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From Higher Education to Work in West Virginia, 2014

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Executive summary

In this report we provide a comprehensive analysis of employment and income outcomes for men and women who graduated from a West Virginia public higher educational institution and who stayed to work in the state after graduation. We cover graduated from the academic years between 2003-2004 and 2012-2013 and who worked in the state in 2014. Key findings of this research are as follows:

Overview

- Of the 124,358 students who graduated from public higher education in West Virginia in the last decade, 58,730 were working in West Virginia in 2014, which translates into a work participation rate of 47.2 percent.
- Though the work participation rate in 2014 was similar to that in 2013, an increase in the number of graduates meant that approximately 2,500 more students were working in West Virginia. This represents a nearly a 5 percent increase in the number of graduates working in the state compared with a similar cohort in 2013, and almost 10 percent higher than the same cohort in 2010.
- Graduates who work in the state earned an average income of \$43,466 in 2014. Average income tends to rise as the time since graduation increases, likely as the result of increased experience.
- In-state students were far more likely to work in the state after graduation than out-of-state students. Nearly 62 percent of in-state students continued to work in West Virginia after graduation.

Degree Earned and Area of Concentration

- Graduates who earned an associate's degree were most likely to work in West Virginia after graduation with a work participation rate of 65 percent. Work participation rates for those earning a bachelor's, master's, or doctoral professional practice degrees were in the 40-percent range.
- Income for associate's degree graduates was lowest among all the degree categories (\$35,645). Income for bachelor's degree holders was only slightly above that of associate's degree holders (\$38,109), but rose more quickly as graduates gained experience. Income was significantly higher for master's degree recipients (\$52,725) and even more so for graduates with doctoral professional practice degrees (\$111,942).
- Health professions were the largest area of concentration in this year's study, with 20,319 graduates, constituting about 16 percent of total graduates. Business, management, and marketing was a close second with 18,612 graduates, about 15 percent of all graduates.
- Work participation and income vary significantly based on area of concentration.

Personal Characteristics: Gender, Age, and Race

- Women represent the majority (56.8 percent) of public higher education graduates in West Virginia over the past decade, and women exhibit a significantly higher work participation rate (51.8 percent for women compared with 41.2 percent for men).
- There exists a significant income gap between men and women graduates who work in the state: Men who work in the state earn approximately 31 percent more than women on average, and this wage gap exists for almost every area of concentration.



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- Work participation is generally higher for those who were between the ages of 35 and 55 when they earned their last degree, compared to those who were outside of that range.
- Work participation and income vary significantly across racial categories, with white graduates showing higher work participation than non-whites.

Academic Achievement

- Graduates with higher ACT scores exhibit significantly lower work participation rates than those with lower ACT scores.
- Work participation exhibits a modest tendency to rise with college GPA.
- Income tends to rise with academic achievement: higher ACT scores and GPA are associated with higher incomes broadly.
- The disparity in earnings between graduates with higher ACT scores and lower ACT scores can at least partially be explained by the types of degrees these graduates earned. Those earning associate's degrees were more likely to have lower ACT scores than graduates earning bachelor's or master's degrees.

Tuition Assistance

- Work participation rates for graduates who received a PROMISE scholarship (57.7 percent) or need-based grants from the Higher Education Grant Program (65.7 percent) were significantly higher than the overall rate of 47.2 percent.
- Low-income students who received federal Pell grants had an overall work participation rate of 56.3 percent, also well above the overall rate.
- Income after graduation for PROMISE, HEGP, and Pell grant recipients tended to be lower than the overall average.

Industry

- Among all graduates of the state's public higher education institutions, just under half were employed in health care and social assistance (27.4 percent of all graduates) and educational services (22.3 percent).
- Graduates were less likely than overall workers statewide to be employed in retail trade; accommodations and food services; construction; manufacturing; transportation; and mining.
- Graduates with associate's degrees were clustered heavily in the health care field. Educational services was by far the top industry for graduates with a master's degree, while graduates with bachelor's degrees worked in a wider variety of industries.
- Graduates working in mining earned the highest income, averaging \$73,511 annually. Utilities; management; manufacturing; and wholesale trade round out the top five income categories.
- The lowest paid industries included arts, entertainment and recreation; accommodation and food services; retail trade; other services; and administration and waste services.

County and Metropolitan Area

• Graduates were highly concentrated in Kanawha, Monongalia, and Cabell counties. Over 36 percent of graduates worked in these three counties.



- Counties with larger shares of total employment and population attracted larger numbers of graduates. Graduates were over-represented in counties with larger metropolitan areas and institutions of higher education.
- Metropolitan counties attracted the largest numbers of graduates and had higher wages overall than nonmetropolitan counties. Of the graduates employed in the state in 2014, more than 68 percent worked in counties that were part of a Metropolitan Statistical Area.
- The Charleston MSA employed the largest number of graduates with 17.2 percent of graduates employed in the state. The Charleston MSA also had the 2nd highest average annual income, at \$37,603. Bluefield Micropolitan Statistical Area had the highest at \$37,874.



1 Introduction and Overview

Human capital development is fundamental to long-run economic growth and prosperity, and so it is vital for policymakers to understand the ways in which publicly provided higher education prepares men and women for the workforce. It is also crucial for policymakers to understand the factors that relate to a state's retention of its graduates of institutions of higher education. To these ends, in this report we provide a comprehensive analysis of employment and income outcomes for men and women who graduated from a public higher education institution in West Virginia and who stay within the state to work after graduation.

This report covers all of the men and women who graduated between the 2003-2004 and the 2012-2013 academic years who worked in West Virginia in 2014. All data were provided by the West Virginia Higher Education Policy Commission (HEPC) in conjunction with WorkForce West Virginia.¹ The analysis is organized based on the following employment outcomes measures: original residency, degree earned, area of concentration, and a number of demographic and socioeconomic characteristics. We also report detailed statistics on which industries graduates are working in, as well as where those jobs are located within the state.

In Table 1 we report in-state work participation and wage outcomes for all West Virginia public college and university graduates for the past 10 academic years. As illustrated, 124,358 men and women in total graduated from West Virginia's public higher educational institutions over the past decade, with 15,358 graduates in the 2012-2013 academic year. This number of graduates has increased every year over the time period analyzed, rising by approximately 49 percent overall from the 2003-2004 academic year to the 2012-2013 academic year.



¹ See the Appendix for more detail on the data used in this report.

Graduation Year	Total Graduates	Graduates Working in West Virginia in 2014	WV Work Participation Rate (%)	Average Annual Income (\$)
2003-2004	10,305	4,307	41.8	55,536
2004-2005	10,809	4,680	43.3	54,301
2005-2006	11,135	4,876	43.8	51,484
2006-2007	11,593	5,127	44.2	50,135
2007-2008	12,004	5,435	45.3	47,000
2008-2009	12,034	5,599	46.5	44,575
2009-2010	12,704	6,096	48.0	42,048
2010-2011	13,530	6,573	48.6	38,785
2011-2012	14,886	7,640	51.3	35,455
2012-2013	15,358	8,397	54.7	31,463
Total	124,358	58,730	47.2	43,466

Table 1: Work participation and income by year of graduation

Of the total 124,358 graduates reported in Table 1, 58,730, or 47.2 percent, were working in West Virginia in 2014. The work participation rate falls consistently as the time from graduation increases. In 2014, 54.7 percent of the 2012-2013 graduating class was working in the state, while the figure diminishes to 41.8 percent for those who graduated a decade ago. There are a number of potential reasons why the work participation rate might fall over time: As graduates gain more work experience,² they become more marketable and thus have a greater ability to acquire employment outside the state. Workers also are more likely to become self-employed as they gain more experience. Since these data only include employees on payroll at establishments in the state, self-employed people are not reflected in the figures. Lastly, workers may be more likely to drop out of the workforce as they get older and life circumstances change; for example, a worker may become a stay-at-home parent.

The overall work participation rate in this year's report is largely unchanged from last year's data.³ However, because the state is graduating more students overall, the number of graduates employed from the 10-year cohort in this study was significantly larger than in last-year's study. In all, more than 2,500 additional students were working in West Virginia in 2014 compared with in 2013, an increase of 5 percent. And the number of graduates employed in the state is up almost 10 percent from 2011.

Overall graduates of the last decade who worked in West Virginia earned \$43,466 on average in 2014. Annual income consistently increases as time from graduation rises, most likely because those earlier graduates tend to have more experience in the workplace. Average annual wages grew from \$31,463 for the most recent graduates to \$55,536 for those graduating one decade earlier who are likely to be the

³ See Bowen, Eric, John Deskins, and Rachelle Cook. 2015. "From Higher Education to Work in West Virginia, 2013." http://be.wvu.edu/bber/pdfs/BBER-2015-05.pdf



² Time since graduation is not necessarily an indication of work experience. Graduates could have less experience if they were unemployed or not in the labor force since graduation. Also graduates could have more experience if they worked prior to entering school.

most experienced in the sample. These figures represent a gain of nearly \$2,674 (about 6 percent) on average for each year of experience.

