

# **The Economic Success of College and University Graduates**

Short and Long Term Outcomes

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The Obama Administration has elevated many issues in higher education to the forefront of policy discussions. While the traditional theme of access has been on the administration's mind, there 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. In many states, policy makers are also concerned with measuring the return on the large investment that state taxpayers are making in higher education—since 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 are still unknown. But whatever the Department of Education tries to do with wage data as a result of this last round of negotiations, it will almost certainly 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 and Assistance Act that expressly ban it from creating a more comprehensive student unit record data system. While there is some discussion that the (ever-) looming overdue reauthorization of the HEOA might revisit 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. While the federal government would match student level data with income tax data, states have instead matched their own student unit records with wage data that states collect through their unemployment insurance system. Since states “own” both the student level data collected from colleges and universities as well as the unemployment insurance wage data, they are not limited by the federal legislative ban. To 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.<sup>1</sup> The legislation states that:

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<sup>1</sup> Florida Statutes 2012 Title XXXI, chapter 445.07

- (1) Beginning December 31, 2013, and annually thereafter, the Department of Economic Opportunity shall prepare, or contract with an entity to prepare, an economic security report of employment and earning outcomes for degrees or certificates earned at public postsecondary educational institutions.
- (2) The report must be easily accessible to and readable by the public and shall be made available online. The report, by educational sector, must:
  - (a) Use the Florida Education and Training Placement Information Program for data relating to the employment, earnings, continued education, and receipt of public assistance by graduates of a degree or certificate program from a public postsecondary educational institution.

Other states have similar legislation or have been building these linked data sets using other authority. Indeed, some states (including Florida, Texas and Virginia) have been matching these data for years and have matched data going back 10 or more years. Many other states have matched data over shorter time frames—but about half the states haven’t 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). However, a growing number of states in the last few years have determined to do just that. Working through College Measures, I have been partnering with several states<sup>2</sup> to put their matched student unit/UI wage data into a format that is more accessible and usable—in effect, moving the matched data that has all too often resided in a “data warehouse” into a “data storefront.”

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

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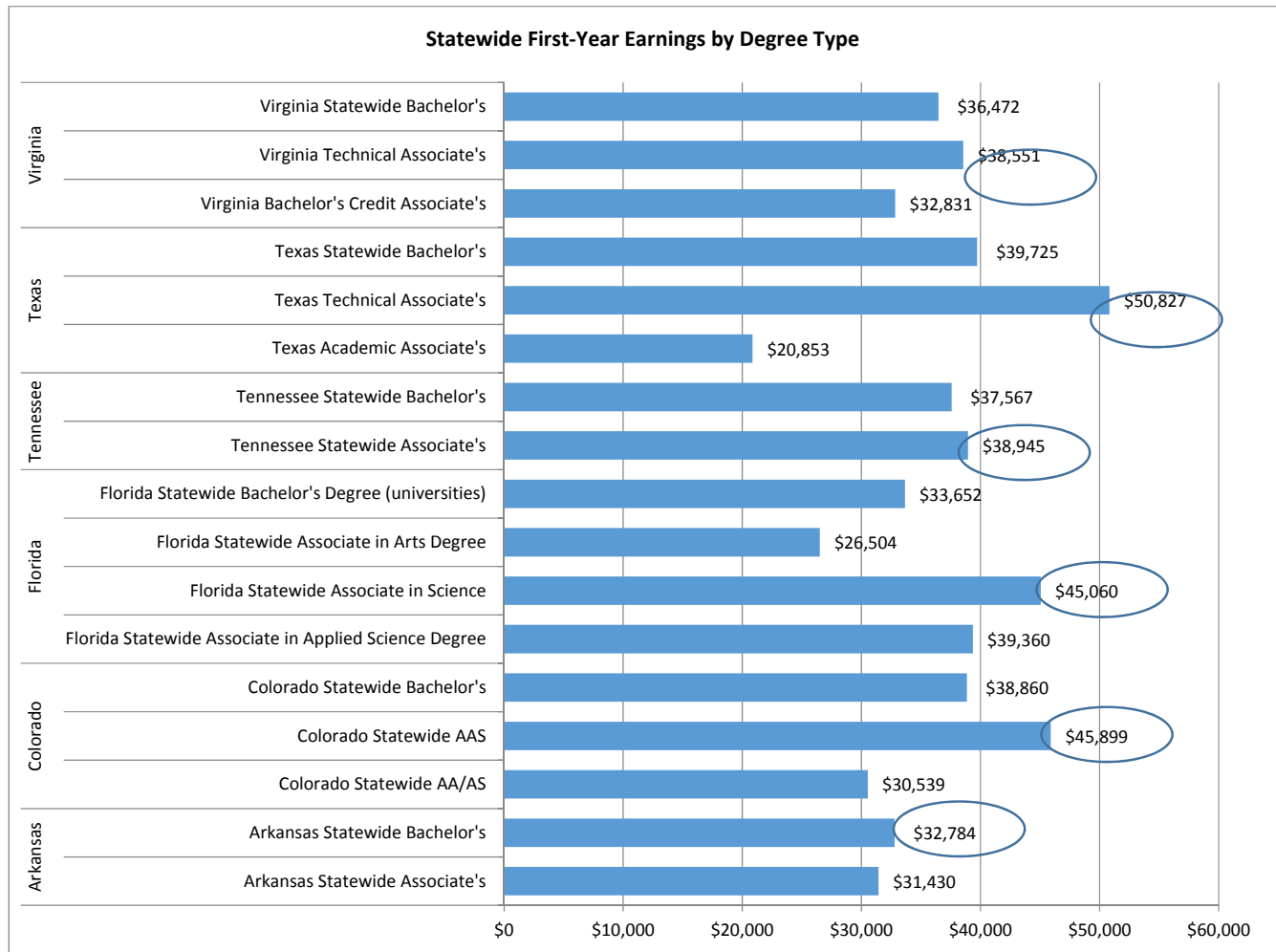
<sup>2</sup> The states that have published their data include Texas, Florida, Virginia, Colorado, Arkansas and Tennessee, with a few more states in the pipeline.

