

DEGREES OF VALUE

Differences in the Wages
of Graduates From Virginia's
Colleges and Universities

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Introduction

As student debt piles up, as media stories proliferate about college graduates failing to launch good careers and satisfying lives, and as college costs continue to escalate faster than inflation or wage increases, concern about the value of a college degree has grown. In this atmosphere, it is easy to lose sight of the fact that a college education is an investment in human capital that leads, on average, to significantly higher earnings over the course of a person's work life.

The key phrase in the last sentence is *on average*—because the data in this report show wide variation in the payoff of a college education across different fields of study and among students completing different postsecondary credentials. Graduates of some programs have a much higher chance of attaining high earnings than graduates of other programs. Variation also exists across institutions, although program of study is often more important than the college or university attended. The goals of the detailed information in this report and on the accompanying website are to help students make better informed decisions about carving out the best path through their postsecondary education, to aid them in wisely choosing their majors, and to guide them in figuring out how much money to borrow to help pay for their education.

This report builds on work that the State Council of Higher Education for Virginia (SCHEV) has pursued since 2005 to create the legal, political, and technical environment to make the use of these data possible. This report is made possible by SCHEV's willingness to share its data treasure trove with College Measures, allowing us to make publicly available and easily accessible information on the wages of recent graduates of programs across the Commonwealth of Virginia. With the support of the Lumina Foundation and USA Funds, College Measures is working with SCHEV and similar agencies in other states to make data about the wages of graduates of higher education programs public.¹ It is important to note that the wages² earned by graduates of any higher education program or institution is not the only measure of how well a program or institution is performing. Given the differences among students who attend different colleges and universities, wages may be as reflective of the abilities and skills of the individuals who enroll in different programs and institutions as they are of program performance. We know, too, that individual student success reflects a variety of factors that may not be affected by students' educational experience, such as the strength of the local and national job market.

The data in this report result from merging (a) student-level information about where and when someone graduated with (b) Unemployment Insurance (UI) wage data that SCHEV obtained from the Virginia Department of Labor. Note that because these wage data are limited to workers within

1 See <http://www.collegemeasures.org> for data on other states.

2 In this report, we are using the term *wages* to cover the data reported by the state's unemployment insurance (UI) records system. Virginia's Employment Commission, which is in charge of the Commonwealth's UI system, frequently uses the term *wages*. See <http://www.vec.virginia.gov/unemployed/benefits-information/benefits-eligibility>.

the state,³ the wages of graduates who work outside Virginia do not appear in the UI data. Thus, the data represent a somewhat limited picture of the total contribution that colleges make to the success of all their graduates. From the perspective of an individual state, however, this limitation is less severe than it may seem. For example, by measuring the percentage of graduates who remain in the state to work after they have graduated, the state can ascertain the degree to which campuses and programs are contributing to the stock of human capital within the state.

With these limitations in mind, the data in this report show that wages of graduates vary considerably across programs and across institutions in Virginia. Because students study a specific subject at a specific college, the detailed information that we report matters. Students who graduate with, for example, a psychology degree from one campus may earn substantially more than students who graduate with a psychology degree from another. And a graduate with a psychology degree may earn more (or less) than a graduate from a mathematics program at the same university. Again, these detailed data are designed to help students understand the financial consequences that may arise from their choices among schools and programs and to help them make better informed decisions.

**This report presents just a few of the highlights that are available at:
<http://va.edpays.org/>**

3 The wage data included here represent only the following: (1) graduates successfully matched to the Unemployment Insurance (UI) wage records collected by the Virginia Employment Commission (VEC) and (2) graduates employed in Virginia by an entity that reports to the VEC. This excludes federal employees, including those within the Department of Defense. Also excluded are individuals hired as independent contractors, aquaculture employees, and other types of nonwage employees. There have been some new attempts to transcend state boundaries by allowing states to track students who earned a degree in one state but work in another. The Wage Record Interchange System (WRIS 2) is perhaps the most ambitious, with more than half of the states agreeing to share their UI data with one another. (See <http://www.doleta.gov/performance/wris2.cfm>.) Currently, however, most data are available only on a state-by-state basis.

