



MAJORS MATTER

Differences in Wages Over Time in Texas

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Executive Summary

The wages of graduates from public colleges and universities in Texas vary radically across majors.¹ This variation is evident immediately after students complete their studies, and it persists over time and is found at all levels of postsecondary education, ranging from short-term certificates to postgraduate studies and professional credentials. The website for College Measures Texas (tx.edpays.org) reports wages at several points in time—up to 10 years after students complete their studies—allowing for comparisons of growth in wages over longer periods of time.

In contrast to some of the most popular college comparison sites, such as *U.S. News & World Report's* Best College Rankings or the U.S. Department of Education's College Scorecard, College Measures Texas provides data by major. This is important because *what* students study is often more important than *where* they study it.

Using the College Measures Texas (tx.edpays.org) website, for example, students can compare the wages of graduates from every psychology program in every public university in Texas. Or, as another example, students can compare the wages of graduates with degrees in sociology from the University of Texas at Austin with that of graduates with degrees in mathematics. These fine-grained data are also available at different credential levels, allowing for a comparison of wages earned by students in the same major but with different degrees (e.g., a psychology graduate with a bachelor's degree versus one with a master's degree).

This report highlights just a narrow slice of the kinds of comparisons that are possible through the data reported on the College Measures Texas website (tx.edpays.org). The data illustrate some important patterns, for example:

- What students study matters. While the median wages of completers² generally increase with successively higher credential levels, subbaccalaureate credentials in some majors offer wages that rival or surpass those of graduates with bachelor's degrees.
- Despite the importance that the nation places on high-quality early childhood education, the training programs that prepare students to work in this field consistently produce graduates that are among the lowest paid in their credential level.

1 This report uses the term *major(s)*. Majors are identified by the official classification of instructional programs (CIP codes), which is maintained by the U.S. Department of Education.

2 Colleges and universities grant degrees, such as associate's, bachelor's, or master's degrees, but they also award certificates that are not degrees. When possible, this report specifies the level of the degree or certificate being analyzed. The term *graduate* applies to only those who finish a degree program. The term *completer* refers to those who finish only a certificate program. The term *completer* is also used as a more encompassing term, when referring to both degrees and certificates.

- Many of the largest majors, especially those associated with the arts, produce students who earn low wages. Furthermore, the relative wages of graduates from different majors are remarkably stable over time—that is, “start low, end low.”
- The shortage of graduates in the fields of science, technology, engineering, and mathematics (STEM) does not translate uniformly into higher wages for graduates in these fields. According to evidence in Texas (and elsewhere), graduates with degrees in Biology do not do particularly well in the labor market. Rather, their wages tend to be similar to the median wages of graduates from all bachelor’s degree programs.
- In contrast, completers in Texas with credentials related to majors in engineering and technology tend to earn high median wages. This is also reflected in all College Measures partner states and in national data.
- Graduates in many health-related majors also earn high wages, as do technicians at every level of postsecondary education. Students who know how to *fix things* or *help people be healthy* earn higher median wages in the labor market.

Many students may be most concerned with the wages that they will earn immediately after completing their credential. However, this report demonstrates the importance of considering wage growth over time. Among other things, the data illustrate more rapid growth in the wages of graduates with bachelor’s degrees relative to their counterparts with associate’s degrees. This type of information may be critical to students as they decide how to allocate their time and money today to better anticipate and prepare for tomorrow. Perhaps even more important is the wide variation in wage outcomes across majors—and the fact that these differences persist over time.

As students think about their options—and as they think about how much college will cost and how much they might need to borrow to pay for their postsecondary education—the kinds of data highlighted in this report and made available at tx.edpays.org should help them make better decisions.

Introduction

Texas is big—and getting bigger. According to the U.S. Census, the population of Texas is now around 27 million people, up 7% since 2010—about twice the national growth rate. While Texas exceeds the nation in growth, it lags in educational attainment. Only 27% of Texans older than 25 years of age hold bachelor’s degrees, which is 2% below the national average. Despite pockets of wealth, Texas also lags the nation in median family income and has more people in poverty (18%) than the nation as a whole (15%).

Postsecondary education is one of the most important human capital investments that individuals and their communities make—and, for most, one of the surest routes to economic success. However, once postsecondary education is thought of as an investment, then as with any investment, *the return on investment matters*. To be sure, postsecondary education is associated with a wide range of valuable outcomes, including longer and healthier lives and increased civic engagement. But as the costs of postsecondary education rise and as students accumulate more and more debt, the wages that students make after completing their postsecondary education has received more attention. By measuring the wage returns on the time and money that students put into their postsecondary education, College Measures can help students and their families identify degrees of value among majors and credential levels.

The Texas Higher Education Coordinating Board (THECB) has developed an extensive data system that captures the wages earned by graduates of public colleges and universities, by major. The board then makes those data available, providing a highly detailed look at the wages of completers at various points between 1 and 10 years after attaining a postsecondary credential.

