	$26,785	124	51.6%	$21,469
Philosophy and Religious Studies	68	27.9%	$25,693	24	n/a	n/a
Physical Sciences	1,032	27.3%	$47,684	579	33.2%	$45,096
Precision Production	236	75.4%	$44,488	n/a	n/a	n/a
Psychology	1,191	36.6%	$32,560	3,251	40.1%	$28,948
Public Administration and Social Service Prof	563	41.4%	$40,531	2,518	49.0%	$32,926
Science Technologies/Technicians	245	68.6%	$47,405	311	74.3%	$24,277
Security and Protective Services	2,490	51.6%	$39,692	2,006	51.1%	$27,145
Social Sciences	2,857	29.4%	$33,688	2,454	38.5%	$25,920
Transportation and Materials Moving	n/a	n/a	n/a	n/a	n/a	n/a
Visual and Performing Arts	1,380	26.2%	$28,071	1,844	30.7%	$21,939
Total	**61,483**	**39.7%**	**$49,865**	**80,564**	**49.5%**	**$37,589**

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

Race

Graduates from West Virginia public higher education institutions during the past 13 years were primarily Caucasian, as Table 8 shows. Indeed, 91.2 percent of graduates during the 1996-1997 to 2008-2009 period were Caucasian. African-American and Asian graduates accounted for the second and third largest shares, at 3.9 percent and 3.2 percent, respectively. Hispanic graduates accounted for 1.0 percent of total graduates, while American-Indian and Other races accounted for less than 1.0 percent each.

Work participation rates varied significantly by race in 2010. Caucasian graduates posted the highest West Virginia work participation rate, at 47.3 percent, followed by American-Indian graduates, at 43.2 percent, and Other races, at 36.0 percent. Asian graduates were the least likely to work in the state in 2010, with a work participation rate of 11.7 percent.

Table 8 also shows that annualized wages earned by graduates in 2010 differed by race. Asian graduates earned the highest wages, at $48,597, followed by Caucasian graduates, at $42,528, and Hispanic graduates, at $42,229. Wages in 2010 were lowest for Other graduates, at $32,059.

Table 8
Work Participation And Annualized Wages In 2010 By Race
For Graduates Of West Virginia Public Higher Education Institutions

Race	Graduates from 1996-1997 to 2008-2009	Work Participation	Average Annualized Wages
Caucasian	129,523	47.3%	$42,528
African-American	5,495	31.2%	$32,140
Hispanic	1,388	23.5%	$42,229
Asian-Pacific or Islander	4,498	11.7%	$48,597
American-Indian or Alaskan Native	437	43.2%	$38,940
Other	706	36.0%	$32,059
Total	**142,047**	**45.2%**	**$42,247**

Graduates during the 1996-1997 to 2008-2009 period.

Results By Academic Achievement And Tuition Assistance

Academic Achievement

West Virginia work participation and wages in 2010 were influenced by individual academic achievement, as Tables 9 and 10 show.[5] The tables summarize results for ACT scores, which are a standardized test for high school academic achievement, and college GPA scores, which are a measure of cumulative academic performance while in college. Overall, work participation rates tended to decline as academic achievement increased. Thus, graduates with higher ACT scores and higher college GPAs were less likely to remain in the state to work. In contrast, annualized wages in 2010 tended to rise with academic achievement, so that graduates with higher ACT scores and higher college GPAs tended to earn higher wages.

Table 9 summarizes work participation and wages for graduates during the past 13 years by ACT score and by degree, gender, race, residency, and year of graduation. ACT scores are grouped into three categories: high (ACT scores of 22.0 and higher), medium (ACT scores at or above 19.0 and below 22.0), and low (ACT scores below 19.0).

As the table shows, work participation rates for graduates were highest for those with ACT scores below 19.0, at 61.9 percent, followed by graduates with ACT scores between 19.0 and 21.0, at 59.4 percent, and graduates with ACT scores at or above 22.0, at 53.8 percent. This general pattern is present for most summary degrees, with the exception of Associate's degree graduates. Associate's degree graduates with ACT scores at or above 22.0 were slightly more likely to work in the state in 2010 than Associate's graduates with lower ACT scores.

Work participation rates tended to fall as ACT scores increased for males and females and for Caucasian, Hispanic, Asian, and American-Indian graduates. African-American graduates with high ACT scores were more likely to work in West Virginia in 2010. Both in-state and out-of-

[5] The dataset includes both ACT scores and college GPAs for 47,120 graduates during the 13 year period. Thus, these results pertain to a subset of all graduates during the period.

state graduates with high ACT scores were less likely to work in the state in 2010 than graduates with lower ACT scores.

In contrast, annualized wages in 2010 tended to rise with ACT scores. Indeed, graduates with ACT scores at or above 22.0 earned $38,054 on average in 2010. That was 17.9 percent higher than average wages earned by graduates with ACT scores below 19.0, at $32,283. A similar pattern appeared for all but one summary degree. First Professional degree graduates with ACT scores at or above 22.0 earned lower annual wages than graduates with lower ACT scores.

Both male and female graduates with higher ACT scores tended to earn higher wages in 2010, as did Caucasian, African-American, and Asian graduates. Hispanic and American-Indian graduates with ACT scores below 19.0 earned higher wages in 2010 than similar graduates with ACT scores above 22.0. Finally, in-state and out-of-state graduates with higher ACT scores tended to earn more in 2010 than similar graduates with lower ACT scores.

Table 9
Work Participation And Annualized Wages For West Virginia Public Higher Education Graduates By ACT Score

	Work Participation Rates in 2010				Annualized Wages In 2010			
	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	57.7%	53.8%	59.4%	61.9%	$35,516	$38,054	$35,204	$32,283
Degree								
Associate	68.9%	69.8%	68.8%	68.4%	$32,134	$33,331	$33,904	$30,148
Bachelor	53.7%	50.0%	55.9%	58.2%	$33,438	$33,642	$33,572	$32,943
Doctoral	53.3%	49.1%	68.8%	n/a	$61,319	$66,544	$46,476	n/a
First Prof	60.4%	60.5%	59.1%	63.0%	$88,145	$86,727	$96,440	$99,754
Master	60.9%	58.9%	63.0%	63.3%	$43,185	$44,896	$42,897	$38,799
Gender								
Male	55.7%	52.2%	57.4%	59.5%	$40,703	$42,110	$40,797	$38,610
Female	59.0%	54.9%	60.8%	63.6%	$32,167	$35,337	$31,833	$28,103
Race								
Caucasian	58.2%	54.0%	59.8%	63.4%	$35,785	$38,182	$35,423	$32,670
African American	46.9%	51.1%	48.4%	45.4%	$27,206	$31,990	$28,175	$25,571
Hispanic	45.6%	43.8%	46.5%	47.1%	$33,184	$32,064	$30,610	$37,204
Asian	34.7%	32.6%	40.5%	34.1%	$32,437	$36,230	$26,812	$30,779
American Indian	54.1%	50.8%	51.7%	60.5%	$34,348	$31,393	$41,525	$33,729
Unknown	65.6%	62.6%	75.9%	61.5%	$29,042	$33,939	$28,506	$23,719
Residency								
In State	61.1%	56.9%	63.0%	65.8%	$35,619	$38,158	$35,289	$32,386
Out of State	14.3%	12.7%	14.5%	16.2%	$30,863	$32,825	$30,644	$28,831
Year								
1996-1997*	47.9%	44.4%	43.8%	54.3%	$34,492	$30,821	$39,324	$33,250
1997-1998*	50.5%	40.6%	53.6%	56.5%	$39,419	$42,274	$40,770	$36,304
1998-1999*	42.7%	32.0%	49.1%	48.6%	$41,962	$46,821	$43,590	$36,687
1999-2000	44.7%	40.9%	45.1%	49.4%	$44,277	$45,167	$46,276	$41,255
2000-2001	48.5%	42.2%	51.3%	52.9%	$42,472	$46,454	$42,508	$38,731
2001-2002	49.6%	44.7%	50.6%	54.7%	$42,384	$47,431	$41,304	$38,208
2002-2003	52.9%	50.5%	52.6%	56.5%	$42,917	$50,618	$40,017	$36,351
2003-2004	53.7%	50.2%	55.1%	57.1%	$40,065	$44,400	$39,287	$35,516
2004-2005	57.5%	54.0%	57.9%	62.0%	$39,481	$43,978	$39,415	$33,811
2005-2006	58.9%	53.6%	61.2%	64.9%	$36,355	$40,063	$34,954	$32,855
2006-2007	60.5%	55.8%	63.2%	66.6%	$33,511	$35,349	$33,290	$30,702
2007-2008	64.2%	59.6%	67.1%	70.4%	$29,986	$32,075	$29,704	$26,560
2008-2009	68.6%	64.1%	72.7%	73.2%	$26,164	$27,483	$26,076	$23,869

n/a: data not available.

