

*September 2014*

# *Mid-Career Outcomes of Graduates of Virginia Institutions of Higher Education*



**State Council of Higher Education for Virginia**

*Advancing Virginia through Higher Education*

# Mid-Career Outcomes of Graduates of Virginia Institutions of Higher Education

## Summary

---

The State Council of Higher Education for Virginia (SCHEV) has produced new reporting tools of graduate wage outcomes out to twenty years post completion. These reports are available at the statewide level by program discipline (two-digit level of the Classification of Instructional Programs). We find reported wages increase by level of degree and that there is significant variation within degree levels by discipline. Technical and professional disciplines generally show higher wages than disciplines in the liberal arts and humanities.

The range of difference is greatest for graduates of four-year baccalaureate programs. This is not unexpected as these degrees represent the majority of degree awards. The difference in wages earned in 2013 for the graduates of 1992-93 is significant – the median wages of the three disciplines with lowest wages are approximately half the median wages of the three highest. We see a similar pattern with master's degrees.

As common wisdom suggests, bachelor's degrees in the discipline areas of engineering, computer science, and engineering technologies demonstrate the highest earnings over time. Education, English, and visual and performing arts demonstrate the lowest earnings. Associate degrees designed for transfer to four-year colleges lag behind the applied science associate degrees initially, but eventually outperform them in later years.

## Background

---

As a follow up to the 2012 release of post completion wages of graduates, SCHEV staff promised to provide reports of longer-term outcomes, beyond the 18 months and five years post-completion originally published. SCHEV has been collecting student-level data since 1992 from public and private, nonprofit institutions. The Virginia Employment Commission has made available, through Virginia's Longitudinal Data System (VLDS) unemployment insurance wage files going back to 1998 through 2013. The availability of these data enables SCHEV to report on post-completion wage

outcomes of up to 20 years following graduation. Over time, the horizon of these data will extend to encompass a full working life, one generally covering multiple jobs, even multiple careers.

The data in these reports provide an unprecedented view of year-by-year wage outcomes of graduates. Through them, we can observe the variability in earnings, not only by degree level, but by broad categories of programs, specifically the “family” or two-digit level of the Classification of Instructional Programs taxonomy used in the U.S. and Canada.

Our review of the data finds the same conclusions we documented in 2012, as confirming the first three “rules” described in *The College Payoff: Education, Occupations, and Lifetime Earnings* from the Georgetown University Center on Education and the Workforce.

- 1. Degree level matters. But...**
- 2. Occupational choice can trump degree level. People with less education in high-paying occupations can out-earn people with more education in less remunerative occupations. But...**
- 3. While occupation can sometimes trump education, degree level still matters most within individual occupations.**

We see these concepts play out over and over again in these data. However, unlike our reports on graduate wage outcomes at 18 months and five years post-completion, we have made no effort to discount individuals from the analysis of a given degree level who have earned a higher-level or additional degree later.<sup>1</sup> As we considered the issue of “additional education and credentials” writ large, we realized degrees and credit-bearing credentials represented only some unknown fraction of the activity individuals engage in to manage their careers. There are tremendous amounts of continuing education and noncredit activities conducted each year currently unreported in VLDS or through national databases, including the National Student Clearinghouse. Disqualifying one kind of additional education beyond our starting point because we can measure it adds little real value. It is also true that sometimes experience matters more than credentials or formal training. Given the wide range of options available, we are not willing to make the assumption that experience and informal education necessarily matter less than formal credentials.

---

<sup>1</sup> In these early years of collection, we lack student names on which to conduct record matches with the National Student Clearinghouse. From 1992 to 2009, SCHEV student record data collections were based solely on Social Security Number as the identifier and thus we could only exclude some individuals with additional or higher credentials from our analysis.

