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# Comparing the Median Quarterly Wages Before, During, and After the COVID-19 Pandemic Recession by Area of Study for the 2012 Cohort from USHE Institutions

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## ABSTRACT

This report analyzes the change in quarterly median wages before, during, and after the recession in early 2020 caused by COVID-19 for Utah System of Higher Education postsecondary graduates from 2012. Using data from USHE and the Department of Workforce Services, individuals were tracked by their area of study, taking into consideration award types received and whether they were employed or strongly attached to the workforce. Permutation tests of medians were used to determine if quarterly median wages were significantly different pre- and post-pandemic. Of the tests that rejected the null hypothesis, only two indicated a decline in wages; a potential explanation for this, as other studies have argued, is due to low-wage workers bearing the brunt of the recession because they worked in sectors of the economy that required close contact between coworkers or customers. Rather than wages growing, the composition of the workforce changed.

## KEYWORDS

coronavirus, COVID-19, recession, COVID-19 recession, postsecondary education, postsecondary outcomes, Utah, state of Utah, Utah System of Higher Education, Utah Department of Workforce Services.

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# 1 | INTRODUCTION

## 1.1 | Background/Intro

The longest economic expansion in United States history started in June 2009, after the 2008 Financial Crisis, and ended in February 2020, the last month before the coronavirus pandemic (Ansell and Mullins, 2021). Subsequently, the COVID-19 recession lasted until April 2020. According to the National Bureau of Economic Research, the COVID-19 recession is the shortest in U.S. history (NBER, 2021), and the disruption the virus caused is yet to be fully understood. In the wake of the economic downturn, individuals across the economy were impacted, though not all demographic groups experienced the same turmoil. While some individuals had the opportunity to continue their jobs from home, a substantial number of employees had to continue conducting their work in person at risk of contracting the virus, had their working hours reduced, or had their positions terminated due to the decrease in demand.

Between March and April 2020, nationwide employment fell by 22.4 million, an overall decline of 15.0% (Ansell and Mullins, 2021); to put this in comparison, the Great Recession of 2007-09 had an employment decline of 6.0%, or 8.6 million jobs (Cunningham, 2018). The loss of positions during the 2020 recession was uncommon insofar as the individuals impacted were in industries that typically are not affected by recessions. In previous recessions, sectors of the economy, such as construction and manufacturing, were heavily affected, which have a high proportion of men (Alon et al., 2021). While the economic downturn impacted all industries, the sectors that were hardest hit by the coronavirus pandemic were those that required close contact with employees and customers (Ansell and Mullins, 2021). These industries had a high proportion of women, minorities, and less-educated individuals — what Lee et al. (2021) called an “industry-occupation composition effect,” meaning those demographics were disproportionately employed in those sectors.

Educational attainment is one of the consistent factors discussed across the literature on why certain individuals potentially lost their jobs during the early months of 2020. The reasoning is that individuals with higher education, usually a bachelor’s degree or higher, would be in positions that are more conducive to work-from-home policies (Mongey et al., 2020; Montenovo et al., 2021; Mongey & Weinberg, 2021). Researchers of this study could not find any reports that analyzed the impact of the COVID-19 recession across

across different postsecondary educational programs, i.e., graduates from Business, Health, or education. This study aims to address the gap.

Using data from the Utah System of Higher Education (USHE) in conjunction with the Utah Department of Workforce Services (DWS), the Utah Data Research Center (UDRC) analyzed the workforce outcomes of all areas of study from 2012 postsecondary graduates in Utah to compare their median quarterly wages before, during, and after the COVID-19 recession. The research objectives are to report the employment rate in Utah’s workforce for all areas of study using the two-digit Classification of Instruction Programs (CIP) codes and to compare the median quarterly wages earned from the first quarter of 2013 (2013Q1) through 2021Q4.

## 1.2 | Literature Review

The literature regarding the COVID-19 pandemic covers a wide range of topics due to the consequences of the virus. The research spans many disciplines, so this review will not provide a comprehensive analysis. Rather, the reports discussed will serve as an understanding of the workforce repercussions felt across demographic groups. Overall, the literature examined illustrates that the effects of the COVID-19 recession were unequal across the economy.

One of the main contributing factors to loss of employment that the literature has highlighted is the fact that the less educated individuals were, the more susceptible to unemployment (Adams-Prassl et al., 2020; Cortes and Forsythe, 2023; Gambau et al., 2022; Lee et al., 2021; Mongey et al., 2020). Cortes and Forsythe (2023) found that the relationship between education groups and employment was monotonic — meaning that as individuals increased their educational attainment, the less impacted they were by the COVID-19 recession. The largest decline in employment was for those with no high school degree, at 31 percentage points, while college degree recipients had a decrease of 12 percentage points. Similarly, Lee et al. (2021), comparing employment rates from April 2019 to April 2020, found that college graduates had the smallest increase in unemployment rates at 6.7 percentage points, while the rate increase for high school graduates was 15.0%. Likewise, Mongey et al. (2020) contend that non-college workers — associated with in-person work — had a 21.0% “excess decline” in employment from February to April 2020, while college-educated workers experienced only 7.0% excess decline.

Another primary difference that separates the COVID-19 recession from other economic downturns is the impact on women's employment compared to men. Likewise, in comparison to



recessions of the past, the coronavirus had a large impact on employment in service sector industries, which had a majority of women employed within them (Ansell and Mullins, 2021; Lee et al., 2021; Alon et al., 2021). Ansell and Mullins (2021) argue that the COVID-19 recession impacted sectors of the economy that had large proportions of women. They go on to state that even within industries that were disproportionately women, employment declines were inordinately felt by women.

One of the potential reasons women were more impacted than men by the 2020 recession was due to women decreasing working hours or no longer working due to child care (Albanesi & Kim, 2021; Couch et al., 2021; Garcia & Cowan, 2022). Albanesi and Kim (2021) show that the labor supply of women with children fell in 2020 and was further restrained in the fall of 2020, and that could likely be due to the continued interference the virus had on childcare needs when students went back to school. Couch et al. (2021) similarly found that mothers with school-age children were disproportionately affected by the COVID-19 recession compared to men; women with children saw employment losses of 2.3-4.3% and a loss of hours ranging from 8.3-26.7% in spring, summer, and fall of 2020. Lastly, Garcia and Cowan (2022) found similar results to Albanesi and Kim (2021) and Couch et al. (2021), though they state that the effects of school closures had more of an impact on the earnings of parents without college degrees.

Like women, non-white individuals were disproportionately affected by the COVID-19 recession (Lee et al., 2021; Couch et al., 2020; Cortes and Forsythe, 2022). Lee et al. (2021) argue that women and non-white individuals were more impacted by the COVID-19 recession due to an "industry-occupation composition effect." To put it another way, they were disproportionately employed in service sectors mainly affected by the COVID-19 recession, e.g. leisure/hospitality and other service-related industries. Lee et al. (2021) also found that individuals of Hispanic and Asian descent were more impacted than Black and White individuals, and Black employees experienced a slower recovery in terms of employment. Couch et al. (2020) had similar findings: the unemployment rate for all demographic groups observed increased significantly, however, not equitably.

## 2 | DATA

### 2.1 | Data Overview

This analysis utilized data from a variety of sources; to compare employment and income differences for college graduates, the UDRC combined data from USHE and DWS. Data was obtained from the Federal Reserve Bank of St. Louis (FRED) to analyze the

earnings of individuals whose highest educational attainment was earning a high school diploma or equivalent.

The data obtained from USHE provided the variables used in this report besides the quarterly wages that individuals received after graduating. The data from USHE included the area of study, the date students enrolled, the award type received, and the graduation date for those who received a postsecondary award.

The analyses in this report examine two groups of individuals. The first group is people who enrolled in a postsecondary institution in 2012 but did not receive an award before entering the workforce. The other group is USHE graduates from the 2012 cohort who entered the workforce and did not re-enroll in a USHE institution to pursue further education. If a student re-enrolled into a higher education program without completing it, they were omitted from the analysis. If an individual received numerous awards, they were only included with the most recent award obtained. Similarly, if an individual acquired multiple awards on the same date, the study arbitrarily used the first observation listed in USHE data to prevent graduates from being included in the analysis multiple times.

Employer payroll reporting information that underscores DWS' administration of the Unemployment Insurance (UI) system provided the quarterly wage data for all graduates who worked and received wages from 2013Q1-2021Q4. Most employers in Utah are required by Title 35A, Chapter 4 of the Utah Code, entitled the Utah Employment Security Act, to report the wages their employees receive quarterly as part of their participation in the UI system. If an individual worked numerous jobs in the same quarter, their wages were aggregated together. To compare income across the observed time frame, the study adjusted for inflation using the Consumer Price Index for All Urban Consumers (CPI-U) indexed to 2010 wages. CPI-U measures the monthly average change for a market basket of consumer goods for urban consumers (Bureau of Labor Statistics, 2018).

Data obtained from FRED provides insight for individuals whose highest educational attainment was a high school diploma. The two FRED data sources included in this analysis are the "Labor Force Participation Rate - High School Graduates, No College, 25 Yrs. & over" and the "Employed full time: Median usual weekly nominal earnings (second quartile): Wage and salary workers: high school graduates, no college: 25 years and over" datasets. Similar to the wages obtained from DWS, the incomes obtained from FRED were adjusted using the CPI-U.

All the analyses conducted in this report were performed in R using the tidyverse package (Wickham et al., 2019).



## 2.2 | Data Limitations

This report is limited in a few ways. First, the data provided by USHE only include public degree-granting and technical colleges in Utah. Data from private institutions, such as Brigham Young University (BYU) and Westminster College, were not included. Similarly, USHE data does not include graduates who completed their postsecondary education outside of Utah.

The second limitation is with the data obtained from DWS' UI system. The UI wage data does not have access to the number of hours individuals worked in a given quarter, so it's not known if individuals worked full-time. To overcome this limitation, only graduates who were "strongly attached to the workforce" were included. Someone who is strongly attached to the workforce is defined as an employee who made no less than the federal minimum wage of \$7.25 per hour and worked 40 hours a week for all four quarters of the calendar year for all years included in this analysis; therefore, if an individual did not have a minimum quarterly income of \$3,770 for all four quarters in a given year, they were not included in the analysis.

Another limitation regarding the UI wage data is that the data set does not capture all the income an individual may receive in each quarter. The data does not include wages from any employment exempted under the Utah Employment Security Act, examples of which are self-employment, federal agency employment, or non-covered agricultural employment. It also does not include any income from the black market or "under the table" transactions. Furthermore, wages received outside of Utah are not included in this research.

## 3 | METHODOLOGY

Permutation tests were utilized to compare the median quarterly wages enrollees and graduates received before, during, and after the COVID-19 recession. Permutation tests use random sampling from one or more populations and obtain statistical significance by the frequency with which the null hypothesis is rejected. The distribution of the test statistic is calculated through all the values of the test statistic for all possible rearrangements of the data. The null hypothesis for the tests is that there is no difference in median wages, while the alpha is 5%. The permutation tests compared the following quarters for each area of study to determine whether the median wages received before, during, and after the COVID-19 recession were statistically significant to each other: 2019Q1-2020Q1, 2019Q2-2020Q2, 2019Q3-2020Q3, 2019Q4-2020Q4, 2020Q1-2021Q1, 2020Q2-2021Q2, 2020Q3-2021Q3, and 2020Q4-2021Q4.

## 4 | RESULTS

### 4.1 | Descriptive Statistics

Of the 20,460 individuals included in the study, 16,609 received a postsecondary award in 2012. The remaining 3,851 people enrolled in a higher education institution in 2012 for the first time but have not subsequently earned a higher education award from a USHE institution. USHE graduates and enrollees were largely similar in their demographics: white individuals account for the highest proportion of people in the analysis, accounting for 80.3% and 69.9%, respectively. Similarly, individuals with an unknown race/ethnicity were the second largest group at 6.0% for graduates and 11.5% for enrollees (Table 1).

**Table 1:** Gender and Race/Ethnicity Distribution for 2012 USHE Graduates and Enrollees. \* Data was missing in UDRC's database.

	USHE Terminal Graduates	USHE Enrollees
Women	8,372 (50.4%)	*
Men	8,237 (49.6%)	*
American Indian or Alaskan Native	110 (0.7%)	75 (1.9%)
Asian	372 (2.2%)	52 (1.4%)
Black	170 (1.0%)	83 (2.2%)
Hispanic	807 (4.9%)	436 (11.3%)
Multiple	135 (0.8%)	44 (1.1%)
Native Hawaiian or Pacific Islander	86 (0.5%)	29 (0.7%)
Non-Resident Alien	590 (3.6%)	NA
Unknown	999 (6.0%)	441 (11.5%)
White	13,340 (80.3%)	2,691 (69.9%)
Total	16,609	3,851

Bachelor's degrees were the most received postsecondary award, accounting for 9,972 (60.0%). Associate and graduate degree recipients' completion rates had the closest award rates at 2,666 (16.1%) and 3,344 (20.1%), respectively. Individuals who earned a certificate in 2012 were the smallest subgroup, with 627 (3.8%) (Table 2).

Separating individuals based on the program completed reveals that the top five areas of study accounted for 8,970 (54.0%) of the 2012 graduates. Due to the five areas of study accounting for a majority of graduates, this section will focus on them, though all programs underwent the same analyses. The two most common programs were Health Professions and Business, accounting for about a third of all graduates. Health Professions had 2,695 (16.2%) individuals receive awards, while there were 2,679 (16.1%) Business graduates. The remaining top five programs, Liberal Arts and Sciences, Education,



**Table 3:** Total Number of Graduates from the Top Five Areas of Study who Received an Award and the Distribution of Certificate, Associate, Bachelor's, and Graduate Degree Recipients from USHE institutions in 2012. \* Suppressed data due to privacy requirements.

	Total # of Graduates	Certificates	Associate's Degrees	Bachelor's Degrees	Graduate Degrees
51: Health Professions	2,695 (16.2%)	301 (48.0%)	476 (17.9%)	1,324 (13.3%)	594 (17.8%)
52: Business	2,679 (16.1%)	23 (3.7%)	130 (4.9%)	1,644 (16.5%)	882 (26.4%)
24: Liberal Arts and General Studies	1,501 (9.0%)	*	1,408 (52.8%)	85 (0.9%)	*
13: Education	1,120 (6.7%)	*	*	*	*
45: Social Sciences	975 (5.9%)	*	*	*	*

**Table 2:** Distribution of Award Types for Individuals who Completed a Postsecondary Program in 2012 from a USHE institution.

Award Type	# of Graduates
Certificate	627 (3.8%)
Associate Degree	2,666 (16.1%)
Bachelor's Degree	9,972 (60.0%)
Graduate Degree	3,344 (20.1%)

Social Sciences, were smaller in proportion at 1,501 (9.0%), 1,120 (6.7%), and 975 (5.9%), respectively (Table 3). The number of individuals for each area of study, see Appendix Table A1. Of those who participated in the workforce, there is a relationship between educational attainment and workforce participation.

Data obtained by FRED reports shows the weekly earnings for high school graduates were stable throughout the analysis, around \$600. During the quarter of the COVID-19 recession, high school graduates had their highest income at \$665 per week (Figure 1). The participation rate, similarly, was relatively constant at 57.0-58.0% until the second quarter of 2020; during the recession, their participation rate fell to 54.7% and had not recovered to its pre-pandemic levels as of 2021Q4.

