

EDUCATION POLICY Center

at American Institutes for Research ■

Why Your Major Matters

College Degrees and Long-Term Payoffs

By Mark Schneider

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Along with providing more students with access to higher education, measuring student outcomes ranks near the top of the Obama administration's education policy priorities. One outcome—how much graduates earn when they enter the labor market—has become a hot-button issue as student debt mounts and fewer new graduates get jobs with the wages needed to pay off their loans. Meanwhile, many state policymakers want to measure the return on taxpayers' investment in higher education—one of the biggest and most important investments states make. And many in academe claim that the liberal arts will be abandoned if the returns on studying them pale when compared with the salaries other majors command in the job market.

In this collision of force fields, federal and state governments have moved cautiously toward measuring and reporting, by major, what recent grads earn, but efforts so far are scattered and incomplete. As this status report and these independent research findings show, the need now is for more long-term earnings data; fuller disclosure; and simpler, more accessible data presentation, so students and parents can make better decisions.

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Mark Schneider

Vice President and Institute Fellow

The Obama administration has elevated many issues in higher education to the forefront of policy discussions. Although the traditional theme of access has been on the administration’s mind, there also has been a strong emphasis on measuring student outcomes. One of the newest and most controversial themes is measuring and reporting how much graduates earn after they enter the labor market.

The concern for wage outcomes springs from many sources. Among the most important is the increasing debt levels that students are incurring and the problems they have in paying off student loans if their wages are too low. Many state policymakers are also concerned with measuring the return on the large investment that state taxpayers are making in higher education—because higher education is one of the most important (and most expensive) human capital investment programs states run.

Given these interests, both the federal government and a growing number of state governments have attempted to link wage data to student-level data (commonly referred to as “student unit records”) indicating what schools students attended, what degrees they attained, and what program of study (e.g., psychology, political science, engineering) they completed. The federal government has tried to publicize these data through its statutory authority to measure the “gainful employment” of students completing career-oriented programs. This has led to two contentious rounds of negotiated rule-making. The first one culminated in a [law suit](#), and the results of the second round that ended in December 2013 resulted in an 841-page [document](#) of proposed regulations. Almost certainly, this new effort will land in court.

Besides its ability to collect student-level wage data from graduates of career and technical programs, the federal government is limited by provisions in the Higher Education Opportunity Act (HEOA) that expressly ban it from creating a more comprehensive student unit record data system. Although there is some discussion about the possibility of the overdue reauthorization of the HEOA revisiting that ban, the ability of the federal government to actually collect and release linked student and wage data is now limited.

Several states have stepped into the breach. The federal government would match student-level data with income tax data, but states have instead matched their own student unit records with wage data that states collect through their unemployment insurance system. Because states “own” both the student-level data collected from colleges and universities and the unemployment insurance wage data, they are not limited by the federal legislative ban. On the contrary, many states have passed legislation requiring that wage data be made public. For example, Florida law requires an “economic security report” of employment and earning outcomes.¹

¹ See [Florida Statutes 2012 Title XXXI](#), chapter 445.07. College Measures help Florida satisfy this reporting requirement by building the state’s new [Beyond Education website](#).

Other states have similar legislation or have been building linked data sets using other authority. Indeed, some states (including Florida, Texas, and Virginia) have been matching these data for years and have data on graduate labor market success going back 10 or more years. Many other states have matched data over shorter time frames—but about half the states have not matched the data at all.

Unfortunately, even in states that have linked these data, there has been little effort to make the data “easily accessible and readable by the public” (to use Florida’s legislative language). In the last few years, however, a growing number of states have determined to do just that. AIR’s subsidiary [College Measures](#) has been partnering with several states² to put their matched student unit/unemployment insurance wage data into a format that is more accessible and usable—in effect, moving the matched data that all too often has resided in a “data warehouse” into a “data storefront.”

Until now, most of the states have released only first-year earnings. These data—limited in time coverage—nonetheless present valuable information about the relative reception graduates will likely experience in the labor market. Consider the wage outcomes presented in Table 1, summarizing the highest and lowest paid bachelor degree programs of study in each of the first six partner states with which College Measures has worked.