These reports are not meant to project earnings for new graduates or to place values, specific or comparative, on given credentials. Instead they are meant to describe the trajectory of earnings for past graduates to provide greater understanding of the possible impacts of funding decisions on higher education and education-related student debt. We can combine these data with our existing data on student and graduate debt to create better models of funding and cost. Students, institutional leaders, and state policymakers should all have access to clearly understandable data about the relationship between higher education credentials and the wage outcomes of graduates. There are clear differences in the data between degree levels and broad programs, but these reports demonstrate an increasing range in values between the first and third quartiles of reported wages the further out from graduation that we review the wage outcomes. This variation might be explained by geography and the differences in local economies but may also reflect the differences in individuals beyond education.

The data we will be describing are based on two collections – SCHEV’s student-level collections beginning in the fall of 1992 and the Unemployment Insurance (UI) quarterly wage reports made by employers to the Virginia Employment Commission from 1998 forward.<sup>2</sup>

## Overall Outcomes for the Graduates of 1992-93

---

### Associate’s Degrees

Virginia institutions offer two types of associate degrees, broadly speaking. One is the associate degree (bachelor’s credit) also known as the “transfer degree” which is ostensibly designed to facilitate transfer to a four-year institution. The second is the associate degree (occupational/technical credit) also known as the “applied science”

---

<sup>2</sup> The UI wage files provide only identifying information for each covered individual, the year, the quarter, and the wage earned. As with our 2012 reports, since we lack any indicator of full- or part-time, we have constructed a definition of “full-time wage equivalent” (FTWE), with a matching “part-time wage equivalent” (PTWE). Readers are reminded that there may be a substantial difference in a low-paying job with full-health insurance and other benefits and a higher paying job, particularly one that may be part-time, that has no benefits. We use these wage equivalents to help define what we do not know. In a departure from the 2012 reports because we are working with significantly longer time periods, we have chosen to use a definition of 150% of the poverty level for a single individual as being the minimum standard for an FTWE wage. Since this has an inflation-adjusted value for each year it addresses some of the differential impacts of inflation in terms of the relationship between wages earned and economic well-being.

associated degree. Combined, 9,355 of these degrees were awarded in 1992-93. In our 2012 report we reported noticeable differences in wages between both associate's degrees with the applied science graduates typically seeing higher earnings. Reviewing the data over a longer period of time, we see that the difference in the medians essentially disappears for the two associate degrees. This may be an effect of many of the "transfer degree" earners making the transfer to a four-year institution and completing a bachelor's degree. However, some number of the applied science degree completers, albeit a much smaller percentage of those graduates, continue successfully to the bachelor's degree, while many more achieve professional licensure or other non-academic credential. We also note in the data that the cohort of transfer degree graduates with full-time equivalent wages is typically about two-thirds the size of the applied science degree cohort.

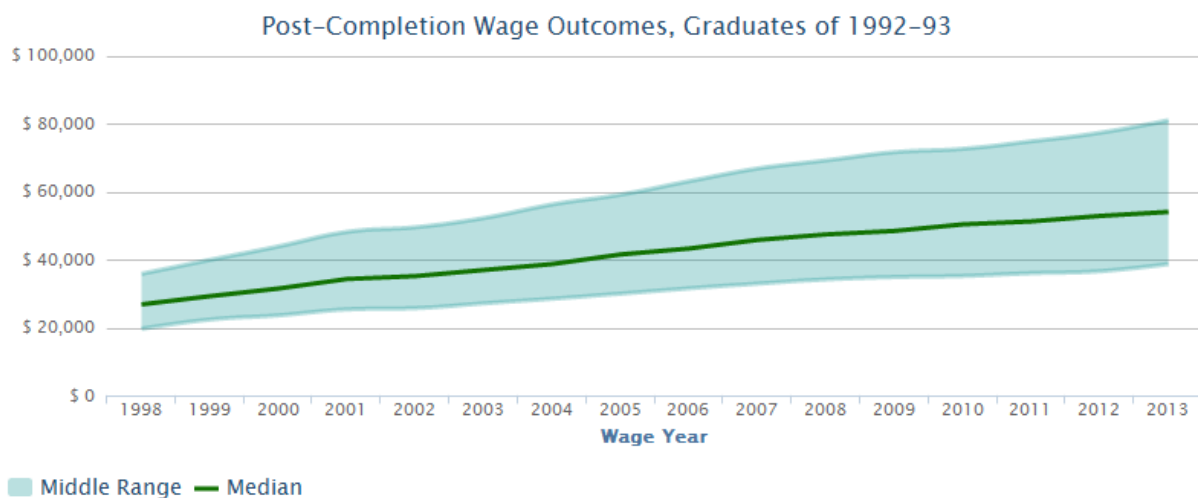
Median wages for those completing the transfer degree in 1992-93 doubled between 1998 (five years post completion) and 2013 from \$26,879 to \$54,122 in non-adjusted dollars. The wages at the first quartile did not increase as much, only by about 96% from \$19,747 to \$38,768 while the earnings of the third quartile increased 126% from \$35,942 to \$81,157. This difference in wage growth explains the growing difference between the first and third quartiles (\$16,195 to \$42,389) suggesting the influences of factors beyond the degree earned, such as completion of a bachelor's degree.