Through its partnership with College Measures, THECB ensures that its rich data on the wage outcomes of students are not merely available, but that the data can be used to inform real-world decisions. The website for College Measures Texas (tx.edpays.org) allows students to learn about wage outcomes by major, both within and across institutions. For example, students can easily compare the wages associated with a credential in psychology versus a credential in political science at one institution (e.g., University of Houston), as well as the wage outcomes of a credential in psychology at all public colleges and universities in the state. The data also allow students to compare the returns on different levels of credentials. For example, students can assess the wage payoff of getting a master’s degree compared with a bachelor’s degree, or discover which majors offered by community colleges may lead to high paying jobs.

Wage information by major is vital, because *what* students study is often far more important than *where* they study it. To put it even more bluntly, “You make what you take!”

Other well-known sources of college information, such as *U.S. News & World Report’s* Best Colleges or the U.S. Department of Education’s College Scorecard, do not provide data by major, limiting their usefulness.

This report highlights key findings from College Measures' look at the wages earned by completers from public colleges and universities in Texas (see tx.edpays.org for more information). The report focuses on the wage outcomes associated with different *levels* of postsecondary credentials 1 and 10 years after completion³ and the wage outcomes across different majors. Students can use this information to make better informed decisions about what to study and where to study it, about which level of degree may be best for their goals and aspirations, and about how much money to borrow to help finance their education.

How Many College Credentials Were Awarded in Texas?

Table 1 shows the number of certificates and degrees that were granted to the class of 2004 by public educational institutions in Texas.⁴ Among the more than 150,000 postsecondary credentials awarded, the bachelor's degree was by far the most common. Still, more than one-third of the credentials were subbaccalaureate, including certificates⁵ and associate's degrees.⁶ About 16% of the degrees awarded to the class of 2004 were master's degrees, far outpacing the almost 4% of credentials at the professional and doctoral levels.

3 Compared with this report, the website of College Measures Texas (tx.edpays.org) presents more comprehensive data for many more majors, by school, and at more time points.

4 Because this report focuses on 10 years of wage outcomes, the data for this report come from the cohort of students who completed their studies in the 2004 academic year, and data on their wages are from 2005 to 2014, the latest year in which data are available.

5 Certificates differ distinctly from degrees. According to THECB, certificates are awarded to students who complete a technical program designed for entry-level employment or for upgrading skills and knowledge within an occupation.

6 Associate's degrees, which are overwhelmingly granted by community colleges, have multiple purposes. Many students pursue associate's degrees as an interim step to achieving a bachelor's degree. But other students pursue associate's degrees, especially those with clear occupational and technical focal points, as pathways into careers.

Table 1. Number and Percent of Postsecondary Credentials Awarded to the Class of 2004 by Public Educational Institutions in Texas

Credential	Number of Completers	Percent
Certificate	21,163	14.3%
Associate's Degree	33,045	21.8%
Bachelor's Degree	66,742	44.3%
Master's Degree	23,879	15.9%
Professional Degree	3,232	2.1%
Doctoral Degree	2,434	1.6%
Total	150,495	100.0%

Bachelor's Degrees Versus Subbaccalaureate Credentials

Reports by College Measures⁷ and others have documented that one year after attaining their credentials, students who complete technical associate's degrees earn as much or even more on average than newly minted graduates with bachelor's degrees. In general, technical associate's degrees are a pathway into the job market that may be particularly valuable for students who do not have the time, money, or inclination to pursue a bachelor's degree.

Similarly, some occupationally oriented certificates can take even less time to attain than an associate's degree and can lead to wages that are comparable to those earned by graduates with bachelor's degrees. Nationwide, the number of such certificates awarded is growing faster than either the associate's or bachelor's degrees, as an increasing number of students are discovering the high rate of return on many occupationally oriented certificates.

Although these subbaccalaureate credentials can be a pathway into the middle class, the wages earned by graduates with bachelor's degrees increase faster than those earned by completers with shorter term credentials: that is, the early wage advantage of many short-term subbaccalaureate credentials erode as wages of graduates with bachelor's degrees catch up, and on average surpass, over time.

Although these trends hold true *overall*, the depth of THECB's data allows a deeper look into the relative wage outcomes of completers by major. The data indicate that not all completers fare equally well during the first 10 years after attaining a credential from a postsecondary institution.

⁷ These reports can be accessed through www.collegemeasures.org/esm.

Wage Outcomes

Figure 1 displays the median wages of students 1 and 10 years after completing different credentials. Table 2 reports the growth rate in those median wages. Together, these data begin to illustrate the importance of looking at longer term wage outcomes when identifying postsecondary credentials of value.

During the first 10 years after attaining a postsecondary credential, on average, wage differentials between successively higher credentials grow larger. In Texas, after one year in the job market, the median wages of graduates with associate's degrees were nearly the same as the median wages of graduates with bachelor's degrees. But after 10 years in the job market, graduates with bachelor's degrees, on average, more than doubled their median wages, while those with associate's degrees experienced a far lower average increase, about 70%.

The growth in wages of graduates with professional degrees is even steeper. The median wages earned among graduates with these credentials increased by over \$130,000 after 10 years. Much of this is attributable to the increase in the wages of doctors, who immediately after completing their formal studies enter into required but relatively low-paying internships. But as these graduates complete their training, their wages increase dramatically.