Table 1: Programs with Bachelor's Graduates Having Lowest and Highest First-Year Earnings, by States

State	Lowest First-Year Earnings		Highest First-Year Earnings	
Arkansas	Music Performance	\$19,808	Engineering	\$56,655
Colorado	Dieticians	\$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 Degree, 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 statewide wage is circled. Four of the six states classify their associate's degrees by the extent to which they are applied or technical (Associate's of Applied Sciences, Associate's of Sciences, or Technical Associate's) 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 further breakdown their associate's degrees by career or academic orientation. In Tennessee, overall, graduates with Associate's degrees 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.



These patterns have caused consternation among academics and leaders of colleges and universities, many of whom see the data as an opening 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, while 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 as we will see below is that it is mostly wrong. Graduates from fields of study with low first-year earnings are still facing lower earnings 10 years later. I

illustrate this with data from Texas, but in the near future data from other states will be released confirming this pattern.

### **Bachelor's Degrees**

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 graduates in the state is just over \$31,000 and those 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, that 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 earnings of graduates with marketing degrees, graduates in other popular business-related fields do far better. Graduates with bachelor's degrees in Business Administration, 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 in year 10). Biology graduates improve their relative wages the most: with a growth rate of over 250% they now 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 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 at in year one 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 Multi-/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% of the statewide average for all graduates in year 10. Note too that these graduates have among the longest time to degree, suggesting that these students have invested more time in attaining a degree that produces lower wages over the long run than many other graduates.

Table 2: Average Wages after Year 1 and after Year 10:  
Graduates from Popular Bachelor's Degree Programs in Texas

Area of Study	Time To Degree	Wages Year 1	Wages Year 10	Years 1-10 growth
Biology, General	5.30	\$23,243	\$81,484	251%
Psychology, General	5.24	\$23,729	\$54,128	128%
Criminal Justice and Corrections	5.56	\$28,184	\$55,025	95%
Health and Physical Education/Fitness	5.64	\$28,818	\$58,109	102%
Marketing	5.05	\$30,776	\$78,133	154%
<b>State wide university bachelors average</b>	<b>5.36</b>	<b>\$31,016</b>	<b>\$69,055</b>	<b>123%</b>
Business Administration, Management and Operations	5.48	\$31,816	\$70,911	123%
Multi-/Interdisciplinary Studies, Other	5.63	\$32,133	\$49,315	53%
Accounting and Related Services	5.70	\$34,331	\$76,236	122%
Finance and Financial Management Services	5.17	\$34,392	\$95,920	179%
Management Information Systems and Services	5.57	\$34,813	\$80,176	130%

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 7 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.