All employed enrollees and graduates were similar insofar as their employment rates in Utah's workforce declined between the beginning of the analysis and the COVID-19 recession in 2020Q2. The rate for all employed enrollees declined by 5.2%, whereas all employed graduates declined by 12.1% (Figure 2). Comparing the employment rates one year before and after the 2020 recession, however, the two groups differed. All employed enrollees declined by 1.2% between the second quarter of 2019 and 2020 and by a further 0.4% between 2020Q2 and 2021Q2—a difference of 1.6% in total. All employed graduates, in comparison, increased their rates in Utah's workforce by 0.3% for both periods, increasing by 0.6% compared to their pre-pandemic rate in 2019Q2 (Figure 2).

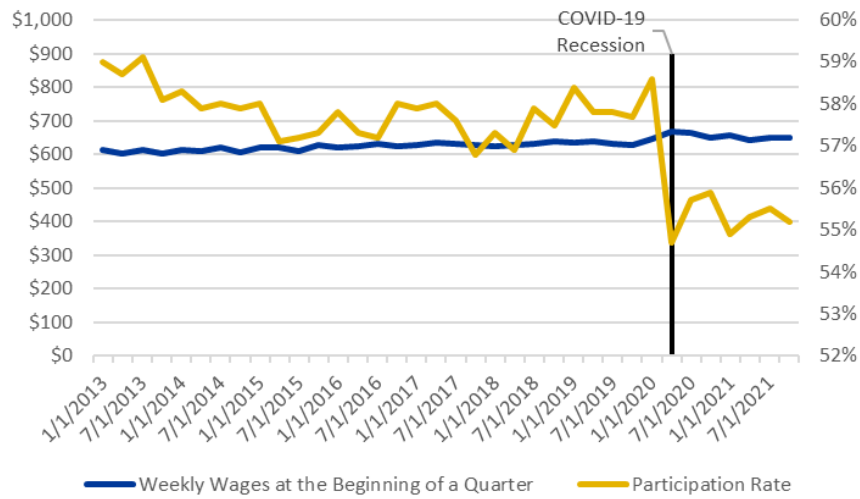
The employment rates for enrolled and graduated individuals converged towards one another throughout the analysis for both all employed and strongly attached employees (Figure 2), though this is not for all programs of study. For most of the analysis, all employed enrollees had a higher employment rate than all employed graduates, though the difference between the two narrowed around the time of the COVID-19 recession (Figure 2). Likewise, strongly attached employees had their employment rates converge by the end of the analysis.

For strongly attached individuals, employees whose highest educational attainment was enrolling into a USHE postsecondary institution had approximately 16.0% less employed than USHE graduates (Figure 2). Throughout the analysis, strongly attached enrollees increased their employment rate, and by 2019, there was only a 2.1% difference between enrollees and graduates. By 2021, the difference widened to 4.2%, about the same difference observed in 2018 (Figure 2).

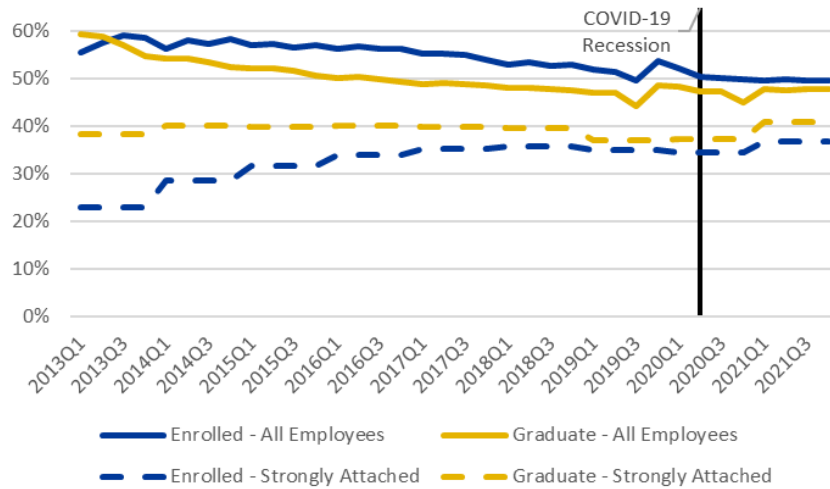
Comparing the differences in quarterly median wages pre- and post-COVID-19 recession for all employed enrollees and graduates illustrates that, in most circumstances, all employed groups had significantly different wages (Figure 3 and Table A2). Enrollees did not have significantly different wages between the 2019Q2 and 2020Q2, though the second quarters of 2020 and 2021, increasing by \$480. All employed graduates, in comparison, had significantly different wages pre- and post-COVID-19 recession: between the second quarter of 2019 and 2020, their quarterly income increased by \$642, and \$412 from 2020Q2 and 2021Q2 (Figure 3 and Table A2).

For employees strongly attached to the workforce, enrollees and graduates differed on their significant tests (Table A2). Enrollees had significantly higher wages in 2019Q4 than 2020Q4, with wages increasing by \$1,100. Strongly attached graduates their wages increased significantly by \$800 between the second quarters of 2019 and 2020 but were

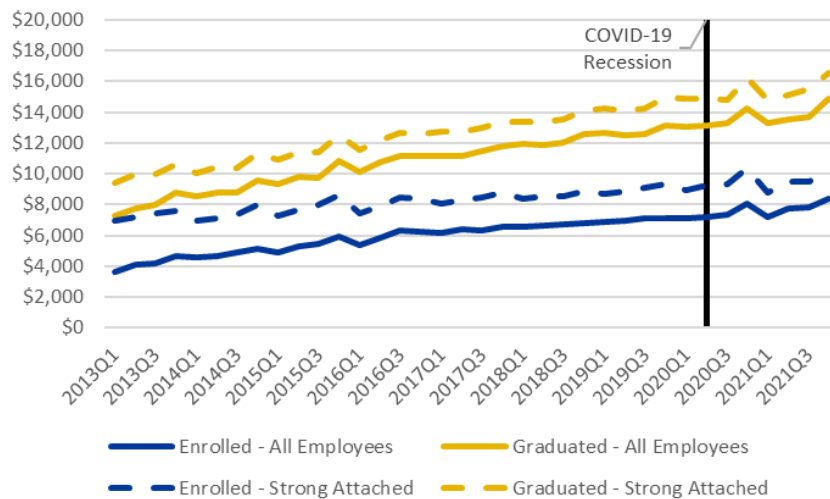




**Figure 1:** Median Weekly Earning and the Labor Force Participation Rate for National High School Graduates Above 25 Years Old with No College Education.



**Figure 2:** Percentage of USHE Enrollees and Graduates who are Employed and Strongly Attached to the Utah Workforce from 2013Q1-2021Q4.



**Figure 3:** Median Quarterly Wages for All Employed and Strongly Attached to the Workforce USHE Enrollees and Graduates from 2012 in Utah's Workforce from 2013Q1-2021Q4.



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not significantly different for the post-pandemic comparison (Table A2).

## 4.2 | Areas of Study Regardless of Award Type Received

The employment rates for all employed graduates from the top five areas of study, regardless of award type received, declined in the observable timeframe (Figure 4). Graduates from Education programs had the largest drop at 21.4%, with the closest decrease being Health Professions graduates at 11.4%. Interestingly, when focused on the difference between 2019Q2 and 2020Q2, only Liberal Arts graduates had a lower employment rate in the latter period. Furthermore, one year after the recession, all areas of study were at, or above, their pre-pandemic levels, with Health graduates having the largest increase at 5.9% (Figure 4).

Strongly attached graduates from the top five areas of study differed from all employed graduates insofar as most of the top areas of study increased their employment in Utah's labor force throughout the analysis – Education and Health Professions being the exceptions. Liberal Arts had the largest increase between 2013Q1 and 2021Q4 at 10.6%, whereas Education and Business had the smallest differences at -1.3% and 1.5%, respectively (Figure 5).

Like all employed individuals, one year after the COVID-19 recession, graduates strongly attached to the workforce had rates above their pre-COVID-19 recession employment rates in Utah's labor force. Between 2019 and 2020, individuals from Liberal Arts and Health Professions strongly attached to the workforce declined in their workforce participation; between 2020 and 2021, however, Liberal Arts and Health Professions increased by 3.1% and 12.9%, respectively (Figure 5). To compare the differences in employment rates in Utah's workforce for the remaining areas of study, see Appendix Figures B1-B12.

Regardless of their employment rate differences between 2019Q1 and 2021Q4, all top five areas of study increased their quarterly median wages through the same period (Figures 6 and 7). All employed graduates from each of the top areas of study had at least one permutation test of medians reject the null hypothesis (Table B1). Education and Business graduates had  $P < 0.05$  for five of the tests conducted. Both had significantly different wages between 2019Q2 and 2020Q2 but not between 2020Q2 and 2021Q2. Liberal Arts and Social Science award recipients only had one instance of significantly different wages, between 2019Q2 and 2020Q2 and between 2019Q4 and 2020Q4, respectively.

For the top five areas of study, individuals strongly

attached to the workforce significantly increased their median quarterly wages more often than all employed graduates. Across the five programs, 15 of the tests resulted in the null hypothesis being rejected, each indicating an increase in median quarterly wages. In comparison, all employed graduates had 14 tests report significantly higher wages (Figure 7 and Table B1).

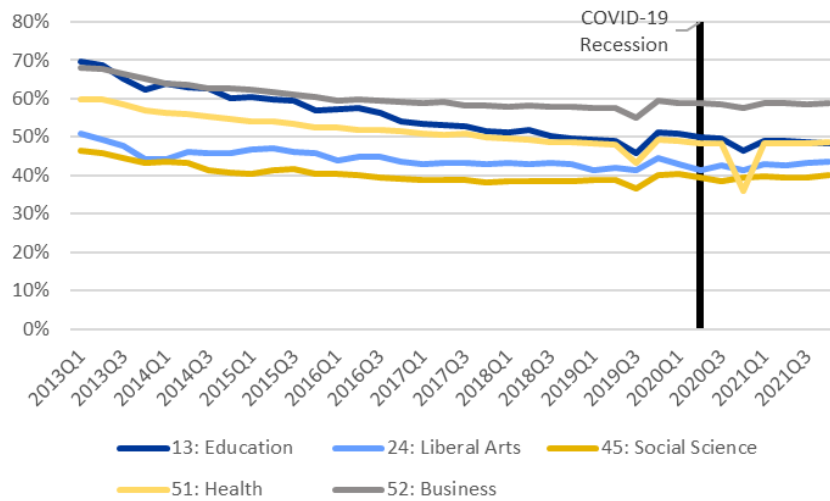
Education and Business graduates had the same number of permutation tests of medians resulting in  $P < 0.05$  as all employed individuals, though not always in the same quarters for Business graduates. Health graduates that were strongly attached had their wages significantly increase two more times than all employed Health individuals. Social Science was the only program for strongly attached employees not to have significantly different wages for the tests conducted. To see the median quarterly wages and their permutation test results for the remaining areas of study, regardless of award type received, see Appendix Figures B13-B24 and Appendix Table B1, respectively.

## 4.3 | Certificate Recipients

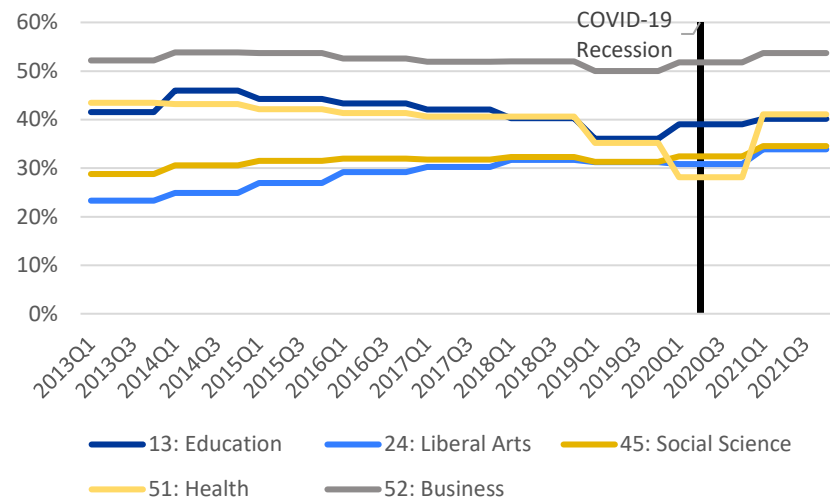
Of all the employed individuals who received postsecondary certificates, only two of the top five areas of study, Health and Business, had sample sizes that met the minimum requirement of ten individuals in each quarter from 2013Q1-2021Q4 for all employed individuals (Figure 8). For all employed Health certificate recipients, the percentage of individuals in Utah's workforce was on a steady decline throughout the observation period and experienced their largest decrease of 4.2% between 2020Q3 and 2020Q4, two quarters after the COVID-19 recession. Compared to the year prior, in 2019Q4, the rate decreased by 6.7%. By the end of the observation period, the rate returned to its pre-pandemic levels (Figure 8).

Similarly, strongly attached employees who earned certificates from Health programs were the only graduates from the top five areas of study reported due to the other programs not meeting the minimum requirement of 10 observations in a quarter (Figure 9). Certificate recipients strongly attached to the workforce from Health programs had their largest decline in Utah's workforce between 2019 and 2020, falling by 3.0%; in 2021, the rate climbed back to 21.3%, 1.9% above their 2019 employment rate (Figure 9). To see the employment rates in Utah's workforce for the remaining areas of study who received certificates, see Appendix Figures C1 and C2.

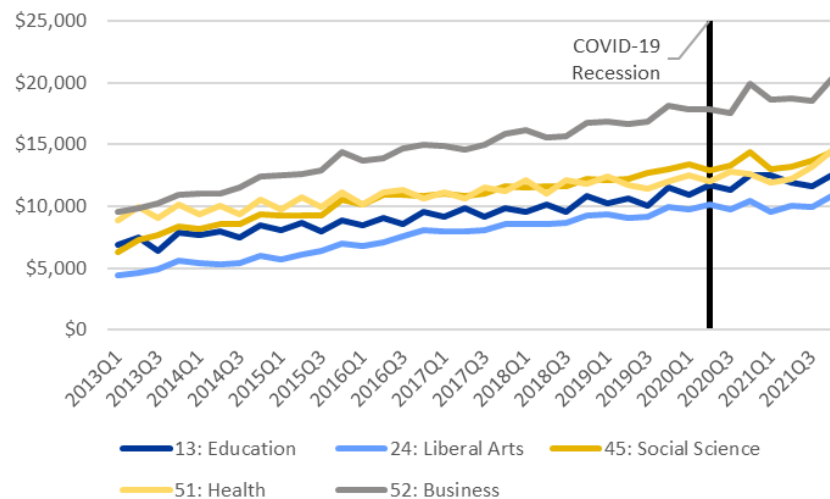
All employed Health and Business certificate recipients had quarterly median wages that followed a similar trend, with Business graduates usually having higher earnings. In the third quarter of 2020,



**Figure 4:** Percent of All Employed USHE Graduates from 2012, Regardless of Award Received, for the Top Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.



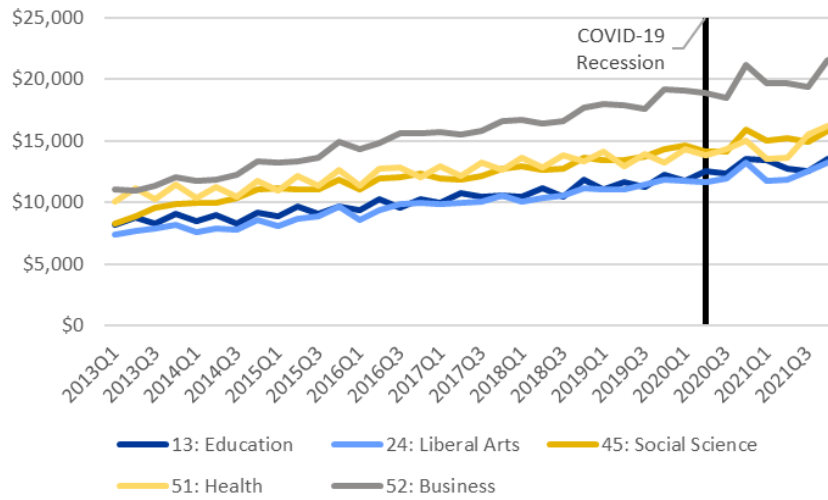
**Figure 5:** Percent of Strongly Attached to the Workforce USHE Graduates from 2012, Regardless of Award Received, for the Top Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.