Table 1. Programs With Bachelor’s Graduates Having Lowest and Highest First-Year Earnings, by State

State	Lowest First-Year Earnings	Highest First-Year Earnings
Arkansas	Music performance \$19,808	Engineering \$56,655
Colorado	Dietetics \$24,876	Chemical engineering \$90,099
Florida	Drama \$19,548	Fire science \$69,756
Tennessee	Photography \$28,743	Systems engineering \$54,346
Texas	Health services \$15,053	Petroleum engineering \$117,177
Virginia	Philosophy \$20,442	Petroleum engineering \$61,517

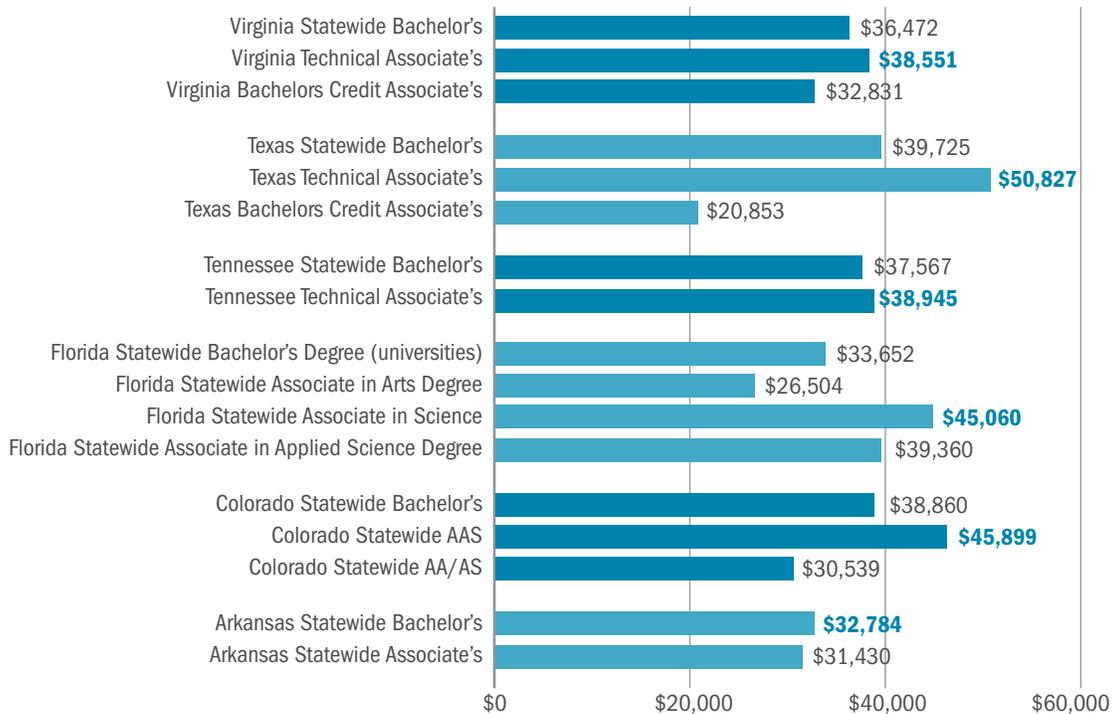
In four states, the lowest paid graduates are from liberal arts/performance-based fields of study (music performance, photography, philosophy, drama). In contrast, in five states, engineers are the highest paid. In Florida, bachelor’s graduates in fire science are the highest paid in the state. The low earnings of liberal arts graduates is consistent across all the states for which we have reported data.

Another consistent finding is that graduates with associate’s degrees, especially in applied or technical fields, can earn more in the year after graduation—often far more than bachelor’s degree graduates. Consider Figure 1, which displays the overall statewide mean or median for first-year wages for graduates with bachelor’s degrees or associate’s degrees. The highest

² The states that have published their data include Texas, Florida, Virginia, Colorado, Arkansas, and Tennessee, and a few more states are in the pipeline.

statewide wage is displayed in blue for each state. Four of the six states classify their associate's degrees by the extent to which they are applied or technical (associate of applied sciences, associate of sciences, or technical associate degree), and in each of these four states, these wages exceed those of bachelor's degree graduates. The other two states, Tennessee and Arkansas, do not break down their associate's degrees by career or academic orientation. In Tennessee, overall, graduates with an associate's degree earn more than bachelor's degree graduates one year postcompletion. Of the six states, only in Arkansas do bachelor's degree graduates earn more than associate's degree graduates.

Figure 1. Statewide First-Year Earnings, by Degree Type



Source: Schneider, M. (2013). *Higher education pays: But a lot more for some graduates than for others*. Rockville, MD: College Measures. Retrieved from www.air.org/sites/default/files/Higher_Education_Pays_Sep_13.pdf

These patterns have caused consternation among academics and leaders of colleges and universities, many of whom see the data as yet another salvo in a war on the liberal arts. The typical argument is that first-year earnings are an inaccurate portrayal of the earnings potential of graduates from different fields—and in particular, that these data are a systematic understatement of the earnings potentials of liberal arts graduates who might take longer to launch careers but whose deep analytic skills and approaches to problem solving will propel them into far higher paying jobs than engineers or business majors who may start high but whose more technical and career-oriented skills will become outmoded five or 10 years after graduation. To put a fine edge to the argument, the philosophy graduate who is today a low-paid barista will in 10 years be a high-paid barrister, and the graduate with a degree in high-tech manufacturing will be replaced by a robot.