### Graduates of 1992-93

#### Associate's Degree (Bachelor's Credit)

#### All Programs at this Level

The chart below overlays the middle range of earnings (25th to 75th percentile) for the selected 2-Digit Classification of Instructional Program (CIP) Code the same range of earnings for all graduates the specified degree level. Wage values in real dollars. Excludes individuals earning less than 150% of the federal poverty line.



Associate's Degree (Bachelor's Credit) Degrees, Graduates of 1992-93						
WAGEYEAR	FT Wages (N)	25th percentile	Median	75th percentile	Middle Range	% Grads FTWE
1998	2,138	\$19,747	\$26,879	\$35,942	\$16,195	48%
1999	2,201	\$22,452	\$29,305	\$40,023	\$17,571	50%
2000	2,249	\$23,668	\$31,570	\$44,002	\$20,334	51%
2001	2,224	\$25,425	\$34,386	\$48,285	\$22,860	50%
2002	2,149	\$25,783	\$35,246	\$49,687	\$23,904	49%
2003	2,081	\$27,192	\$37,023	\$52,381	\$25,189	47%
2004	2,087	\$28,578	\$38,764	\$56,397	\$27,819	47%
2005	2,065	\$30,067	\$41,600	\$59,261	\$29,194	47%
2006	2,027	\$31,642	\$43,382	\$63,256	\$31,614	46%
2007	2,013	\$33,019	\$45,883	\$66,962	\$33,943	46%
2008	1,987	\$34,238	\$47,521	\$69,364	\$35,126	45%
2009	1,923	\$34,938	\$48,565	\$71,794	\$36,856	43%
2010	1,898	\$35,284	\$50,513	\$72,778	\$37,494	43%
2011	1,856	\$36,063	\$51,352	\$75,003	\$38,941	42%
2012	1,812	\$36,645	\$52,954	\$77,502	\$40,857	41%
2013	1,808	\$38,768	\$54,122	\$81,157	\$42,389	41%