Figure 1. Median Wages Among Completers in 2005 and 2014 (1 and 10 Years After Completion), by Credential

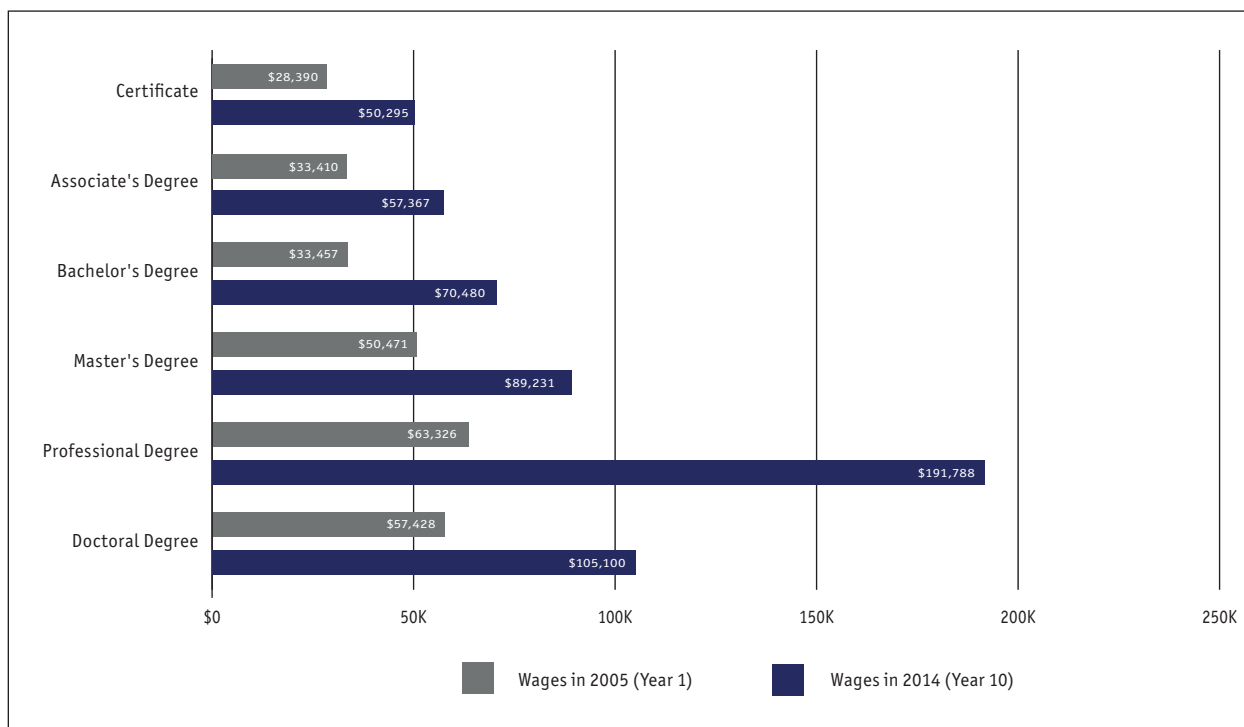


Table 2. Ten-Year Growth Rate in the Median Wages of Completers, by Credential

Credential	Change in Wages From 2005 to 2014
Certificate	77%
Associate's Degree	72%
Bachelor's Degree	111%
Master's Degree	77%
Professional Degree	203%
Doctoral Degree	83%

These data only begin to scratch the surface of the wealth of information available at the website of College Measures Texas. While overall numbers contain some important information about the relative payoff of different levels of credentials, they do not show the large variation in wage outcomes associated with different majors. The next several sections document variations in the wages of completers of different majors in the four most common types of credentials awarded in Texas: certificates, associate's degrees, bachelor's degrees, and master's degrees.

This report focuses on completers in larger majors—that is, majors that awarded at least 500 bachelor's degrees statewide, and for the other majors, at least 100 certificates, associate's degrees, or master's degrees. The higher cutoff point for bachelor's degree programs is a function of the large number of students who complete this type of degree in Texas.⁸

Wage Outcomes of Certificate Programs

Ten years after completing their certificates, wages varied widely across majors, from just over \$23,000 to more than \$73,000 (Figure 2). At the low end, students in the class of 2004 who completed a certificate in Human Development, Family Studies, and Related Services (which is one of the main pathways into early childhood education) earned median wages of slightly more than \$23,000 in 2014. Ten years into their careers, they were earning *less* than the median wage of high school graduates, which is just short of \$28,000.⁹