This has become an article of faith in response to the first-year earnings that are increasingly available across the states. The problem is that the argument is mostly wrong. Graduates from fields of study with low first-year earnings are still facing lower earnings 10 years later. Data from Texas illustrate this (see the next section), and in the near future data from other states will be released confirming this pattern.

High and Low Earnings for Bachelor's Degree Graduates

Table 2 shows the average wages for bachelor's degree graduates from the 10 most popular program areas in the state of Texas one year and 10 years after graduation. The program areas are arranged from lowest to highest according to first-year wages. The average for all bachelor's degree graduates in the state is just over \$31,000, and the programs that fall below the statewide year 1 average wage are marked in red.

By far, graduates with biology and psychology degrees have the lowest average earnings one year after graduation. Psychology is one of the largest majors in the nation, and biology is the largest degree in the STEM (science, technology, engineering, and mathematics) area, which many think is critical to the economic success of the nation. Rounding out the popular fields with the lowest first-year earnings are criminal justice, health and physical education, and marketing.

In contrast to the low first-year earnings of graduates with marketing degrees, graduates in other popular business-related fields do far better. Graduates with bachelor's degrees in business administration and accounting and finance all command wages above the statewide average for all bachelor's degree recipients. And graduates with degrees in management information systems and services have the highest first-year wages across all top 10 programs.

What happens 10 years later? Of the five lowest paying majors, three of them are below the 10-year average, including graduates from the very popular field of psychology (who on average are the second lowest paid in year 1 and again in year 10). Biology graduates improve their relative wages the most: With a growth rate of more than 250 percent, they go from the lowest paid set of graduates to one of the highest. This is likely the result of some number of these graduates attending and completing medical school, but data to explore this linkage is not currently available. Graduates with marketing degrees also experience an above-average rate of growth and in turn move from below-average wages in year 1 to above average in year 10.

Of the higher paying popular fields in year 1, graduates from four of the five fields are above average 10 years later. Graduates with degrees in multidisciplinary/interdisciplinary studies have the lowest wage growth rate of all, and the average wages go from slightly above average in year 1 to only 70 percent of the statewide average for all graduates in year 10.

Table 2. Average Wages After Year 1 and after Year 10, Graduates From Popular Bachelor's Degree Programs in Texas

Area of Study	Wages Year 1	Wages Year 10	Years 1–10 Growth
Biology, general	\$23,243	\$81,484	251%
Psychology, general	\$23,729	\$54,128	128%
Criminal justice and corrections	\$28,184	\$55,025	95%
Health and physical education/fitness	\$28,818	\$58,109	102%
Marketing	\$30,776	\$78,133	154%
Statewide university bachelor's degree average	\$31,016	\$69,055	123%
Business administration, management, and operations	\$31,816	\$70,911	123%
Multidisciplinary/interdisciplinary studies, other	\$32,133	\$49,315	53%
Accounting and related services	\$34,331	\$76,236	122%
Finance and financial management services	\$34,392	\$95,920	179%
Management information systems and services	\$34,813	\$80,176	130%

Source: www.MyFutureTX.com

Another way of looking at the data about long-term wage outcomes is to compare the experiences of students graduating with majors at the extremes of the first-year wage distribution. Which fields produce the lowest paid graduates? The highest? What happens to these students 10 years later?

Table 3 reports the data on the 10 lowest and 10 highest paying majors at the end of the first year postgraduation. Graduates from four of these programs earn less than \$20,000 on average, and the average for all 10 of these programs never exceeds \$22,000. Graduates from six of these programs have spent more than the average amount of time earning their degree—and graduates specializing in international relations and national security studies have spent, on average, almost seven years earning a degree, with the third lowest average wages in year 1 and the sixth lowest in year 10. Of the 10 lowest paying programs in year 1, graduates from six of them are below average in year 10, with graduates from drama falling from the fourth lowest paying program to the lowest in year 10. Graduates from the below-average paying programs of anthropology and Germanic languages, literatures, and linguistics have below-average growth rates and hence fall further beyond their peers.

All of the 10 highest paying majors are either in engineering or health-related professions. Over time, engineering graduates do far better than graduates in health fields. Graduates from all the health-related fields experience below-average rates of growth—although these graduates, on average, earn more than most bachelor's degree graduates, the gap closes over the course of 10 years. In contrast, graduates with engineering degrees, regardless of specific subfield, had rates of growth higher than the statewide average. Graduates with petroleum engineering degrees saw their average earnings triple, and graduates with degrees in mechanical engineering related technologies/technicians saw their average wages double.