Sub-Baccalaureate Awards

Table 1 shows the changing landscape in the types of postsecondary credentials being awarded in Virginia. The most common undergraduate degree in Virginia, as in the nation as a whole, is the bachelor's degree. In terms of numbers, however, the gap between the bachelor's degree and sub-baccalaureate credentials (certificates and associate's degrees) is narrowing. For example, between 2005 and 2014, the number of bachelor's degrees awarded in Virginia grew by 54 percent. Nevertheless, the number of associate's degrees granted rose by 74 percent, and the number of certificates rose even more. Adding together certificates and associate's degrees, Table 1 shows that the number of sub-baccalaureate credentials nearly doubled, far outstripping the growth in the number of bachelor's degrees awarded. The growth in sub-baccalaureate credentials is due in part to the fact that many can lead to good-paying jobs, and earning them can be faster and less costly than pursuing a bachelors' degree.

In the next few pages, we examine some of the wage outcomes that graduates of different certificate and associate's degree programs have experienced. We then turn to data on the wages of bachelor's program graduates.

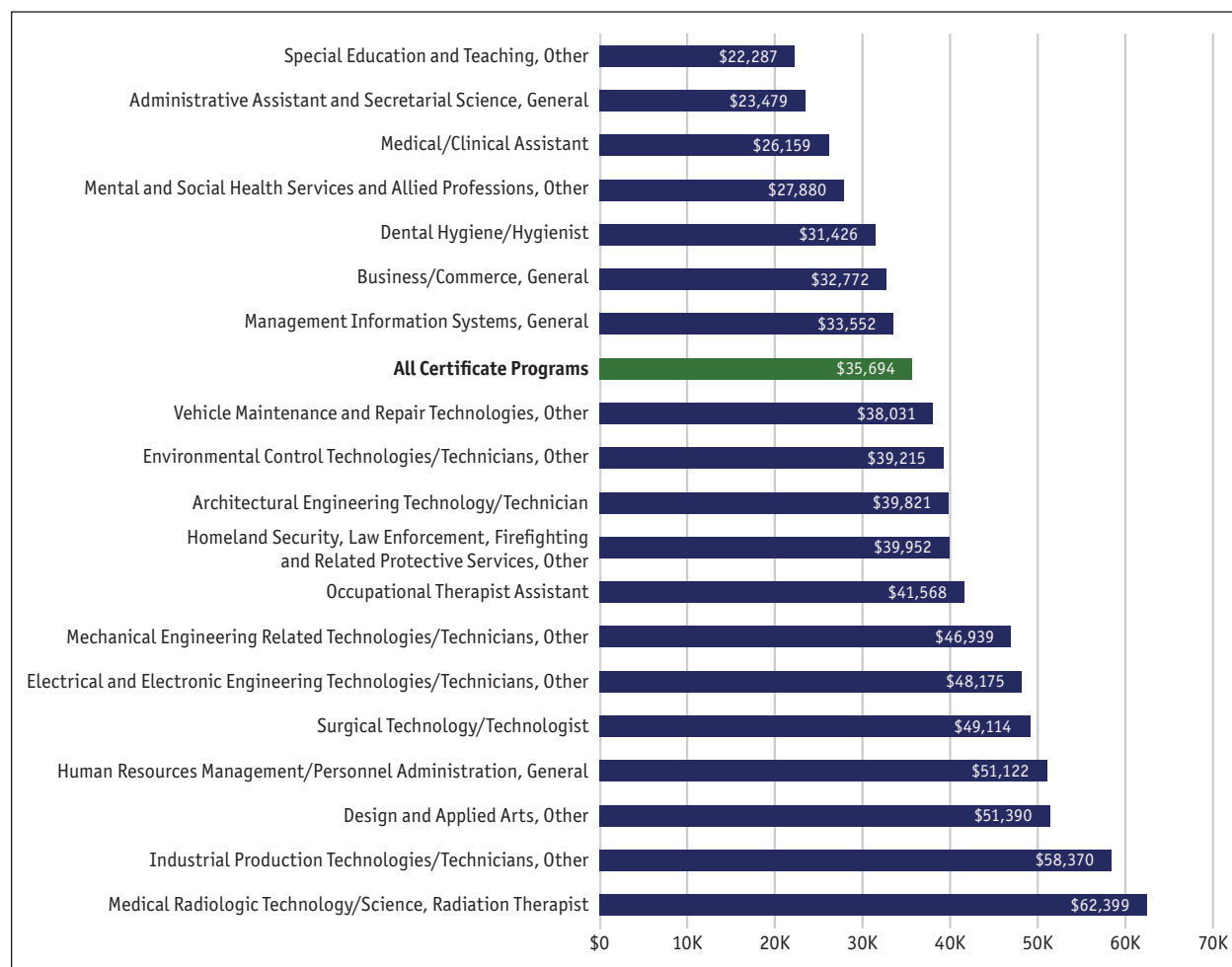
Table 1: Growth in the Number of Postsecondary Credentials Awarded