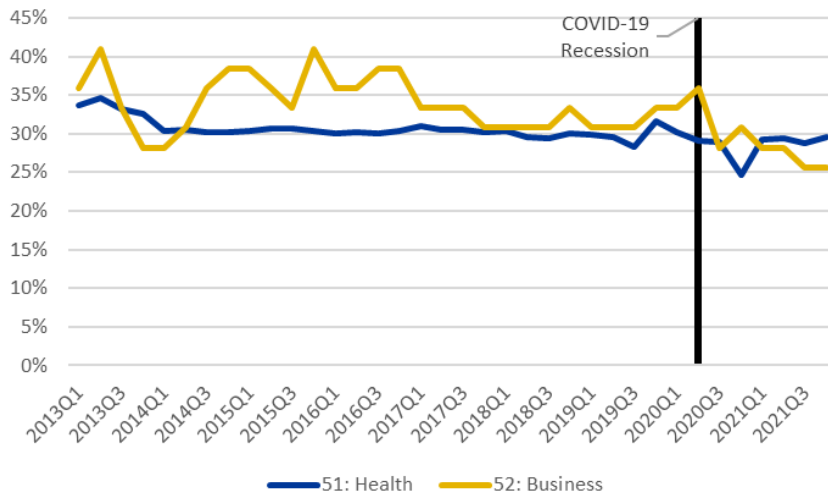
**Figure 6:** Median Quarterly Wages for All Employed USHE Graduates from 2012, Regardless of Award Type Received, for the Top Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.



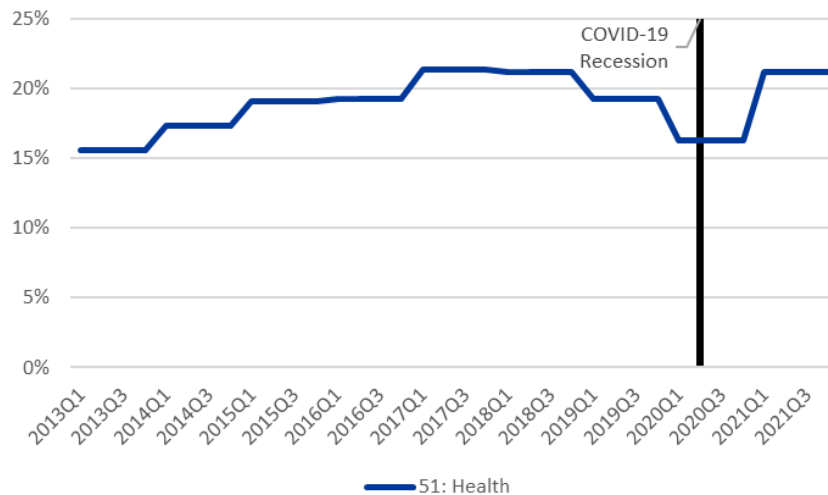




**Figure 7:** Median Quarterly Wages for Strongly Attached to the Workforce USHE Graduates from 2012, Regardless of Award Type Received, for the Top Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.

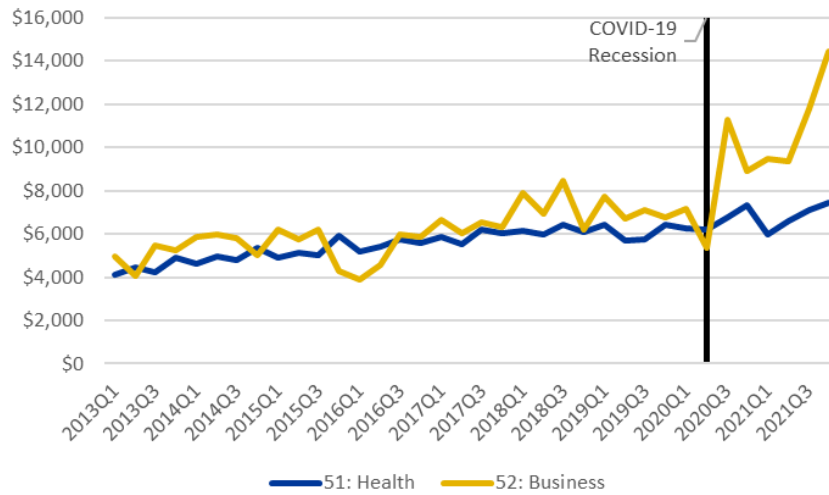


**Figure 8:** Percent of All Employed USHE Graduates from 2012 who Received Certificates from the Top Reportable Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.

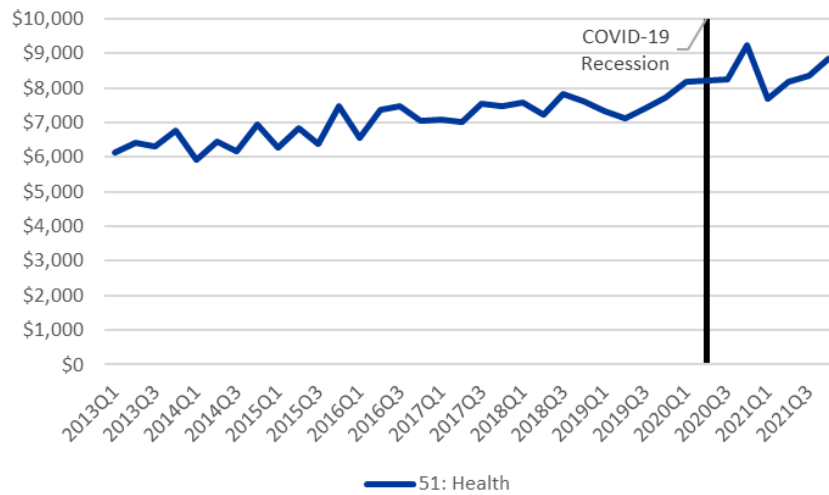


**Figure 9:** Percent of Strongly Attached to the Workforce USHE Graduates from 2012 who Received Certificates from the Top Reportable Areas of Study in Utah’s Labor Force from 2013Q1-2021Q4.





**Figure 10:** Median Quarterly Wages for All Employed USHE Graduates from 2012 who Received Certificates from the Top Reportable Areas of Study in Utah's Labor Force from 2013Q1-2021Q4.



**Figure 11:** Median Quarterly Wages for Strongly Attached to the Workforce USHE Graduates from 2012 who Received Certificates from the Top Reportable Areas of Study in Utah's Labor Force from 2013Q1-2021Q4.

Business graduates experienced a substantial increase in their quarterly median earnings, increasing by over \$5,900 compared to the previous quarter. However, the permutation tests conducted did not indicate that the difference in median quarterly wages was statistically significant (Figure 10). All employed Health graduates, in comparison, rejected the null hypothesis once between 2019Q3 and 2020Q3, increasing their quarterly median wages by over \$1,000 (Figure 10 and Table C1).

Strongly attached to the workforce Health graduates, the only reported top area of study in Utah's workforce due to sample sizes, did not experience a large difference in their median quarterly wages until 2020Q4, where their quarterly median wages increased by \$1,000 compared to the previous quarter (Figure 11). This increase in wages was significantly higher than their wages in 2019Q4.

To see the median quarterly wages and permutation tests of medians for certificate recipients for the remaining areas of study, see the Appendix: Figures C3 and C4 show the median quarterly wages for all and strongly attached employees, respectively, and Appendix Table C1 reports the results of the permutation tests of medians.

#### 4.4 | Associate's Degree Recipients

Similar to other all-employed graduates' employment rates in Utah's workforce, associate degree recipients declined in their rates throughout the analysis (Figure 12). Education associate degree recipients had their employment rate decline by 14.5% throughout the analysis, two and a half times more than their peers from Health programs(-5.8%). In 2020Q2, employment rates in Utah's labor force declined by 0.6% for Liberal Arts and 1.9% for



Business graduates compared to the year prior. One year after the COVID-19 recession, only Liberal Arts and Education had employment rates at, or above, their pre-pandemic levels – Health Professions and Business were 0.9% and 1.4%, respectively, below their 2019Q2 rates (Figure 12).

For associate degree recipients strongly attached to the workforce, the employment for the top areas of study increased between the beginning and end of the analysis, besides Health, which marginally declined by 0.4%. The other two areas of study, Liberal Arts and Business, increased by 6.5% and 1.9%, respectively. Focusing on the impact of the COVID-19 recession, Health degree recipients were the most impacted in terms of their employment rate in Utah's labor force, with 6.2% less during 2020 than in 2019. By 2021, all the reportable top areas of study increased, with Health graduates increasing by 8.5% (Figure 13). To see the employment rates for the remaining areas of study for associate degree recipients, see Appendix Figures D1-D4. Interestingly, there was not a large difference in median wages received.

Figure 14 appears to show that the quarterly median wages after the 2020 recession increased for all employed associate degree recipients; referencing the results of the permutation tests of medians in Appendix Table A5 reveals that most of the tests failed to reject the null hypothesis. Only two of the tests resulted in  $P < 0.05$ , and they were from different areas of study. Liberal Arts graduates had significantly different wages between 2019Q2-2020Q2, increasing by \$1,000, and individuals from Health programs were the other group to reject the null hypothesis in 2019Q4-2020Q4, increasing by \$1,500 (Figures 14 and Table D1).

Likewise, employees strongly attached to the workforce from Liberal Arts and Health programs with associate degrees were the only programs with significantly different wages (Table D1). In contrast to all employed individuals, strongly attached employees from Health programs rejected the null hypothesis three times, with the 2020Q1-2021Q1 test indicating that quarterly median wages declined by about \$1,300 (Figures 14 and 15).

To compare the remaining areas of studies for associate degree recipients, see Appendix Figures D1-D8. Likewise, the permutation tests of medians for the remaining areas of studies are in Appendix Table D1.

#### 4.5 | Bachelor's Degree Recipients

Figure 16 reports that rather than bachelor's degree recipients experiencing a decline in employment in Utah's workforce between the second quarter of 2019 and 2020, the top areas of study had their rates decrease between 2019Q4-2020Q4. Health

program graduates had the largest decline at 8.7%, while Education had the second largest difference at 2.5%. By the same time in 2021, the top areas of study were at, or above, their 2020Q4 employment rates (Figure 16).

Similar to all employed individuals, most strongly attached bachelor's degree recipients were largely not impacted by the COVID-19 recession, with minimal to moderate increases to their employment rates in Utah's labor force, with Health graduates being the exception. 5.5% of Health graduates were no longer strongly attached to the workforce in 2020 than in 2019. By the end of the analysis, however, Health graduates had a substantial increase of 9.2% in their employment rate in Utah, 3.6% above their rate in 2019 (Figure 17).

The results of the permutation tests of medians for the quarterly wages pre- and post-pandemic are relatively sporadic for all employed bachelor's degree recipients from the top areas of study (Table A6). Indicating an increase in median wages, Education graduates had the most tests result in rejecting the null hypothesis, five of the eight tests, with wages increasing by \$600-1,400 depending on the significance test. Regarding the other top areas of study, Health and Business had two tests that rejected the null hypothesis, not in the same tests, but median wages did increase. Social Science graduates differed from their peers insofar as the one significance test that rejected the null hypothesis had a drop in quarterly wages by \$345 (Figure 18 and Table E1).

For strongly attached bachelor's degree recipients from the top areas of study, results largely followed their employed equivalents (Figure 19 and Table A6). The significant tests for Education graduates rejected the null hypothesis for five of the eight tests, in the same quarters as their all-employed peers. Health graduates rejected the null hypothesis twice, but only one test corresponded with their all-employed counterparts. The differences are in regard to Business and Social Science programs: Business and Social Science bachelor's degree recipients had  $P < 0.05$  once, and Social Science had an increase in their median quarterly wages (Figure 19 and Table A6).

To examine the results for the remaining bachelor's degree recipients, see the Appendix. Appendix Figures E1-E10 report the employment rates in Utah's labor force, Appendix Figures E11-E20 show the median quarterly wages, and the results for the permutation tests of medians are in Appendix Table E1.

#### 4.6 | Graduate Degree Recipients

The employment rates in Utah's workforce for graduate degree recipients from the top five areas

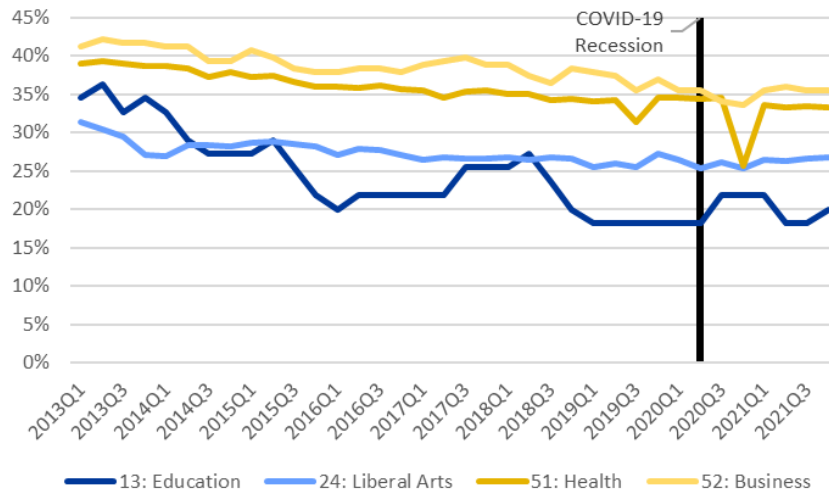


of study were relatively stable (Figures 20 and 21). For all employed graduate degree recipients, Social Science programs had the biggest change in Utah's workforce between the second quarter of 2019 and 2020, declining by 1.3%. The other all-employed subgroup to experience a decline in Utah's workforce was people from Education programs, dropping by 0.4%. By 2021Q2, the only area of study that was not at, or above, their pre-pandemic employment rates were all employed Education program recipients, 1.4% below their pre-pandemic rates (Figure 20).

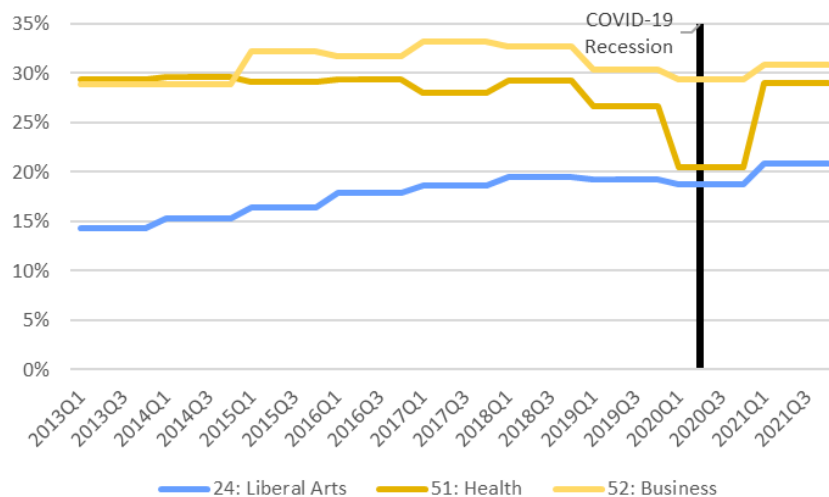
Graduate degree recipients who were strongly attached to the workforce were slightly less negatively impacted by the COVID-19 recession, with only one program declining in their employment rate in Utah's workforce. Individuals from Health programs declined by 1.5% between

2019 and 2020. In the post-recession recovery, each of the top areas of study increased their rates, with Health and Social Science having employment rates in Utah not experienced since 2015 and 2013, respectively (Figure 21).