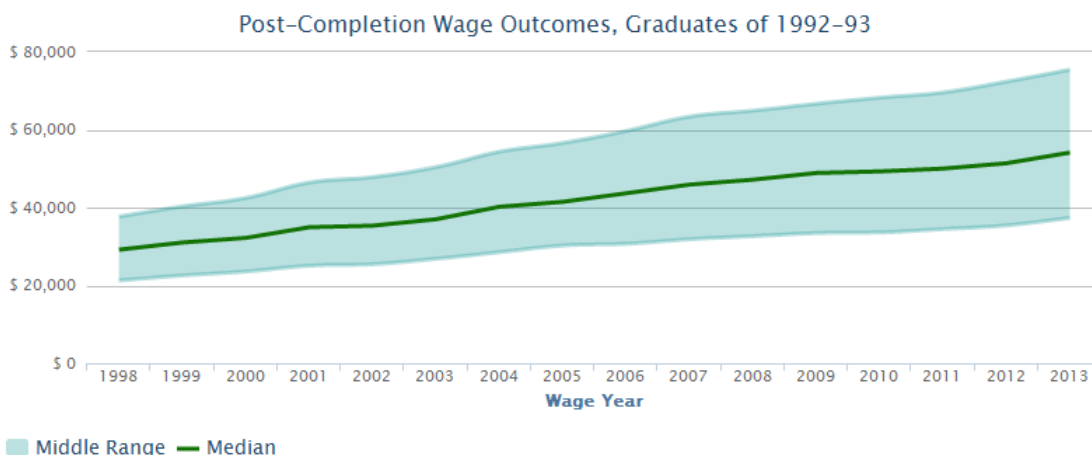
We see a similar pattern with the applied science associate, but with muted outcomes, despite the fact that graduates with these degrees start off at year five with a higher median wage - \$29,224 compared to \$26,879. The median earnings increased only 85% from 1998 through 2013, from \$29,224 to \$54,179. The increase for the first quartile was 76% from \$21,290 to \$37,408 with the third quartile showing a 100% increase from \$37,773 to \$75,511. The spread between the first and third quartiles (\$16,483 to \$38,103) also increased less dramatically.

### Graduates of 1992-93

#### Associate's Degree (Occ/Tech Credit)

#### All Programs at this Level

The chart below overlays the middle range of earnings (25th to 75th percentile) for the selected 2-Digit Classification of Instructional Program (CIP) Code the same range of earnings for all graduates the specified degree level. Wage values in real dollars. Excludes individuals earning less than 150% of the federal poverty line.



Associate's Degree (Occupational/Technical Credit) Degrees, Graduates of 1992-93						
WAGEYEAR	FT Wages (N)	25th percentile	Median	75th percentile	Middle Range	% Grads FTWE
1998	3,392	\$21,290	\$29,224	\$37,773	\$16,483	58%
1999	3,462	\$22,583	\$31,081	\$40,366	\$17,783	59%
2000	3,450	\$23,600	\$32,252	\$42,516	\$18,916	59%
2001	3,386	\$25,099	\$34,998	\$46,479	\$21,380	58%
2002	3,302	\$25,480	\$35,394	\$47,887	\$22,407	56%
2003	3,235	\$26,875	\$37,054	\$50,458	\$23,583	55%
2004	3,209	\$28,591	\$40,270	\$54,401	\$25,810	55%
2005	3,155	\$30,281	\$41,528	\$56,667	\$26,386	54%
2006	3,145	\$30,737	\$43,697	\$59,762	\$29,025	54%
2007	3,051	\$31,891	\$45,944	\$63,438	\$31,547	52%
2008	3,001	\$32,673	\$47,195	\$64,978	\$32,305	51%
2009	2,913	\$33,463	\$48,938	\$66,744	\$33,281	50%
2010	2,837	\$33,648	\$49,336	\$68,303	\$34,655	48%
2011	2,800	\$34,512	\$50,040	\$69,666	\$35,155	48%
2012	2,737	\$35,455	\$51,408	\$72,429	\$36,974	47%
2013	2,671	\$37,408	\$54,179	\$75,511	\$38,103	46%

In the case of both degrees, we note that the percentage of FTWE graduates decreases over time. It is also true that the percentage of PTWE graduates decreases over time. This likely indicates some amount of mobility in the workforce as well as movement into (perhaps in and out of) jobs covered by unemployment insurance. In addition, to a lesser degree, mortality is a factor, as is unemployment or opting out of the workforce altogether. We see similar patterns with all levels of degrees.