	Associate's Degree	Certificates of Less Than 1 Year	Certificates of 1 But Less Than 2 Years	Sub-Baccalaureate Credentials	Bachelor's Degree
2005	13,916	2,739	2,807	19,462	36,167
2014	24,224	5,963	8,478	38,665	55,794
Change	+74%	+118%	+202%	+99%	+54%

Wages of Completers of Certificates

Figure 1 shows median wages for some of the largest certificate programs⁴ in Virginia. The median wage for all completers of certificates is around \$36,000.⁵ This figure doesn't tell the whole story, however. The range is substantial, from less than \$25,000 (Special Education; Administrative Assistant) to around \$60,000 (Industrial Production Technologies/Technician; Radiation Therapist). Note that many of the highest paying certificates are in the health professions or have *technology/technician* in their classification. This pattern is not unique to Virginia: Students who can fix things or keep people healthy tend to fare best in the job market.

Figure 1: Median Wages at Year 8 Among Completers of Certificates



4 All of these certificates require more than 1 but less than 2 years to complete. Data for shorter term certificates are available at <http://va.edpays.org/>

5 According to the American Community Survey, per capita income in Virginia was \$34,052 in 2014.

Wages of Graduates of Associate's Degree Programs

According to the American Association of Community Colleges, some 45 percent of undergraduate students in the nation attend community colleges—and these institutions grant the majority of the nation's associate's degrees.⁶ As Table 1 shows, more than 24,000 associate's degrees were awarded in the Commonwealth in 2014, up from less than 14,000 in 2005.

Students enroll in community colleges to pursue a variety of goals: learning specific skills to obtain an industry-recognized certificate, taking a few courses to improve professional credentials, completing remedial courses to prepare for further postsecondary education, taking courses to prepare for transfer to a four-year college or university, or pursuing an associate's degree.

Because of the different goals of associate's degree programs, Virginia separates these programs into two distinct classifications: *career/technical-oriented programs* and *bachelor's credit programs*. A terminal associate's degree is not the ultimate goal for many associate's degree students. In fact, many of these students pursue bachelor's credits that will help them to obtain a four-year degree later. Nonetheless, the graduates whose information is recorded in our database are currently in the workforce, and it is important to identify the relationship between their associate's degrees and their wages.

Students who are pursuing bachelor's credit associate's degrees concentrate in a small number of fields: Business Administration and Management; General Studies; Liberal Arts and Sciences/Liberal Studies (the largest concentration); and Social Sciences. The most popular fields of study among students pursuing occupational/technical associate's degrees include Registered Nursing/Registered Nurse (the largest program); Business Administration, Management and Operations; Criminal Justice/Law Enforcement Administration; and Computer and Information Sciences.

Figure 2 illustrates the first-year wages for the most recent graduates and Year 8 wages for earlier graduates, arranged by associate's degree program. (Programs that are classified as bachelor's credit programs are marked with an asterisk.) Regardless of program track, all of these graduates are in the job market.

First, note the large range between the programs with the lowest and highest paid graduates. At the low end, graduates of Mental and Social Health Services and Visual and Performing Arts programs earn around \$30,000 in annual wages. At the high end, graduates of Emergency Medical Technology/Technician (EMT Paramedic) programs earn, on average, more than \$67,000, whereas graduates with associate's degrees in Computer and Information Sciences earn an average of close to \$75,000.

Note that in Year 1, there is a gap of almost \$10,000 in favor of graduates with occupational/technical associate's degrees. But by Year 8, the gap shrinks to less than \$1,000 but still favors occupational/technical graduates. The shrinking gap is driven by low growth rates in wages within

⁶ http://www.aacc.nche.edu/AboutCC/Documents/Facts14_Data_R3.pdf

fields such as Mechanical Engineering Technologies or Dental Hygienist (both of which have high wages but not much upward growth), compared to much higher growth rates in, for example, the Liberal Arts and Sciences bachelor's credit program (a low-paying field) or the even faster growth rate for Computer and Information bachelor's credit graduates. Even given differences in growth rates, there is still a great degree of stability in the relative position of majors along the wage continuum: For most programs in which wages are low in Year 1, graduates are still earning low wages in Year 8. These programs include Mental and Social Health Services and Allied Professions; Visual and Performing Arts; Social Sciences; and Liberal Arts and Sciences/Liberal Studies. At the opposite end of the spectrum, many high-paying fields in Year 1, including Industrial Production Technologies/Technicians and Emergency Medical Technology/Technician (EMT Paramedic), are still at the top of the distribution in Year 8.