2 Residency Upon Entering College

Whether graduates lived in West Virginia when entering higher education in the state appears to be a significant determinant of whether they work in the state after graduation. Unsurprisingly, in-state students were much more likely to work in the state after graduation than out-of-state students.⁴ As reported in Table 2, in all, 61.8 percent of in-state students worked in the state in 2014, compared with only 9.7 percent of out-of-state students. Students who were classified as "other" report a work participation rate of 24.7 percent.

Work participation for all residency classifications tends to decline as time since graduation increases, in a similar pattern to that reported in Table 1. For in-state students, work participation decreases steadily over time, falling from 70.1 percent for the most recent graduates to 54.2 percent for graduates from one decade earlier. Out-of-state graduates' work participation stands at 16.7 percent for the most recent graduates, falls rapidly over the first three years, then declines at a slower rate, reaching 6.2 percent for the 2003-2004 graduating class. West Virginia retained a higher share of recent out-of-state graduates in 2014 than in 2013. The work participation rate for out-of-state students in the most recent graduating class was 16.7 percent, compared with 15.2 percent for the most recent class in our 2013 report.

⁴ In-state versus out-of state status is identified based on fees paid while enrolled in a higher education institution. Graduates who are classified as "other" include those participating in the SREB Academic Common Market, Reciprocity Agreement, Metro Agreement, and Disaster Relief (includes out-of-state students receiving a special tuition and fee rate as a result of a disaster in their state of legal residence).



	In-State		Out-of-S	tate	Other	
Graduation Year	Work Participation (%)	Average Income (\$)	Work Participation (%)	Average Income (\$)	Work Participation (%)	Average Income (\$)
2003-2004	54.2	55,669	6.2	52,511	16.8	54,044
2004-2005	55.3	54,221	7.0	58,478	26.6	51,393
2005-2006	56.7	51,266	7.4	60,877	20.8	43,388
2006-2007	58.1	49,919	7.4	57,471	22.7	45,050
2007-2008	59.8	46,906	7.5	52,597	25.1	40,840
2008-2009	62.3	44,570	7.5	45,599	23.5	42,648
2009-2010	63.8	42,176	9.3	42,457	26.2	35,717
2010-2011	64.5	38,784	10.2	38,822	26.8	38,743
2011-2012	67.7	35,592	12.8	34,157	25.7	33,772
2012-2013	70.1	31,570	16.7	31,144	29.2	28,561
Total	61.8	43,596	9.7	42,819	24.7	39,554

Table 2: Work participation and average annual wages by residency

Annual income is slightly higher for in-state students than for out-of-state students working in the state. Overall, in-state students earn \$43,596 on average, compared with \$42,819 for out-of-state students, representing a 1.8 percent premium for in-state students. Graduates of all residency classifications receive higher incomes as the time from graduation increases, repeating the pattern discussed earlier.

3 Degree Earned

The type of degree earned also appears to be an important determinant of employment outcomes for the state's graduates. Graduates earn degrees in five categories, ranging from two-year associate's degrees to doctoral degrees.⁵ The doctoral professional practice category includes professional doctorate degrees that are designed to lead to careers in areas such as medicine, law, dentistry, pharmacy, nursing, and education. The doctorate category represents degrees that are designed primarily for conducting research. This category includes degrees such as doctorate of philosophy (PhD) and doctorate of business administration (DBA), among others.

⁵ Graduates can also receive non-degree certificates, but these classifications are not detailed in this report.

Graduation Year	Associate's (%)	Bachelor's (%)	Master's (%)	Doctoral Professional Practice (%)	Doctorate (%)
2003-2004	57.9	36.8	45.3	36.7	15.3
2004-2005	60.5	37.6	46.4	42.0	11.5
2005-2006	58.8	39.6	46.7	38.0	13.2
2006-2007	62.5	39.3	45.6	38.3	22.2
2007-2008	63.3	40.4	46.2	43.1	22.1
2008-2009	65.6	41.6	47.0	42.1	16.7
2009-2010	67.8	42.4	50.7	42.6	19.4
2010-2011	67.3	44.8	47.6	36.7	17.8
2011-2012	69.5	47.0	49.4	43.7	20.9
2012-2013	69.8	51.1	53.3	43.0	17.4
Total	65.0	42.6	47.9	40.7	17.8

Table 3: Work participation by degree earned

As reported in Table 3, graduates who earned an associate's degree were far more likely to work in the state after graduation than those who graduated with other degrees. Of those graduates earning an associate's degree over the past decade, 65.0 percent were working in West Virginia in 2014. The overall work participation rate is above 40 percent for those with a bachelor's (42.6 percent), master's (47.9 percent), and doctoral professional practice degrees (40.7 percent). Among these three categories, the relatively high work participation rate among master's degree recipients may be largely explained by the fact that the majority of master's degree recipients who earned education degrees most likely remain in the state to teach in primary and secondary schools. Those earning a doctorate degree exhibit the lowest West Virginia work participation rate overall of 17.8 percent. This is perhaps unsurprising given the fact that most job markets at this degree level are national markets, with very few jobs being typically available in any one location.

The trend that was observed above of falling work participation rates as time from graduation increases is present in each degree category. The trend of falling work participation is most pronounced in the bachelor's degree category. While the trend is also present in the associate's degree category, the lowest associate's degree work force participation rate is still higher than the highest rate for any other degree category. The trend is present in the master's degree category, but is weaker.

As reported in Table 4, average annual income for graduates whose highest degree is an associate's degree was \$35,645 in 2014, the lowest among all of the categories. Associate's degree holders had the smallest difference in income between recent graduates and older graduates, as well. Wages for the 2003-2004 graduating class were approximately \$14,111 higher than the recent graduates from the 2012-2013 class, a difference of approximately 50 percent.



Graduation Year	Associate's (\$)	Bachelor's (\$)	Master's (\$)	Doctoral Professional Practice (\$)	Doctorate (\$)
2003-2004	42,171	48,937	61,481	168,107	97,539
2004-2005	42,081	49,563	62,246	138,268	97,496
2005-2006	40,619	45,567	57,001	157,729	89,254
2006-2007	40,771	44,314	55,968	145,769	64,691
2007-2008	38,182	41,190	53,915	132,229	74,758
2008-2009	37,144	39,549	51,689	111,610	66,272
2009-2010	35,408	35,646	52,472	101,205	54,331
2010-2011	33,073	34,679	48,757	78,523	65,072
2011-2012	30,577	31,116	45,600	79,425	59,085
2012-2013	28,060	27,120	43,039	68,394	60,339
Total	35,645	38,109	52,725	111,942	69,848

Table 4: Average annual income by degree earned

Graduates with doctoral professional practice degrees earned the highest income in 2014, at \$111,942 on average. This average income is nearly 60 percent higher than the second-highest paid category (doctorate), and is nearly triple the average earnings for those graduating with a bachelor's degree. Wages grew rapidly in this group, rising from \$68,394 for the most recent graduates to \$168,107 for those who graduated one decade earlier, a gain of nearly \$9,971 per year on average. Graduates with doctorate degrees report the second-highest earnings, with an average annual income of \$69,848 in 2014.

Master's degree recipients report an overall average annual income of \$52,725 for 2014, while bachelor's degree recipients report an income of \$35,645. Although a master's degree commands an overall income premium of nearly 38 percent over a bachelor's degree according to these data, income growth is slower among master's degree recipients, averaging 4.3 percent annually, compared to 8 percent annually for bachelor's degree recipients. Surprisingly, average annual income for bachelor's degree recipients comes in at only 6.9 percent above that of associate's degree recipients (\$35,645). First-year bachelor's degree holders earned slightly less than their associate's degree counterparts, but income grew faster for these graduates.



4 Area of Concentration

The primary area of study while at college or university also appears to play an important role in West Virginia employment outcomes after graduation. In Table 5 we report data on graduates by degree and by area of concentration.⁶

The health professions remained the largest area of concentration among recent college graduates in this year's study. In all, 20,319 people graduated with degrees in this area, with the largest number graduating with associate's degrees (7,207) and bachelor's degrees (5,368). Health professions were also by far the largest area of concentration for graduates with doctoral professional practice degrees at 4,180 graduates. Business, management, and marketing was a close second with 18,612 graduates, followed by education with 16,858 graduates. Liberal arts, with 13,399 graduates, is the only other category with more than 10,000 graduates. Communications and journalism, engineering, and social sciences come in next with around 5,000 graduates each. These seven degrees constituted more than two-thirds of all degrees earned in West Virginia over the past decade.