It is when we look at the two-digit CIP code level, or “broad program,” that we begin to understand some of the variance. For example, in CIP Family 15 “Engineering technologies,” we see a higher median wage in 2013 of \$62,523 and higher wages at each quartile - \$44,366 at the first and \$84,685 at the third quartile. Similarly, in CIP 51, “Health professions,” we see a higher median wage of \$62,690 and first and third quartiles at \$46,326 and \$77,248, respectfully. Perhaps surprisingly, since this does not appear to be a technical field, we see that CIP 52 “Business, management, marketing,” which accounts for about a third of wage-reported graduates, the median wage in 2013 was \$43,378 with the middle half of graduates earning between \$31,619 and \$65,118 in 2013.

## Bachelor’s Degrees

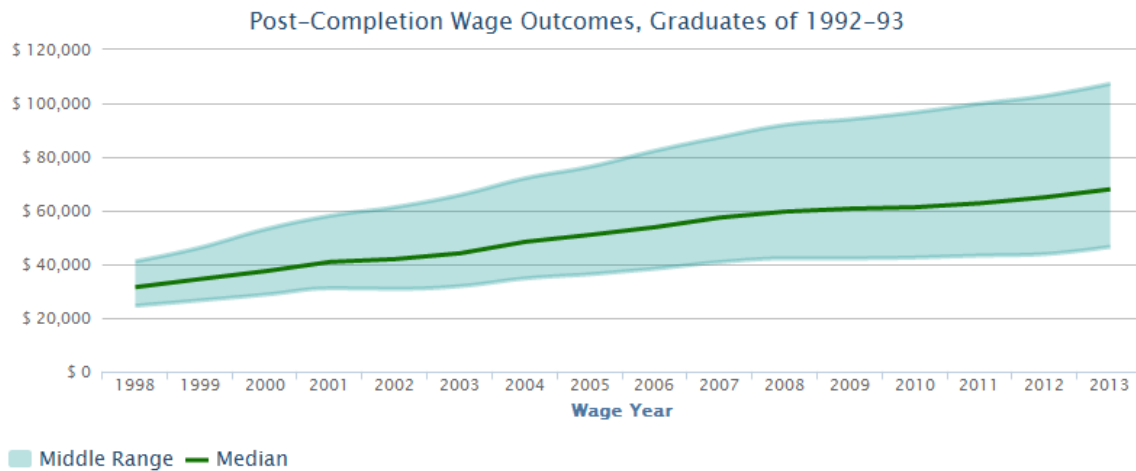
When it comes to bachelor’s degrees, we see a broader range of outcomes. In 1992-93, Virginia institutions awarded 30,866 bachelor’s degrees. These four-year degree completers experienced a doubling (106% increase) of the median wage between 1998

and 2013 from \$31,543 to \$68,036. The 25th percentile wage increased by 89% from \$24,621 to \$46,602 and there was a 160% increase in wages at the 75th percentile from \$41,250 to \$107,406. Further, the range between the 25th percentile and 75th percentile has increased well over three times from \$16,629 to \$60,804. When graphed out, it is easy to see the greater dispersion in earnings the further out from the completion the data go. This is explained, as above, by differential impacts of acquiring additional credentials, both formal and informal, gaining experience, and individual talent.

#### Four-Year Bachelor's Degree

##### All Programs at this Level

The chart below overlays the middle range of earnings (25th to 75th percentile) for the selected 2-Digit Classification of Instructional Program (CIP) Code the same range of earnings for all graduates the specified degree level. Wage values in real dollars. Excludes individuals earning less than 150% of the federal poverty line.