Of the 10 highest paying majors, all 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—while these graduates still, on average, earn more than most bachelor's degree graduates, the gap closed over the course of these 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, while graduates with degrees in Mechanical Engineering Related Technologies/Technicians saw their average wages double.

Of the top ten 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% 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 correlation between earnings in year 1 and year 10 is high (.75).



Table 3: Change In Wages By Fields At The Top And Bottom Of First Year Earnings: Bachelor's Degree Graduates

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%
<b>Statewide university bachelors average</b>	<b>5.36</b>	<b>\$31,016</b>	<b>\$69,055</b>	<b>123%</b>
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%

## Associate's Degrees

While the Bachelor's degree is the most common degree granted in the United States, the second most common is the "two-year" associate's degree. These degrees are granted in many fields of study and students earning technical associate's degrees can often earn more than students who have earned a bachelor's degree. Many critics have argued that graduates from even the most high paying two-year degrees will fall behind over time—that is, that graduates with associate's degrees that lead to high paying jobs immediately after graduation will not advance and that in the long run these students would have been better off with a bachelor's degree. Census data confirm that nationally in the long run the rate of increase in earnings for bachelor's graduates is higher than that of students with associate's degrees and that, on average, bachelor's graduates will outearn associate degree holders by a substantial margin. The census numbers are based on averages across all fields of study and doesn't drill down into finer detail, which these data allow.

The following tables present data for associate's degrees that parallel the data for bachelor's degrees presented above.

Comparing the statewide figures, a striking pattern is the lower growth rate in wages for associate degree holders compared to bachelor's graduates. While statewide the average growth rate for all bachelor's graduates is 123%, it is only 75% for graduates with associate's degrees. Only one area of study, Communications Technologies/Technicians and Support Services, has a growth rate that is higher than that of the average growth in bachelor's degree graduates.

Second, the data show that at the associate's degree level, as with bachelor's graduates, graduates with degrees that are associated with low paying wages in year 1 are likely to be low paid in year 10. Of the ten most popular programs that are below average in year 1 wages, eight are below average in year 10. The two that move from below average in year 1 to above average in year 10 are Mechanic and Repair Technologies/Technicians and Precision Production. Graduates with degrees in Personal and Culinary Services are by far the lowest paid in the first year postgraduation and barely make it into second place, after Family And Consumer Sciences/Human Services. If one factors in the time to degree, then 10 years postgraduation, one could argue that Personal and Culinary Services is a better investment than Family and Consumer Sciences, but neither of them seem a particularly lucrative choice.

Table 4: Average Wages after Year 1 and after Year 10:  
Graduates from Popular Associate's Degree Programs in Texas

Area of Study	Wages Year 1	Wages Year 10	Years 1-10 growth	Time to Degree
Personal and culinary services	\$13,916	\$25,723	85%	2.24
Family and consumer sciences/human sciences	\$19,218	\$25,262	31%	4.46
Visual and performing arts	\$19,755	\$36,208	83%	4.41
Communications technologies/technicians and support services	\$20,576	\$47,936	133%	3.85
Transportation and materials moving	\$24,530	\$36,854	50%	4.89
Computer and information sciences and support services	\$24,930	\$48,598	96%	3.65
Business, management, marketing, and related support services	\$27,558	\$44,836	63%	4.05
Mechanic and repair technologies/technicians	\$28,091	\$53,706	92%	2.88
Legal professions and studies	\$28,701	\$46,649	63%	4.88
Precision production	\$29,672	\$59,814	102%	2.55
<b>Statewide Associate's average</b>	<b>\$29,795</b>	<b>\$52,136</b>	<b>75%</b>	<b>4.03</b>
Engineering technologies and engineering-related fields	\$30,746	\$57,969	89%	3.51
Homeland security, law enforcement, firefighting and related protective services	\$31,137	\$57,687	84%	4.06
Construction trades	\$34,194	\$64,679	89%	3.06
Health professions and related programs	\$34,329	\$52,770	56%	4.57
Science technologies/technicians	\$44,353	\$93,386	111%	4.71

Of the five most popular fields in which graduates had above average earnings in their first year postgraduation, all were above average in year 10. As with bachelor's graduates, graduates in the health-related field that was above average had low rate of growth, leaving graduates above average in year 10, but just barely. Graduates with degrees in Science Technology/Technicians had the highest first-year earnings and a strong growth rate, leaving them far above average for associate's degree graduates and at over \$93,000 earning more on average than bachelor's graduates in every field but Finance and Financial Management Services.