⁶ Areas of concentration are defined by two-digit Classification of Instructional Program (CIP) codes that correspond to groups of individual majors.



Area of Concentration	Total	Assoc.	Bach.	Mast.	Doct. Prof. Practice	Doct.
Agriculture, agriculture operations	1,448	87	1,024	306		31
Architecture and related services	264		262			
Biological and biomedical sciences	3,490	1	2,911	359		219
Business, management, marketing	18,612	2,797	11,912	3,600		82
Communications, journalism	5,697	76	4,274	1,336		11
Communications technologies/technicians	222	48	169			
Computer and information sciences	2,223	692	932	461		29
Construction trades	6	4				
Education	16,858	231	7,010	9,092	408	5
Engineering	5,222	18	3,529	1,410		265
Engineering technologies and engineering- related fields	2,139	775	1,180	105		
English language and literature/letters	1,690		1,213	444		33
Family and consumer/human sciences	1,197	178	990	29		
Foreign languages, literatures, and linguistics	698	65	308	312		
Health professions and related programs	20,319	7,207	5,368	2,689	4,180	99
History	1,571		1,352	171		48
Homeland security, law enforcement,	3.670	982	2.261	286		
firefighting and related protective services			_,			
Legal professions and studies	1,//0	308		76	1,364	
Liberal arts and sciences, general studies and humanities	13,399	4,135	9,137	46		
Library science	12	5				
Mathematics and statistics	591		296	262		33
Mechanic and repair technologies/technicians	354	329				
Multi/interdisciplinary studies	2,995	681	2,272	39		
Natural resources and conservation	1,323	67	922	239		95
Parks, recreation, leisure, and fitness	2,054		1,820	209		25
Personal and culinary services	245	230				
Philosophy and religious studies	118		118			
Physical sciences	1,368	6	983	248		131
Precision production	208	174				
Psychology	3,629		2,894	398	46	172
Public administration and social service	2,353	148	853	1,352		
Science technologies/technicians	860	595				
Social sciences	4,756		4,286	387		83
Transportation and materials moving	5	2	3			
Visual and performing arts	2,992	117	2,486	325		64
Total	124,358	19,958	70,765	24,181	5,998	1,425

Table 5: Number of graduates by area of concentration and degree earned



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The level of degree earned varies considerably across areas of concentration. Health professions dominate the associate's degree category, while the largest number of bachelor's degrees were in business (16.8 percent). Master's degree graduates are highly concentrated in education, which constituted 37.6 percent of all master's degrees earned. Doctoral professional practice degrees are primarily in health professions, with smaller numbers in legal professions, education, and psychology. Doctorates are heavily concentrated in engineering, biological sciences, psychology, and physical sciences.

Many of the skilled trade degrees exhibit the highest rates of work participation,⁷ as shown in Table 6. Mechanic and repair technologies/technicians had the highest work participation rate with 70.3 percent, followed by precision production, science technologies, and education. As shown above in Table 5, most of the graduates in these fields earned associate's degrees. Education also exhibited a very high work participation rate, with 61.3 percent of graduates working in the state, as did personal and culinary services, communications technologies, engineering technologies, and health professions.

Architecture had the lowest work participation rate with only 17.4 percent of graduates working in the state. The next four lowest areas in terms of work participation were mathematics and statistics, engineering, parks and recreation, foreign languages, and philosophy and religious studies. Each of these areas exhibit work participation rates in the upper-20 percent range.

Graduates earning the highest annual incomes earned degrees in the engineering, legal professions, health professions, and engineering technologies fields. Engineering graduates earned an average annual income of \$72,617, which is approximately 67 percent above the overall average of \$43,466. Wages in legal professions, health professions, and engineering technologies fields range from 34 percent to 42.7 percent above the overall average. Wages were lowest for personal and culinary services, visual and performing arts, and foreign languages, literatures, and linguistics. These fields report average incomes in the low-\$20 thousand range, which is around 50 to 60 percent of the overall average.

⁷ For privacy reasons we do not disclose work participation and income data for categories with fewer than 10 graduates. All statistics in this and later sections refer only to those graduates whose information can be disclosed.



	Work	Average
Area of Concentration	Participation	Annual
	(%)	Income (\$)
Agriculture, agriculture operations	35.8	34,607
Architecture and related services	17.4	47,494
Biological and biomedical sciences	34.7	36,674
Business, management, marketing	44.9	43,873
Communications, journalism	32.9	37,265
Communications technologies/technicians	55.4	29,437
Computer and information sciences	45.3	46,309
Construction trades	n/d	n/d
Education	61.3	41,299
Engineering	27.8	72,617
Engineering technologies and engineering-related fields	59.6	58,253
English language and literature/letters	37.2	29,159
Family and consumer sciences/human sciences	36.5	25,566
Foreign languages, literatures, and linguistics	29.4	26,388
Health professions and related programs	56.5	58,579
History	39.0	28,966
Homeland security, law enforcement, firefighting, related services	53.1	34,547
Legal professions and studies	53.5	62,043
Liberal arts and sciences, general studies and humanities	51.5	32,389
Library science	n/d	n/d
Mathematics and statistics	27.6	38,623
Mechanic and repair technologies/technicians	70.3	48,490
Multi/interdisciplinary studies	37.0	34,136
Natural resources and conservation	37.9	46,513
Parks, recreation, leisure, and fitness studies	28.6	32,263
Personal and culinary services	60.4	22,398
Philosophy and religious studies	29.7	28,599
Physical sciences	31.8	45,387
Precision production	70.2	50,195
Psychology	42.3	30,880
Public administration and social service professions	54.8	34,997
Science technologies/technicians	68.7	38,960
Social sciences	33.7	31,290
Transportation and materials moving	n/d	n/d
Visual and performing arts	32.6	25,446
Total	47.2	43,466
n/d: For privacy reasons we do not disclose work participation and in	come data for ca	tegories with

Table 6: Work participation and average annual wages by area of concentration

fewer than 10 graduates.



In Table 7 we turn back to a focus on the degree earned by reporting work participation rates by graduates' area of concentration and degree earned. Also, in Table 8, we focus on income earned by graduates' area of concentration and degree earned.

For graduates with an associate's degree, who post the highest rate of work participation overall, as discussed above, work participation rates were highest in the biological and biomedical sciences, library science, mechanic and repair technologies, health professions, precision production, and engineering technologies. All of these had work participation rates above 70 percent. In areas where work participation rates were relatively low for associate's degree earners, rates still ranked high in comparison to other degree earners.

Income was highest among associate's degree holders in engineering technologies, precision production, mechanic and repair technologies, natural resources and conservation, science technologies and health professions, which all had incomes above \$40,000 per year. The lowest incomes were in family and consumer sciences, agriculture, public administration, and biological and biomedical sciences.

Among bachelor's degree holders, work participation rates were highest for education, communications technologies, health professions, engineering technologies, and public administration. All of these had work participation rates above 50 percent. The lowest work participation rates were in philosophy and religious studies, communications and journalism, parks and recreation studies, and architecture, which all had work participation rates of less than 30 percent.

Income for graduates with bachelor's degrees was highest in engineering, engineering technologies, and computer and information sciences, each of which were higher than \$50,000 per year on average. The lowest wages were found in the fields of foreign languages, literatures, and linguistics, and visual and performing arts. Graduates in these fields were paid less than \$26,000 per year on average in 2014.

Master's degree graduates who majored in liberal arts and sciences, legal professions, and education had work participation rates above 60 percent. The lowest rates were found in the fields of foreign languages, literatures, and linguistics, mathematics and statistics, and engineering. Each of these fields had work participation rates in the low 20-percent range or below.

Income was highest among master's degree holders in the fields of engineering, health professions; computer and information sciences, engineering technologies, and business, management, and marketing. Each of these areas had incomes above \$70,000 per year. The lowest incomes for master's degree holders were found in history and foreign languages. Graduates in these area earned around \$35,000 or less per year on average.

Work participation rates for doctoral professional practice graduates are only reported in four areas and range from the high 30-percent range to the low 50-percent range. Education had the highest work participation rate at 51.7 percent. The lowest, health professions, was 36.3 percent. Average wages were highest among the health fields, and psychology came in lowest.

Among doctorate degree holders, work participation rates were below 35 percent for all areas of concentration except for education, which had a work participation rate of 60 percent. Wages for this degree averaged \$69,848, with wide variation depending on the area of concentration.