Figures 22 and 23, in conjunction with Appendix Table F1, reveal that the shock of the COVID-19 recession did not have much of an impact on the quarterly median wages for the significant tests conducted. For the permutation tests of medians conducted, both all and strongly attached employees with graduate degrees rejected the null hypothesis for the same areas of studies in the same quarters. Health programs rejected the null hypothesis between 2019Q3 and 2020Q3 and between 2020Q1 and 2021Q1, while Business graduates had significantly higher wages in 2019Q2-2020Q2, 2019Q4-2020Q4, and 2020Q2-2021Q2.

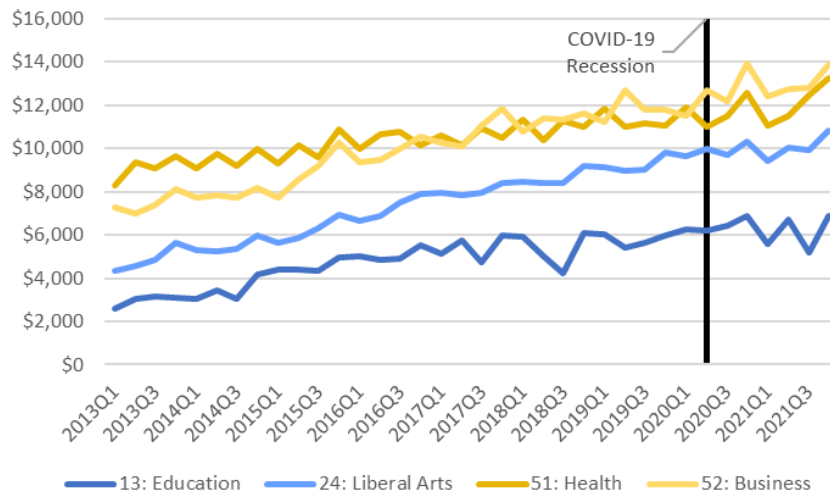


**Figure 12:** Percent of All Employed USHE Graduates from 2012 who Received Associate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

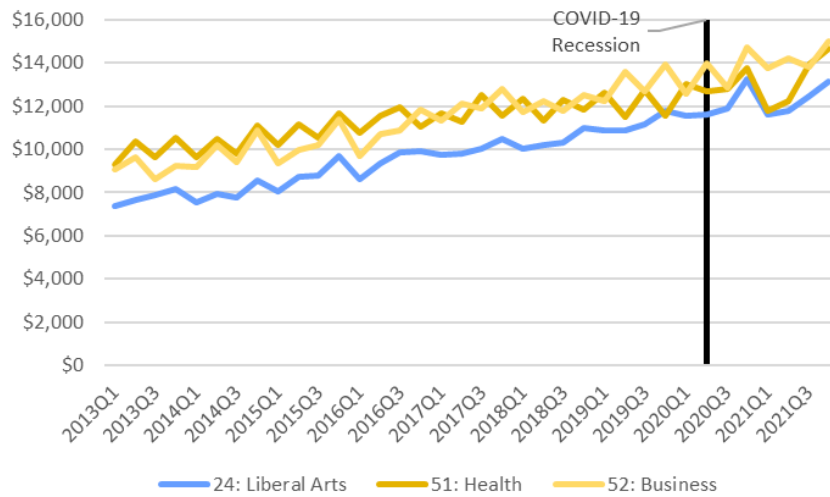


**Figure 13:** Percent of Strongly Attached to the Workforce USHE Graduates from 2012 who Received Associate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

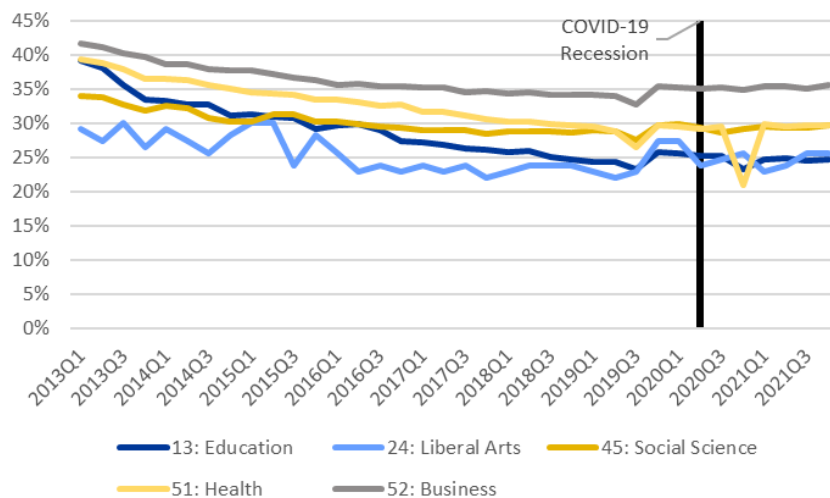




**Figure 14:** Median Quarterly Wages All Employed USHE Graduates from 2012 who Received Associate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

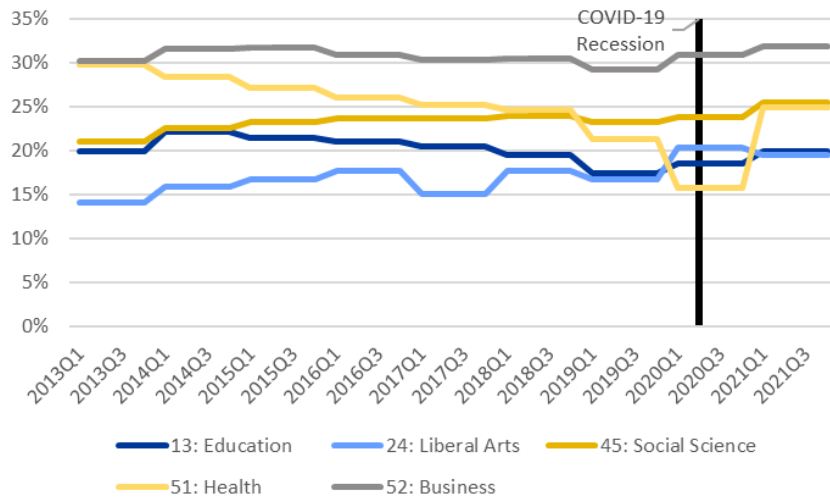


**Figure 15:** Median Quarterly Wages for Strongly Attached to the Workforce USHE Graduates from 2012 who Received Associate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

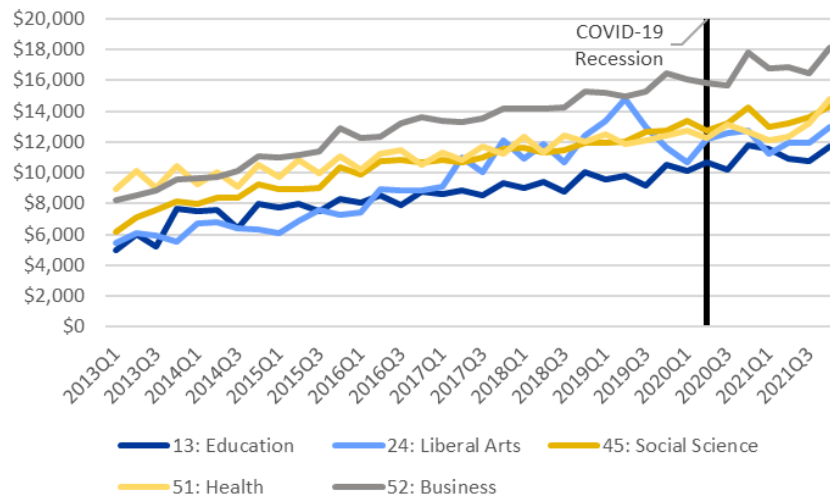


**Figure 16:** Percent of All Employed USHE Graduates from 2012 who Received Bachelor's Degrees from the Top Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

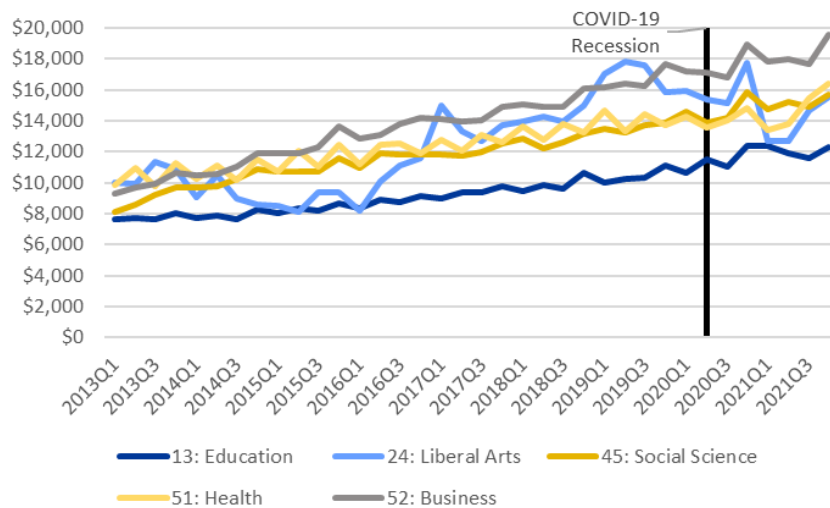




**Figure 17:** Percent of Strongly Attached to the Workforce USHE Graduates who 2012 who Received Bachelor’s Degrees from the Top Areas of Study in Utah’s Workforce from 2013Q1-2021Q4.

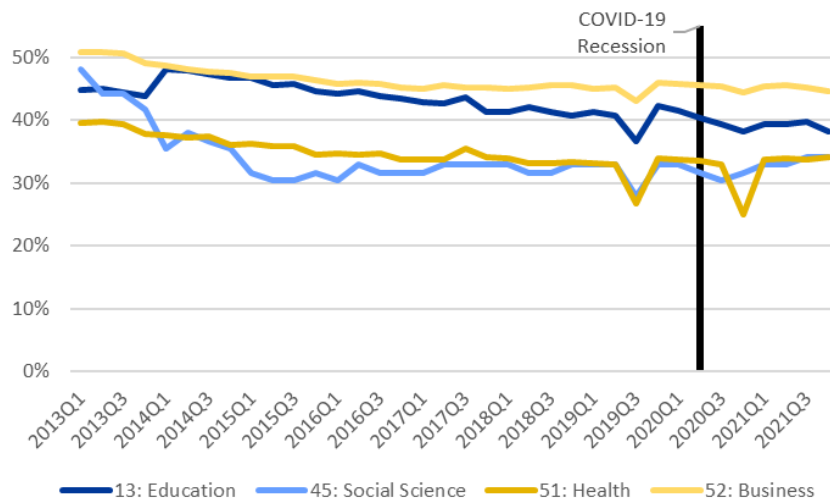


**Figure 18:** Median Quarterly Wages for All Employed USHE Graduates who 2012 who Received Bachelor’s Degrees from the Top Areas of Study in Utah’s Workforce from 2013Q1-2021Q4.

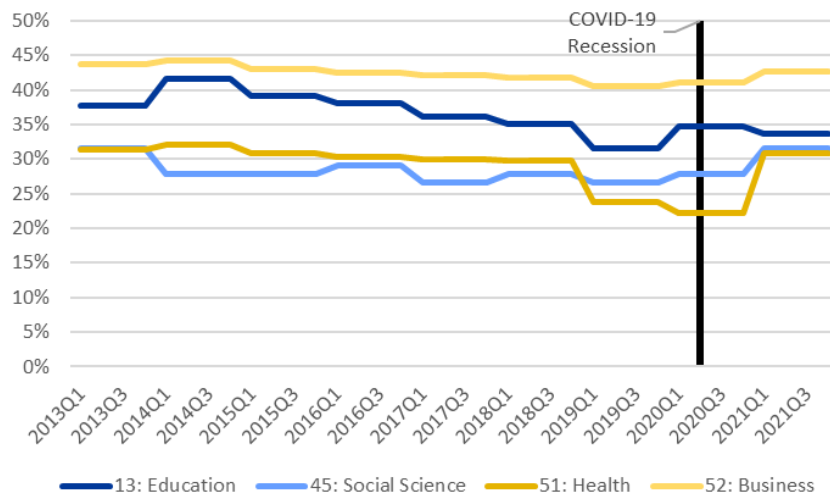


**Figure 19:** Median Quarterly Wages for Strongly Attached to the Workforce USHE Graduates who Received Bachelor’s Degrees from the Top Areas of Study in Utah’s Workforce from 2013Q1-2021Q4.

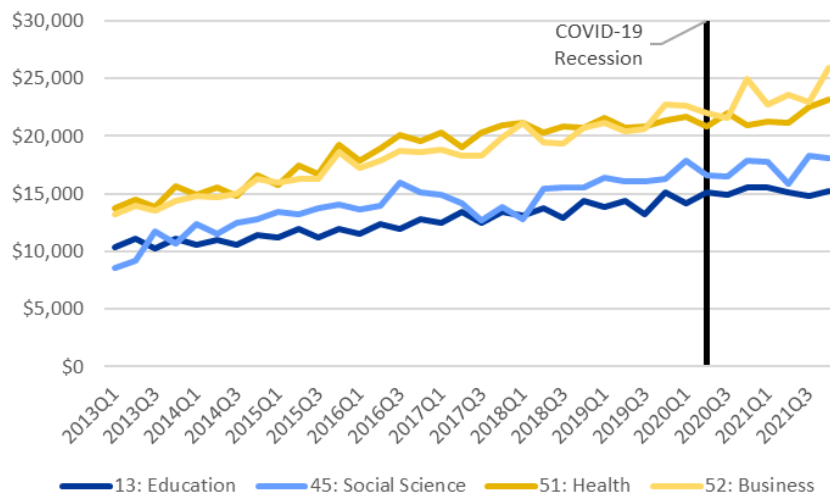




**Figure 20:** Percent of All Employed USHE Graduates from 2012 who Received Graduate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.

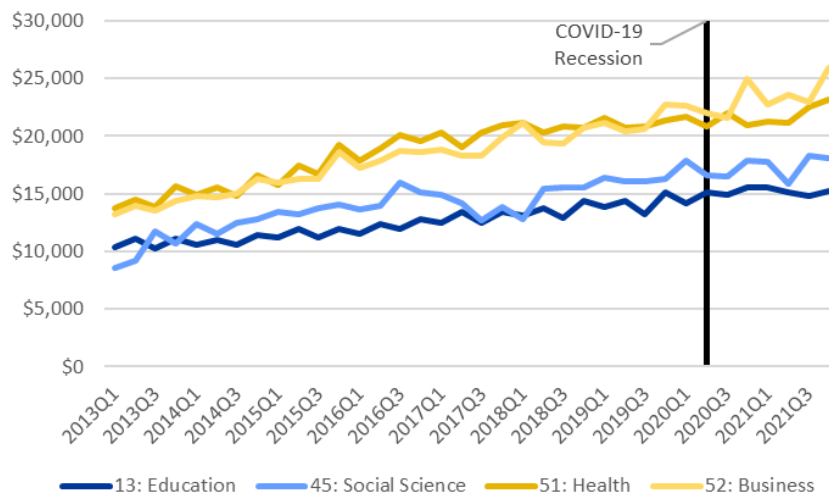


**Figure 21:** Percent of Strongly Attached to the Workforce USHE Graduates from 2012 who Received Graduate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.