Figure 3 offers yet another window into the relative wages of graduates with occupational/technical associate's degrees versus those of bachelor's credit programs: This figure compares the Year 8 wages of graduates from the two different tracks within the *same* community college. One advantage of comparing graduates from the same school is that regional differences in the strength of the local job market or in costs of living are taken into account.

Across all seven selected colleges in Figure 3, graduates with occupational/technical associate's degrees earn more than their peers who graduate with bachelor's credit associate's degrees. The average difference in favor of the occupational/technical degrees is more than \$5,700, with a range of around \$1,800 (Thomas Nelson Community College) to more than \$10,000 (Lord Fairfax and John Tyler Community Colleges).

Figure 2: Median Wages at Years 1 and 8 Among Graduates of Large Associate’s Degree Programs

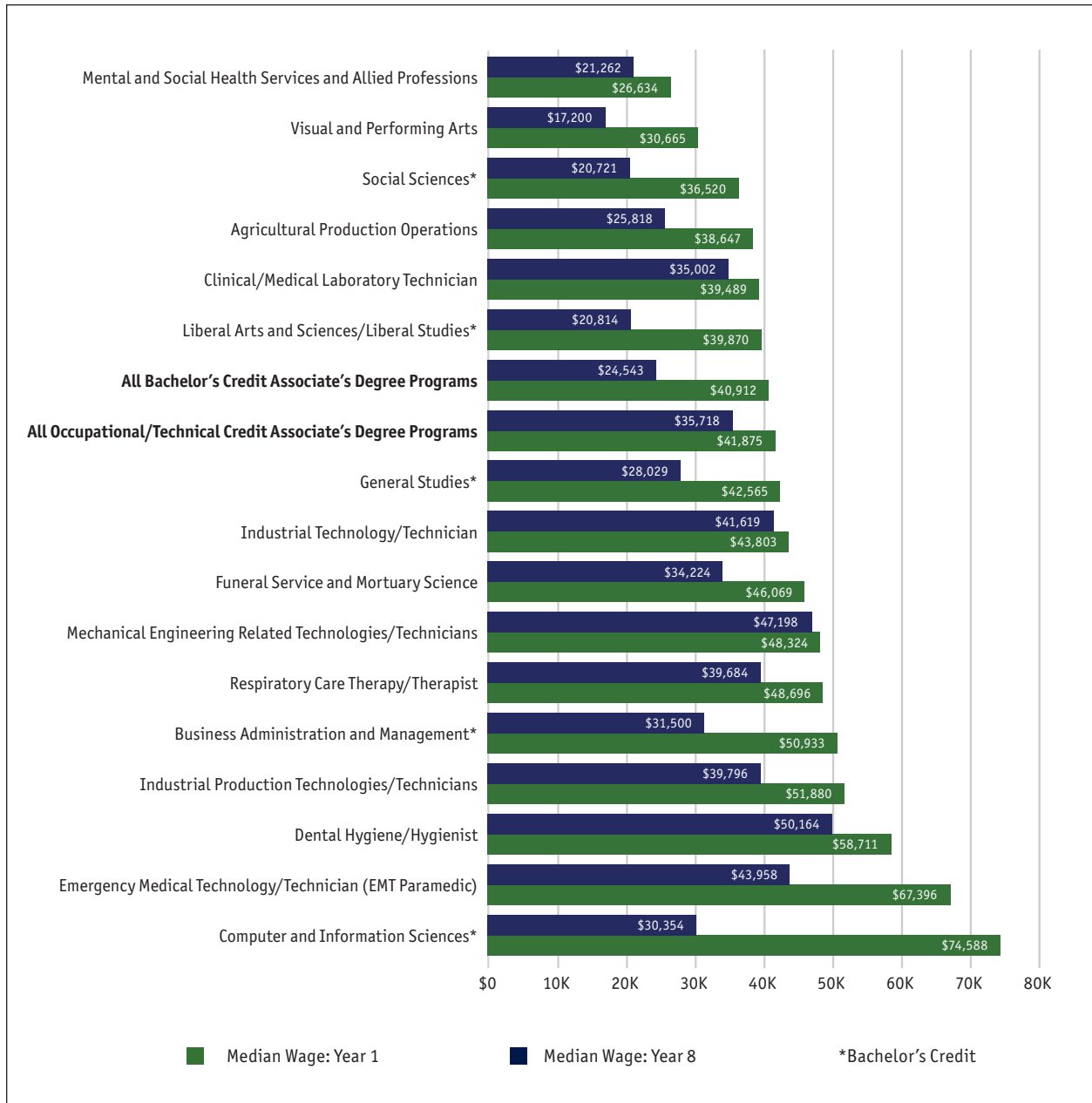
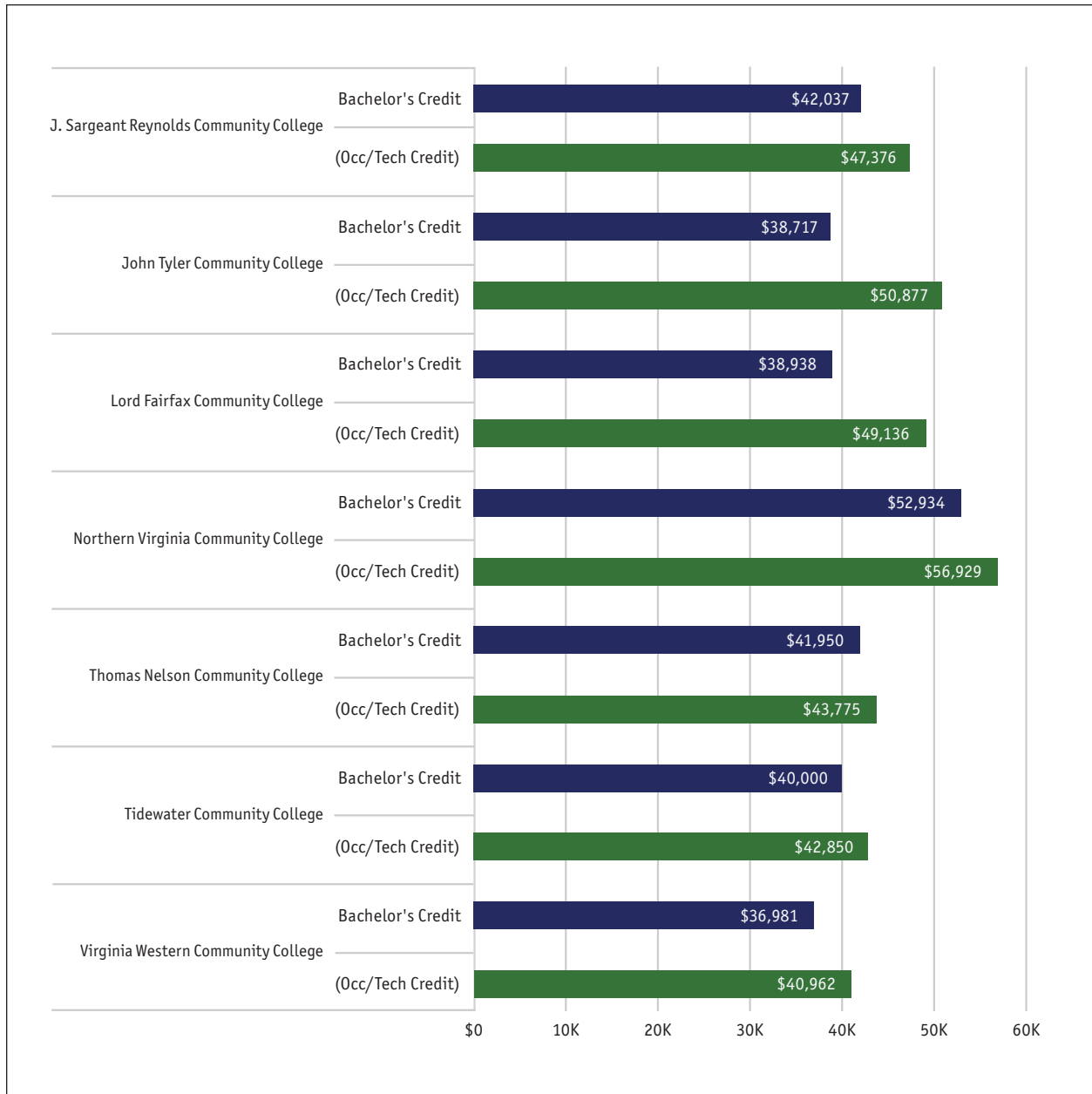


Figure 3: Median Wages at Year 8 Among Graduates With Occupational/Technical and Bachelor's Credit Associate's Degrees, by Selected Institutions