	Assoc.	Bach.	Mast.	Doct. Prof.	Doct.
Area of Concentration	(%)	(%)	(%)	Practice (%)	(%)
Agriculture, agriculture operations	41.4	35.3	38.6		n/d
Architecture and related services		16.8			
Biological and biomedical sciences	n/d	36.9	25.6		20.1
Business, management, marketing	62.8	42.9	37.6		n/d
Communication, journalism	61.8	28.5	45.5		n/d
Communications technologies/technicians	56.3	55.0			
Computer and information sciences	59.3	41.4	31.7		n/d
Construction trades	n/d	n/d	n/d	n/d	n/d
Education	57.6	61.1	61.9	51.7	n/d
Engineering	n/d	31.7	20.6		14.7
Engineering technologies and engineering-related fields	70.1	54.2	33.3		
English language and literature/letters		38.3	35.4		n/d
Family and consumer sciences/human sciences	62.4	31.6	44.8		
Foreign languages, literatures, and linguistics	64.6	32.1	18.3		
Health professions and related programs	70.7	54.8	51.4	36.3	29.3
History		39.5	38.0		29.2
Homeland security, law enforcement, firefighting and		10.2	20.4		
related protective services	05.0	48.5	30.4		
Legal professions and studies	63.0		63.2	50.7	
Liberal arts and sciences, general studies and	50.1	47.0	60.6		
humanities	39.1	47.9	09.0		
Library science	n/d	n/d	n/d	n/d	n/d
Mathematics and statistics		36.2	20.6		n/d
Mechanic and repair technologies/technicians	71.4				
Multi/interdisciplinary studies	56.7	30.8	56.4		
Natural resources and conservation	67.2	38.7	31.4		26.3
Parks, recreation, leisure, and fitness studies		27.6	37.3		n/d
Personal and culinary services	60.0				
Philosophy and religious studies		29.7			
Physical sciences	n/d	35.8	22.6		19.1
Precision production	70.1				
Psychology		42.3	53.3	50	8.7
Public administration and social service	61.5	51.1	56.4		
Science technologies/technicians	67.6				
Social sciences		34.4	28.9		18.1
Transportation and materials moving					
Visual and performing arts	49.6	32.7	28.9		15.6
Total	65.0	42.5	47.9	40.7	17.8
n/d: data not disclosed					

Table 7: Work participation by area of concentration and degree earned



Table 8: Income by	y area of concentratio	on and degree earned
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				Doct. Prof.	Doct.
Area of Concentration	Assoc. (\$)	Bach. (\$)	Mast. (\$)	Practice (\$)	(\$)
Agriculture, agriculture operations	17,325	33,806	41,736		n/d
Architecture and related services		48,447			
Biological and biomedical sciences	n/d	34,825	45,122		64,555
Business, management, marketing	28,599	41,742	73,737		n/d
Communication, journalism	19,074	31,832	49,357		n/d
Communications technologies/technicians	26,765	30,587			
Computer and information sciences	32,025	53,430	73,529		n/d
Construction trades	n/d				
Education	18,724	35,343	45,193	72,180	n/d
Engineering	n/d	69,142	84,540		89,810
Engineering technologies and engineering- related fields	53,135	61,741	81,669		
English language and literature/letters		26,349	36,321		n/d
Family and consumer sciences/human sciences	18,723	27,204	44,548		
Foreign languages, literatures, and linguistics	23,958	25,732	30,306		
Health professions and related programs	41,256	47,573	73,079	135,735	81,296
History	,	28,588	30,731	,	35,183
Homeland security, law enforcement, firefighting		-,			,
and related protective services	32,920	33,832	42,946		
Legal professions and studies	25.992		54.800	73.378	
Liberal arts and sciences, general studies and	- /		- ,	-,	
humanities	27,972	34,963	37,661		
Library science	n/d				
Mathematics and statistics	, -	34.327	46.674		n/d
Mechanic and repair technologies/technicians	49.332	- ,,-=:			.,
Multi/interdisciplinary studies	33.383	34.047	49.748		
Natural resources and conservation	48.240	43.345	54.980		63.230
Parks, recreation, leisure, and fitness studies		30.547	41.599		n/d
Personal and culinary services	22 423	00,017)		, «
Philosophy and religious studies	22) 123	28 599			
Physical sciences	n/d	41.844	51,542		82 950
Precision production	52.546	12,044	51,572		02,000
Psychology	52,540	27 694	37 684	67 656	68 520
Public administration and social service		27,054	57,004	07,000	00,020
professions	16,982	29,207	40,460		
Science technologies/technicians	<u> </u>				
Social sciences	,0+1	30 387	20 226		60 821
Transportation and materials moving		30,307	55,250		00,051
Visual and performing arts	27 002	2/1 071	25 167		36 767
visuai anu periorining arts Total	27,092	24,071 20 100	53,107 53,107	111 043	50,207
	33,043	38,109	52,725	111,942	09,848



5 Gender

Women represent the majority of public higher education graduates in West Virginia, as reported in Table 9. Of the 124 thousand-plus West Virginia graduates in the past decade, nearly 57 percent are women, and this ratio has been stable over the past decade. Women graduates are also more likely to be found in the West Virginia workforce. The work participation rate for women is 51.8 percent overall for graduates of the past decade, significantly higher than the 41.2 percent for men. However, despite the fact that women exhibit higher work participation rates, the income for working men exceeds that of working women by more than \$12,000, or approximately 31 percent. The income premium for men increases as time since graduation increases.

		Female		Ма	le
	Female	Work	Average	Work	Average
Graduation	Share of	Participation	Annual	Participation	Annual
Year	Total (%)	(%)	Income (\$)	(%)	Income (\$)
2003-2004	57.8	45.6	46,503	36.6	70,941
2004-2005	56.8	47.0	47,710	38.4	64,913
2005-2006	57.6	47.7	44,490	38.4	63,290
2006-2007	56.6	48.8	43,815	38.2	60,663
2007-2008	57.0	49.6	41,204	39.6	56,631
2008-2009	56.4	51.7	40,580	39.8	51,284
2009-2010	56.9	53.0	38,490	41.4	48,047
2010-2011	55.9	53.0	35,542	43.0	43,850
2011-2012	56.3	56.8	32,852	44.3	39,758
2012-2013	57.4	59.7	29,664	47.9	34,482
Total	56.8	51.8	38,907	41.2	51,020

Table 9: Work participation and income by gender

In Table 10 we report work participation and annual income by gender for area of concentration. These data reveal several important findings: Women are most heavily concentrated in health professions, education; business, management, and marketing; and liberal arts and sciences/humanities. Health professions and education comprise around 39 percent of total women graduates, while these four areas altogether comprise nearly two-thirds of female graduates. Men were most heavily concentrated in business, management, and marketing; liberal arts and sciences/humanities; education; health professions; and engineering. These five areas comprise roughly 55 percent of male graduates.

Women were more highly concentrated in their top fields. Health professions constituted 22.2 percent of the total, and the top three fields garnered 51.6 percent of all women graduates. Men were more dispersed among fields. Their top three fields constituted only 38 percent of total graduates. The health professions attracted more than three times as many women as men, and twice as many women graduated with education degrees than men.

Men's work participation rates were highest in the fields of precision production, mechanic and repair technologies, science technologies, and personal and culinary services. These areas of concentration had work participation rates above 60 percent. Architecture and related services had the lowest work participation among men at 18.0 percent. Mathematics and statistics, engineering, social sciences,

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multidisciplinary studies, foreign languages, and parks and recreation studies, all had work participation rates below 30 percent.

For women, work participation rates were highest in science technologies, library science, education, and personal and culinary services, all of which were above 60 percent. Work participation in architecture and related services; engineering; mathematics and statistics; and philosophy and religious studies were the lowest, and all below 30 percent.

Incomes for men were highest in the health professions, averaging \$87,254. Men also had high salaries in the legal professions, and engineering. The lowest wages for men were in personal and culinary services, visual and performing arts, foreign languages, visual and performing arts, and English language and literature. All of these were below \$30,000 per year on average.

For women, the highest paying field was engineering, which paid \$63,828 on average per year. Other high paying jobs for women were in legal professions and health professions. The lowest paying jobs for women were in philosophy and religious studies and library science, which paid \$20,000 per year or less.

In Figure 1 we depict the specific areas of concentration that drive the male-female wage gap. The wage gap is present in virtually every area of concentration. The wage gap is largest in health professions, legal professions, philosophy and religious studies, and science technologies. The wage gap is generally smallest in education, history, psychology, and visual and performing arts. In English language and literature, women earn more than men on average by a very small margin.