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

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

Table 10 summarizes work participation and wages for three levels of academic performance, measured by college GPA. This includes graduates with a GPA of 3.5 or higher, a GPA between 3.0 and 3.49, and a GPA below 3.0.

As the table shows, the pattern was similar to that found for ACT scores. Graduates with higher GPAs tended to be less likely to work in the state. This pattern was particularly evident for Bachelor's degree graduates, but less so for First Professional and Master's degree graduates. The pattern arose clearly for both males and females, as well as for all race categories except Asian graduates. The same pattern also emerged for both in-state and out-of-state graduates.

Similarly, annualized wages in 2010 tended to be higher for graduates with higher GPAs. This pattern became more pronounced as the level of education increased. For instance, Associate's degree graduates with GPAs below 3.0 on average earned more in 2010 than did Associate's graduates with higher GPAs. However, the pattern reversed for graduates with Bachelor's, Master's, and First Professional degrees. Both male and female graduates with higher GPAs tended to earn higher wages in 2010 than graduates with lower GPAs, as did graduates of all races except Hispanic. Both in-state and out-of-state graduates with higher GPAs earned higher wages on average in 2010 than did graduates with lower GPAs.

Table 10
Work Participation And Annualized Wages For West Virginia Public Higher Education Graduates By College GPA

	Work Participation Rates in 2010				Annualized Wages In 2010			
	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	57.7%	55.1%	57.5%	59.2%	$35,516	$37,914	$35,859	$34,039
Degree								
Associate	68.9%	65.9%	70.0%	69.1%	$32,134	$30,246	$31,794	$32,646
Bachelor	53.7%	49.0%	54.7%	55.2%	$33,438	$33,235	$33,930	$33,167
Doctoral	53.3%	59.3%	n/a	n/a	$61,319	$60,549	n/a	n/a
First Prof	60.4%	62.9%	62.8%	57.4%	$88,145	$93,290	$93,518	$81,115
Master	60.9%	62.1%	54.9%	62.5%	$43,185	$43,062	$45,063	$40,241
Gender								
Male	55.7%	50.5%	55.2%	57.8%	$40,703	$42,777	$41,806	$39,501
Female	59.0%	57.1%	58.8%	60.6%	$32,167	$36,043	$32,401	$29,226
Race								
Caucasian	58.2%	55.5%	57.7%	60.1%	$35,785	$37,984	$36,111	$34,388
African American	46.9%	38.1%	54.3%	46.1%	$27,206	$36,662	$27,599	$25,930
Hispanic	45.6%	45.6%	38.0%	51.0%	$33,184	$30,767	$29,336	$36,454
Asian	34.7%	38.7%	32.9%	33.1%	$32,437	$32,100	$34,256	$31,762
American Indian	54.1%	50.0%	55.6%	55.4%	$34,348	$46,433	$30,381	$31,180
Unknown	65.6%	65.5%	64.9%	66.3%	$29,042	$35,402	$27,626	$26,566
Residency								
In State	61.1%	58.3%	61.1%	62.7%	$35,619	$38,028	$35,941	$34,149
Out of State	14.3%	13.8%	14.6%	14.3%	$30,863	$32,674	$33,223	$28,328
Year								
1996-1997*	47.9%	57.9%	44.2%	46.9%	$34,492	$42,990	$29,934	$34,033
1997-1998*	50.5%	50.7%	48.2%	52.1%	$39,419	$35,889	$36,907	$42,909
1998-1999*	42.7%	33.8%	45.6%	44.8%	$41,962	$42,962	$41,715	$41,787
1999-2000	44.7%	38.0%	45.2%	46.9%	$44,277	$44,754	$45,035	$43,638
2000-2001	48.5%	45.4%	48.1%	49.9%	$42,472	$43,838	$42,667	$41,873
2001-2002	49.6%	44.8%	50.4%	51.2%	$42,384	$44,967	$42,849	$41,094
2002-2003	52.9%	47.9%	51.7%	55.5%	$42,917	$47,434	$45,159	$40,314
2003-2004	53.7%	49.7%	54.1%	55.5%	$40,065	$43,923	$41,374	$37,661
2004-2005	57.5%	56.1%	57.2%	58.3%	$39,481	$43,649	$41,094	$36,393
2005-2006	58.9%	56.5%	59.0%	60.3%	$36,355	$39,394	$36,326	$34,580
2006-2007	60.5%	57.3%	60.3%	62.9%	$33,511	$36,488	$33,298	$31,772
2007-2008	64.2%	60.8%	63.8%	66.9%	$29,986	$33,464	$30,366	$27,421
2008-2009	68.6%	65.3%	67.9%	71.5%	$26,164	$29,467	$25,459	$24,565

n/a: data not available.

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

Tuition Assistance

Tuition assistance also had an impact on graduate work participation and wages in West Virginia. Table 11 summarizes the results for PROMISE scholarship recipients, HEGP recipients, and all graduates during the 2003-2009 period. The 2003-2009 period is of interest since it includes PROMISE graduates.

As the table shows, the work participation rate for PROMISE graduates during the six years was 60.1 percent. That was above the rate for all graduates (including both in-state and out-of-state graduates) during the period, of 50.5 percent. This occurred in part because the all graduates total included both in-state and out-of-state graduates. In contrast, PROMISE graduates must be in-state for fee purposes. Previous results have shown that in-state graduates were more likely to work in the state than out-of-state graduates.

In contrast, PROMISE graduates were less likely to work in the state in 2010 than HEGP graduates. HEGP graduates posted a work participation rate of 67.6 percent in 2010 and must also be in-state for fee purposes.

PROMISE graduates posted lower work participation rates in 2010 than HEGP graduates for Bachelor's and Master's degrees. PROMISE graduates had higher work participation rates for Associate's and First Professional degrees. Both male and female PROMISE graduates recorded lower work participation rates than HEGP graduates, as did most race categories. American Indian graduates were the sole exception.

Annualized wages for PROMISE graduates tended to be lower in 2010 than those for HEGP graduates and all graduates. In part, this reflected differences in the experience/age mix of PROMISE graduates compared to HEGP graduates and all other graduates. PROMISE graduates tended to be more recent graduates and are likely to be younger as well. Annualized wages for PROMISE graduates by year suggests that average wages in 2010 were fairly similar to those earned by HEGP graduates.

Table 11
Work Participation And Annualized Wages In 2010 For West Virginia Public Higher Education Graduates Receiving PROMISE And HEGP Assistance

	PROMISE Recipients 2003-2009		W.Va. HEGP Recipients 2003-2009		All Graduates 2003-2009	
	Work Paticipation	Annualized Wages	Work Paticipation	Annualized Wages	Work Paticipation	Annualized Wages
Total	60.1%	$29,126	67.6%	$33,026	50.5%	$36,119
Residency						
In State	-	-	-	-	64.0%	$36,290
Out of State	-	-	-	-	10.9%	$34,012
Degree						
Associate	79.8%	$30,069	73.1%	$27,826	67.8%	$30,913
Bachelor	56.8%	$27,067	64.9%	$29,927	46.2%	$31,153
Doctoral	n/a	n/a	64.0%	$67,008	29.4%	$64,051
First Prof	67.5%	$84,717	62.8%	$81,878	45.5%	$84,248
Master	64.4%	$36,147	71.1%	$44,755	50.3%	$46,785
Gender						
Male	57.3%	$30,614	62.6%	$36,663	44.1%	$40,490
Female	62.0%	$28,185	70.4%	$31,255	55.2%	$33,541
Race						
White	60.6%	$29,230	68.2%	$33,297	52.7%	$36,382
Black	49.4%	$26,773	60.0%	$27,191	37.6%	$28,166
Hispanic	50.0%	$32,398	58.2%	$29,430	28.0%	$33,528
Asian	38.9%	$21,239	50.0%	$34,647	15.8%	$40,363
American Indian	66.7%	$18,415	58.8%	$35,634	46.6%	$34,467
Unknown	59.3%	$30,975	65.7%	$28,240	36.5%	$32,059
Year						
2003-2004	77.8%	$39,647	61.9%	$39,404	45.6%	$43,744
2004-2005	68.9%	$30,714	63.7%	$38,606	48.1%	$41,926
2005-2006	55.7%	$33,763	65.5%	$35,608	49.1%	$38,987
2006-2007	54.2%	$30,618	67.3%	$33,071	50.5%	$35,992
2007-2008	59.9%	$30,155	70.9%	$30,170	52.2%	$32,343
2008-2009	65.5%	$25,844	73.9%	$26,031	55.7%	$28,798

n/a: no data available for this degree

Results For Nearby States

Many graduates from West Virginia public higher education institutions remained in the state to work last year. However, not all graduates during the past 13 years worked in the state in 2010. Employment and wage data for 2010 from the Regional Wage Record Exchange Project (TRADE) provide information on West Virginia public higher education graduates that worked in the District of Columbia, Maryland, New Jersey, Pennsylvania, and Virginia.[6]

Figure 3 provides a map of the participating states, along with the number of West Virginia graduates working in each state in 2010. As the figure shows, of the participating states in 2010, Pennsylvania accounted for the largest number of graduates, with 8,947, followed by Virginia, with 8,611, Maryland, with 6,341, New Jersey with 1,804, and the District of Columbia, with 1,029.