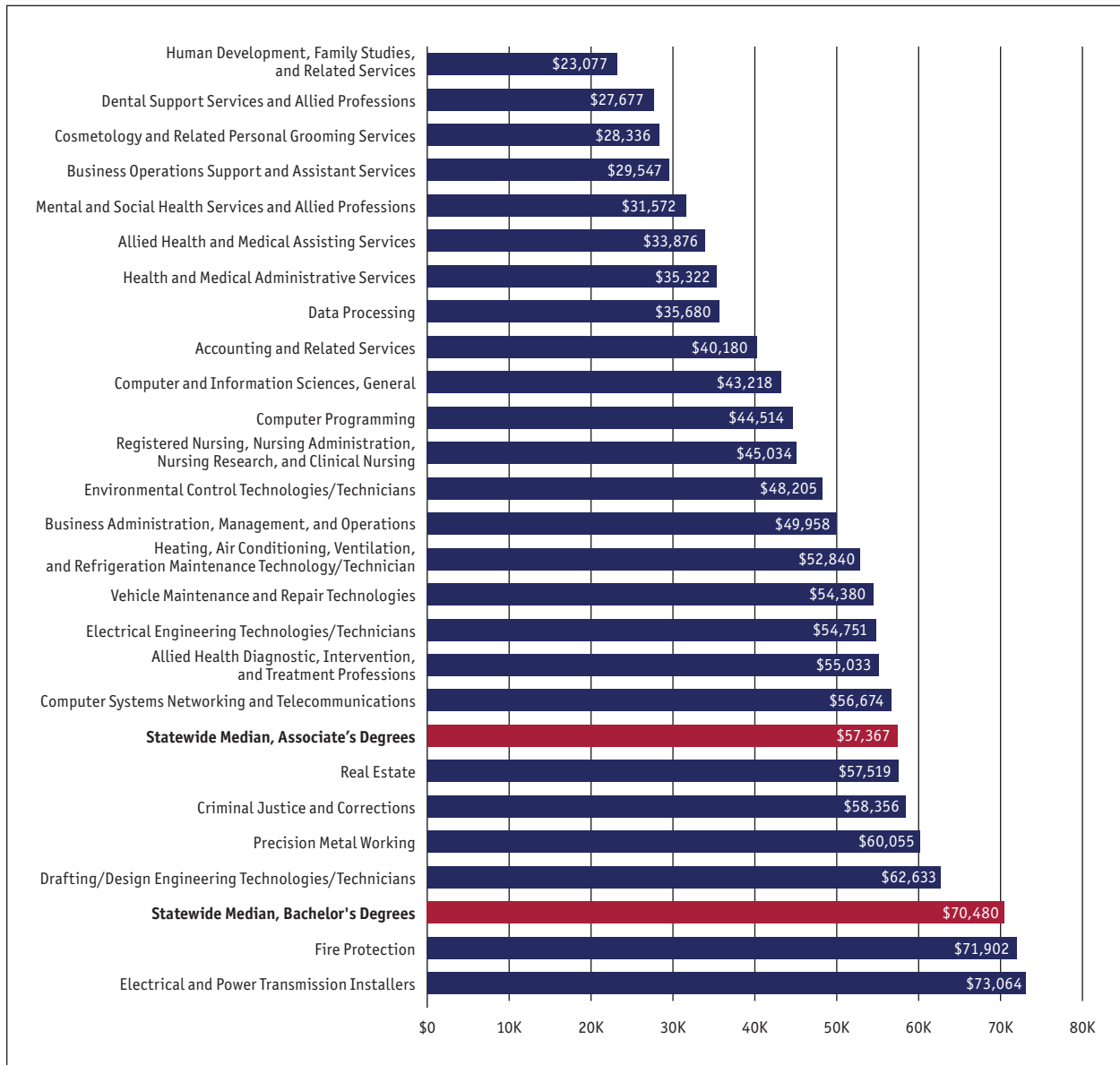
Graduates from three other certificate majors (Dental Support Services and Allied Professions, Cosmetology and Related Personal Grooming Professions, and Business Operations Support and Assistant Services) also had median wages less than \$30,000.

⁸ Data on all majors and wage outcomes for doctoral and professional degrees is available at tx.edpays.org.

⁹ See data for 2014 at http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S2001&prodType=table

To aid in the comparison of wage returns between certificate programs and associate's and bachelor's degree programs, Figure 2 displays the statewide median wages for graduates with associate's degrees (\$57,367) and bachelor's degrees (\$70,480).

Figure 2. Median Wages Among Completers of Certificates in 2014 (10 Years After Completion), by Major



While completers of most certificate majors had lower median wages than graduates with associate's degrees, completers from six certificate majors (Real Estate, Criminal Justice and Corrections, Precision Metal Working, Drafting/Design Engineering Technologies/Technicians, Fire Protection, and Electrical and Power Transmission Installers) had median wages higher than graduates with associate's degrees. Furthermore, the median wages of completers of certificates in two majors (Fire Protection and Electrical and Power Transmission Installers) were higher than the median wage of graduates with bachelor's degrees.¹⁰ Clearly, some certificates lead to middle class wages. Of note, wage data are reported for individuals—not households—which means that even more majors likely put the *households* of certificate-holders into the middle class.

Wage Outcomes of Associate's Degree Programs

Wages for graduates with associate's degrees vary widely across majors (Figure 3). As with certificates, the lowest wages were earned by graduates with an associate's degree in Human Development, Family Studies, and Related Services. Even 10 years after graduation, the median wages of graduates with associate's degrees in this field barely exceeded that of high school graduates. Despite the great attention at the state and federal levels to majors related to early childhood education, wages for students attaining subbaccalaureate credentials in this field are at the very bottom of the wage distribution.¹¹

Graduates of associate's degree programs with median wages above the statewide median tend to have completed majors that have technician or technology in their titles (e.g., Physical Science Technologies/Technicians, Electromechanical and Instrumentation and Maintenance Technologies/Technicians, and Electrical Engineering Technologies/Technicians). Graduates with associate's degrees in two other majors (Registered Nursing, Nursing Administration, Nursing Research and Clinical Nursing; and Allied Health Diagnostic, Intervention, and Treatment Professions) also had median wages above the statewide median.