Table 10: Work participation and income by area of concentration and gender

		Female			Male		
Area of Concentration	Total	Work Part. (%)	Average Annual Income (\$)	Total	Work Part. (%)	Average Annual Income (\$)	
Agriculture, agriculture operations	806	36.9	29,763	642	34.4	41,117	
Architecture and related services	53	n/d	n/d	211	18.0	49,010	
Biological and biomedical sciences	1,951	35.3	35,174	1,539	33.9	38,650	
Business, management, marketing	8 <i>,</i> 807	50.2	36,538	9,805	40.2	52,107	
Communication, journalism	3,530	34.5	36,837	2,167	30.3	38,059	
Communications technologies/technicians	92	52.2	25,617	130	57.7	31,881	
Computer and information sciences	468	45.9	35,913	1,755	45.1	49,135	
Construction trades	2	n/d	n/d	4	n/d	n/d	
Education	11,969	65.7	40,445	4,889	50.6	44,010	
Engineering	779	21.7	63,828	4,443	28.9	73,774	
Engineering technologies and engineering- related fields	196	56.1	49,090	1,943	59.9	59,119	
English language and literature/letters	1,107	36.5	29,244	583	38.4	29,004	
Family and consumer/human sciences	1,148	36.5	25,218	49	36.7	33,667	
Foreign languages, literatures, and linguistics	500	30.8	25,923	198	25.8	27,792	
Health professions and related programs	15,687	59.1	51,778	4,632	47.5	87,254	
History	544	42.5	26,259	1,027	37.2	30,603	
Homeland security, law enforcement,	1 0 4 0	FO 1	27.067	1 0 2 2	50.2	40 502	
firefighting and related protective services	1,848	50.1	27,907	1,822	50.2	40,503	
Legal professions and studies	932	55.0	50,020	838	51.8	76,255	
Liberal arts and sciences, general studies and	7 602	56.2	27.020	F 716	4F 1	20.040	
humanities	7,083	50.2	27,930	5,710	45.1	39,848	
Library science	12	n/d	n/d				
Mathematics and statistics	266	25.6	37,843	325	29.2	39,182	
Mechanic and repair	2	n/d	n/d	251	70.4	10 101	
technologies/technicians	5	nyu	nyu	221	70.4	40,494	
Multi/interdisciplinary studies	1,349	47.4	27,706	1,646	28.6	42,878	
Natural resources and conservation	323	32.2	36,535	1,000	39.8	49,120	
Parks, recreation, leisure, and fitness	795	33.6	27,134	1,259	25.5	36,530	
Personal and culinary services	148	60.1	20,422	97	60.8	25,380	
Philosophy and religious studies	35	n/d	n/d	83	32.5	32,788	
Physical sciences	506	33.8	38,932	862	30.6	49,567	
Precision production	6	n/d	n/d	202	71.3	50,512	
Psychology	2,719	42.6	30,444	910	41.3	32,221	
Public administration and social service	1 01/	55 7	22 465	120	50.9	17 210	
professions	1,914	55.7	55,405	435	50.8	42,510	
Science technologies/technicians	441	70.3	28,251	419	67.1	50,774	
Social sciences	2,209	39.4	27,225	2,547	28.8	36,115	
Transportation and materials moving				5	n/d	n/d	
Visual and performing arts	1,861	31.7	23,449	1,131	34.1	28,493	
Total	70,689	51.8	38,907	53 <u>,</u> 669	41.2	51,020	
n/d: data not disclosed							



Figure 1: Male-female income gap



Male/Female Wage Gap (\$, thousands)

Note: Wage gaps have been withheld for privacy reasons for the following industries: architecture, construction trades, library science, mechanic and repair technologies, precision production, and transportation and materials moving. Source: Author calculations



6 Age

A worker's age at graduation may also be an important determinant of work participation outcomes. Table 11 details work participation for graduates by age at graduation and degree earned. In general work participation is largest in the middle of the age distribution. Work participation is, in general, above 60 percent for students who are between the ages of 35 and 54 when they graduate. But work participation is lower in younger and older graduates. Work participation for all graduates younger than 24 and older than 60 are both approximately 42 percent. This trend of higher participation among middle-age-range graduates may indicate that these graduates were already working and/or had work experience before returning to higher education to advance their careers.

Age at Graduation	All Graduates (%)	Associate's (%)	Bachelor's (%)	Master's (%)	Doctoral Professional Practice (%)	Doctorate (%)
Age 24 or less	41.8	66.1	37.3	38.7	52.9	
Age 25-29	46.4	66.7	47.7	41.2	39.3	16.0
Age 30-34	53.6	64.9	55.2	52.8	35.4	14.4
Age 35-39	60.3	67.8	60.1	60.5	45.9	15.6
Age 40-44	62.0	64.8	62.3	62.8	45.4	24.6
Age 45-49	63.0	64.6	60.1	69.3	44.6	25.0
Age 50-54	61.1	60.7	57.1	66.2	67.1	33.3
Age 55-59	53.0	48.4	52.4	58.0	58.3	57.1
Age 60+	42.5	43.3	37.8	47.3	53.1	n/d
Total	47.2	65.0	42.6	47.9	40.7	17.8

Table 11: Work Participation by age at graduation and degree

The overall age trend holds true for graduates with bachelor's and master's degrees. Both of these degree types have the highest work participation rates in the middle of the age distribution. The trend is particularly pronounced for master's degree graduates, whose work participation rises from almost 39 percent for graduates under the age of 24 to almost 70 percent for graduates ages 45-49.

For associate's degree holders, work participation stays relatively constant for graduates up until age 55, with rates above 60 percent. Work participation rates are smaller for older graduates, falling to under 44 percent for graduates who are 60 years or older at graduation. For graduates with doctorate degrees, work participation tends to rise as age at graduation increases. Aside from the under-24 category, for which there is a small sample size, work participation rates are below 20 percent for graduates who earn their degrees when they are younger than 40. The work participation rate rises to about 57 percent for doctoral graduates who are older than 55 at the time of graduation. Finally, the work participation for doctoral professional practice graduates starts off relatively high for graduates under the age of 24, then falls through the age group 30-34. The highest work participation rates are above 50 percent.



Age at Graduation	All Graduates (\$)	Associate's (\$)	Bachelor's (\$)	Master's (\$)	Doctoral Professional Practice (\$)	Doctorate (\$)
Age 24 or less	37,379	32,496	37,950	45,820	101,784	
Age 25-29	48,421	36,293	36,971	49,538	114,516	73,242
Age 30-34	47,384	38,582	38,397	55,057	115,540	75,055
Age 35-39	47,263	39,055	40,560	57,405	115,320	61,449
Age 40-44	46,865	38,397	40,287	61,881	93,778	62,673
Age 45-49	47,123	38,519	41,451	58,889	102,303	65,922
Age 50-54	46,536	37,496	41,814	56,099	98,587	70,996
Age 55-59	42,346	32,027	35,573	48,520	97,735	68,494
Age 60+	33,540	25,575	27,046	42,467	57,936	n/d
Total	43,466	35,645	38,109	52,725	111,942	69,848

Table 12: Income by age at graduation and degree

Income levels by age follow a similar trend as work participation. In general income starts lower for younger graduates and rises into the middle of the age distribution before falling again for older graduates. This trend holds true for three of the degree categories reported: associate's, bachelor's, and master's degrees. Master's degree graduates have the most pronounced trend with income rising from less than \$46,000 to over \$60,000 in the middle of the age distribution.

For doctoral professional practice and doctorate degrees, however, income tends to fall with age at graduation. Younger workers who earn these degrees tend to have higher incomes than graduates who are older when they receive these degrees. Graduates who earn doctoral professional practice degrees when they are under the age of 40 earn more than \$100,000 per year on average, while income falls to less than \$100,000 for the oldest graduates in the sample. This disparity is a result of the area of concentration for these graduates. Professional degrees awarded to younger graduates are largely in the health and legal professions, which have higher incomes in general. Older graduates who earn professional degrees tend to concentrate in education, which correlates with lower salaries.

7 Race

Approximately 88 percent of graduates from West Virginia's public higher education institutions in the last decade were white, as reported in Table 13.⁸ Black graduates made up the next largest share of the graduates with almost 4 percent of the total. Asian, Pacific Islander, or Native Hawaiian; and Hispanic make up the next largest shares with 1.6 percent and 1.2 percent, respectively.

At 50 percent, work participation rates for white graduates were also the highest work among all of the graduates working in the state in 2014. American Indian or Alaska Native, and multi-racial graduates exhibit work participation rates that are in the 40-percent range. Work participation falls to the 30-



⁸ Race is not reported for approximately 4 percent of graduates.

percent range and below for graduates who are Black, Hispanic, or Asian, Pacific Islander, or Native Hawaiian.