Wages of Graduates of Bachelor's Degree Programs

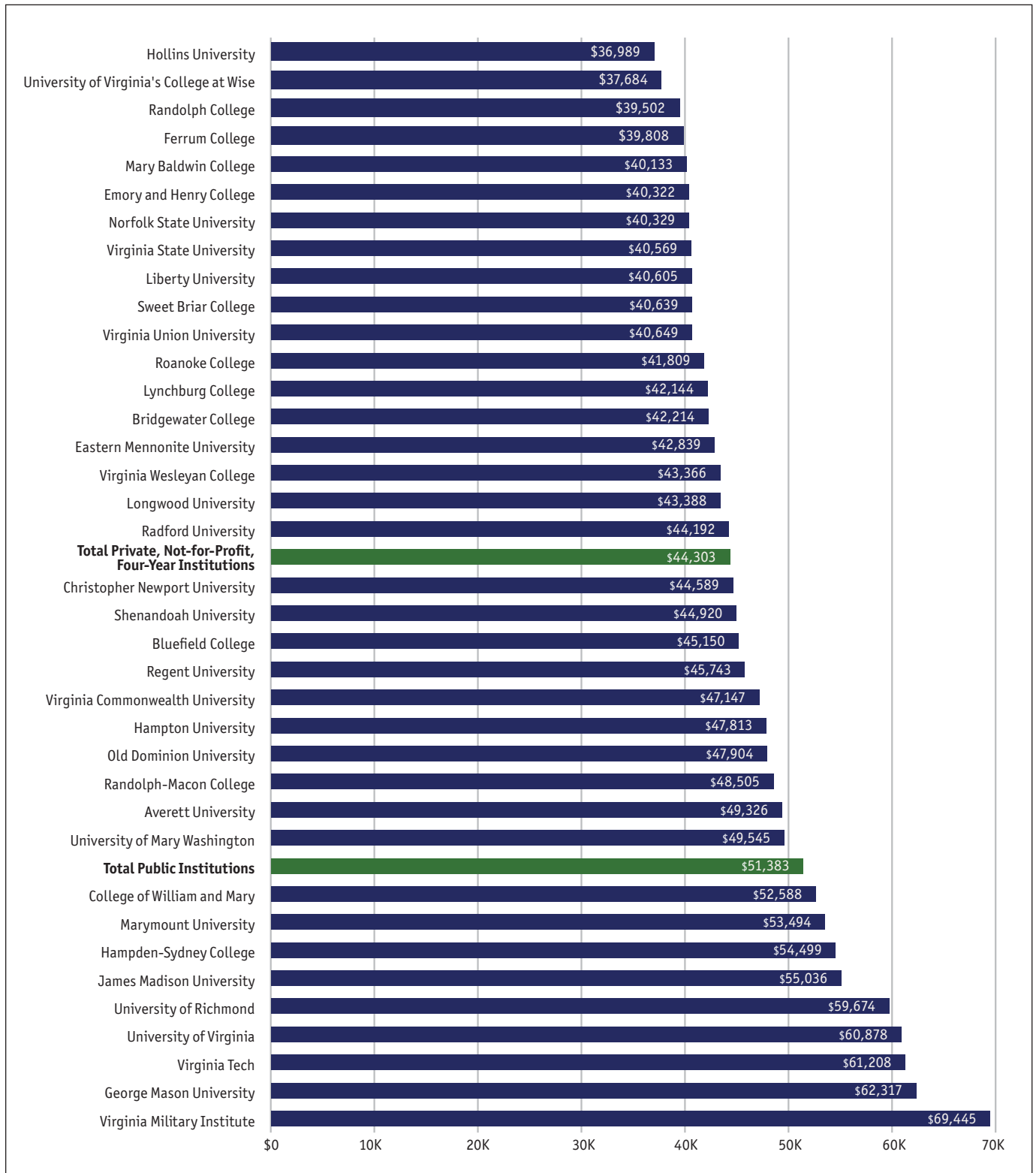
Recall from Table 1 that the bachelor's degree is the most common postsecondary credential awarded in Virginia. This degree is awarded by many public, private not-for-profit, and proprietary institutions. Although many states have data on graduates of public institutions, very few have data on the private colleges and universities that operate within their borders. Virginia is unique in the extent to which it tracks and publicizes data from its not-for-profit colleges.⁷ According to recent federal statistics, there are 15 public four-year institutions in Virginia and one quasi-public medical school, with a collective enrollment of more than 220,000 students. There are many more private colleges in Virginia (62), but with a combined enrollment of around 175,000 students, they are, on average, smaller than public institutions. Not all the private colleges are represented in the SCHEV database, but about half of them are—those regionally accredited, not-for-profit institutions that participate in the Tuition Assistance Grant Program for Virginia residents.