[6] Data for Ohio, which is summarized in previous reports, is not available for 2010, due to administrative issues. We expect the Ohio data to be available again in the future.

Figure 3

W.Va. Public Higher Education Graduates (1996-97 To 2008-09)
Working In Participating States In 2010
Regional Wage Record Exchange Project Participating States

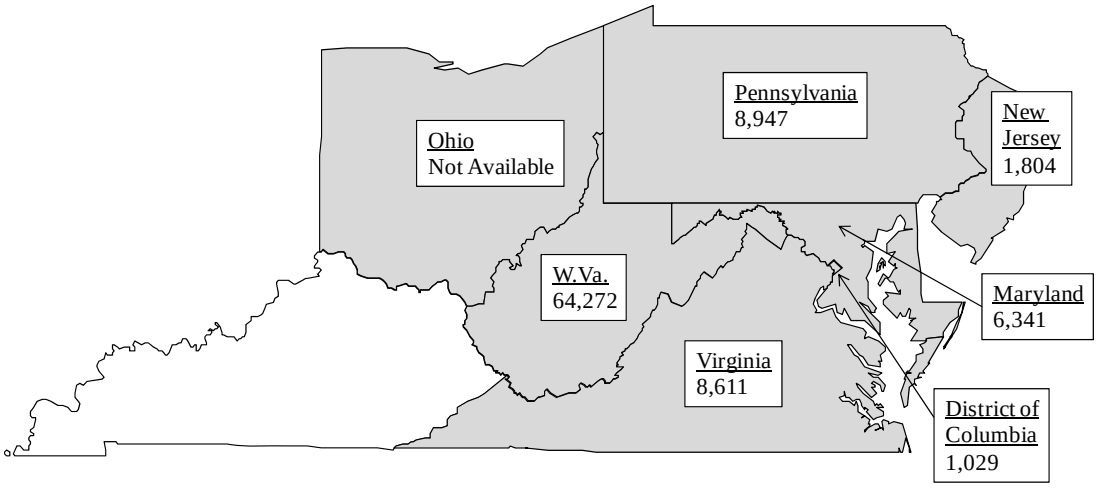


Table 12 summarizes work participation rates in 2010 for the participating nearby states and the District of Columbia by summary degree, gender, race, residency, and year of graduation. As the table shows, 16.5 percent of state graduates worked in these nearby states in 2010. Thus, this data shows that 61.7 percent of state public higher education graduates worked in West Virginia or in one of these nearby states. That leaves 39.3 percent of graduates that may be either working elsewhere in the U.S. or abroad, or be self-employed, or be out of the labor force altogether.

Results for nearby states show that Pennsylvania employed 6.3 percent of state graduates in 2010, followed by Virginia, at 6.1 percent, Maryland, at 4.5 percent, New Jersey, at 1.3 percent, and the District of Columbia, at 0.7 percent.

Overall, these nearby states attracted a large share of graduates with Bachelor's degrees, at 20.5 percent, followed by Doctoral graduates, at 17.5 percent, Master's graduates, at 13.5 percent, First Professional graduates, at 12.5 percent, and Associate's graduates, at 7.0 percent.

In addition, the nearby states posted higher work participation rates for males, at 19.0 percent, than for females, at 14.5 percent. This reverses the pattern for West Virginia, where female graduates are more likely to work in the state, at 49.5 percent, than males, at 39.7 percent.

Across race categories, Caucasian graduates were the most likely to work in West Virginia in 2010. In contrast, African American graduates were the most likely to work in these nearby states in 2010, at 22.0 percent, followed closely by Hispanic graduates, at 21.8 percent.

The nearby states were also more likely to attract graduates that were out-of-state for fee purposes. Indeed, in 2010, 38.5 percent of out-of-state graduates worked in one of the nearby states, compared to 9.6 percent of in-state graduates. This was a reflection of the pattern for graduates working in West Virginia, where 58.0 percent of in-state graduates worked in West Virginia in 2010, compared to 8.1 percent of out-of-state graduates.

Finally, the results by year show that work participation rates in the nearby states had little tendency to decline as graduates gain experience. Indeed, graduates with 13 years of experience were just as likely to work in the nearby states as were the most recent graduates. For graduates working in West Virginia, work participation rates fall rapidly with experience, declining from 55.7 percent for the most recent graduates to 36.4 percent for graduates with 13 years of experience.

Table 12
Work Participation Rates In 2010 For West Virginia Public Higher Education Graduates By Participating State
Graduates From 1996-1997 To 2008-2009

	Work Participation Rates in 2010 (In Percent)							
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Five States**	West Virginia
Total	0.7%	4.5%	1.3%	n/a	6.3%	6.1%	16.5%	45.2%
Degree								
Associate	0.2%	2.2%	0.1%	n/a	3.0%	3.5%	7.0%	62.5%
Bachelor	0.9%	5.7%	1.8%	n/a	7.4%	7.3%	20.5%	40.3%
Doctoral	0.3%	4.8%	1.3%	n/a	9.8%	3.2%	17.5%	24.5%
First Prof	1.0%	1.5%	0.4%	n/a	6.2%	5.0%	12.5%	41.7%
Master	0.5%	3.4%	0.9%	n/a	5.6%	4.9%	13.5%	47.6%
Gender								
Male	0.8%	4.8%	1.7%	n/a	7.4%	6.9%	19.0%	39.7%
Female	0.6%	4.2%	1.0%	n/a	5.5%	5.4%	14.5%	49.5%
Race								
Caucasian	0.6%	4.3%	1.2%	n/a	6.5%	5.9%	16.1%	47.3%
African American	3.2%	7.2%	1.8%	n/a	4.5%	8.4%	22.0%	31.2%
Hispanic	1.9%	6.1%	3.5%	n/a	5.9%	7.5%	21.8%	23.5%
Asian	1.2%	3.9%	2.8%	n/a	4.3%	6.9%	17.5%	11.7%
American Indian	0.5%	4.1%	1.1%	n/a	4.3%	5.9%	14.2%	43.2%
Unknown	1.7%	4.7%	1.4%	n/a	6.5%	5.2%	16.0%	36.0%
Residency								
In State	0.4%	2.6%	0.2%	n/a	3.7%	4.9%	9.6%	58.0%
Out of State	1.7%	9.7%	4.8%	n/a	15.4%	9.8%	38.5%	8.1%
Year								
1996-1997	0.5%	3.9%	1.3%	n/a	5.4%	5.7%	15.5%	36.4%
1997-1998	0.6%	4.1%	1.6%	n/a	5.3%	5.7%	16.1%	37.3%
1998-1999	0.6%	4.5%	1.8%	n/a	6.1%	5.8%	17.3%	37.9%
1999-2000	0.7%	4.5%	1.5%	n/a	5.8%	6.3%	17.1%	38.7%
2000-2001	0.5%	3.9%	1.3%	n/a	5.8%	5.5%	15.6%	41.4%
2001-2002	0.7%	4.5%	1.0%	n/a	6.1%	6.0%	16.4%	42.3%
2002-2003	0.7%	4.3%	1.5%	n/a	5.7%	6.0%	16.4%	43.8%
2003-2004	0.7%	4.7%	1.2%	n/a	6.2%	6.3%	17.2%	45.3%
2004-2005	1.0%	4.3%	1.0%	n/a	6.3%	6.2%	16.2%	48.0%
2005-2006	0.8%	4.4%	1.1%	n/a	6.6%	6.4%	16.6%	48.9%
2006-2007	0.8%	4.8%	1.0%	n/a	7.0%	6.6%	16.9%	50.3%
2007-2008	1.0%	4.6%	1.2%	n/a	7.2%	6.3%	17.0%	52.1%
2008-2009	0.7%	5.2%	1.2%	n/a	7.3%	5.8%	15.5%	55.7%

*Multi-state workers are included in each state where they earned wages.
**Total counts each worker once and excludes W.Va. workers with wages in one or more nearby states.
Thus, it does not equal the sum of state rates. n/a: data not available.