Asian, Pacific Islander, or Native Hawaiian graduates report the highest annual wages, with an average annual wage of \$47,440, which exceeds the overall average by nearly 9 percent. White graduates also reported an average income that was just above the overall average. Multi-racial and Black graduates report the lowest incomes, with income levels that are roughly 25 percent below the average.

Race	Number	Work Participation (%)	Average Annual Wage (\$)
American Indian or Alaska Native	393	48.4	43,752
Asian, Pacific Islander, Native Hawaiian	2,032	28.8	47,440
Black	4,862	36.7	31,911
Hispanic	1,506	30.6	39,010
Multi-Racial	585	42.7	32,876
White	109,454	50.0	43,914
Total ⁹	124,358	47.2	43,466

Table 13: Work participation and income by race

8 Academic Achievement

Academic achievement has a theoretically ambiguous effect on work outcomes after graduation. Graduates who enjoyed higher levels of academic achievement might receive more job opportunities within the state and could therefore exhibit higher rates of work participation within the state given the wider array of opportunities. Alternatively, higher academic achievement could also mean that those graduates might have more economic opportunities broadly and could be induced to leave the state to pursue such opportunities elsewhere. This section examines work participation and income for graduates based on incoming ACT score and college GPA. The ACT is a common standardized test taken before entry into college, while the GPA measures one's academic performance while in college.

Table 14 summarizes work participation and income for the graduates who submitted ACT scores to the school they attended. In general students with higher ACT scores when entering college have lower work participation rates than those with lower scores. Graduates in the lowest quintile (those with ACT scores below 18)¹⁰ had a work participation rate of roughly 65 percent, while those with ACT scores in the highest quintile (25 and above) had a work participation rate of less than 52 percent.

However, students with higher ACT scores were less likely to leave the state as they gained more experience than graduates in other quintiles. Work participation for graduates with ACT scores in quintile 5 fell only around 1.4 percentage points per year and quintile 4 graduates work participation decreased about 2 percentage points per year between the 2012-2013 graduating class to the 2003-

¹⁰ Quintiles are calculated based on all of the scores of graduates from West Virginia colleges and universities rather than the distribution nationally.



⁹ Includes graduates whose race was not reported.

2004 graduating class. The most rapid declines in work participation were in quintiles 1 and 2, where the work participation rate dropped from the low 70s for the 2012-2013 graduating classes to the low 50s for the 2003-2004 graduating classes, a drop of a little over 2 percentage points per year on average.

Income tended to rise with higher ACT scores. Overall, graduates with the highest ACT scores enjoyed an average annual income that exceeded that of those with ACT scores in the bottom quintile by a little more than 36 percent. Further, this premium for higher ACT scores does not appear to diminish as time since graduation increases, but rather it increases over time. For the most recent graduates, the top ACT quintile earned nearly 23 percent more than the bottom quintile; for graduates in the 2003-2004 academic year, the top quintile earned roughly 52 percent more on average than the bottom quintile.

This disparity in earnings between graduates with higher ACT scores and lower ACT scores can at least partially be explained by the types of degrees these graduates earned. Table 15 shows the number of graduates and average annual income by degree type and ACT score quintile. Graduates who earned associate's degrees were more than 4 times as likely to have an ACT score from the bottom quintile as from the top quintile. In contrast, graduates who earned master's degrees were more heavily concentrated in the top two quintiles of ACT scores. Within each degree, however, income was still positively associated with ACT score for both associate's degree and master's degree holders, but not for bachelor's degree holders.



Graduation	Quinti (Less tha	Quintile 1 (Less than 18)		Quintile 2 (18-19)		Quintile 3 (20-21)		Quintile 4 (22-24)		Quintile 5 (25+)	
Year	Work Participation (%)	Average Annual Income (\$)									
2003-2004	52.7	43,519	51.0	47,558	51.3	50,126	48.2	52,497	44.8	66,165	
2004-2005	57.6	42,387	52.9	47,001	53.4	54,630	49.9	51,442	43.4	68,394	
2005-2006	60.9	40,484	54.7	46,131	56.1	46,651	51.6	52,110	47.2	60,505	
2006-2007	62.3	40,575	56.6	43,496	57.0	46,980	51.9	49,415	45.8	63,045	
2007-2008	61.0	37,332	60.5	41,622	60.7	42,639	55.9	44,248	49.2	58,024	
2008-2009	65.8	36,050	63.8	39,212	61.9	39,050	57.4	41,899	51.6	52,161	
2009-2010	69.7	33,856	63.7	38,481	63.1	40,006	60.6	40,847	52.5	47,484	
2010-2011	69.5	31,879	67.9	34,352	63.8	35,623	60.6	38,756	54.3	42,331	
2011-2012	74.0	30,140	68.4	31,688	67.7	33,911	62.7	35,129	55.8	37,197	
2012-2013	73.4	27,010	71.7	28,565	70.6	30,300	67.9	30,353	58.6	33,180	
Total	65.2	35,418	61.7	38,539	61.3	40,482	58.1	41,224	51.7	48,318	

Table 14: Work participation and income by ACT score

Table 15: Number of graduates and average annual income by degree type and ACT score

	Quintile 1 (Less than 18)		Quint (18-	ile 2 19)	Quint (20-2	ile 3 21)	Quint (22-	ile 4 24)	Quin (2!	tile 5 5+)
Degree Earned	Number of Graduates	Average Annual Income (\$)	Number of Graduates	Average Annual Income (\$)	Number of Graduates	Average Annual Income (\$)	Number of Graduates	Average Annual Income (\$)	Number of Graduates	Average Annual Income (\$)
Associate's	2,083	32,490	1,447	35,216	1,274	36,794	1,196	35,565	483	36,808
Bachelor's	3,138	36,228	3,490	37,460	3,973	38,116	5,208	37,761	4,101	38,739
Master's	491	45,399	723	47,522	1,053	48,825	1,282	48,285	1,210	50,392



Table 16 summarizes work participation and income for the graduates for whom GPA is available. On average, students with higher GPAs tended to work in the state at higher rates than those with lower GPAs, though there appears to be only a weak correlation between these variables. The average work participation rate for graduates in the lowest GPA quintile (Less than 2.78), was 46.5 percent, compared with 48.5 percent for those in the highest quintile (GPA above 3.78). However, the work participation rate did not show a consistent trend upward. Work participation in the second quintile, on average, was higher than for the fourth quintile.

Unlike work participation, college GPA does have a significant positive association with annual income. Income levels consistently rise as graduates' GPA move from the bottom to the top quintile. Top GPA graduates earned roughly 37 percent more each year than bottom-quintile graduates. However, here the income premium diminishes over time. For the most recent graduation year, top-quintile graduates earned more than 50 percent higher annual incomes than the lowest GPA graduates. However, top-quintile graduates in the 2003-2004 graduation year earned only 26 percent more than their lower-quintile counterparts.



	Quintile 1 (Less than 2.78)		Quinti (2.78-3	le 2 8.12)	Quinti (3.13-3	ile 3 8.43)	Quinti (3.44-3	ile 4 8.77)	Quinti (3.78	le 5 8+)
Graduation Year	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)
2003-2004	39.0	47,734	37.9	51,105	39.4	58,239	40.7	61,953	46.6	60,399
2004-2005	42.2	47,153	43.0	50,063	41.9	56,770	42.4	56,905	47.1	59,593
2005-2006	42.9	43,329	44.0	47,548	42.7	49,976	41.4	53,268	47.2	53,704
2006-2007	43.1	40,855	43.6	44,897	43.4	49,845	42.2	53,457	47.5	54,586
2007-2008	44.7	39,165	44.2	41,906	44.4	46,892	45.0	48,233	46.6	53,763
2008-2009	47.5	37,302	46.3	40,178	46.0	43,802	43.6	46,882	47.8	51,170
2009-2010	46.8	33,611	48.0	37,216	48.4	39,764	48.7	44,268	49.1	50,747
2010-2011	50.2	31,906	52.0	35,016	49.3	36,852	46.4	42,282	48.2	47,202
2011-2012	51.4	29,334	53.2	33,726	53.0	33,766	50.5	37,962	51.0	41,605
2012-2013	53.8	25,676	54.8	29,198	58.7	31,296	55.4	33,169	51.9	38,713
Total	46.5	36,474	47.3	39,565	47.6	42,306	46.4	45,561	48.5	50,018

Table 16: Work participation and income by GPA



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9 Tuition Assistance and Low Income Status

Among the goals of the state's tuition assistance programs is to entice graduates to remain in the state after graduation. It is also useful to examine the outcomes of students who entered college from low-income households. This section examines work participation and income for those receiving the PROMISE scholarship, the state's Higher Education Grant Program (HEGP) scholarship, and federal Pell Grants. The merit-based PROMISE scholarship pays full tuition and fees for in-state students who met the program's academic requirements.¹¹ The first students with PROMISE scholarships graduated in 2003, so this is the first Higher Education to Work report for which we have a full complement of graduates who had received the PROMISE scholarship. HEGP and Pell grants are based on need and may not cover all tuition costs. Both PROMISE and HEGP are programs for students who are West Virginia residents, while the Pell grant program is nationwide. There may be considerable overlap between these three programs.