Figure 4 illustrates the median Year 8 wages for graduates of more than 30 four-year institutions in Virginia. Note that, on average, the median wage of graduates of the state's public institutions is more than \$7,000 higher than the median Year 8 wage of graduates of the state's private institutions.

The range in median wages is substantial, from less than \$40,000 (Hollins, University of Virginia College at Wise, Randolph and Ferrum Colleges) to more than \$60,000 (University of Virginia, Virginia Tech, George Mason University, and Virginia Military Institute). Note also that all of the schools with highly paid graduates are public institutions. In contrast, many of the institutions whose graduates have the lowest wages are private schools. For example, seven of the 10 institutions whose graduates have the lowest wages are private, not-for-profit institutions. Some of these private schools have very low rates of matching student data with state wage data (Liberty University's match rate, at 16 percent, is the lowest in the state; Sweet Briar College and Randolph College each have 26 percent match rates). Although the SCHEV data likely do not fully reflect the contribution that these schools make to their graduates, the data do reflect the wages of graduates who remained in the state to work. Also note that among the three public institutions in the bottom 10, two are Historically Black Colleges or Universities (HBCUs), and the University of Virginia's Wise campus is situated in the less affluent, far southwestern corner of the state, in the heart of Appalachia.

⁷ Data on wage outcomes for proprietary colleges are published by the federal government as part of its gainful employment regulatory process. See <https://studentaid.ed.gov/sa/about/data-center/school/ge>.

Figure 4: Median Wages at Year 8 Among Graduates of Four-Year Institutions



Majors Matter

Although there are obvious differences in the earnings of graduates across institutions, there are also large differences—often significantly larger ones—depending on the major that a student chose. Table 2 reports both Year 1 and Year 8 wages for some of the largest programs of study in Virginia, plus a selection of STEM (science, technology, engineering, and mathematics) and health programs. Virginia, like many other states, has a vested interest in the success of its STEM graduates, who are viewed as constituting a crucial segment of the workforce of the future, contributing to continued prosperity and solid economic growth in the state. And in Virginia, like most states, the demand for workers in health-related fields is strong.

The college majors listed in Table 2 are ordered by Year 8 wages, from lowest to highest. Median wages for college majors that lag behind the statewide median wage for all graduates with bachelor's degrees are highlighted in red.

The median wages of graduates of traditional liberal arts and social sciences programs fall below the statewide median wage for graduates with bachelor's degrees in both Years 1 and 8. For example, the median wage of graduates in Psychology, one of the largest majors on almost all campuses, is below the statewide bachelor's median wage in Year 1 and lags in Year 8. Similarly, graduates in Sociology, English, and Multi-/Interdisciplinary Studies and Liberal Arts and Sciences all earn below the statewide bachelor's median in Year 1 and, again, in Year 8. Note that in contrast to the below-median wages of other social sciences, Economics graduates are at or above the statewide bachelor's median in both Years 1 and 8. Despite being called the “dismal science” by essayist and historian Thomas Carlyle, graduates of programs in economics hold a relatively robust position in the job market.

Among the large science fields (the *S* in STEM), wages of Biology graduates lag behind the statewide median wage for graduates with bachelor's degrees in both Years 1 and 8. Wages of graduates in Chemistry also fall below the statewide bachelor's median in both years, but are still somewhat higher than the wages of Biology graduates. In addition to the relatively low wages of graduates with a major in one of these sciences, graduates in Mathematics (the *M* in STEM) trail behind.

Although the science and mathematics fields are not heavily rewarded in the job market, Engineering graduates and Technology graduates (the *T* and *E* in STEM, respectively) dominate the high end of the wage list. Of the half-dozen highest paid majors, three have the word *engineering* in their official titles, and two are related to Information/Computer sciences.

Additionally, the wages of graduates in two health-related fields (Allied Health Diagnostics and Occupational Therapy) exceed the statewide median wage for graduates with bachelor's degrees in Year 1 and remain above the median in Year 8.

Finally, note the distribution of majors above and below the statewide median wage for graduates with bachelor’s degrees at the two different time points. Graduates of programs below the median in Year 1 stay below the median in Year 8. And programs with graduates above the median in Year 1 stay above the median in Year 8. In short, when it comes to wages by major, the reality is “start low, end low.”