**Figure 22:** Median Quarterly Wages for All Employed USHE Graduates who Received Graduate Degrees from the Top Reportable Areas of Study in Utah's Workforce from 2013Q1-2021Q4.





**Figure 23:** Median Quarterly Wages for Strongly Attached to the Workforce USHE Graduates who Received Graduate Degrees from the Top Reportable Areas of Study in Utah’s Workforce from 2013Q1-2021Q4.

To see the results for graduate degree recipients for the remaining areas of study, reference the Appendix. Appendix Figures F1-F6 report the percentage of graduate degree recipients in Utah’s workforce from 2013Q1-2021Q4, Appendix Figures F7-F12 show the quarterly median wages, and Appendix Table F1 reports the permutation tests of medians.

## 5 | Discussion

While this report cannot measure the rate of individuals actively seeking a job, the employment rates in Utah’s workforce for both employment types analyzed between 2019Q2 and 2020Q2 are similar (Figure 2). Compared to the 2019Q2, all and strongly attached graduates had their employment rates decline by 0.3% and 0.2%, respectively, whereas all employed enrollees increased by 1.2% and strongly attached enrollees rose by 0.4% during the second quarter of 2020. By the second quarter of 2021, every group besides all employed enrollees increased their employment rates above the rates they had in 2019Q2 (Figure 2). In comparison, the U.S. BLS found that the labor force participation rates for Some College or associate and bachelor’s degree recipients did not return to their April 2019 rates by April 2021; both were 1.7% below their pre-pandemic levels (U.S. BLS).

Similarly, separating USHE graduates by their area of study, regardless of their award type received, and their employment type demonstrates that most groups of graduates returned to their 2019Q2 employment rates in Utah’s workforce by the second quarter of 2021 (Table G1). Of the 64 subgroups and 32 areas of study, each having all and strongly attached employees, 18 fell below their 2019Q2 employment rates in 2020Q2; examples included all and strongly attached Agriculture, strongly attached Culinary Services,

and strongly attached Human Sciences.

By 2021Q2, there were 16 groups that had the same employment in Utah’s workforce 2019Q2, though they were not always the same areas of study that decreased between the second quarter of 2019 and 2020. For example, all employed computer graduates had more individuals in Utah’s workforce in 2020Q2 than in 2019Q2, but by 2021Q2, their employment rates were 0.4% below their second-quarter 2019 levels (Table G1).

There are a few potential explanations as to why areas of study were impacted differently. First, the environment individuals worked in impacted whether they kept their jobs. Ansell and Mullins (2021) state that while job loss occurred throughout the economy, sectors that required close contact with other individuals experienced the largest job loss. This pattern can be seen for USHE graduates, although it does not seem to apply to every area of study. For example, all employed individuals from Construction Trades programs, which include programs such as Carpenters, Electrical and Power Transmission Installers, and Construction Trades, declined by 1.7% between the second quarters of 2019 and 2020; by 2021Q2, the employment rate fell further by 0.9% (Figures A9-A10). Likewise, all and strongly attached employees from Architecture programs fell by 4.7% and 3.5%, respectively, between 2019Q2 and 2021Q2 (Figures A1 and A2). In comparison, Education graduates increased their employment rates between 2019Q2 and 2020Q2 and were still above their pre-pandemic levels by the second quarter of 2021 (Figures 4 and 5). Whereas Construction Trades and Architecture may be related to workforce professions that require close contact with colleagues or customers at a time when social distancing practices were implemented, individuals from Education





programs, which include areas of studies related to teachers, transitioned to online learning when the coronavirus pandemic started, allowing them to keep their jobs.

The other potential explanation pertains to the award type received by individuals. The literature indicates that one of, if not the primary, variable for individuals who remained in their jobs was the educational attainment employees had, particularly university degrees (Adams-Prassl et al., 2020; Cortes and Forsythe, 2023; Gambau et al., 2022; Lee et al., 2021; Mongey et al., 2020). The explanation as to why postsecondary education enabled individuals to be less impacted is because they were more likely to work in industries that allowed them to conduct work remotely (Mongey et al., 2020; Montenovio et al., 2021; Crowley et al., 2020; Mongey & Weinberg, 2021). The results of this research highlight the importance of disaggregating education by major as this directly translates into job type. Through disaggregating by major and comparing employment rates before and during the COVID-19 recession this research finds that educational attainment alone did not create a buffer from the effects of the COVID-19 recession. (Table G2).

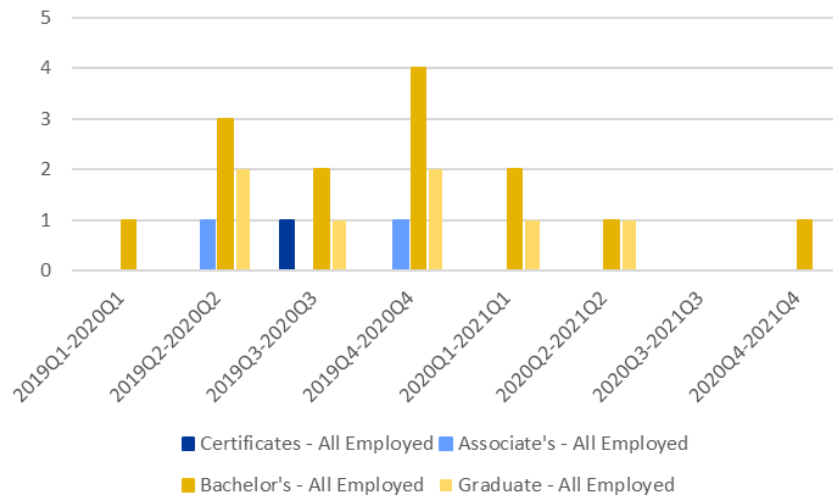
To demonstrate, out of the 32 programs in this analysis, only Computer, Health Professions, and Business had sample sizes large enough to compare the employment rates in Utah's workforce for all the award types included in this analysis, although strongly attached certificate recipients from Business programs did not meet the minimum threshold of ten individuals. Strongly attached Computer (Figure G2) and all employed Health Professions (Figure G3) followed the pattern of higher educational attainment resulting in less impact on employment rates between 2019Q2 and 2020Q2. In comparison, all employed Computers (Figure G1), strongly attached Health (Figure G4), and both employment types for Business graduates (Figures G5 and G6) did not follow the same pattern. Comparing the employment rate in 2021Q2 to pre-pandemic levels for these programs reveals that certificate and associate degree recipients did not return to their employment rates in 2019Q2 by 2021Q2 more often than their Bachelor's and Graduate degree counterparts; however, it is worth noting that this does not happen in every circumstance (Table G2).

Comparing the differences in median quarterly wages for areas of study by award type received between 2019-2020 and 2020-2021 to their respective quarters illustrates that eight programs had significantly different wages, with most receiving higher quarterly salaries than the year prior. (Table G1). The only two subgroups to

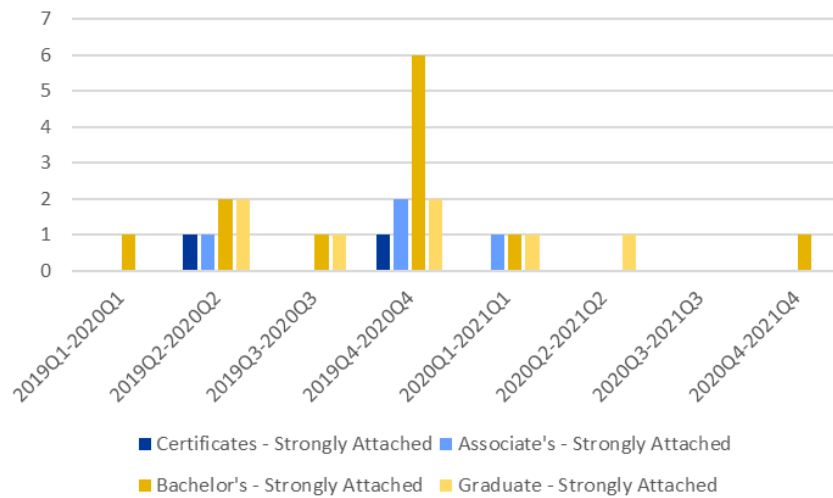
receive significantly lower wages were all employed associate degree recipients from Health programs and all employed Social Science graduates with bachelor's degrees between 2020Q1 and 2021Q1. Furthermore, the programs that had significantly different wages at least once for all and strongly attached employees did not always reject the null hypothesis for the same tests, such as graduates from Liberal Arts programs, all employed individuals rejected the null hypothesis for the permutation test comparing 2019Q2 and 2020Q2, whereas their strongly attached counterparts had  $P < 0.05$  between 2019Q4 and 2020Q4. As a matter of fact, only employees from Education and Graduate Business programs rejected the null hypothesis in the same permutation tests of medians (Table G3). Figures 24 and 25 show the number of significance tests that rejected the null hypothesis by employment type and award type received. For all and strongly attached graduates, bachelor's degree recipients had the most tests result in  $P < 0.05$  at 26 – 14 for all employed and 12 for individuals strongly attached to the workforce; graduate degree recipients had the second highest with seven tests indicating significantly different wages for both employment types. Comparing the significant tests by how many times they rejected the null hypothesis by award type received reveals that between 2019Q2-2020Q2 and 2019Q4-2020Q4 accounted for the majority of tests that resulted in  $P < 0.05$  (Figures 24 and 25). Of the 49 permutation tests that indicated significantly different wages, tests comparing 2019Q2-2020Q2 and 2019Q4-2020Q4 rejected the null hypothesis 12 and 18 times, respectively. There are potential explanations why these permutation tests of medians accounted for most of the significant differences in wages.

For the difference in wages between the second quarter of 2019 and 2020, the COVID-19 recession occurred in 2020Q2, and job loss was felt across the economy. Between February and April 2020, approximately 22 million jobs were lost, and they were not felt evenly across all industries (Ansell and Mullins, 2021; Dalton et al., 2021). Research has found that the lowest-paid employees and establishments had the steepest decline in employment at the onset of the pandemic (Dalton et al., 2021; Cortes and Forsythe; Gould and Kassa, 2021; Dey and Loewenstein, 2020). Due to low-wage employees facing the brunt of the job loss, Gould and Kandra (2021) state that this is why wages grew in 2020; they argue that of the 9.6 million jobs lost in 2020, 80.0% were individuals in the bottom 25.0% of the wage distribution. Rather than wages growing during and after the COVID-19 recession, the composition of the workforce changed.





**Figure 24:** Count of Permutation Tests of Medians that Rejected the Null Hypothesis by Award Type Received for All Employed 2012 USHE Graduates.



**Figure 25:** Count of Permutation Tests of Medians that Rejected the Null Hypothesis by Award Type Received for Employees Strongly Attached to the Workforce 2012 USHE Graduates.

The arguments why median quarterly wages were significantly different between 2019Q4 and 2020Q4 are largely the same: low-wage individuals were not returning to the workforce at the same rates as their higher-paid counterparts. Dalton et al. (2021) found that by November 2020, the bottom two quintiles had recovered less than their peers from the top two quintiles. Similarly, Abel and Deitz (2021) found that low-wage individuals had a substantial recovery in employment between April and October 2020 before declining again.

## 6 | Conclusion

Using data from USHE and DWS, employment rates in Utah's workforce and the median quarterly wages received pre- and post-COVID-19 recession were compared to determine whether the wages earned were statistically significantly different. For most of the statistical tests that rejected the null hypothesis, results indicated that median quarterly

incomes increased. While seeming counterintuitive given the economic upheaval caused by the COVID-19 virus, this result is in line with results from other researchers; analyses indicate that low-income employees were the most at risk of losing their jobs, thus changing the composition of the workforce.

There are several explanations for why incomes did not decrease in this analysis. First, this analysis focused on postsecondary graduates. Individuals with higher educational attainment were less likely to lose their jobs due to the higher likelihood of them being able to conduct work remotely. Second, employees from low-wage industries were most likely to be impacted and lose their positions, even in sectors that were not highly susceptible to the coronavirus. While it is not guaranteed that individuals with higher education awards work in higher-earning sectors of the economy, obtaining a



postsecondary award does increase the likelihood. This study adds to the literature regarding the impact of the COVID-19 recession in early 2020 caused by the COVID-19. Overall, this study cannot establish a causal mechanism for why employees with higher educational attainment experienced an increase in wages during or after the recession. While prior literature found that individuals with postsecondary awards were less likely to be economically impacted by the economic downturn, no research was found that analyzed specific higher educational program outcomes regarding their wages. This study should be updated when more data is available regarding the recovery after 2020.

#### DATA PARTNERS & ACKNOWLEDGMENTS

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## APPENDIX A

**TABLE A1:** TOTAL NUMBER OF GRADUATES FROM ALL AREAS OF STUDY WHO RECEIVED AN AWARD AND THE DISTRIBUTION OF CERTIFICATE, ASSOCIATE, BACHELOR'S, AND GRADUATE DEGREE RECIPIENTS FROM USHE INSTITUTIONS IN 2012.

	All	Certificate	Associate's	Bachelor's	Graduate
1: Agriculture	104 (0.6%)	*	*	*	*
3: Natural Resources	80 (0.5%)	0 (0.0%)	0 (0.0%)	56 (0.6%)	24 (0.7%)
4: Architecture	86 (0.5%)	*	*	39 (0.4%)	47 (1.4%)
5: Gender Studies	57 (0.3%)	0 (0.0%)	0 (0.0%)	40 (0.4%)	17 (0.5%)
9: Journalism	636 (3.8%)	0 (0.0%)	11 (0.4%)	608 (6.1%)	17 (0.5%)
10: Communications Technologies	*	*	*	*	*
11: Computer	554 (3.3%)	38 (6.1%)	31 (1.2%)	379 (3.8%)	106 (3.2%)
12: Culinary Services	86 (0.5%)	26 (4.1%)	60 (2.3%)	0 (0.0%)	0 (0.0%)
13: Education	1,120 (6.7%)	*	*	*	*
14: Engineering	668 (4.0%)	0 (0.0%)	10 (0.4%)	383 (3.8%)	275 (8.2%)
15: Engineering Tech.	241 (1.5%)	99 (15.8%)	48 (1.8%)	94 (0.9%)	0 (0.0%)
16: Linguistics	173 (1.0%)	*	*	153 (1.5%)	17 (0.5%)
19: Human Sciences	359 (2.2%)	*	*	324 (3.0%)	28 (0.8%)
22: Legal Professions	184 (1.1%)	0 (0.0%)	29 (1.1%)	27 (0.3%)	128 (3.8%)
23: English Language	337 (2.0%)	*	*	*	*
24: Liberal Arts	1,501 (9.0%)	*	1408 (52.8%)	85 (0.9%)	*
26: Biological Sciences	375 (2.3%)	*	*	293 (2.9%)	75 (2.2%)
27: Mathematics	85 (0.5%)	0 (0.0%)	0 (0.0%)	62 (0.6%)	23 (0.7%)
30: Interdisciplinary Studies	344 (2.1%)	0 (0.0%)	21 (0.8%)	296 (3.0%)	27 (0.8%)
31: Parks	301 (1.8%)	*	*	253 (2.5%)	43 (1.3%)
32: Basic Skills	*	*	*	*	*
36: Leisure	15 (0.1%)	15 (2.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
38: Philosophy	29 (0.2%)	*	*	25 (0.3%)	*
40: Physical Sciences	240 (1.4%)	*	*	126 (1.3%)	108 (3.2%)
41: Science Technologies	*	*	*	*	*
42: Psychology	704 (4.2%)	0 (0.0%)	31 (1.2%)	587 (5.9%)	86 (2.6%)