As Table 17 shows, the overall work participation rate for PROMISE graduates was just over 57 percent, which is somewhat below the work participation rate for in-state students overall (61.8 percent). The first two classes of PROMISE scholarship recipients continue to exhibit high work participation rates. More than 75 percent of the 2003-2004 class who received PROMISE scholarships, for example, work within West Virginia. However, the remaining cohorts exhibit lower work participation rates as the time from graduation increases. The figure falls from 65.4 percent for graduates from the 2012-2013 academic year to 48.8 percent for graduates of the 2005-2006 academic year. Work participation rates show consistent decline over time for HEGP and Pell grant recipients.

PROMISE graduates earned an average of \$40,320 per year, slightly higher than HEGP recipients, who earned \$38,678. Pell grant recipients earned \$37,131 per year. The five most recent graduating classes who received PROMISE scholarships had earnings 12 to 15 percent higher than their HEGP counterparts. Pell grant recipients, tended to have the lowest incomes among the three tuition assistance programs within each year. All three tended to earn lower income than the average for all graduates.

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¹¹ Beginning January 1, 2010, new PROMISE recipients received a block grant of \$4,750 per year, or full tuition and fees, whichever was less.

	PROMISE R	lecipient	HEGP Re	cipient	Pell Grant R	ecipients
Graduation Year	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)	Work Participation (%)	Average Annual Income (\$)
2003-2004	76.5	43,650	57.2	49,501	48.6	45,625
2004-2005	58.8	35,755	58.0	49,861	48.8	46,151
2005-2006	48.8	46,491	60.2	45,869	51.2	43,693
2006-2007	47.9	47,362	60.3	45,744	51.9	43,506
2007-2008	52.7	46,309	65.1	42,494	54.9	40,017
2008-2009	54.7	44,235	65.8	39,576	56.2	38,573
2009-2010	58.4	44,009	67.6	38,293	57.4	36,152
2010-2011	57.1	40,374	68.2	35,102	58.8	34,391
2011-2012	62.3	36,498	70.9	32,354	61.3	31,673
2012-2013	65.4	32,170	72.9	28,665	64.6	28,023
Total	57.7	40,320	65.7	38,768	56.3	37,131

Table 17: Work participation and income based on scholarship assistance and lowincome status

10 Industry

Table 18 reports graduate employment and income by two-digit NAICS industry.¹² This year's results show that the concentration of graduates in the educational services and health care sectors is holding steady. Among all graduates of the state's public higher education institutions, approximately 49.9 percent were employed in these two industries, compared with 49.7 percent in last year's study. In all, 27.5 percent of graduates were employed in health care, and another 22.4 percent were employed in education. Other sectors that attracted large number of graduates include retail trade, professional and technical services, and public administration, which together accounted for 20.9 percent of jobs held by graduates.

Real estate, and rental and leasing; utilities; management of companies and enterprises; and agriculture, forestry, fishing, and hunting attracted the fewest graduates. Each of these industries employed less than 1 percent of graduates in 2014.

¹² The North American Industry Classification System (NAICS) classifies jobs into 21 major sectors by work type. Jobs in the Oil and Gas industry are included under the Mining sector, but may be under-represented in the report, as the available data do not include independent contractors.



NAICS	Sector	Total Graduates	Share of Total Graduates (%)	Average Annual Income (\$)	State Industry Share (%)
72	Accommodation and food services	4,115	5.3	12,326	9.5
56	Administrative and waste services	3,462	4.5	23,883	5.1
11	Agriculture, forestry, fishing and				
11	hunting	71	0.1	25,372	0.3
71	Arts, entertainment, and recreation	827	1.1	10,984	1.1
23	Construction	1,360	1.8	38,485	5.4
61	Educational services	17,318	22.4	34,608	8.5
52	Finance and insurance	2,432	3.1	37,222	2.6
62	Health care and social assistance	21,292	27.5	39,910	19
51	Information	1,214	1.6	33,984	1.5
	Management of companies and				
22	enterprises	346	0.4	58,941	0.9
31-33	Manufacturing	2,523	3.3	53,737	6.8
21	Mining	1,191	1.5	73,511	4.2
01	Other services, except public				
01	administration	1,425	1.8	23,053	3
54	Professional and technical services	5,068	6.5	45,391	3.8
92	Public Administration	4,764	6.2	33,300	7
53	Real estate and rental and leasing	651	0.8	33,480	1
44-45	Retail Trade	6,359	8.2	22,790	12.4
48-49	Transportation and warehousing	800	1	37,232	3.7
22	Utilities	433	0.6	64,359	0.7
42	Wholesale trade	1,569	2	51,226	3.2
	Total ¹⁴	77,461	100	35,555	100

Table 18: Employment and income by industry¹³



¹³ The number of jobs in this table exceeds the number of graduates employed in West Virginia in 2013 because graduates who worked in more than one industry were counted for each industry in which they worked.

¹⁴ Includes 241 unclassified establishments.





Figure 2 illustrates the difference between the industry share for public higher education graduates and the share of workers in the state as a whole. As illustrated, graduates are far more likely to be employed in education and health care services than workers overall. The professional and technical services; finance and insurance; and information industries also attracted a greater share of educated workers than the economy as a whole.

Graduates were least likely to be employed in retail trade; accommodations and food services; construction; manufacturing; and mining, compared with the share in the overall economy. This result likely reflects the lower educational requirements of these industries.









Source: Author Calculations



The degree graduates earned had a great deal of influence over the industries in which they worked. As Figure 3 illustrates, associate's degree graduates were clustered heavily in the health care fields. Almost 43 percent of associate's degree graduates worked in this one field. Associate's degree graduates also worked heavily in retail trade, educational services, and accommodation and food services.

Bachelor's degree graduates were more spread out among the different industries in the state. Health care services was still the top industry, with 21.7 percent of graduates with bachelor's degrees working in that industry. However, it was closely matched by educational services, which comprised 19.4 percent of bachelor's degree graduates. Other major industries for bachelor's degree graduates were retail trade; professional and technical services; public administration; accommodations and food services; and administration and waste services, all of which employed more than 5 percent of bachelor's degree graduates.

Educational services was by far the top industry for graduates with a master's degree. Almost half of all graduates with a master's worked in education. Health care was a distant second with 21.2 percent of graduates, followed by professional and technical services, and public administration, both of which employed roughly 5 percent of graduates.



Figure 4: Industry composition by gender

Source: Author Calculations

Figure 4 shows the ratio of men to women graduates in the major industries. Overall, women graduates held more than 62 percent of jobs in all industries. This is likely a result of women having graduated in



larger numbers than men in the last decade, and higher work participation rates among women. In relation to this overall average, women are overrepresented in two industries: health care, and educational services. More than 80 percent of graduates working in health care were women, as were 72 percent of education workers. As mentioned above, these two industries also constitute by far the largest share of employment for the state's college graduates. Women also held a large share of jobs in finance and insurance; and accommodations and food services, and other services, all of which were more than 60 percent women.

In relation to their share of the graduate workforce, men are over-represented in every industry except health care and education. This disparity is particularly pronounced in mining where men held nearly 82 percent of jobs. Male graduates also held a large share of jobs in utilities and construction, both of which were more than 75 percent male.



Figure 5: Income by industry

Source: Author Calculations

As Figure 5 shows, average annual income varied significantly by industry in 2014. Graduates working in mining earned the highest income, averaging over \$73 thousand per year. Utilities; management of companies; manufacturing; and wholesale trade also paid high incomes, with each above \$50 thousand per year. The lowest paid industries included administrative and waste services; other services; retail trade; accommodation and food services; and arts, entertainment, and recreation, each of which paid less than \$25 thousand per year on average.



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11 County Statistics

Graduates of West Virginia public higher education institutions worked in every county in the state in 2014. Table 19 shows the number of graduates and average annual income for graduates in all of West Virginia's 55 counties. It also includes the distribution of overall employment and population in the state.