Table 2: Median Wages at Years 1 and 8, by Selected Majors

Major	Year 1 Median Wages	Year 8 Median Wages
Sociology	\$25,292	\$42,088
English Language and Literature	\$23,710	\$43,103
Psychology	\$24,991	\$43,729
Mathematics	\$37,230	\$48,914
Political Science and Government	\$26,190	\$50,817
Biology/Biological Sciences	\$22,439	\$51,309
Chemistry	\$27,405	\$54,218
Allied Health Diagnostic, Intervention, and Treatment Professions	\$44,809	\$64,027
Economics	\$38,229	\$67,212
Information Science/Studies	\$50,492	\$72,179
Mechanical Engineering	\$55,453	\$77,933
Occupational Therapy/Therapist	\$52,859	\$78,667
Computer and Information Sciences	\$58,244	\$87,383
Electrical and Electronics Engineering	\$60,543	\$87,694
Computer Engineering	\$58,917	\$93,734

Conclusions

Overall, a college education is a good investment. College graduates are less likely to be unemployed than high school graduates, and they live longer and healthier lives. But if college pays financially, it pays more—often far more—for some graduates than for others. Students face many options as they choose among colleges, degrees, and majors—often with dramatically different payoffs.

The data contained in this report and on the College Measures website can serve many informational purposes, but one of the most important is to help students follow President Obama’s advice, which was shared in a foreign policy context yet has broader application: “Don’t do dumb stuff.”

Perhaps the most important “dumb stuff” for students to avoid pertains to student loan debt: Don’t borrow \$75,000 for a degree that likely will net a \$30,000 annual wage. Another dumb thing to avoid: Don’t believe that a bachelor’s degree alone in sociology (or English or psychology) will necessarily lead to a big house with a fancy sports car in the garage. Differences among individuals and in the opportunities they encounter may be more powerful influences than their college majors. In short, the data here and on <http://va.edpays.org/> should help students to reconcile lifestyle goals with some meaningful data about average, expected wages for individuals who are employed in the marketplace.

Avoiding doing dumb stuff is a pretty good reason to explore these wage data.

A few other lessons are contained in these data. All too often, we equate “college” with a bachelor’s degree. And many students also equate college with a good career and strong earnings. But the equation in which “college = bachelor’s degree = high earnings” is not always true. Some bachelor’s degree programs don’t make the cut, and some two-year technical degrees can lead to middle-class wages. Recent research from Gallup⁸ shows that on many dimensions of engagement and life/career satisfaction, no differences exist between graduates of bachelor’s and associate’s degree programs. In short, higher education offers many more options beyond a bachelor’s degree that can lead to a good job and a good life.

The data provided here can also serve as a reality check concerning some of the rhetoric that surrounds STEM. Clearly, a terminal bachelor’s degree in biology or chemistry (the largest science programs in the nation) does not automatically lead to a high-paying job. And, on average, math graduates don’t do better than many other bachelor’s graduates. STEM may be a compelling acronym, but we may simply be wrong about the power of its labor market outcomes. So, when it comes to wages, perhaps we should be using the acronym TEM rather than STEM—but only if we think of the *M* as representing *Medical*, not *Math*.

8 <http://www.gallup.com/services/190523/gallup-usa-funds-associate-degree-report.aspx>

Finally, there is remarkable stability in the relative wages that postsecondary program graduates earn over time. Very few programs—and not a single one shown in Table 2—move from the bottom of the distribution to above the median. One common argument is that liberal arts graduates simply take longer to find their path forward than graduates with technical degrees, but that once they launch into a trajectory, the critical thinking skills that they developed in college will propel them upward and onward. Yet the data suggest that a more accurate description is “start low, end low”—that graduates in fields at the bottom of the wage distribution early in their careers will earn more money years later, but they will still lag behind their peers who came out of the gate with higher initial earnings. Another example of this phenomenon can be explored on the SCHEV website,⁹ where wages have been reported out to 20 years postcompletion at the state level, by broad discipline.

⁹ http://research.schev.edu/EOM/EOM19_Report.asp

Technical Note

To ensure that there are enough graduates to report wage outcomes without violating privacy, SCHEV combines several years of data to create a cohort. Of the data shown in this report, the following years are represented:

	Years Combined to Create Wage Cohort
Figure 1	2001–02 to 2005–06
Figures 2, 3, and 4	Year 1: 2007–08 to 2011–12
Table 2	Year 8: 2001–02 to 2005–06



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