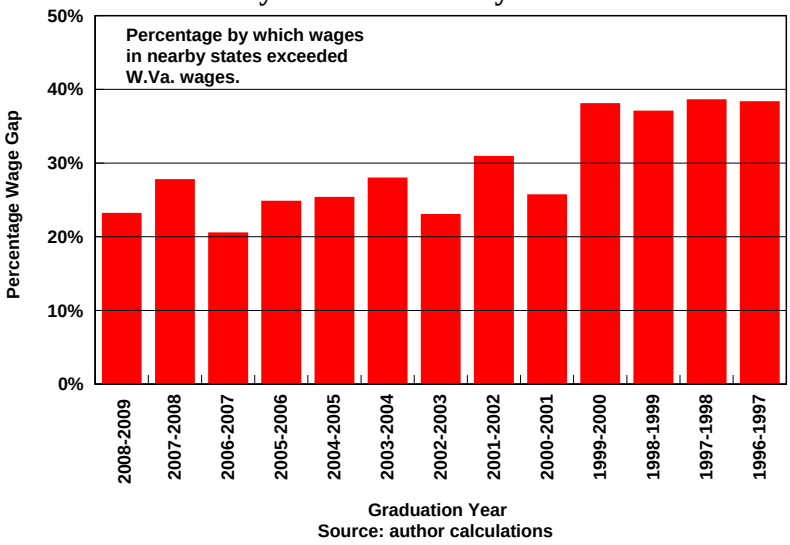
Table 13 summarizes annualized wages earned by West Virginia public higher education graduates in the participating nearby states by summary degree, gender, race, residency, and years of experience. As the table shows, average wages earned in 2010 by graduates working in nearby states substantially exceeded wages earned in West Virginia. Indeed, average annualized wages in 2010 in the nearby states was $56,224, compared to $42,247 in West Virginia. Thus, in 2010 wages earned in the nearby states were 33.1 percent above the West Virginia average. This may occur for a variety of reasons, including differences among graduates in the degree earned, gender, race, and experience, among others. However, for the summary results presented in the table, wages earned in nearby states were higher than West Virginia wages for all summary degrees, genders, races, residency, and years of experience.

Overall, annualized wages in 2010 were highest in New Jersey, at $60,054, followed by the District of Columbia, at $58,351, Virginia, at $53,549, Pennsylvania, at $50,133, and Maryland, at $49,058.

The largest percentage difference in annualized wages between West Virginia and the nearby states was found for Bachelor's degree graduates, who earned 41.8 percent more in the nearby states. The smallest percentage difference was for First Professional graduates, who earned 5.4 percent more in nearby states.

The wage gap between West Virginia and the nearby states was identical for both males and females in 2010, at 28.6 percent. Asian graduates posted the largest wage gap in 2010, with graduates working in nearby states earning 72.2 percent more than Asian graduates working in West Virginia. Further, the wage gap was larger for out-of-state graduates, at 41.4 percent, than for in-state graduates, at 37.3 percent. Finally, as Figure 4 shows, the wage gap in 2010 increased as graduates gained experience. Indeed, the gap increased from 23.2 percent for the most recent graduates to 38.4 percent for graduates with 13 years of experience.

Figure 4
Percentage Wage Gap Between W.Va.
And Nearby States In 2010 By Graduation Year



Source: author calculations

Table 13
Annualized Wages In 2010 For West Virginia Public Higher Education Graduates By Participating State
Graduates From 1996-1997 To 2008-2009

	Annualized Wages In 2010							
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Five States**	West Virginia
Total	$58,351	$49,058	$60,054	n/a	$50,133	$53,549	$56,224	$42,247
Degree								
Associate	$41,216	$33,551	$49,013	n/a	$37,760	$40,769	$42,453	$34,215
Bachelor	$54,682	$47,219	$55,844	n/a	$45,544	$49,714	$52,327	$36,906
Doctoral	$83,441	$74,596	$98,936	n/a	$72,312	$82,336	$80,682	$66,383
First Prof	$91,263	$116,855	$91,426	n/a	$110,387	$125,564	$119,499	$113,365
Master	$68,902	$57,814	$77,479	n/a	$57,953	$62,415	$65,569	$51,418
Gender								
Male	$64,136	$55,479	$66,556	n/a	$57,859	$61,355	$64,127	$49,865
Female	$52,486	$43,479	$51,244	n/a	$42,135	$46,040	$48,329	$37,589
Race								
Caucasian	$60,726	$49,387	$59,537	n/a	$49,923	$53,083	$55,897	$42,528
African American	$45,060	$40,981	$43,930	n/a	$38,485	$43,305	$46,466	$32,140
Hispanic	$55,660	$37,437	$48,006	n/a	$49,069	$51,647	$52,262	$42,229
Asian	$73,512	$65,741	$83,386	n/a	$78,586	$83,487	$83,675	$48,597
American Indian	$32,485	$44,880	$42,686	n/a	$43,680	$39,753	$46,479	$38,940
Unknown	$41,937	$32,203	$71,022	n/a	$35,867	$42,556	$46,211	$32,059
Residency								
In State	$60,956	$47,921	$62,948	n/a	$52,155	$53,833	$58,329	$42,482
Out of State	$56,581	$50,623	$59,639	n/a	$48,561	$53,581	$54,887	$38,825
Year								
1996-1997	$86,147	$70,875	$90,935	n/a	$69,805	$68,974	$76,280	$55,116
1997-1998	$75,726	$67,538	$83,251	n/a	$70,400	$71,156	$75,062	$54,136
1998-1999	$84,066	$61,660	$75,870	n/a	$66,907	$69,875	$71,663	$52,267
1999-2000	$73,106	$61,309	$75,032	n/a	$64,003	$68,730	$69,395	$50,237
2000-2001	$75,453	$56,282	$67,116	n/a	$58,875	$62,564	$63,748	$50,687
2001-2002	$67,456	$57,329	$63,669	n/a	$53,552	$58,149	$60,658	$46,311
2002-2003	$68,127	$50,013	$61,172	n/a	$54,234	$54,478	$58,024	$47,142
2003-2004	$69,426	$49,359	$60,763	n/a	$49,857	$54,864	$56,046	$43,773
2004-2005	$51,102	$48,293	$61,386	n/a	$45,780	$49,475	$52,610	$41,946
2005-2006	$46,153	$45,241	$43,426	n/a	$43,857	$46,593	$48,699	$38,992
2006-2007	$42,675	$36,789	$41,781	n/a	$39,149	$42,536	$43,414	$36,000
2007-2008	$44,547	$34,650	$33,362	n/a	$38,215	$39,853	$41,346	$32,346
2008-2009	$33,559	$29,009	$29,175	n/a	$32,216	$33,200	$35,517	$28,820

*Multi-state workers are included in each state where they earned wages.
**Total counts each worker once and excludes W.Va. workers with wages one or more nearby states. n/a: data not available.

Results By Industry

Graduates from state higher education institutions contributed to all industries in West Virginia in 2010. Table 14 shows graduate employment and annualized wages by two-digit NAICS industry in 2010, along with the industry employment shares for all state workers.[7] The data identified 74,497 jobs across the 21 NAICS industries. Note that the number of jobs exceeded the number of employed graduates in 2010. This occurred because a graduate that worked in two different industries during the year was counted twice, once in each industry.

As the table shows, Health Care and Educational Services attracted by far the most graduates in 2010. Indeed, these two industries accounted for 49.3 percent of graduate employment by

[7] NAICS is the North American Industry Classification System.

industry during the year.[8] In addition, Professional, Scientific, and Technical Services; Public Administration; and Retail Trade also attracted large numbers of graduates, with these industries accounting for 21.7 percent of graduate employment in 2010. Agriculture, Forestry, Fishing, and Hunting; Management of Companies; Utilities; Transportation and Warehousing; and Real Estate and Leasing attracted fewer graduates in 2010, with each industry accounting for less than 1.0 percent of graduate employment.