Graduates were highly concentrated in Kanawha, Monongalia, and Cabell counties. Over 36 percent of the graduates were working in these three counties in 2014, with 16 percent in Kanawha, 10.4 percent in Monongalia, and 9.7 percent in Cabell. Berkeley, Harrison, and Marion counties each contained more than 4 percent of graduates.



County of Work	Total Graduates	County Share of Graduates (%)	Average Annual Income (\$)	County Share of State Employment (%)
Barbour	197	0.4	35,574	0.5
Berkeley	2,263	5.0	33,018	4.5
Boone	411	0.9	37,535	1.0
Braxton	211	0.5	30,821	0.5
Brooke	508	1.1	31,843	1.2
Cabell	4,450	9.7	36,806	7.3
Calhoun	115	0.3	30,544	0.2
Clay	115	0.3	32,800	0.2
Doddridge	90	0.2	36,900	0.2
Fayette	758	1.7	31,729	1.6
Gilmer	214	0.5	29,522	0.3
Grant	258	0.6	31,976	0.5
Greenbrier	888	1.9	35,166	1.9
Hampshire	254	0.6	33,857	0.6
Hancock	443	1.0	31,821	1.5
Hardy	332	0.7	25,888	0.8
Harrison	2,221	4.9	36,488	5.0
Jackson	628	1.4	34,197	1.1
Jefferson	1,210	2.6	32,375	2.1
Kanawha	7,334	16.0	37.682	14.8
Lewis	321	0.7	34.865	1.0
Lincoln	256	0.6	35,480	0.4
Logan	741	1.6	33,409	1.5
Marion	1 868	4 1	35,100	2.8
Marshall	578	1 3	36,626	1.6
Mason	407	0.9	32 364	0.8
McDowell	233	0.5	12,504	0.8
Mercer	1 3//	2 9	42,580	2.8
Minoral	510	2.9	21 602	2.0
Mingo	295	1.1	25 600	1.1
Monongolio	1752	10.4	35,009	0.9
Monroe	4,752	10.4	33,710	0.2
Morgon	174	0.4	54,545	0.3
Nicholog	130	0.3	32,218	0.4
Nicholas	491	1.1	37,935	1.1
Onio	1,729	3.8	31,220	4.1
Pendleton	89	0.2	23,122	0.2
Pleasants	168	0.4	34,303	0.4
Pocanontas	195	0.4	24,419	0.4
Preston	422	0.9	35,093	1.0
Putnam	1,350	3.0	36,009	2.8
Raleigh	1,646	3.6	35,669	4.7
Randolph	352	0.8	30,077	1.6
Ritchie	141	0.3	40,075	0.5
Roane	248	0.5	27,912	0.4
Summers	115	0.3	30,193	0.3
Taylor	238	0.5	37,552	0.5
Tucker	160	0.4	20,514	0.4
Tyler	151	0.3	34,720	0.3
Upshur	533	1.2	36,798	1.1
Wayne	520	1.1	32,180	1.3
Webster	129	0.3	43,780	0.3
Wetzel	304	0.7	29,078	0.7
Wirt	62	0.1	28,553	0.1
Wood	1,758	3.8	32,907	5.4
Wyoming	307	0.7	37,698	0.7
Total	45,713	100.0	35,057	100.0

Table 19: Employment and income by county of work



Counties with larger shares of total employment and population attracted larger numbers of graduates, and graduates were over-represented in counties with larger metropolitan areas and institutions of higher education. Figure 6 depicts the difference in each county's share of graduate employment and its share of the state's overall employment. At 2.7 percentage points, Monongalia County, which is home to WVU's main campus, had the largest difference between its share of graduate employment and share of overall state employment. Graduates were also over-represented in Cabell County, which is home to Marshall University; Marion County, where Fairmont State University is located; and Kanawha County, all of which had differentials greater than 1.



Figure 6: Graduate and state employment share differential

Source: Author Calculations



Income for graduates was more evenly distributed across the state than workers (Figure 7). The majority of graduates were earning between \$30 thousand and \$40 thousand annually on average. Webster, McDowell, and Ritchie counties had the highest average annual incomes, all of which were over \$40 thousand. The lowest average income was in Tucker County, where average annual income was \$20,514. Hardy, Pocahontas, and Pendleton counties all had average annual incomes below \$27,000.





Source: Author Calculations



12 Metropolitan Area Statistics¹⁵

As Table 20 shows, metropolitan counties attracted the largest numbers of graduates and had higher wages overall than nonmetropolitan counties. Of the graduates employed in the state in 2014, more than 68.5 percent worked in counties that were part of a Metropolitan Statistical Area (MSA), compared with slightly less than 65 percent of all state workers. The MSA with the largest share of graduates, the Charleston MSA, fell to 17.2 percent of graduates from 17.9 percent in last year's report. The Huntington MSA stayed in second place with 14.4 percent of graduates, followed by the Morgantown MSA with 11.3 percent of graduates. Among metropolitan areas, the Winchester MSA had the lowest percentage of graduates at 0.6 percent.

Micropolitan counties accounted for 15.9 percent of all graduate employment in 2014. The Clarksburg micro-SA had the largest share of graduates in this category, with 5.6 percent of all graduates. The next largest micro-SAs were Fairmont and Bluefield, with 4.1 percent and 2.9 percent respectively. Nonmetropolitan areas employed 15.6 percent of graduates.

Average annual income in metropolitan and micropolitan counties were also higher than in nonmetropolitan areas. The average annual incomes in metropolitan and micropolitan areas were both above \$35 thousand, which was about 1,500 more per year than graduates in non-metropolitan counties earned. The wage premium in an average metropolitan area versus a nonmetropolitan area was roughly 4.8 percent.

The Bluefield micro-MSA had the highest average annual income, at \$37,874. Average annual income in the Charleston MSA was next highest at \$37,603, followed by the Clarksburg micro-MSA at \$36,602. The lowest incomes were found in the Elkins micro-SA, at \$30,077, followed by the Cumberland MSA (\$31,602) and the Weirton-Steubenville MSA (\$31,833).

¹⁵ The data in this section reflect the number of jobs in each category, not the number of graduates. See the Appendix for more information.



	Number of	Share of	Average Annual	Share of State
	Graduates	Graduates (%)	Income (\$)	Employment (%)
Metropolitan Areas	31,329	68.5	35,261	64.9
Beckley MSA	2,404	5.3	34,427	6.3
Charleston MSA	7,860	17.2	37,603	15.9
Cumberland MSA	510	1.1	31,602	1.1
Hagerstown-Martinsburg MSA	2,263	5.0	33,018	4.5
Huntington-Ashland MSA	6,576	14.4	36,225	11.8
Morgantown MSA	5,174	11.3	35,660	8.8
Parkersburg-Vienna MSA	1,820	4.0	32,758	5.5
Washington MSA	1,210	2.6	32,375	2.1
Weirton-Steubenville MSA	951	2.1	31,833	2.6
Wheeling MSA	2,307	5.0	32,574	5.7
Winchester MSA	254	0.6	33,857	0.6
Micropolitan Areas	7,261	15.9	35,571	15.4
Bluefield MicroSA	1,344	2.9	37,874	2.8
Clarksburg MicroSA	2,549	5.6	36,602	5.7
Elkins MicroSA	352	0.8	30,077	1.6
Fairmont MicroSA	1,868	4.1	35,100	2.8
Logan MicroSA	741	1.6	33,409	1.5
Point Pleasant MicroSA	407	0.9	32,364	0.8
Nonmetropolitan	7,123	15.6	33,632	16.1
Total	45,713	100.0	35,057	100.0

Table 20: Employment and income by metropolitan area¹⁶

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¹⁶ This table uses the US Census Bureau's Core Based Statistical Area definitions in place in 2014. It includes only the West Virginia portion of each metropolitan or micropolitan statistical area.

13 Appendix: Detailed Description of the Data in this Report

The data analyzed in this study come from the matching of demographic information on graduates from West Virginia public institutions of higher education (compiled by the HEPC) with employment records maintained by Workforce West Virginia.

Education data are gathered from HEPC records of graduates from the state's public higher education institutions. The data reflect graduates' highest degree earned at the time of measurement. Graduation years follow a July to June educational year, meaning that graduates in the last six months of one year are combined with those of the first six months of the next year.

The employment data used are gathered from West Virginia unemployment compensation records. This is a well-known dataset that 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. Additional employment data come from WorkForce West Virginia.

The data in the industry, county, and metropolitan area sections reflect the number of jobs in each category, not the number of graduates. Graduates who work at multiple jobs in different locations will be counted twice. This has the effect of lowering the average annual wage, because the wages are spread across multiple jobs and divided by a larger number of people.

Finally, the county of employment cannot be identified for a 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 further. These graduates are not included in sections of this report that address employment by county or metropolitan area.



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