Four-Year Bachelor's Degree Degrees, Graduates of 1992-93						
WAGEYEAR	FT Wages (N)	25th percentile	Median	75th percentile	Middle Range	% Grads FTWE
1998	11,999	\$24,621	\$31,543	\$41,250	\$16,629	39%
1999	12,300	\$26,667	\$34,578	\$46,358	\$19,691	40%
2000	12,111	\$28,743	\$37,528	\$53,200	\$24,457	40%
2001	11,783	\$31,115	\$40,980	\$58,215	\$27,100	38%
2002	11,288	\$30,917	\$42,076	\$61,454	\$30,537	37%
2003	11,004	\$31,926	\$44,194	\$66,025	\$34,100	36%
2004	10,879	\$34,796	\$48,500	\$72,225	\$37,429	36%
2005	10,738	\$36,400	\$51,091	\$76,550	\$40,150	35%
2006	10,630	\$38,456	\$53,963	\$82,475	\$44,019	35%
2007	10,441	\$40,933	\$57,502	\$87,533	\$46,600	34%
2008	10,299	\$42,250	\$59,732	\$92,082	\$49,832	34%
2009	10,112	\$42,261	\$60,801	\$94,176	\$51,916	33%
2010	10,001	\$42,603	\$61,333	\$96,773	\$54,170	33%
2011	10,001	\$43,320	\$62,861	\$100,000	\$56,680	33%
2012	9,908	\$43,890	\$65,087	\$102,939	\$59,049	32%
2013	9,865	\$46,602	\$68,036	\$107,406	\$60,804	32%



If we make a straight comparison of the median wages for the applied science associate degree to that of the bachelor's degree, we can see the changes in relative wages. There were greater increases in the top-end earnings of the middle half of bachelor degree completers than the comparable group of associate degree completers. Third quartile earnings have increased at a significantly greater rate. Given that a bachelor's degree is a necessary step to a master's, doctor's, or first professional degree, it is not surprising to see this increase in actual earnings.

We overlaid the earnings of the bachelor's degree on those of the applied science associate with the range of earnings of the middle half of graduates of the two degrees. We found that most of the associate completers have earnings in common with bachelor's completers. In fact, a noticeable fraction (10-15%) of the associate degree completers has earnings greater than the median of the bachelor's degree completers. These data reinforce our findings in 2012 regarding the value of certain associate degrees.

At the two-digit CIP Code level, as one would expect, we see a range of outcomes. There are few, if any, surprises. For all four-year bachelor's degrees, there was a 116% increase in the median wages between 1998 and 2013. The lowest percentage increase was 76% for Family and consumer sciences (CIP 19), 77% for Parks, recreation, leisure, and fitness studies (31), and 79% for Education (CIP 13). The largest increases in median wages over the same period was 123% for Biological and biomedical sciences (CIP 26), 132% Engineering (CIP 14), and 157% Physical sciences (CIP 40).

The three program areas with the lowest median wages in 2013 are:

Family and consumer sciences/human sciences (CIP 19)	\$47,784
Visual and performing arts (CIP 50)	\$51,414
Education (13)	\$52,615

The three program areas with the highest median wages in 2013 are:

Engineering technologies (CIP 15)	\$102,404
Computer and information sciences and support services (CIP 11)	\$113,844
Engineering (CIP 14)	\$120,515

We find that, in most cases, as the median wage increases, so does the magnitude of the difference between the first and third quartiles of wages. For example, for Family and consumer sciences/human sciences (CIP19), this difference is only \$32,709 compared to \$74,099 for Engineering (CIP 14). This indicates that a specific outcome

for a given major is not guaranteed, only that there tends to be a greater potential of a higher wage for some majors.

The five program areas with the largest number of bachelor's graduates in 1992-93, representing 17,692 (58%) graduates were:

	Number of Graduates	Median Wages 2013
Business, management, marketing, and related support services (CIP 52)	6,119	\$77,830
Social sciences (CIP 45)	5,321	\$70,600
English language and literature/letters (CIP 23)	2,230	\$60,566
Psychology (CIP 42)	2,484	\$55,878
Engineering (CIP 14)	1,538	\$120,515