**APPENDIX TABLE A1 (CONTINUED): TOTAL NUMBER OF GRADUATES FROM ALL AREAS OF STUDY WHO RECEIVED AN AWARD AND THE DISTRIBUTION OF CERTIFICATE, ASSOCIATE, BACHELOR'S, AND GRADUATE DEGREE RECIPIENTS FROM USHE INSTITUTIONS IN 2012.**

	All	Certificate	Associate's	Bachelor's	Graduate
43: Protective Services	266 (1.6%)	*	*	*	*
44: Public Administration	370 (2.2%)	*	*	99 (1.0%)	267 (8.0%)
45: Social Sciences	975 (5.9%)	*	*	*	*
46: Construction Trades	115 (0.7%)	*	42 (1.6%)	68 (0.7%)	*
47: Mechanic and Repair Tech.	117 (0.7%)	34 (5.4%)	70 (2.6%)	13 (0.1%)	0 (0.0%)
48: Precision Production	36 (0.2%)	18 (0.2%)	12 (0.5%)	*	*
49: Transportation	267 (1.6%)	42 (1.6%)	25 (0.9%)	200 (2.0%)	0 (0.0%)
50: Performing Arts	658 (4.0%)	*	*	*	*
51: Health Professions	2,695 (16.2%)	301 (48.0%)	476 (17.9%)	1,324 (13.3%)	594 (17.8%)
52: Business	2,679 (16.1%)	23 (3.7%)	130 (4.9%)	1,644 (16.5%)	882 (26.4%)
54: History	140 (0.8%)	*	*	123 (1.2%)	12 (0.4%)
Total	16,609	627	2,666	9,972	3,344

**APPENDIX TABLE A2: RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AND STRONGLY ATTACHED USHE ENROLLEES AND GRADUATES FROM 2012 IN UTAH'S WORKFORCE. STATISTICAL SIGNIFICANCE: BOLDED MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

	Enrolled		Graduates	
	All Em-ployed	Strongly Attached	All Em-ployed	Strongly Attached
2019Q1-2020Q1	\$250	<b>\$443</b>	\$239	<b>\$690</b>
2019Q2-2020Q2	\$289	<b>\$642</b>	\$403	<b>\$792</b>
2019Q3-2020Q3	<b>\$294</b>	<b>\$684</b>	\$268	<b>\$591</b>
2019Q4-2020Q4	<b>\$915</b>	<b>\$1,126</b>	<b>\$1,011</b>	<b>\$1,332</b>
2020Q1-2021Q1	\$91	\$193	(\$181)	(\$122)
2020Q2-2021Q2	<b>\$480</b>	<b>\$412</b>	\$236	\$255
2020Q3-2021Q3	<b>\$431</b>	<b>\$437</b>	\$150	<b>\$681</b>
2020Q4-2021Q4	\$317	<b>\$595</b>	(\$105)	\$323



## APPENDIX B: CIP REGARDLESS OF AWARD TYPE

**TABLE B1:** RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AREAS OF STUDY FOR ALL AND STRONGLY ATTACHED EMPLOYED USHE GRADUATES FROM 2012 IN UTAH'S WORKFORCE. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.

Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
01: Agriculture	All Employed	-\$393.88	-\$208.02	\$56.27	\$495.00	\$1,054.48	\$1,155.14	-\$150.33	-\$646.13
	Strongly Attached	\$723.73	\$2,588.49	\$897.27	\$2,408.15	\$1,172.10	\$551.66	\$14.75	\$326.08
03: Natural Resources	All Employed	\$782.65	-\$380.00	\$1,139.29	\$1,616.51	-\$427.41	\$1,019.26	\$26.09	-\$108.69
	Strongly Attached	-\$582.76	-\$825.68	\$1,250.03	\$2,173.66	\$945.72	\$1,854.43	-\$262.61	-\$217.62
04: Architecture	All Employed	\$77.79	\$218.17	\$506.75	\$1,175.70	-\$658.22	\$522.51	\$552.24	\$878.08
	Strongly Attached	-\$37.66	\$89.23	\$506.75	\$1,031.21	-\$765.74	\$742.76	\$926.08	\$898.26
05: Gender Studies	All Employed	\$343.29	\$401.11	-\$874.61	\$1,093.86	\$1,246.94	\$1,106.01	\$2,058.09	\$1,274.57
	Strongly Attached	\$1,009.57	\$13.19	-\$817.22	\$2,093.34	\$1,789.35	\$1,216.36	\$2,024.99	\$253.31
09: Journalism	All Employed	\$87.72	<b>\$1,452.65</b>	\$845.92	<b>\$1,779.38</b>	\$506.60	\$556.85	\$467.02	\$444.10
	Strongly Attached	\$828.47	\$1,299.90	\$500.38	<b>\$2,096.98</b>	-\$5.03	\$503.08	\$1,906.46	\$869.52
11: Computer	All Employed	\$861.37	\$1,707.40	\$1,289.74	\$1,255.32	-\$24.41	-\$215.98	\$128.89	-\$38.29
	Strongly Attached	<b>\$2,101.56</b>	\$1,023.67	\$907.04	\$1,653.16	-\$635.10	-\$81.71	\$197.37	-\$383.12
12: Culinary Services	All Employed	-\$1,060.74	-\$986.87	-\$937.98	-\$23.09	\$833.18	\$1,031.97	\$959.49	-\$398.65
	Strongly Attached	-\$253.16	-\$115.73	\$980.39	\$935.31	\$2,663.05	\$1,907.09	\$2,336.22	\$1,293.92
13: Education	All Employed	\$675.36	<b>\$1,132.41</b>	<b>\$1,286.06</b>	<b>\$1,050.74</b>	<b>\$1,560.99</b>	\$233.22	\$319.61	-\$50.05
	Strongly Attached	\$678.53	<b>\$877.43</b>	<b>\$1,137.71</b>	<b>\$1,304.41</b>	<b>\$1,650.08</b>	\$201.88	\$128.52	-\$5.75
14: Engineering	All Employed	\$510.59	<b>\$889.12</b>	\$826.26	<b>\$1,786.74</b>	-\$321.58	\$686.79	\$335.77	\$723.73
	Strongly Attached	\$1,012.42	<b>\$910.82</b>	\$735.82	<b>\$1,859.03</b>	\$80.43	\$782.89	\$666.60	\$586.73
15: Engineering Tech.	All Employed	\$767.81	\$123.26	\$39.99	\$1,157.68	-\$435.46	\$549.16	\$753.04	\$866.98
	Strongly Attached	\$885.46	-\$437.77	\$374.55	\$202.19	-\$512.36	\$1,150.82	\$892.20	\$1,374.68
16: Linguistics	All Employed	\$1,618.42	\$631.92	-\$104.46	\$1,285.79	\$350.95	-\$148.93	-\$385.79	-\$521.78
	Strongly Attached	\$449.55	\$157.92	\$754.06	\$2,133.98	\$608.66	\$89.80	-\$811.13	-\$465.23
19: Human Science	All Employed	\$3.92	\$1,034.18	\$528.99	\$1,431.64	\$44.92	-\$761.01	-\$377.78	-\$837.07
	Strongly Attached	\$927.31	\$1,105.60	\$258.01	<b>\$1,257.13</b>	-\$32.19	-\$313.15	-\$164.17	-\$1,328.05



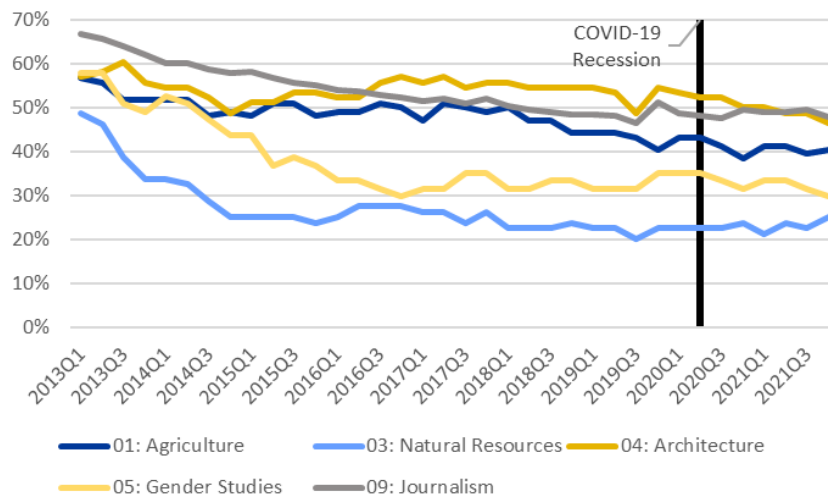
**TABLE B1 (CONTINUED): RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AREAS OF STUDY FOR ALL AND STRONGLY ATTACHED EMPLOYED USHE GRADUATES FROM 2012 IN UTAH'S WORKFORCE. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
22: Legal Professions	All Employed	\$245.65	\$1,936.65	-\$411.78	\$218.39	\$691.60	\$1,488.27	\$1,266.09	\$1,794.70
	Strongly Attached	\$516.09	\$701.26	-\$352.43	\$124.03	\$701.44	\$1,552.27	\$1,571.07	\$1,878.32
24: Liberal Arts	All Employed	\$385.05	<b>\$1,104.55</b>	\$636.16	\$480.90	-\$204.15	-\$67.82	\$178.57	\$456.06
	Strongly Attached	\$687.91	\$598.51	\$573.27	\$1,396.46	\$17.79	\$277.77	\$506.05	-\$38.25
26: Biological Sciences	All Employed	\$275.78	\$206.37	\$159.96	\$898.80	-\$514.98	\$1,502.48	\$12.80	\$511.76
	Strongly Attached	-\$189.07	\$19.60	-\$245.79	\$544.52	-\$354.69	\$867.07	\$1,419.36	\$616.94
27: Mathematics	All Employed	\$331.06	\$2,180.14	\$361.70	\$3,255.04	\$2,718.78	\$262.53	-\$2,689.21	\$730.13
	Strongly Attached	-\$1,662.44	\$2,322.04	\$2,062.86	\$3,006.69	\$2,498.39	-\$226.65	-\$1,739.61	-\$336.72
30: Interdisciplinary Studies	All Employed	-\$182.58	\$1,167.24	\$406.41	\$825.79	-\$190.51	-\$546.61	\$238.35	\$816.82
	Strongly Attached	-\$114.53	-\$179.90	-\$480.35	\$427.43	\$39.84	\$685.20	\$429.06	-\$124.07
31: Parks	All Employed	\$872.89	\$876.89	\$97.01	\$277.42	\$4.32	\$601.73	\$121.81	\$1,236.75
	Strongly Attached	\$619.57	\$560.87	\$164.51	\$647.42	\$936.34	\$705.65	\$718.39	\$1,133.08
40: Physical Sciences	All Employed	\$793.59	\$863.12	-\$696.64	\$1,763.33	\$516.20	\$983.91	\$2,269.82	-\$685.49
	Strongly Attached	-\$4,114.46	-\$688.01	-\$48.18	\$2,382.58	\$259.60	\$331.30	\$1,686.09	-\$411.43
42: Psychology	All Employed	\$693.15	\$914.19	\$1,083.60	\$670.67	\$5.89	\$100.66	\$652.90	\$432.47
	Strongly Attached	\$871.54	\$1,213.04	\$89.46	\$890.17	\$284.78	\$237.31	\$679.26	-\$51.62
43: Security	All Employed	\$454.84	\$742.10	\$1,106.93	\$1,340.63	-\$768.48	-\$10.44	\$391.06	-\$97.87
	Strongly Attached	\$468.45	\$264.17	\$734.61	\$1,488.16	-\$968.83	\$651.49	\$1,038.81	\$401.34
44: Public Administration	All Employed	\$466.07	\$619.91	\$790.68	\$1,390.10	\$237.38	\$184.13	\$23.72	\$16.76
	Strongly Attached	\$339.72	\$796.64	\$171.18	\$783.02	\$647.02	\$173.59	\$710.80	\$434.28
45: Social Science	All Employed	\$1,250.03	\$658.76	\$605.01	<b>\$1,389.17</b>	-\$368.81	\$341.80	\$437.80	-\$24.94
	Strongly Attached	\$1,171.77	\$677.65	\$449.68	\$1,618.82	\$380.27	\$1,145.90	\$795.97	-\$130.00
46: Construction Trades	All Employed	\$1,232.16	\$1,309.47	\$541.11	\$1,080.75	-\$1,110.76	-\$137.99	\$158.67	-\$117.77
	Strongly Attached	\$1,373.40	\$991.51	\$646.62	\$2,938.57	-\$710.69	\$424.58	\$450.25	-\$2,175.75
47: Mechanic and Repair Tech.	All Employed	-\$83.75	-\$139.05	-\$3.14	\$1,515.89	\$589.37	\$750.87	\$794.08	\$397.16
	Strongly Attached	\$593.81	-\$277.52	-\$838.82	\$1,653.73	-\$405.92	\$1,112.82	\$1,036.79	\$495.10



**TABLE B1 (CONTINUED): RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AREAS OF STUDY FOR ALL AND STRONGLY ATTACHED EMPLOYED USHE GRADUATES FROM 2012 IN UTAH'S WORKFORCE. STATISTICAL SIGNIFICANCE: BOLDED MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

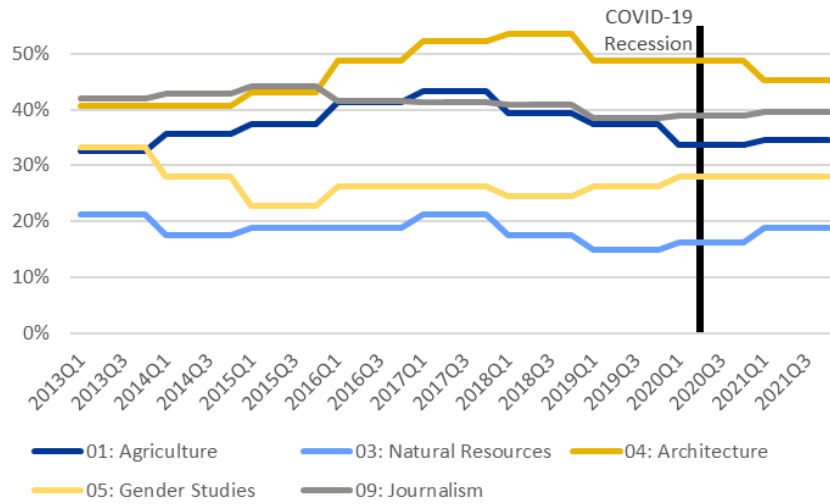
Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
48: Precision Production	All Employed	-\$560.60	\$1,596.25	\$298.34	\$624.80	-\$300.96	-\$1,846.14	-\$645.27	-\$689.68
	Strongly Attached	-\$1,353.27	-\$561.93	-\$34.98	\$289.47	-\$240.74	-\$937.05	-\$828.75	-\$777.87
49: Transportation	All Employed	-\$431.80	\$1,097.37	-\$902.08	-\$215.28	-\$117.67	\$55.12	\$1,790.67	\$825.57
	Strongly Attached	-\$329.72	\$337.65	-\$509.06	\$896.92	-\$523.70	\$419.17	\$1,645.45	\$1,194.65
50: Performing Arts	All Employed	\$474.54	\$691.05	\$355.78	\$694.72	\$702.48	\$1,158.31	\$458.16	\$832.95
	Strongly Attached	\$290.95	\$570.98	\$633.95	<b>\$1,278.75</b>	\$911.24	\$315.58	\$517.81	\$222.89
51: Health Professions	All Employed	\$125.41	\$308.94	<b>\$1,303.45</b>	\$572.87	-\$656.51	\$151.25	\$390.91	<b>\$1,855.35</b>
	Strongly Attached	\$257.62	<b>\$874.03</b>	\$393.54	<b>\$1,774.51</b>	-\$775.17	-\$190.85	<b>\$1,220.92</b>	<b>\$1,195.48</b>
52: Business	All Employed	<b>\$958.31</b>	<b>\$1,111.09</b>	\$685.17	\$1,731.58	\$799.73	<b>\$912.48</b>	<b>\$946.00</b>	\$444.53
	Strongly Attached	<b>\$1,137.28</b>	<b>\$963.86</b>	<b>\$934.02</b>	<b>\$1,938.35</b>	\$564.20	\$818.51	<b>\$857.04</b>	\$410.58
54: History	All Employed	\$1,254.23	\$2,356.08	\$2,054.28	\$1,402.69	\$1,215.52	-\$211.40	-\$391.01	-\$105.73
	Strongly Attached	\$631.40	\$1,310.47	\$993.85	\$695.82	\$768.82	-\$824.61	\$674.63	\$1,174.39