Figure 3 displays the median wages of graduates with an *academic associate's degree* (\$49,724)¹² who were in the labor market. Note that this median wage is almost \$8,000 less than the

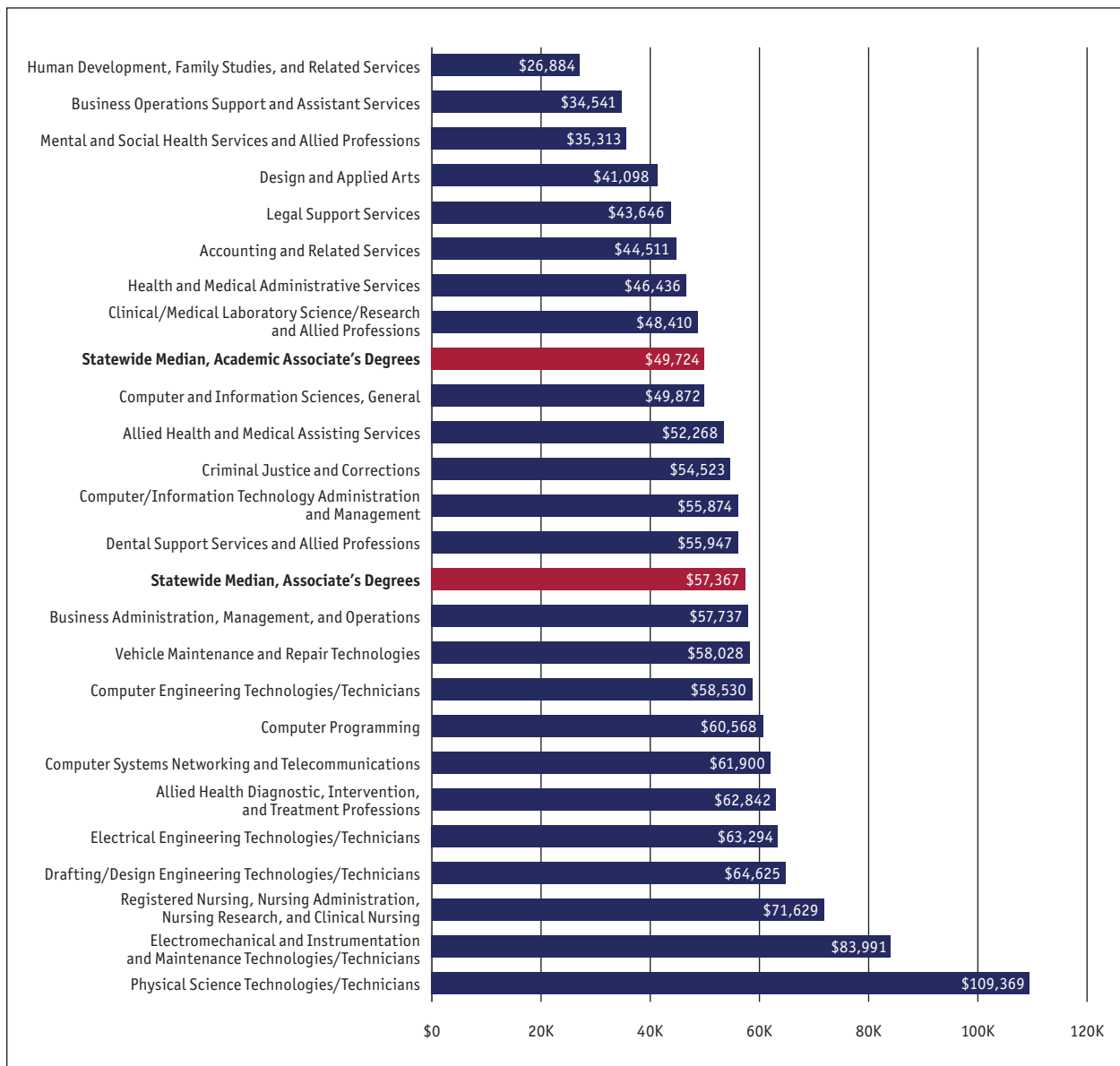
10 Some students pursuing certificates may already have other training or degrees and may be pursuing these credentials for advancement in an existing career.

11 This is not just true in Texas. The wages earned by completers in this major in other College Measures partner states are at the bottom of the distribution (http://www.realcleareducation.com/articles/2015/04/23/early_childhood_education_no_money_lots_of_mouth_1193.html).