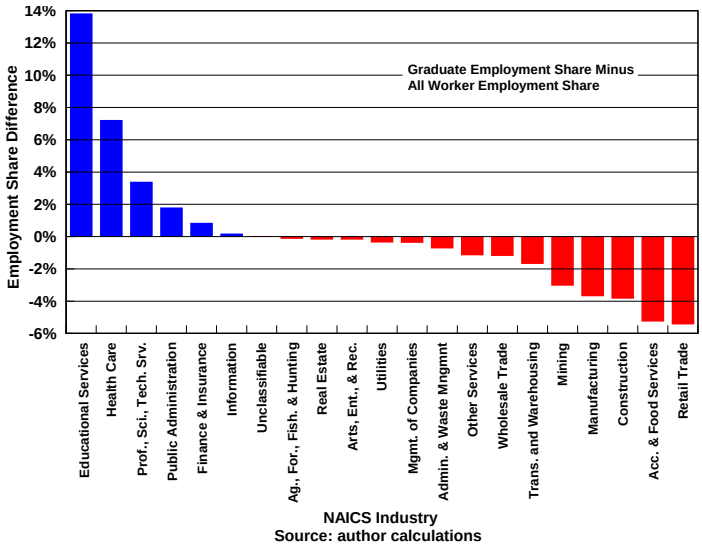
Table 14
Employment And Annualized Wages Of West Virginia Public Higher Education Graduates From 1996-1997 To 2008-2009 Working In West Virgina In 2010 By Industry

NAICS Code	Industry	Number Of Graduates Employed	Percentage Of Grad. Workers	Average Annualized Wages	Industry Share: All Workers
72	Accommodation and Food Services	3,102	4.2%	$12,256	9.4%
56	Admin. and Support and Waste Mngmnt and Remed. Serv.	2,957	4.0%	$24,203	4.7%
11	Agriculture, Forestry, Fishing and Hunting	95	0.1%	$30,791	0.3%
71	Arts, Entertainment, and Recreation	905	1.2%	$12,949	1.4%
23	Construction	1,224	1.6%	$37,745	5.5%
61	Educational Services	17,669	23.7%	$35,733	9.9%
52	Finance and Insurance	2,818	3.8%	$34,385	2.9%
62	Health Care and Social Assistance	19,047	25.6%	$43,866	18.3%
51	Information	1,417	1.9%	$36,769	1.7%
55	Management of Companies and Enterprises	323	0.4%	$57,140	0.8%
31-33	Manufacturing	2,736	3.7%	$54,754	7.4%
21	Mining	1,016	1.4%	$68,529	4.4%
81	Other Services (except Public Administration)	1,466	2.0%	$22,857	3.1%
54	Professional, Scientific, and Technical Services	5,261	7.1%	$44,563	3.7%
92	Public Administration	5,247	7.0%	$34,531	5.2%
53	Real Estate and Rental and Leasing	640	0.9%	$33,340	1.0%
44-45	Retail Trade	5,639	7.6%	$25,362	13.0%
48-49	Transportation and Warehousing	595	0.8%	$44,412	2.5%
99	Unclassifiable	67	0.1%	$40,168	0.0%
22	Utilities	597	0.8%	$60,094	1.2%
42	Wholesale Trade	1,676	2.2%	$55,734	3.4%
--	**Total**	**74,497**	**100%**	**$37,533**	**100.0%**

Figure 5 shows the difference by industry between the graduate employment share and the employment share for all workers in the state. Note that the graduate employment shares for Educational Services; Health Care; and Professional, Scientific, and Technical Services were well above the employment shares for all workers. Employment shares for higher education graduates were relatively low in Retail Trade; Accommodation and Food Services; Construction; Manufacturing; and Mining. This reflects the lower education requirements in these sectors.

[8] Note that there is no "government" industry included in the table. For this table, state and local government employees are assigned to industries that reflect their actual activities. Thus, public school teachers, who would normally be included in local government employment, are included in Educational Services. Many other government employees are included in Public Administration.

Figure 5
W.Va. Graduate Industry Employment Share Difference In 2010

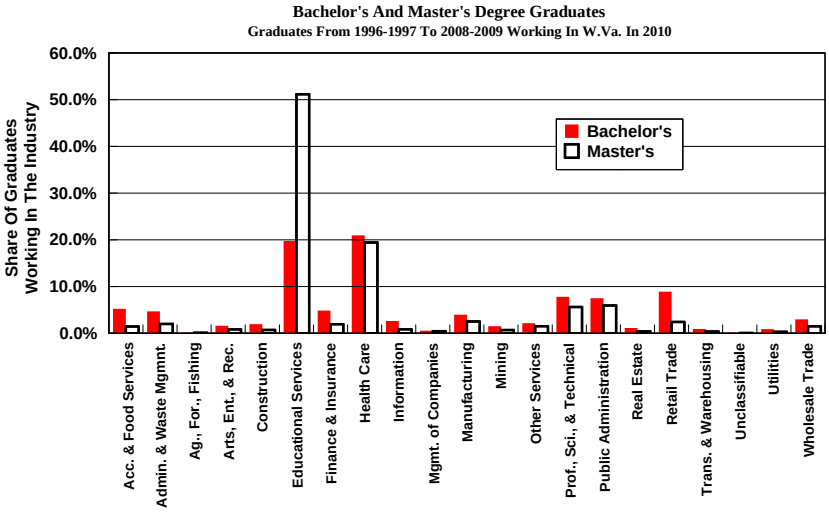


Source: author calculations

The industry in which a graduate worked was influenced by the degree earned, as Figure 6 shows. Note that more than one-half of graduates with a Master's degree worked in Educational Services in 2010, followed by Health Care, with 19.4 percent, Public Administration, with 5.9 percent, and Professional, Scientific, and Technical Services, with 5.6 percent.

In contrast, graduates with a Bachelor's degree were much more evenly spread across industries. In 2010, 20.9 percent of Bachelor's graduates worked in Health Care, 19.7 percent worked in Educational Services, 8.9 percent worked in Retail Trade, 7.8 percent worked in Professional, Scientific, and Technical Services, and 7.5 percent worked in Public Administration.

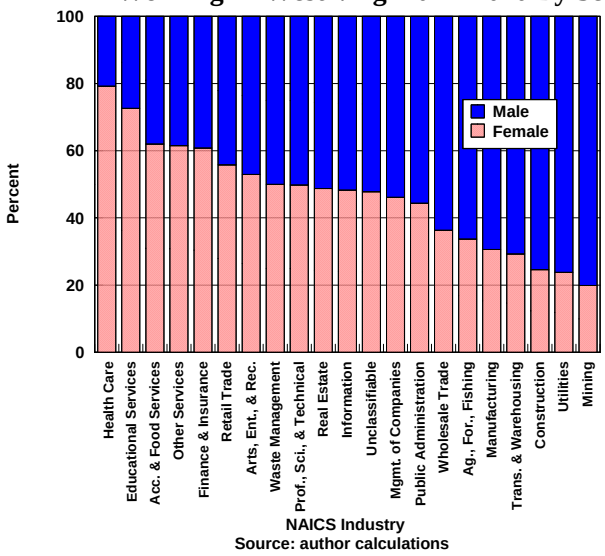
Figure 6
W.Va. Graduate Industry Employment Shares By Degree



Source: author calculations

Male and female graduates tended to work in different industries in 2010. As Figure 7 shows, female graduates accounted for 79.2 percent of graduates working in Health Care, 72.6 percent of graduates working in Educational Services, and 62.0 percent of graduates working in Accommodation and Food Services. In contrast, males accounted for 80.1 percent of graduates working in Mining, 76.2 percent of graduates working in Utilities, and 75.4 percent of graduates working in Construction.