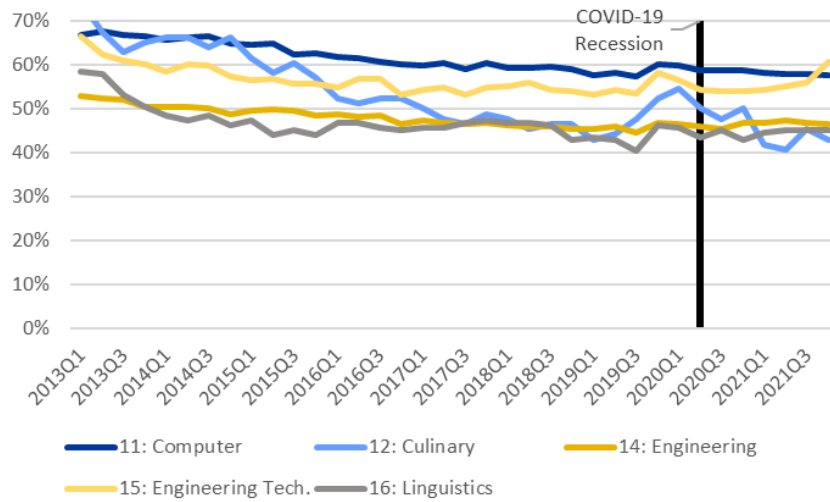
**FIGURE B1: PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**



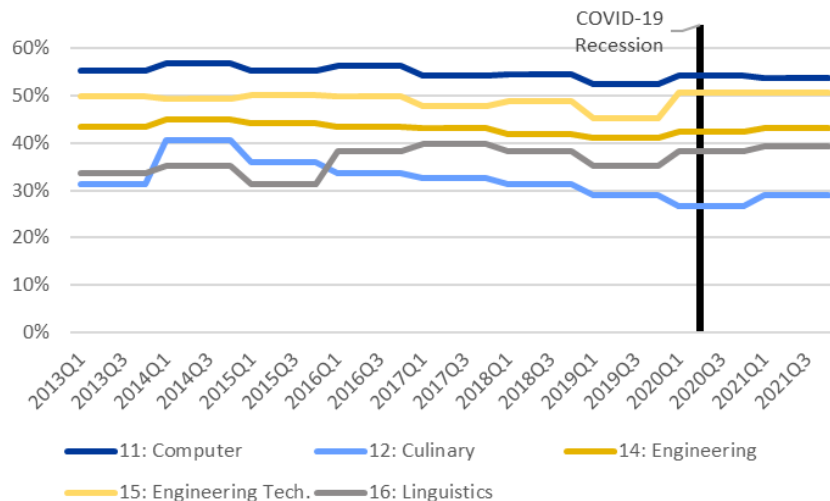




**FIGURE B2:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE EMPLOYED USHE GRADUATES FROM 2012 REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

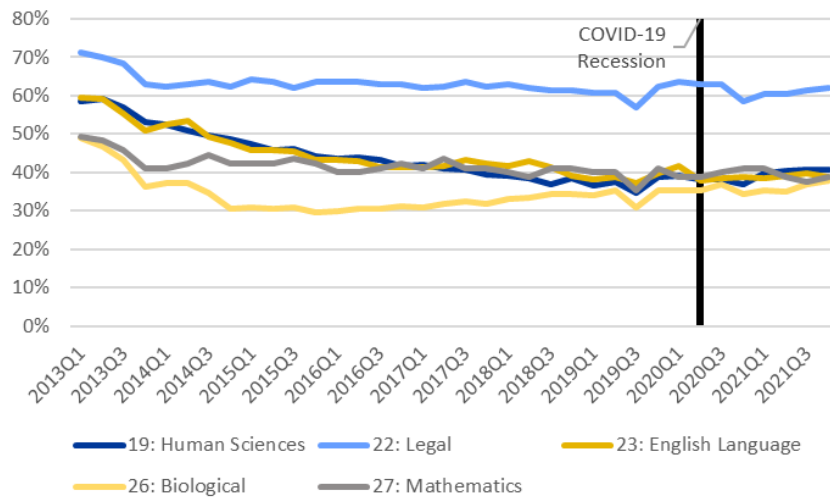


**FIGURE B3:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

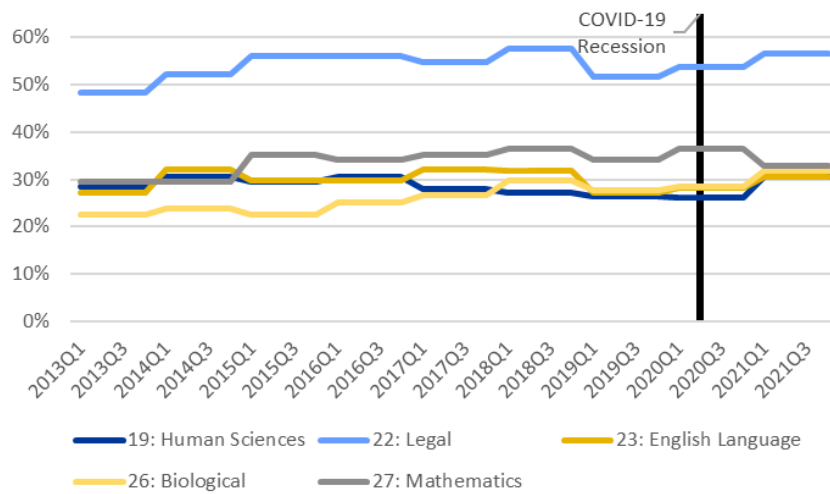


**FIGURE B4:** PERCENT OF ALL STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

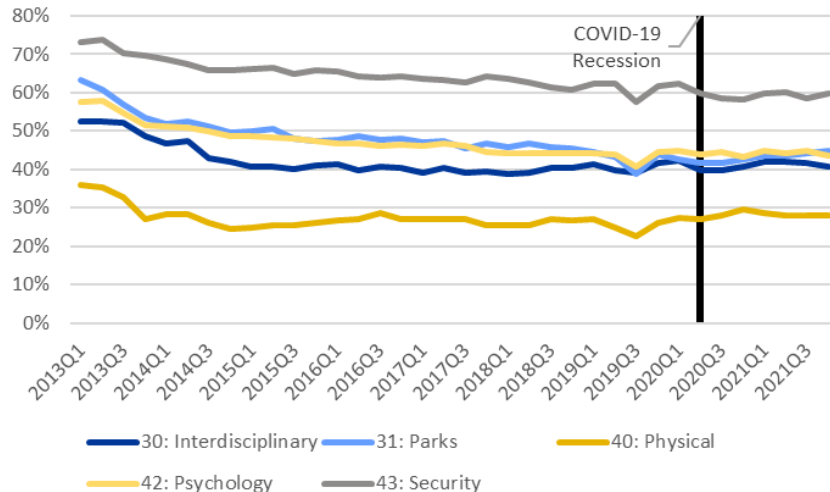




**FIGURE B5:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 19-27 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

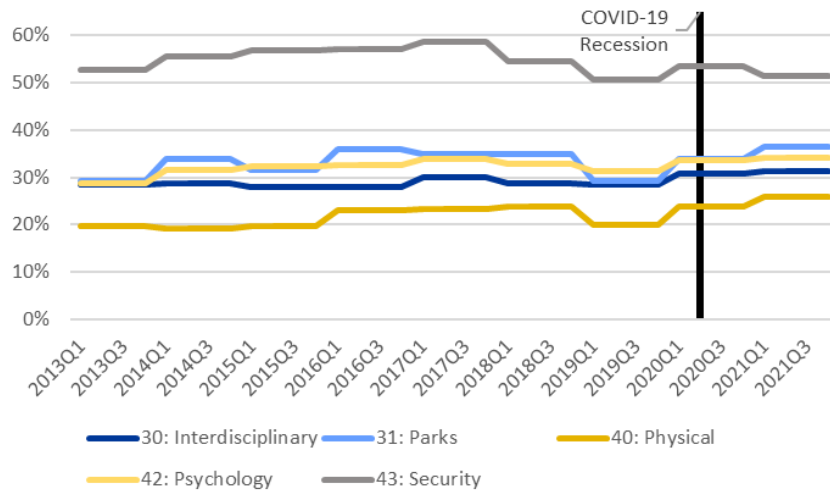


**FIGURE B6:** PERCENT OF ALL STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 19-27 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

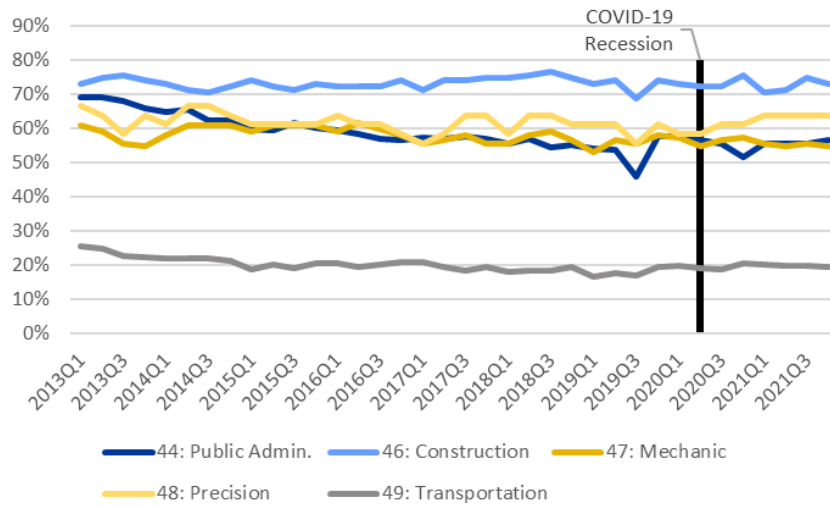


**FIGURE B7:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 30-43 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

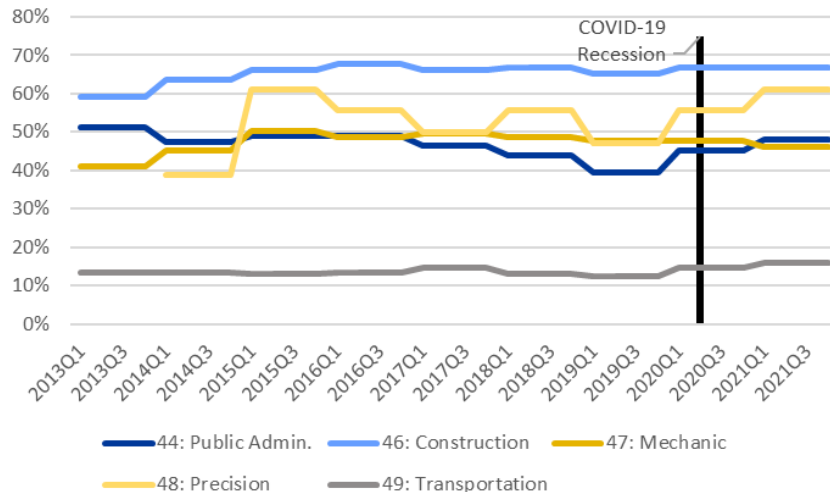




**FIGURE B8:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 30-43 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

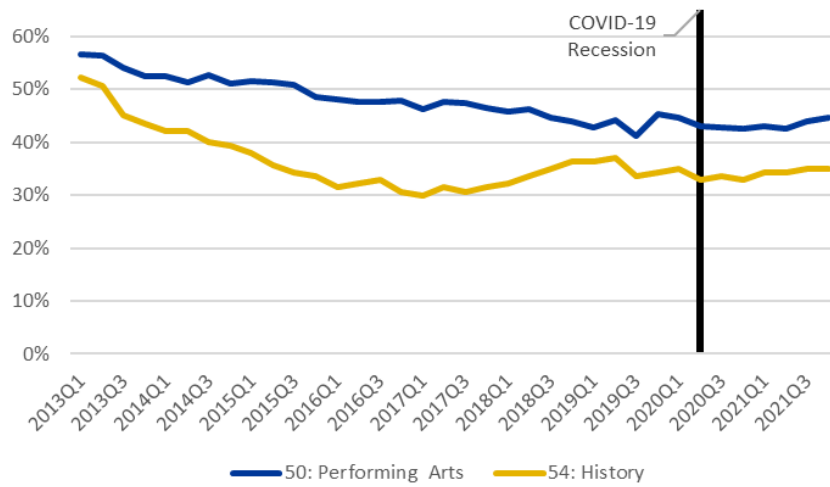


**FIGURE B9:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 44-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

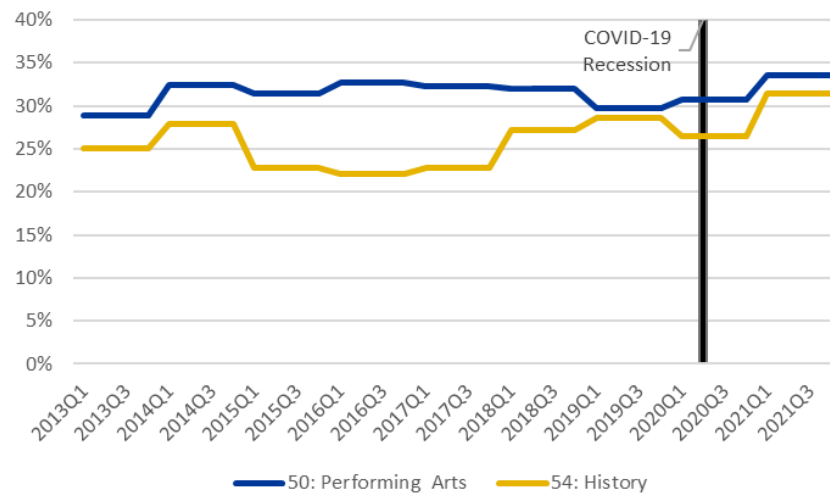


**FIGURE B10:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 44-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

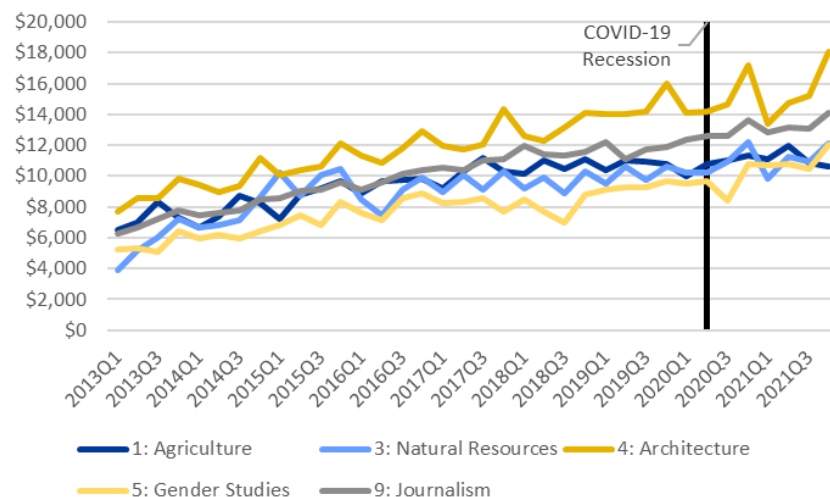




**FIGURE B11:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF AWARD RECEIVED, FOR THE TWO-DIGIT CIP CODES 50 AND 54 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