12 If a student with a subbaccalaureate credential completes a higher degree in a state-funded institution in Texas, they are removed from the subbaccalaureate cohort. In other words, many students who are in an academic associate's degree program as a launching pad to a bachelor's degree have not succeeded in doing so, according to the records of the THECB.

median wage of graduates of *all associate's degree* programs (\$57,367). While many graduates with academic associate's degrees continue their studies in pursuit of bachelor's degrees, the median wages of graduates with an academic associate's degree who are in the job market lag behind most of their colleagues who chose majors in more career-oriented associate's degree programs.

Figure 3. Median Wages Among Graduates With Associate's Degrees in 2014 (10 Years After Completion), by Major



Wage Outcomes of Bachelor's Degree Programs

The bachelor's degree is the most commonly granted postsecondary credential in the state of Texas and in the nation. In general, the bachelor's degree has proven to be a good investment—but the rate of return varies considerably across majors.

Figure 4 displays median wages 10 years after graduating with bachelor's degrees in majors with more than 500 graduates.¹³ Ten years after attaining their credential, graduates with bachelor's degrees earned between \$46,000 and \$132,000. Figure 4 also displays the median wages for graduates of all associate's degree programs (\$57,367) and all bachelor's degree programs (\$70,480).

Paralleling the low wages earned by completers with subbaccalaureate credentials in Human Development, Family Studies and Related Services, graduates with bachelor's degrees in that major also had the lowest median wages of all the majors shown in Figure 4. Recalling that these postsecondary credentials are designed as pathways into early childhood education, it is clear that despite the importance many policymakers assign to early childhood education, people who have trained to enter that field are poorly paid relative to their peers in other majors.

Graduates with degrees in many of the arts, such as Fine and Studio Arts and Music, also had low median wages. In addition, graduates with degrees in seven other majors—including ones with large numbers of students, such as English, Psychology, and Sociology—had median wages that were *lower than the statewide median for all graduates with associate's degrees*.

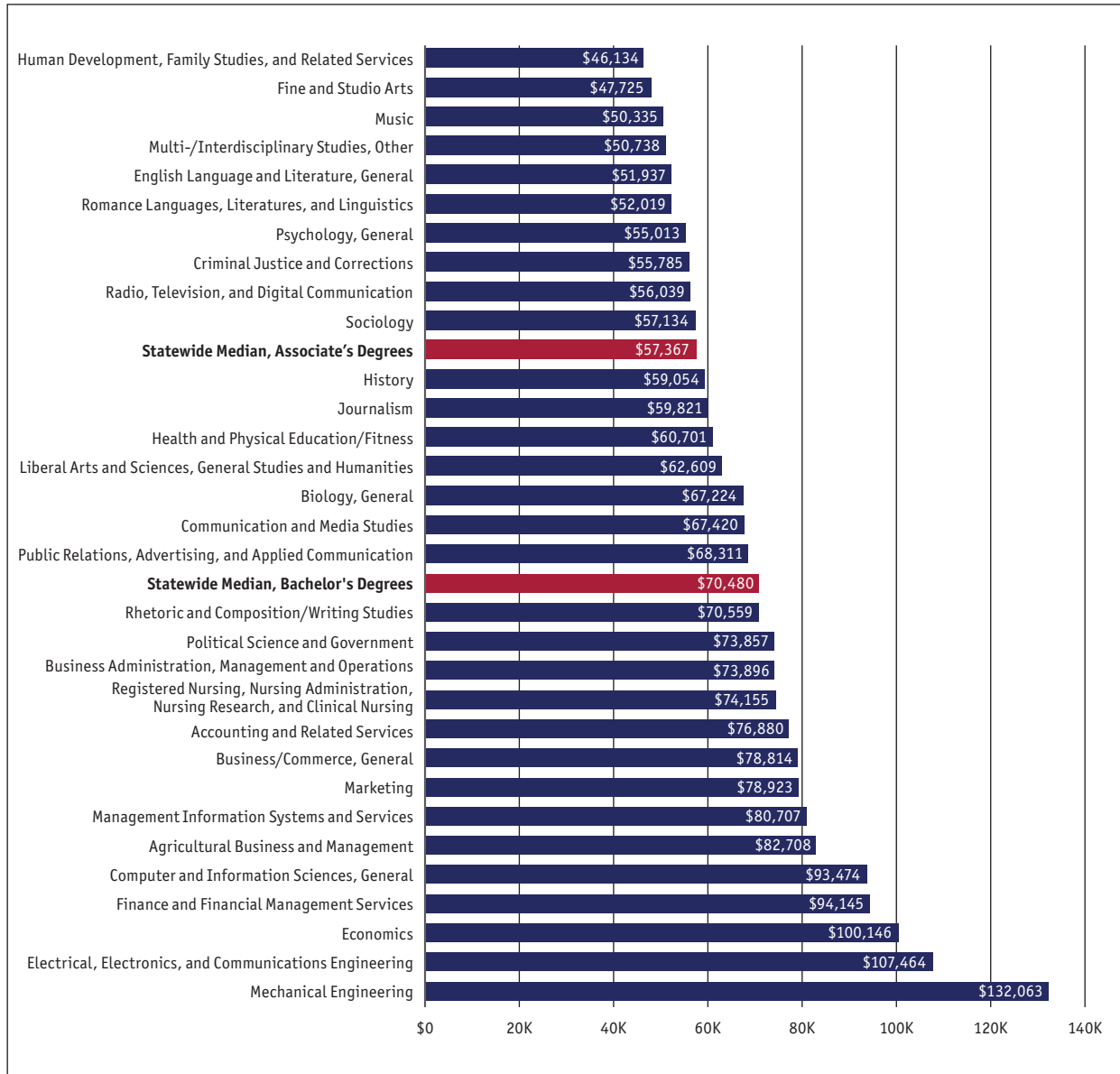
There has been a consistent call across the nation during the past few years for more graduates in the fields of STEM. Graduates in two majors related to engineering (Electrical, Electronics, and Communications Engineering; and Mechanical Engineering) earned the highest median wages, and graduates in Computer and Information Sciences, General also earned above-median wages. In contrast, graduates with bachelor's degrees in Biology, General (which is by far the largest science major in Texas and in the nation) earned less than the statewide median for graduates from all bachelor's degree programs.