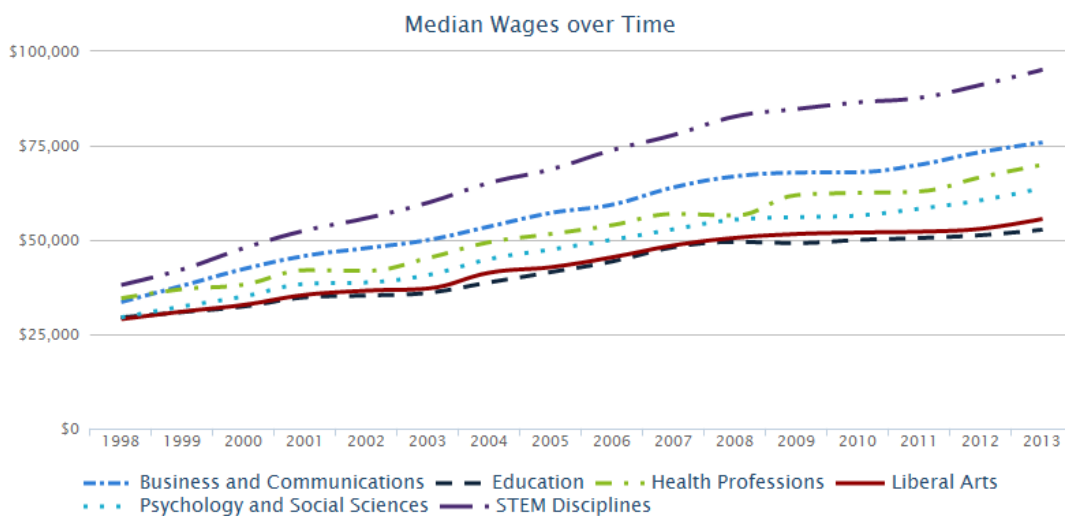
In the next chart, we group the various CIP codes (see Appendix) into broad categories and compare median wages over time. As can be seen, the STEM categories outperform all others, followed by business and communications, health professions, psychology and the social sciences, liberal arts, and education.

### Grand Total, All reporting Institutions

Graduates of 1992-93

Four-Year Bachelor's Degree

The chart below provides the trend of earnings at median for six groupings of disciplines for all graduates the specified degree level. Wage values in real dollars. Excludes individuals earning less than 150% of the federal poverty line.



## Master's Degrees

Virginia institutions graduated 9,240 degrees at this level in 1992-93. At the master's degrees level, we see a range of outcomes that do not appear to be radically different from the bachelor's level. First, the master's degree completers experienced an 86% increase of the median wage between 1998 and 2013 from \$39,130 to \$72,946. The 25th percentile wage increased by 70% from \$30,974 to \$52,656 and there was a 112% increase in wages at the 75th percentile from \$44,460 to \$115,213. Over this time period, the difference between the first and third quartiles of wages increased from \$23,486 to \$62,557, or by 166%.

We have 13 program areas meeting disclosure standards at the master's level.

The three program areas with the lowest median wages in 2013 are:

English language and literature/letters (23)	\$53,795
Education (13)	\$59,881
Visual and performing arts (50)	\$61,365

The three program areas with the highest median wages in 2013 are:

Business, management, marketing, and related support services (52)	\$113,539
Computer and information sciences and support services (CIP 11)	\$132,779
Engineering (CIP 14)	\$142,703

## Doctor's Degrees

In 1992-93, Virginia institutions produced 1,003 doctor's degrees. Of these, only 22% had reportable full-time equivalent wages in 1998, and this decreased to 16% in 2013. Very few program areas have reportable wages given our disclosure rules and these data indicate a significant amount of mobility in and out of the analysis pool. In 1998, the median wage for this degree level was \$49,734 increasing by 75% to \$86,922 in 2013. The first quartile wages demonstrated an 82% increase from \$36,556 to \$66,450. Third quartile wages increased from \$64,239 to \$125,386, a 95% increase.

## First Professional Degrees – Health and Legal Professions

It is with these degree programs we see the largest increases, representing about one-third of the 1,800 graduates in 1992-93.

In health professions, primarily Doctors of Medicine (MD)s, we observe a 256% increase in the median wage from \$55,515 in 1998 to \$197,638 in 2013. Wages at the

first quartile increased 182% from \$35,443 to \$100,000. Wages at the third quartile increased 235% from \$97,862 to \$327,790.