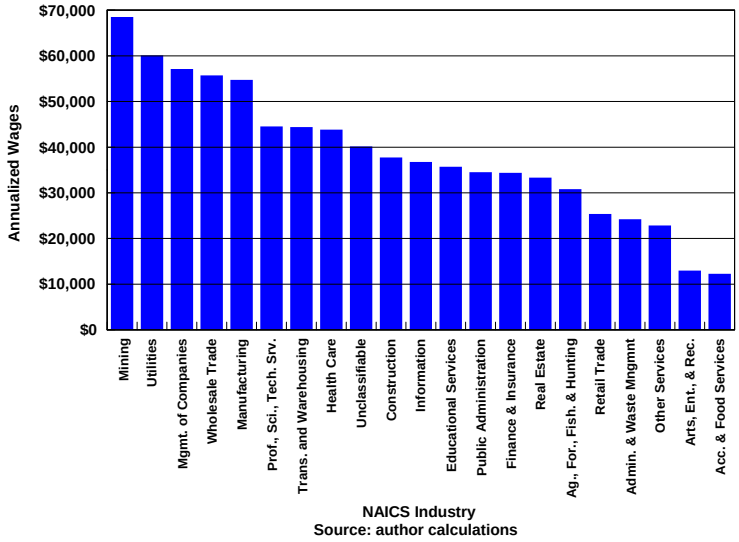
Figure 7
Industry Composition Of West Virginia Graduates Working In West Virginia In 2010 By Sex



Source: author calculations

As Table 14 and Figure 8 show, annualized wages vary significantly by industry of employment. Annualized wages were highest in 2010 in Mining, at $68,529, followed by Utilities, at $60,094, Management of Companies, at $57,140, Wholesale Trade, at $55,734, and Manufacturing, at $54,754. Annualized wages in 2010 were lowest in Accommodation and Food Services, at $12,256; Arts, Entertainment, and Recreation, at $12,949; Other Services, at $22,857; Administration and Waste Management, at $24,203; and Retail Trade, at $25,362.

Figure 8
W.Va. Graduate Annualized Wages
By Industry In 2010



Source: author calculations

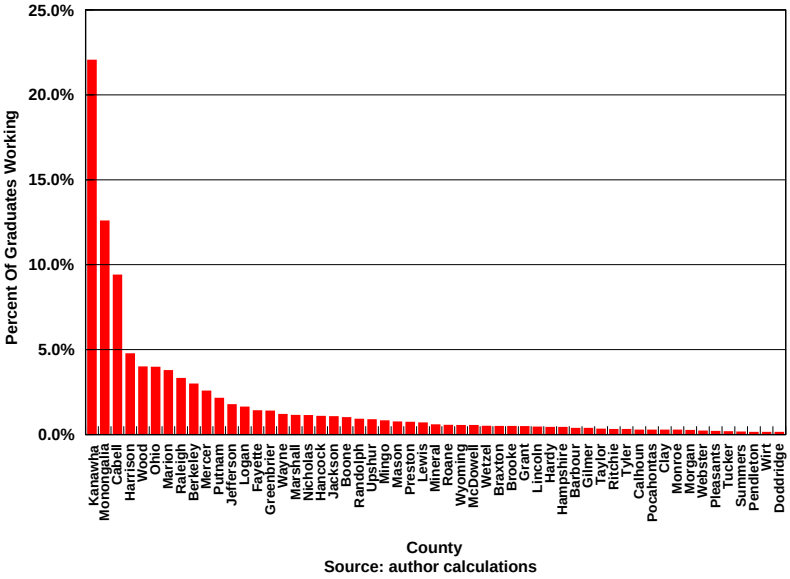
Results By County And Region

West Virginia public higher education graduates also worked in all counties in the state in 2010. However, graduates were not evenly distributed across the state. Table 15 summarizes graduate employment and annualized wages by county in 2010. The table also includes the distribution of total employment and total population across West Virginia's counties, for comparison purposes. Note that the data identifies 61,831 graduates working in the 55 state counties. This is less than the total number of graduates working in the state, because the data does not identify county of work for all graduates.

Figure 9 provides a graphical depiction of the share of higher education graduates by county. As the figure shows, 22.1 percent of graduates working in West Virginia in 2010 worked in Kanawha County, followed by Monongalia County, with 12.6 percent, Cabell County, with 9.4 percent, Harrison County, with 4.8 percent, and Wood County, with 4.0 percent.

In contrast, counties with the smallest shares of graduates in 2010 were Doddridge County, Wirt County, Pendleton County, Summers County, Tucker County, Pleasants County, and Webster County, each with 0.2 percent of graduates.

Figure 9
Share Of W.Va. Graduates Employed By County



Source: author calculations

Note as well, from Table 15, that there was a positive correlation between the economic size of the county, given by the shares of employment and population, and the share of graduates working in the county. Indeed, the raw correlation coefficient between the share of graduates working in a county and the share of jobs located in that county was 0.969.[9] The correlation of graduate employment and population was slightly weaker, at 0.894. These strongly positive correlation coefficients mean that counties with larger shares of state jobs and population also tended to attract larger shares of college graduates. This makes sense because the larger counties are likely to have a more diverse job market with higher human capital requirements.

In addition, Monongalia County and Cabell County are home to West Virginia University and Marshall University, the two largest universities in the state. Academic research shows that the presence of colleges and universities in a local area contributes to human capital accumulation.[10]

[9] A correlation coefficient takes a value between +1.0 and -1.0. A value close to 1.0 indicates a strong positive correlation. A value close to -1.0 indicates a strong negative correlation.

[10] See Hammond, George W. and Eric C. Thompson. 2010. Divergence and Mobility In College Attainment Across U.S. Labor Market Areas: 1970-2000. *International Regional Science Review* 33(4): 397-420.

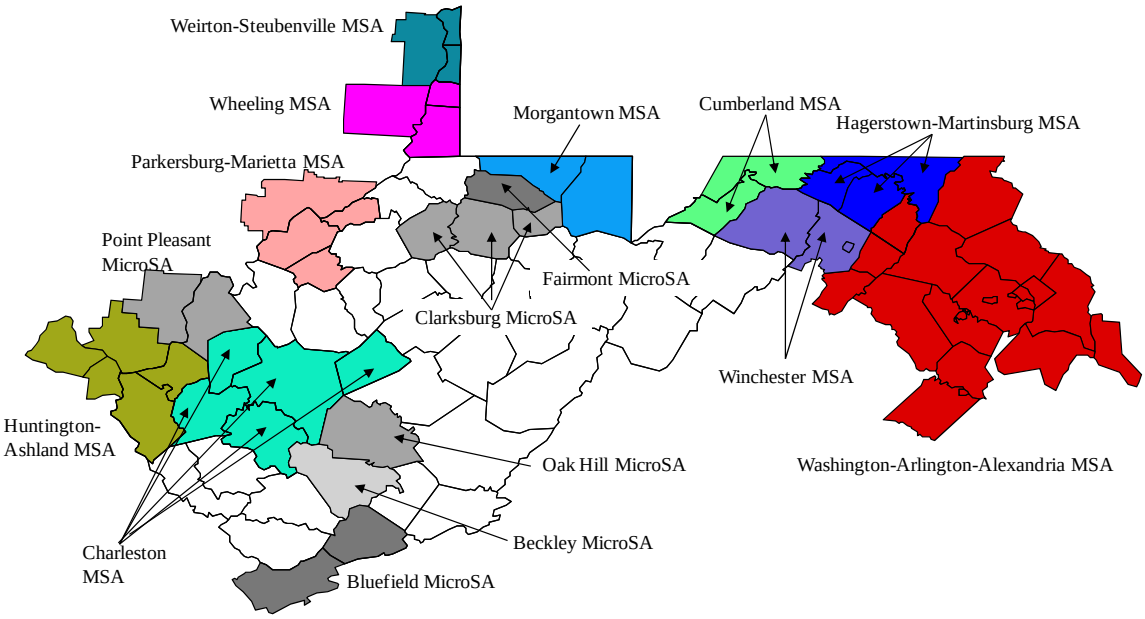
Table 15
Employment And Annualized Wages Of West Virginia Public Higher Education Graduates From 1996-1997 To 2008-2009 Working In West Virgina In 2010 By County