Notwithstanding the emphasis on majors in STEM, the labor market does not always reward graduates with bachelor's degrees in science or mathematics—although graduates with bachelor's degrees in majors related to technology and engineering generally earn high wages.

Despite being called the “dismal science,” graduates with bachelor's degrees in Economics earned the third-highest median wages (\$100,146) among the larger majors. Furthermore, graduates with bachelor's degrees in business-related majors (Business Administration, Management, and Operations; Marketing; and Finance and Financial Management Services) also earned median wages above the median for all bachelor's degree programs.

¹³ The higher cutoff point for bachelor's degree programs is a function of the large number of students that complete this type of degree in Texas. See Table 1.

Figure 4. Median Wages Among Graduates With Bachelor’s Degrees in 2014 (10 Years After Completion), by Major



Wage Outcomes of Master's Degree Programs

Figure 5 presents median wages 10 years after graduating with master's degrees in majors with more than 100 graduates. Figure 5 also highlights the median wage of graduates with bachelor's degrees (\$70,480) and the statewide median wage for graduates from all master's degree programs (\$89,231).

In general, graduates with master's degrees outearn graduates with bachelor's degrees by almost \$19,000. But, as with other postsecondary credentials, the differential varies by major.

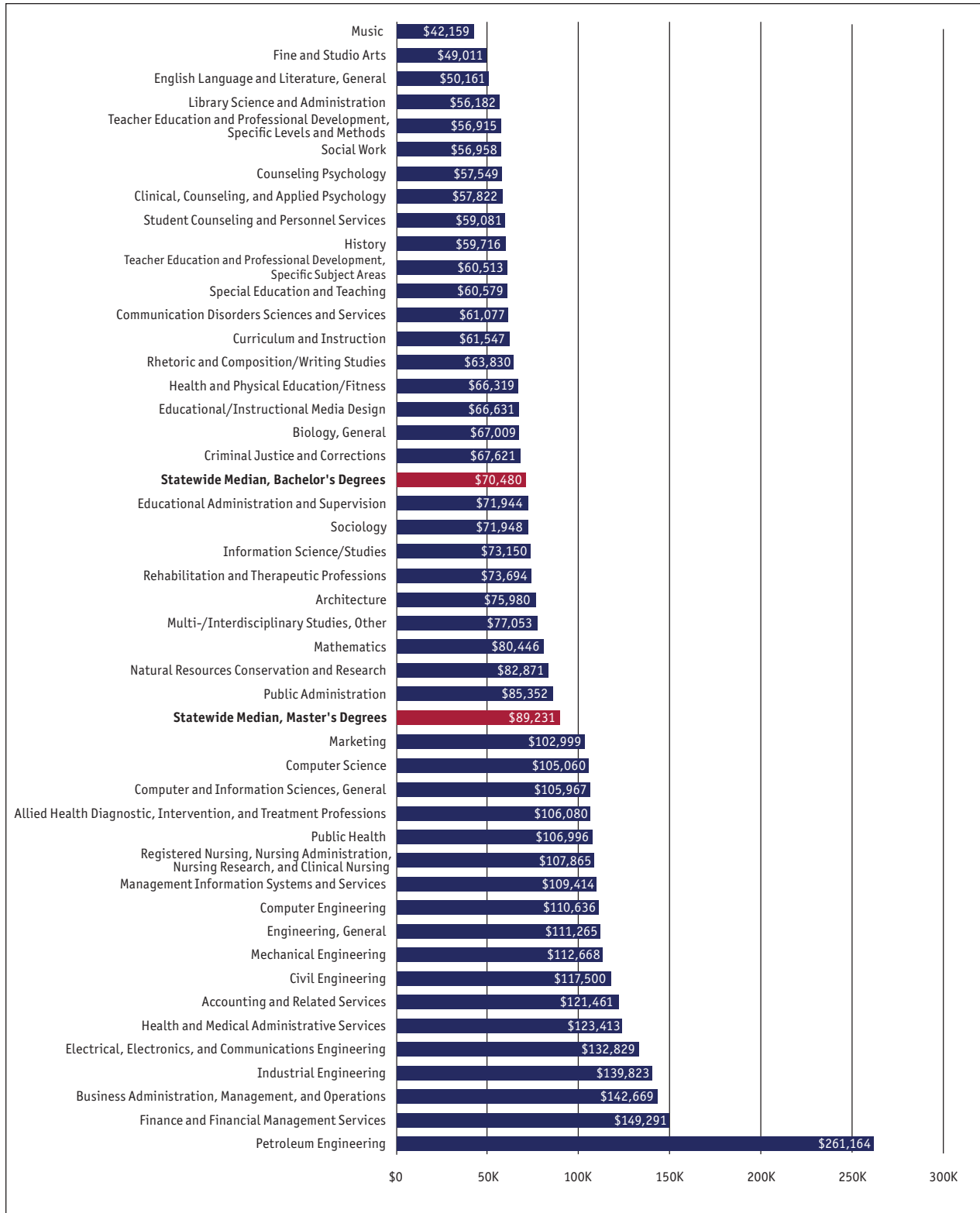
Ten years after attaining their degree, graduates with master's degrees in Music had median wages of just over \$42,000, which is less than one-fifth of the \$260,000-median wage earned by graduates with master's degrees in Petroleum Engineering.¹⁴ While this is the most extreme comparison, graduates with master's degrees in six majors (Music; Fine and Studio Arts; English Language and Literature, General; Library Science and Administration; Teacher Education and Professional Development, Specific Levels and Methods; and Social Work) earned less than the median wage of graduates from *all associate's degree programs* (\$57,367).¹⁵ Furthermore, the wages of graduates with master's degrees from 13 other majors had median wages that fell below that of graduates with bachelor's degrees (\$70,480).