Table 5 displays the data for those programs with the lowest and highest first year earnings and then reports graduate earnings in year 10. First with a correlation of .92 across the two years of earnings, there is high stability in relative earnings over time. Of the 10 lowest paying programs in year 1, only carpenters are above average in year 10. In contrast of the 10 highest paying programs, all remain above average 10 years postgraduation. With the exception of carpentry, the fastest growth rates were among associate's graduates with technology oriented degrees (including Heavy/Industrial Equipment Maintenance Technologies and Industrial Production Technologies/Technicians). It should also be noted that in Table 1, graduates with degrees in Precision Production were among the fields that went from below average at year 1 to above average in year 10—and the growth rate in their wages (102%) was far above average for graduates with associate's degrees.

Table 5: Change In Wages By Fields At The Top And Bottom Of First Year Earnings:  
Associate's Degree Graduates

Area of Study	Wages Year 1	Wages Year 10	Years 1-10 growth	Time To Degree
Cosmetology and Related Personal Grooming Services	\$13,981	\$25,967	86%	2.3
Teaching Assistants/Aides	\$16,391	\$24,757	51%	3.3
Educational/Instructional Media Design	\$17,753	\$28,436	60%	3.7
Carpenters	\$17,882	\$60,922	241%	4.7
Business Operations Support and Assistant Services	\$18,336	\$31,170	70%	3.4
Social Work	\$18,549	\$30,174	63%	4.9
Communication Disorders Sciences and Services	\$19,198	\$31,809	66%	4.4
Human Development, Family Studies, and Related Services	\$19,300	\$25,309	31%	4.3
Mental and Social Health Services and Allied Professions	\$19,311	\$31,424	63%	4.1
Design and Applied Arts	\$19,664	\$35,770	82%	4.4
<b>Statewide Associate's average</b>	<b>\$29,795</b>	<b>\$52,136</b>	<b>75%</b>	<b>4.0</b>
Public Health	\$36,807	\$66,359	80%	4.5
Heavy/Industrial Equipment Maintenance Technologies	\$36,866	\$72,375	96%	3.3
Public Administration	\$37,922	\$62,207	64%	2.5
Allied Health Diagnostic, Intervention, and Treatment Professions	\$38,212	\$65,374	71%	4.6
Registered Nursing, Nursing Administration, Nursing Research and Clinical Nursing	\$38,465	\$57,642	50%	4.6
Industrial Production Technologies/Technicians	\$39,862	\$79,365	99%	2.8
Quality Control and Safety Technologies/Technicians	\$40,883	\$70,181	72%	3.9
Plumbing and Related Water Supply Services	\$41,846	\$71,497	71%	2.9
Physical Science Technologies/Technicians	\$43,444	\$92,405	113%	4.6
Science Technologies/Technicians	\$44,353	\$93,386	111%	4.7

### 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 increases, 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 law makers will want to know more about what their large investments 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 and 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.

Higher education is indeed about more than just money—but it is also about money! The vast majority of students, around 90% in a recent HERI poll, say that one of the prime reasons for pursuing higher education is to get a good job and earn more money. And for years, colleges and universities took great pains to stress that a bachelor’s degree was worth \$1 million in added wages. Colleges are also 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 can’t 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 doesn’t 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 Outlook suggests that the while we should collect and publish longer term wage outcomes, 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 mid-career ones. Moreover, while it is clear that bachelor’s degree graduates on average experience more rapid increases in earnings than associate’s degree graduates, it is also clear that some associate’s degrees, especially in technical fields, can lead to solid wages that are can exceed those of bachelor’s graduates both in the short- and mid-term.

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.