Of the top 10 highest paying programs at the end of year 1, only graduates with their bachelor's degree in dental support services and allied professions fell out of the top 10. Indeed, with an average increase of only 29 percent over 10 years, these graduates did far worse than graduates in any other field.

In general there is very little movement in the relative earnings of graduates from different fields of study. Indeed, the rank order correlation between programs arranged by earnings in year 1 and year 10 is high (.72).

Table 3. Change in Wages by Fields at the Top and Bottom of First-Year Earnings: Bachelor's Degree Graduates in Texas

Area of Study	Time To Degree	Wages Year 1	Wages Year 10	Years 1-10 Growth
Museology/museum studies	5.94	\$19,039	\$47,688	150%
Zoology/animal biology	4.84	\$19,671	\$88,933	352%
International relations and national security studies	6.84	\$19,672	\$49,279	151%
Drama/theatre arts and stagecraft	5.44	\$19,804	\$45,219	128%
Statistics	5.26	\$20,895	\$84,276	303%
Film/video and photographic arts	5.94	\$21,072	\$47,362	125%
Anthropology	5.43	\$21,166	\$46,328	119%
Animal sciences	5.13	\$21,197	\$62,729	196%
Germanic languages, literatures, and linguistics	5.38	\$21,525	\$46,554	116%
Air transportation	4.46	\$21,550	\$80,701	274%
Statewide university bachelor's degree average	5.36	\$31,016	\$69,055	123%
Allied health diagnostic, intervention, and treatment professions	5.95	\$45,561	\$70,355	54%
Dental support services and allied professions	5.65	\$46,968	\$60,643	29%
Mechanical engineering	5.32	\$46,984	\$113,774	142%
Mechanical engineering related technologies/technicians	5.90	\$47,567	\$143,633	202%
Chemical engineering	5.20	\$48,675	\$130,196	167%
Registered nursing, nursing administration, nursing research, and clinical nursing	5.83	\$51,204	\$81,543	59%
Ocean engineering	5.41	\$51,528	\$139,207	170%
Naval architecture and marine engineering	4.87	\$52,911	\$140,212	165%
Petroleum engineering	4.79	\$61,362	\$252,484	311%
Allied health and medical assisting services	6.30	\$65,485	\$126,262	93%

Source: www.MyFutureTX.com

Graduate Earnings: Start Low, End Low

The push for more information about the labor market success of graduates from different programs, colleges, and universities will no doubt gain momentum over the next few years. As their out-of-pocket costs and debt burden increase, students and their families will continue to want to know more about the likely payoff for their investment of time and money in college degrees. State lawmakers will want to know more about what their large investment in higher education is buying. And the federal government will seek to provide more wage data to use in the College Scorecard and in the Obama administration's more recent proposal for a college ratings system.

As all of these efforts go forward, we can expect pushback from the higher education establishment. The complaints will take many forms. Among the most common will be that higher education is about so much more than monetary outcomes, that there is great variation in the mission of the schools and programs, that emphasizing earnings will discourage schools from offering programs that feed into low-paying professions that have high social value, and that the time frame of the measurement is wrong.

True: Higher education is indeed about more than just money—but it is also about money!

The vast majority of students, almost 90 percent in a recent [Higher Education Research Institute poll](#), say that one of the prime reasons for pursuing higher education is to get a better job. And for years, colleges and universities took great pains to stress that a bachelor's degree was worth \$1 million in [added wages](#). Colleges also are pitching the added income that graduates earn as they lobby state legislatures for funding. According to a recent article in the [Chronicle of Higher Education](#), “To try to preserve their relevance in statehouses, colleges emphasize that they are central to the state economy by attracting or retaining businesses that require well-educated workers and by enabling those employees to earn more money than if they had only high school degrees.” Higher education cannot have it both ways.

And, yes, we need to be mindful that graduates may choose to enter professions that have high social value but low pay (e.g., social work), but that does not mean that the wages associated with different programs should not be publicized. Students should follow their passions and their skills—but they should know what their choices are likely to mean after they graduate. And they should absolutely know how much they will be likely to earn **before** they make decisions about how much to borrow.

Finally, the empirical evidence presented in this policy brief suggests that we should collect and publish longer term wage outcomes, but the time frame captured is less important than it seems on the surface. There is a high correlation in earnings by field of study over time, and graduates in very few fields of study can expect to experience increased earnings that catapult them, on average, from low early-career earnings to high midcareer ones.

Again, earnings data are not the only pieces of information that students should attend to as they consider their higher education options, but these outcomes should be part of any decision process concerning what college to attend, what degree to pursue, and how much to borrow to pay for that education.

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at American Institutes for Research ■

1000 Thomas Jefferson Street NW
Washington, DC 20007-3835
877.322.8700

www.edupolicycenter.org



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