For legal professions graduates, primarily law degrees (JDs), there was a 109% increase at the median from \$48,620 in 1998 to \$113,008 in 2013. Wages at the first quartile increased 115% from \$35,031 to \$75,263. Wages at the third quartile increased 217% from \$66,179 to \$210,106.

## Concluding Thoughts

---

We see a clear pattern that higher levels of educational attainment in terms of academic degrees leads to higher earnings.

Degrees in technical fields tend to provide the highest wages. They also tend to have a broader range of earnings across the middle half of graduates with reported wages. Despite this broader range of earnings, the lowest quartile of wages may exceed the median wages for all programs at the level. Computer and information sciences is a good example of this effect for bachelor's degrees. Conversely, third quartile wages of the graduates in visual and performing arts barely exceed the median wages for all programs at the bachelor's level.

In considering the data presented, it is worth a review of a basic set of income numbers for families and households in Virginia. The source of these data is the American Community Survey (ACS) from the US Census and reflects all families and households (the collection of people who occupy a housing unit, regardless of relationship status), all levels of educational attainment, and all levels of work experience. Our thought is that absent a standard of what a graduate at a specific level *should* earn, we should review these data in the context of being part of a family or household.

Thus, consider that the median *family* income in Virginia is roughly \$75-77,000 per year (about \$64,000 for households), and the presented wage outcomes are for a single individual. Also, readers are reminded that Northern Virginia wages heavily influence that state median wage and the median family income is significantly less in other regions of the Commonwealth. In this context, there seems to be a clear advantage for most individuals with the credentials we have reviewed.

The Mid-Career Wage Reports can be found with the rest of Post-Completion Wage Reports at [Research.schev.edu](http://research.schev.edu). There are three reports allowing different explorations of the data with this release that can be found at:

<http://research.schev.edu/apps/info/Reports.Guide-to-the-Mid-Career-Wages-Reports.ashx>

Users can also download an MS Excel workbook with the complete public dataset for their own use.



## **Appendix**

### **Classification of Instructional Programs (CIP)**

#### **BUSINESS AND COMMUNICATIONS**

Business, management, marketing, and related support services (52)  
Communication, Journalism, and related programs (09)  
Communications Technologies/Technicians and support services (10)

#### **EDUCATION**

Basic skills and developmental/remedial education (32)  
Citizenship activities (33)  
Education (13)  
Health-related knowledge and skills (34)  
Interpersonal and social skills (35)  
Parks, recreation, leisure, and fitness studies (31)

#### **HEALTH PROFESSIONS**

Health professions and related programs (51)

#### **LIBERAL ARTS**

Area, Ethnic, Cultural, Gender, and Group studies (05)  
English language and literature/letters (23)  
Family and consumer sciences/human sciences (19)  
Foreign languages, literatures, and linguistics (16)  
Leisure and recreational activities (36)  
Liberal arts and sciences, general studies and humanities (24)  
Library science (25)  
Multi/interdisciplinary studies (30)  
Philosophy and religious studies (38)  
Theology and religious vocations (39)  
Visual and performing arts (50)

#### **PSYCHOLOGY AND SOCIAL SCIENCES**

History (54)  
Homeland security, law enforcement, firefighting and related protective services (43)  
Psychology (42)  
Public administration and social service professions (44)  
Social sciences (45)

#### **STEM**

Agriculture, Agriculture Operations, and related sciences (01)  
Architecture and related services (04)  
Biological and biomedical sciences (26)  
Computer and Information Sciences and Support services (11)  
Construction trades (46)  
Engineering (14)  
Engineering technologies and engineering-related fields (15)  
Mathematics and statistics (27)  
Mechanic and repair technologies/technicians (47)  
Natural Resources and Conservation (03)  
Physical sciences (40)  
Precision production (48)  
Science technologies/technicians (41)  
Transportation and materials moving (49)