County	Metropolitan/Micropolitan	Number Of Graduates Employed	Percentage Of All Graduate Workers	Average Annualized Wages	Percentage Of State Employment	Percentage Of State Population
Barbour	Nonmetropolitan	247	0.4%	$33,193	0.5%	0.9%
Berkeley	Hagerstown-Martinsburg MSA	1,858	3.0%	$37,175	4.2%	5.8%
Boone	Charleston MSA	637	1.0%	$48,332	1.3%	1.3%
Braxton	Nonmetropolitan	316	0.5%	$33,233	0.6%	0.8%
Brooke	Steubenville-Weirton MSA	313	0.5%	$29,652	1.1%	1.3%
Cabell	Huntington-Ashland MSA	5,823	9.4%	$39,129	7.5%	5.2%
Calhoun	Nonmetropolitan	181	0.3%	$33,056	0.2%	0.4%
Clay	Charleston MSA	179	0.3%	$39,910	0.3%	0.5%
Doddridge	Clarksburg MicroSA	97	0.2%	$33,980	0.2%	0.4%
Fayette	Oak Hill MicroSA	886	1.4%	$30,958	1.8%	2.5%
Gilmer	Nonmetropolitan	245	0.4%	$24,694	0.3%	0.4%
Grant	Nonmetropolitan	310	0.5%	$34,021	0.5%	0.6%
Greenbrier	Nonmetropolitan	875	1.4%	$35,970	2.0%	1.9%
Hampshire	Winchester	279	0.5%	$29,372	0.6%	1.2%
Hancock	Steubenville-Weirton MSA	681	1.1%	$34,336	1.6%	1.6%
Hardy	Nonmetropolitan	281	0.5%	$30,061	0.9%	0.8%
Harrison	Clarksburg MicroSA	2,958	4.8%	$38,710	5.0%	3.8%
Jackson	Nonmetropolitan	671	1.1%	$36,246	1.1%	1.5%
Jefferson	Washington MSA	1,110	1.8%	$34,757	2.1%	2.9%
Kanawha	Charleston MSA	13,649	22.1%	$41,093	15.6%	10.5%
Lewis	Nonmetropolitan	443	0.7%	$33,166	1.0%	1.0%
Lincoln	Charleston MSA	289	0.5%	$31,760	0.5%	1.2%
Logan	Nonmetropolitan	1,020	1.6%	$32,024	1.7%	1.9%
McDowell	Nonmetropolitan	348	0.6%	$39,713	0.9%	1.2%
Marion	Fairmont MicroSA	2,345	3.8%	$34,101	3.0%	3.1%
Marshall	Wheeling MSA	716	1.2%	$30,221	1.6%	1.8%
Mason	Point Pleasant MicroSA	480	0.8%	$37,822	1.0%	1.4%
Mercer	Bluefield MicroSA	1,602	2.6%	$33,728	3.2%	3.4%
Mineral	Cumberland MSA	373	0.6%	$27,066	1.1%	1.5%
Mingo	Nonmetropolitan	516	0.8%	$35,237	1.2%	1.4%
Monongalia	Morgantown MSA	7,794	12.6%	$39,129	7.6%	5.1%
Monroe	Nonmetropolitan	179	0.3%	$31,388	0.3%	0.8%
Morgan	Hagerstown-Martinsburg MSA	171	0.3%	$40,425	0.4%	0.9%
Nicholas	Nonmetropolitan	710	1.1%	$35,618	1.3%	1.4%
Ohio	Wheeling MSA	2,471	4.0%	$31,521	4.4%	2.4%
Pendleton	Nonmetropolitan	102	0.2%	$29,043	0.2%	0.4%
Pleasants	Parkersburg MSA	132	0.2%	$39,587	0.4%	0.4%
Pocahontas	Nonmetropolitan	180	0.3%	$28,315	0.5%	0.5%
Preston	Morgantown MSA	463	0.7%	$34,063	1.0%	1.7%
Putnam	Charleston MSA	1,340	2.2%	$40,954	2.8%	3.1%
Raleigh	Beckley MicroSA	2,062	3.3%	$35,523	4.7%	4.4%
Randolph	Nonmetropolitan	579	0.9%	$33,594	1.7%	1.6%
Ritchie	Nonmetropolitan	205	0.3%	$36,771	0.4%	0.6%
Roane	Nonmetropolitan	354	0.6%	$33,850	0.5%	0.8%
Summers	Nonmetropolitan	109	0.2%	$30,685	0.3%	0.7%
Taylor	Clarksburg MicroSA	216	0.3%	$40,628	0.4%	0.9%
Tucker	Nonmetropolitan	121	0.2%	$27,477	0.4%	0.4%
Tyler	Nonmetropolitan	203	0.3%	$36,634	0.3%	0.5%
Upshur	Nonmetropolitan	561	0.9%	$33,695	1.2%	1.3%
Wayne	Huntington-Ashland MSA	752	1.2%	$31,783	1.3%	2.2%
Webster	Nonmetropolitan	148	0.2%	$39,090	0.3%	0.5%
Wetzel	Nonmetropolitan	323	0.5%	$31,323	0.6%	0.9%
Wirt	Parkersburg MSA	98	0.2%	$34,066	0.1%	0.3%
Wood	Parkersburg MSA	2,479	4.0%	$36,896	5.6%	4.8%
Wyoming	Nonmetropolitan	351	0.6%	$33,387	0.8%	1.3%
Total		**61,831**	**100.0%**	**$37,251**	**100.0%**	**100.0%**

Note from Table 15 that four of the top five counties in graduate employment share were classified as metropolitan in 2010. Harrison County was classified as micropolitan in 2010. This means that these counties were part of a metropolitan statistical area or in the case of Harrison County, part of a micropolitan statistical area. Metropolitan and micropolitan areas are designated by the federal Office of Management and Budget to reflect local labor market areas.

A metropolitan statistical area (MSA) is defined around a densely populated city (or urban agglomeration) with 50,000 or more residents. Once the urbanized area is defined the county containing it becomes the core county of the MSA. Any adjacent counties with at least 25 percent of its labor force commuting to or from the core are included in the MSA designation. A Micropolitan Statistical Area is similar in spirit to an MSA, but is based around an urban agglomeration with at least 10,000 (but less than 50,000) residents. Metropolitan and micropolitan areas are designed to reflect local labor markets (which can and often do cross state lines). Counties that are not part of MSAs or micropolitan areas are classified as nonmetropolitan. Figure 10 depicts the MSAs and micropolitan areas with component counties in West Virginia.

Figure 10
West Virginia's Statistical Areas
Census 2000



Source: Office of Management and Budget (OMB)

Table 16 summarizes work participation rates and annualized wages for metropolitan, micropolitan, and nonmetropolitan areas in the state. Note that data for individual MSAs include

data for the West Virginia portion only and thus do not reflect employment and wages earned outside of the state.

Table 16
Employment And Annualized Wages Of Graduates
By Region Of Employment In 2010
W.Va. Public Higher Education Graduates From 1996-1997 To 2008-2009

	Number Of Graduates Employed	Percentage Of All Graduate Workers	Average Annualized Wages	Percentage Of State Employment	Percentage Of State Population
Metropolitan Counties*	41,607	67.3%	$38,465	61.3%	55.8%
Charleston MSA	16,094	26.0%	$41,187	20.4%	16.6%
Cumberland MSA	373	0.6%	$27,066	1.1%	1.5%
Hagerstown-Martinsburg MSA	2,029	3.3%	$37,449	4.6%	6.7%
Huntington-Ashland MSA	6,575	10.6%	$38,289	8.9%	7.5%
Morgantown MSA	8,257	13.4%	$38,845	8.7%	6.7%
Parkersburg-Marietta MSA	2,709	4.4%	$36,924	6.1%	5.5%
Wash.-Arl.-Alex. MSA	994	1.6%	$32,861	2.8%	2.9%
Steubenville-Weirton MSA	1,110	1.8%	$34,757	2.1%	2.9%
Wheeling MSA	3,187	5.2%	$31,229	6.0%	4.2%
Winchester MSA	279	0.5%	$29,372	0.6%	1.2%
Micropolitan Counties*	10,646	17.2%	$35,638	19.1%	19.9%
Beckley MicroSA	2,062	3.3%	$35,523	4.7%	4.4%
Bluefield MicroSA	1,602	2.6%	$33,728	3.2%	3.4%
Clarksburg MicroSA	3,271	5.3%	$38,696	5.6%	5.1%
Fairmont MicroSA	2,345	3.8%	$34,101	3.0%	3.1%
Oak Hill MicroSA	886	1.4%	$30,958	1.8%	2.5%
Point Pleasant MicroSA	480	0.8%	$37,822	1.0%	1.4%
Nonmetropolitan Counties	9,578	15.5%	$33,770	19.6%	24.3%
Total (metropolitan, micropolitan, and nonmetropolitan)	**61,831**	**100.0%**	**$37,251**	**100.0%**	**100.0%**

*includes only West Virginia portion of metropolitan or micropolitan area.