As was the case with bachelor's degrees, the median wages of graduates with master's degrees in Biology, General were lower than the statewide median wage for graduates in all master's degree programs. But that does not mean that wages lag for graduates in all STEM majors. Indeed, the list of majors with the highest wages is dominated by those related to engineering and computer and information technologies. Health-related majors are also well represented. In fact, just as with subbaccalaureate credentials, graduates with master's degrees who know how to *fix things* or *help people be healthy* garner the highest wages.

¹⁴ The years covered by these data no doubt matter. The steep decline in the price of oil and the subsequent downsizing of the oil industry has no doubt affected these high wages.

¹⁵ Wages are based on data gathered from the state's Unemployment Insurance (UI) system. Some forms of income, such as self-employment, are not covered by the state's UI system. Thus, for example, income garnered by musicians who play in a band are not captured.

Figure 5. Median Wages Among Graduates With Master's Degrees in 2014 (10 Years After Completion), by Major



Majors Matter

Attaining a postsecondary credential is a good investment for Texans, and the value of that investment typically increases with more advanced studies. Ten years after completion, the median wage of completers of certificate programs (just over \$53,000) was almost twice as high as the median income of high school graduates (around \$28,000) in Texas. And the median wage of graduates with associate's degrees was even higher.

Graduating with a bachelor's degree is more valuable still. Ten years after graduation, the median wage of graduates with bachelor's degrees from a public institution in Texas was \$13,000 more than that of graduates with associate's degrees. An even larger premium—nearly \$19,000 on average—separated graduates with master's degrees from their counterparts with bachelor's degrees.

Overall, wages varied substantially among completers across majors but with the same credential. And completers from many majors at lower credential levels earned more, often far more, than their peers who had invested more time and money pursuing advanced postsecondary degrees.

Clearly, while postsecondary education pays, it pays a lot more for some than for others.

Data on the College Measures Texas website (tx.edpays.org) are much more extensive than what is presented in this report, allowing for far more detailed comparisons. Such rich data reinforce the patterns that are presented in this report, for example:

- What students study matters. While the median wages of completers generally increase with successively higher credential levels, subbaccalaureate credentials in some majors offer wages that rival or surpass those of graduates with bachelor's degrees.
- Despite the importance that the nation places on high-quality early childhood education, the training programs that prepare students to work in this field consistently produce graduates that are among the lowest paid in their credential level.
- Many of the largest majors, especially those associated with the arts, produce students that earn low wages. Furthermore, the relative wages of graduates from different majors are remarkably stable over time—that is, “start low, end low.”
- The shortage of graduates in the fields of STEM does not translate uniformly into higher wages for graduates in these fields. According to evidence in Texas (and elsewhere), graduates with degrees in Biology do not do particularly well in the labor market. Rather, their wages tend to be similar to the median wages of graduates from all bachelor's degree programs.

- In contrast, completers in Texas with credentials related to majors in engineering and technology tend to earn high median wages. This is also reflected in all College Measures partner states and in national data.
- Graduates in many health-related majors also earn high wages, as do technicians at every level of postsecondary education. Students who know how to *fix things* or *help people be healthy* earn higher median wages in the labor market.

Although many students may be most concerned with the wages that they will earn immediately after completing their credential, this report demonstrates the importance of considering wage growth. Among other things, the data illustrate more rapid growth in the wages of graduates with bachelor's degrees relative to their counterparts with associate's degrees. This type of information may be critical to students as they decide how to allocate their time and money today to better anticipate and prepare for tomorrow. Perhaps even more important is the wide variation in wage outcomes across majors—and the fact that these differences persist over time.

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