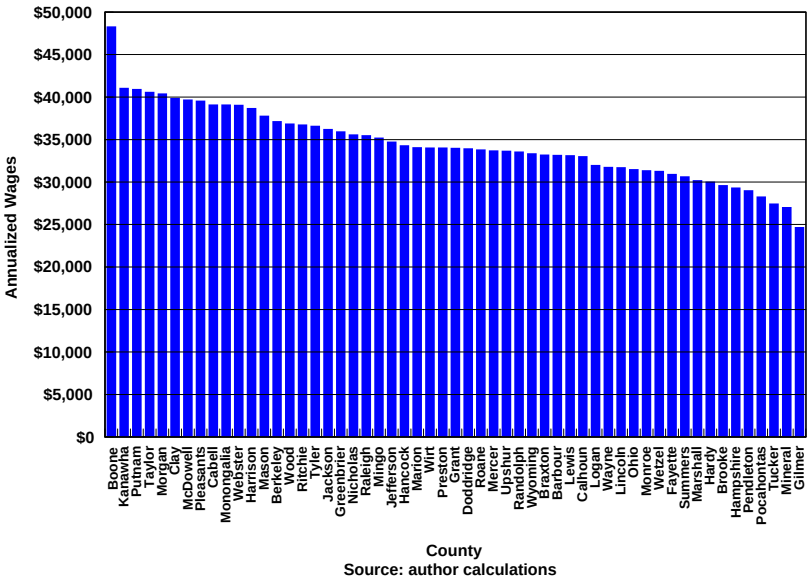
As the table shows, most graduates working in the state in 2010 worked in metropolitan counties, with 67.3 percent. Micropolitan counties accounted for 17.2 percent of graduates working in the state, followed by nonmetropolitan counties, with 15.5 percent. Thus, the majority of graduates worked in the larger labor markets defined by metropolitan and micropolitan areas. This reflects in part the larger size of the labor markets and also the role that larger labor markets play in the overall economy. These larger labor markets tend to become centers for high skill activities, such as accounting, consulting, scientific, health care, and legal services.

The Charleston MSA had the largest share of graduates working in the state in 2010, with 26.0 percent. In addition to other factors, this reflects the presence of the state capital in Kanawha County. The Morgantown MSA had the second largest share of graduates in 2010, with 13.4 percent, followed by the Huntington MSA, with 10.6 percent. The Winchester and Cumberland MSAs accounted for fewer graduates in 2010, with less than 1.0 percent of graduates working in either area.

Graduates were more evenly spread across micropolitan areas in 2010, with the Clarksburg micropolitan area accounting for 5.3 percent of graduates, while the Point Pleasant micropolitan area accounted for 0.8 percent.

Figure 11 shows annualized wages in 2010 for graduates working in the state, by county. As the figure shows, Boone County had the highest annualized wages in 2010, at $48,332, followed by Kanawha County, at $41,093, and Putnam County, at $40,954. Annualized wages in Boone County likely reflect the large concentration of coal mining jobs in the county, which tended to pay relatively high wages. Graduate wages tended to be lower in Gilmer County, at $24,694, Mineral County, at $27,066, and Tucker County, at $27,477.

Figure 11
Annualized Wages For W.Va. Graduates By County



Source: author calculations

Table 16 shows graduate annualized wages for metropolitan areas, micropolitan areas, and nonmetropolitan counties. As the table shows, annualized wages in 2010 were highest in metropolitan counties, at $38,465, followed by micropolitan counties, at $35,638, and nonmetropolitan counties, at $33,770. Thus, the larger labor markets tended to attract more graduates and graduates tended to earn higher wages in those areas.

Conclusion And Directions For Future Research

Human capital matters for state and local economic growth. Since high levels of educational attainment are associated with high levels of human capital, the work and migration choices of college graduates are of critical concern. This report analyzes in detail the West Virginia work participation and wages of state public higher education graduates from 1996-1997 to 2008-2009.

Overall, the results show that public higher education graduates contribute significantly to the West Virginia economy. In 2010, 64,272 graduates during the past 13 years worked in the state and earned $2.7 billion in wages, excluding fringe benefits. These graduates worked in all industries and in all counties in the state.

One of the most striking trends identified in the data is the tendency for the West Virginia work participation rate to fall rapidly as time since graduation increases. Our results also suggest that work participation rates for West Virginia graduates working in nearby states do not decline with experience. This, in turn, suggests that the state labor market may be less attractive overall to higher education graduates.

The data analyzed in this report tracks graduate employment at establishments located in the state. However, it is possible that graduates may live in the state and work in neighboring states. This is especially likely for graduates living in the Eastern Panhandle region, which has strong commuting connections with nearby states due to the location of the greater Washington metropolitan area. Graduates that live in West Virginia but work out of state contribute to the state economy in important ways, but are not covered in the data analyzed in this report. Tracking graduates by place of residence would be a very valuable addition to future reports.

Graduates work at a wide variety of establishments in the state, ranging from very large establishments to very small establishments. The next report in the current series will examine differences in graduate employment by establishment size, with the results disaggregated by graduation year, summary degree, gender, and other dimensions.

In addition, it would be valuable to broaden the measure of employment to include the self-employed and to include graduates working in all U.S. states, not just those participating in the Regional Wage Record Exchange Project. A match of this kind may be possible through a competitive program administered by the U.S. Internal Revenue Service, Statistics On Income Division.

Finally, the research so far on graduate work participation in West Virginia has been retrospective. An important next step in this research will be to generate forecasts of occupational demand and academic degree supply for the state. This will provide additional information on the match between demand and supply of human capital in West Virginia.

Appendix I: Detailed Description Of Employment Data

The West Virginia data analyzed in this study came from the matching of demographic information on graduates from West Virginia institutions of higher education (compiled by the HEPC[11]) with employment records maintained by WorkForce West Virginia. Graduates reflect the highest degree earned at the time of measurement.

The employment data came 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 and is often referred to as covered employment. 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.

For this report, we do not include civilian federal government employment and wages due to recent administrative problems with the FEDES match. The U.S. Postal Service and the Office of Personnel Management have begun to vary their response quarter (and whether they respond at all). Based on recent matches to Federal employment data, there are roughly 2,000 graduates (during the past decade) that hold Federal jobs.

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 normally include Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and the District of Columbia. These states participate in the Regional Wage Record Exchange Project (TRADE), but the data does not include geographic identifiers beyond state of employment. Data for Ohio were not available for inclusion in this report due to administrative problems.

Finally, the county of employment could not be identified for a significant number of employed graduates. This can occur due to the administrative nature of the data. For instance, for a firm with multiple establishments located in multiple states, the unemployment insurance contact information (and thus the geographic identifier) is sometimes only available for a centralized payroll processing center that happens to be located out of the state. Thus, for some graduates, we know they are employed in the state, but we cannot narrow the location down any further.

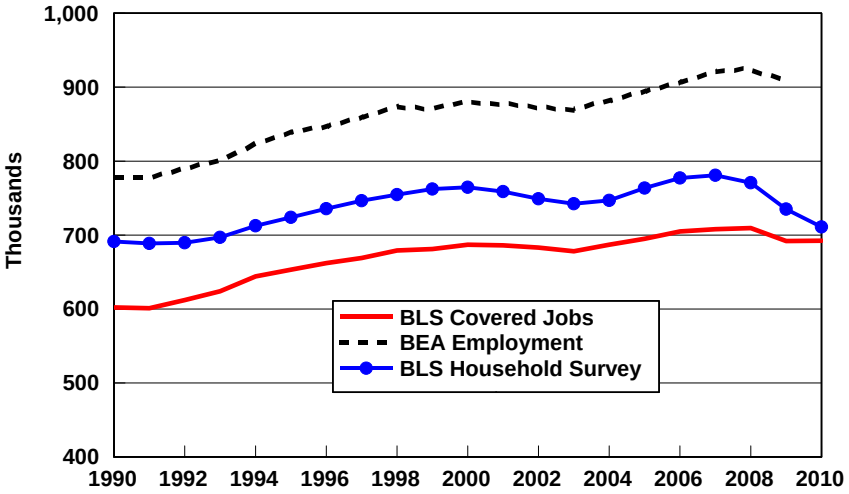
Covered employment counts 691,921 jobs at establishments in West Virginia in 2009.[12] As Figure 12 shows, this measure of employment is lower than two other major measures of employment: employment measured by the U.S. Bureau of Economic Analysis (BEA) and employment measured by the U.S. Bureau of Labor 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.

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

[12] Federal government jobs are added in separately for completeness.

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 private other labor income to gross earnings by place of work has risen from 6.3 percent in 1969 to 14.3 percent in 2009 for West Virginia.

Figure 12
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