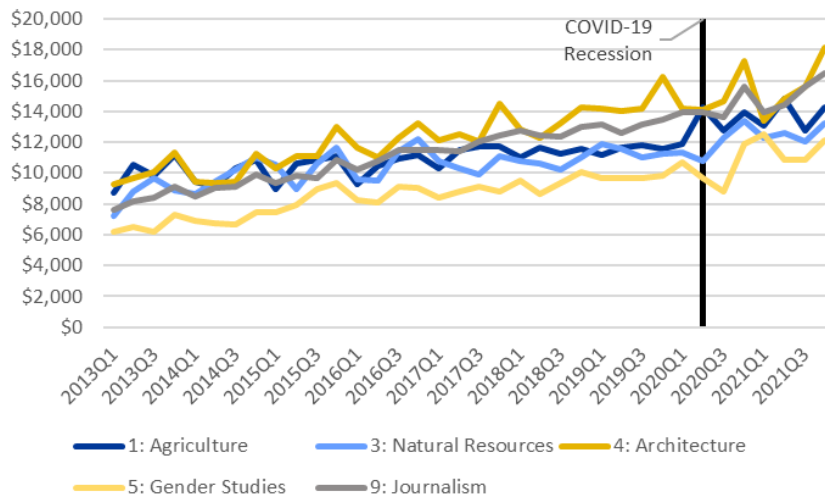


**FIGURE B12 :** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF AWARD, RECEIVED FOR THE TWO-DIGIT CIP CODES 50 AND 54 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

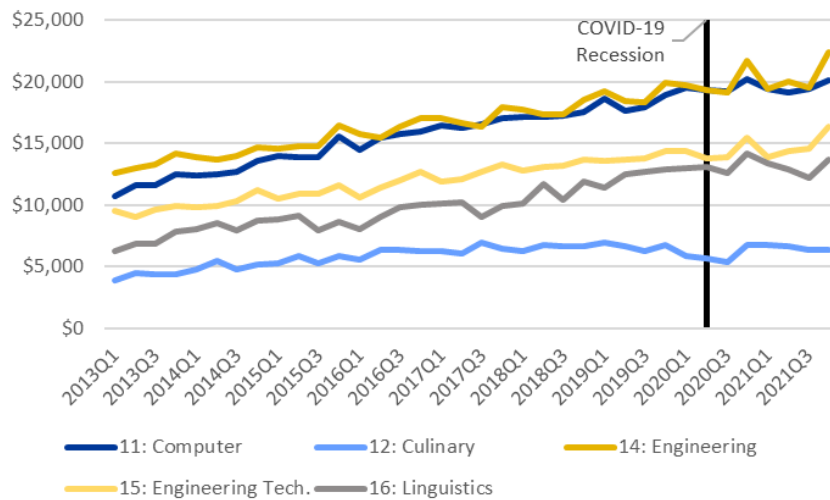


**FIGURE B13:** MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q4.

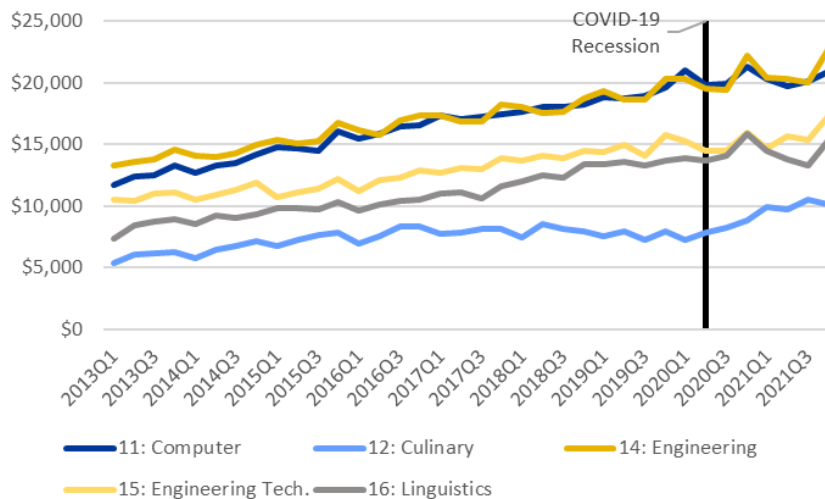




**FIGURE B14: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

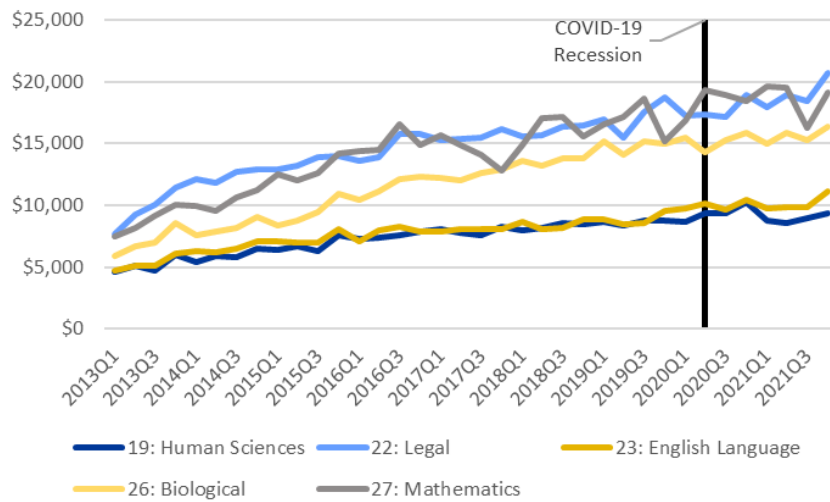


**FIGURE B15: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

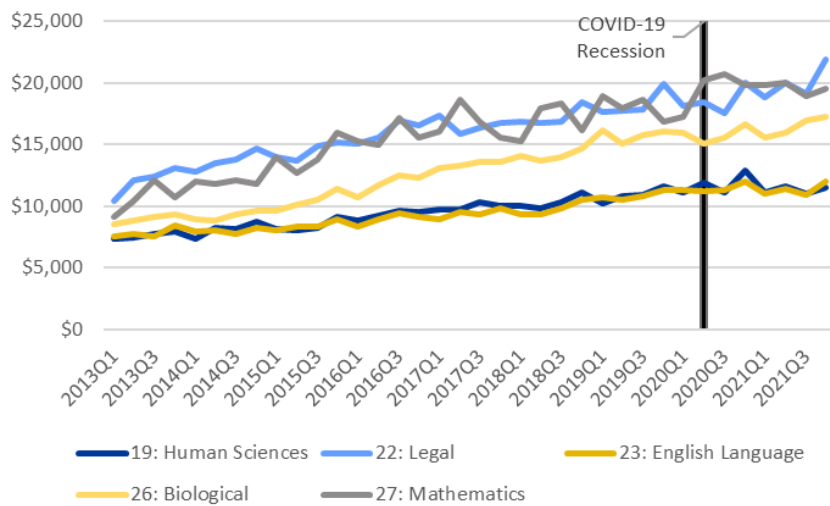


**FIGURE B16: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

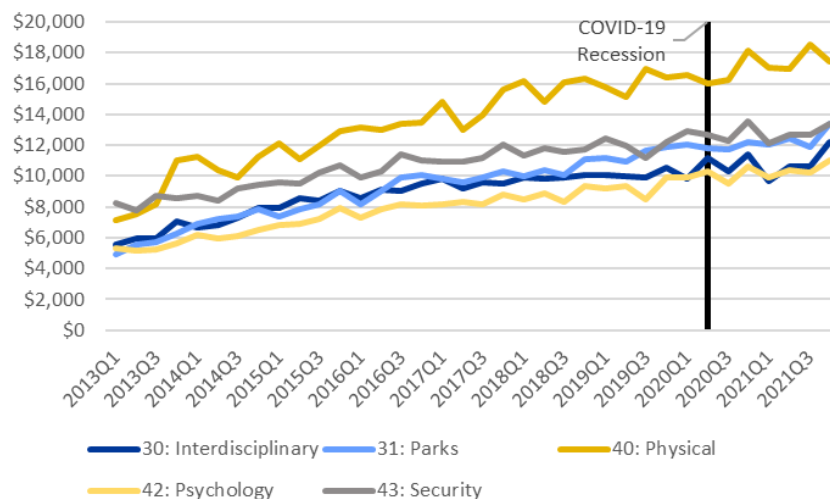




**FIGURE B17: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 19-27 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

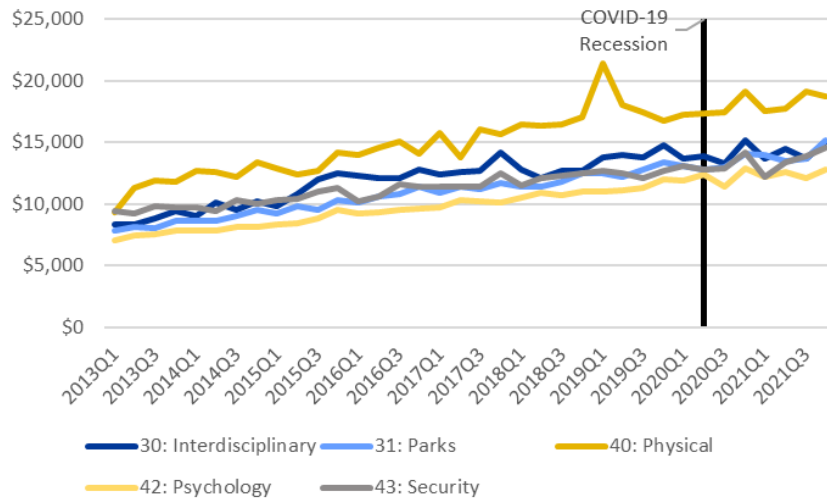


**FIGURE B18: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 19-27 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

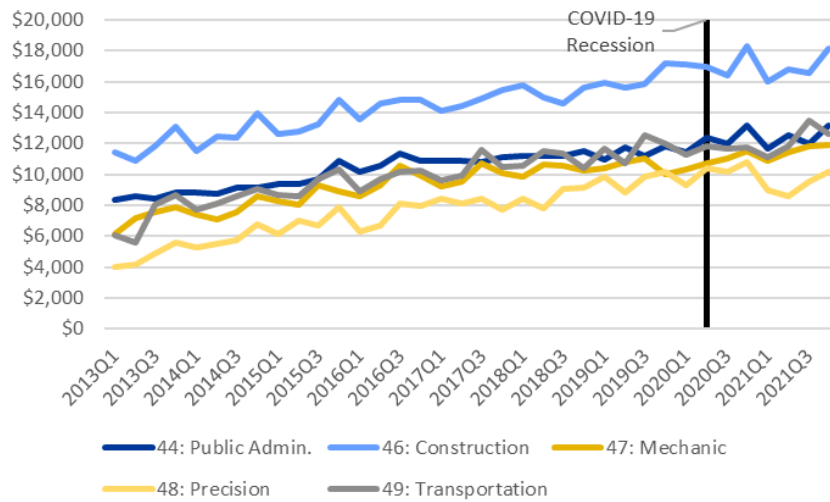


**FIGURE B19: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 30-43 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

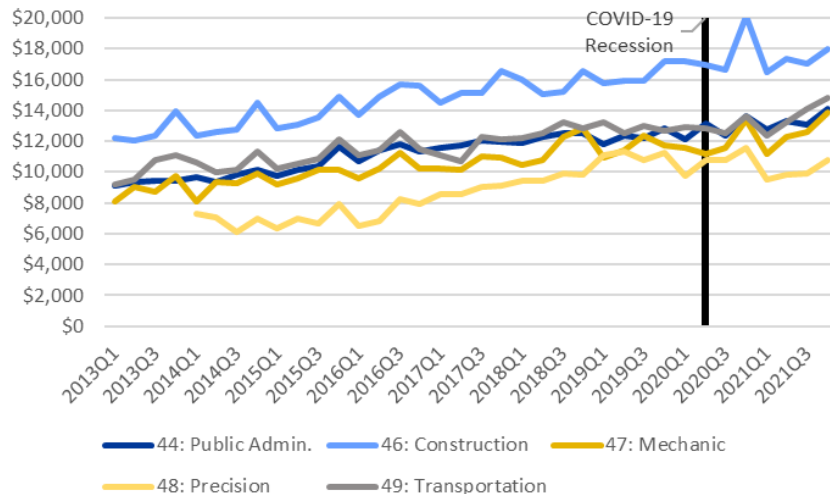




**FIGURE B20: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 30-43 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

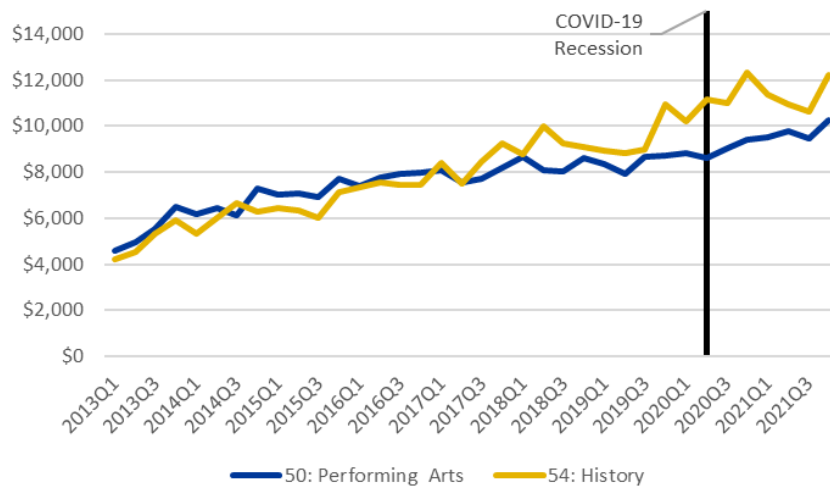


**FIGURE B21: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 44-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

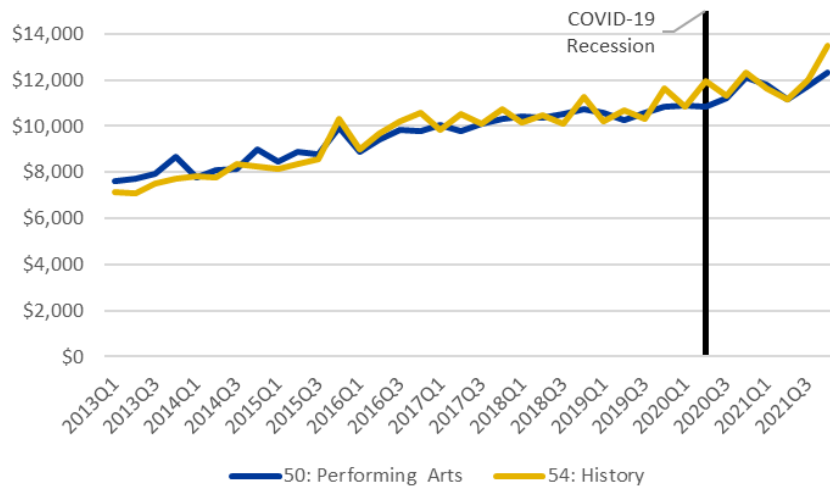


**FIGURE B22: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 44-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**





**FIGURE B23:** MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 50 AND 54 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

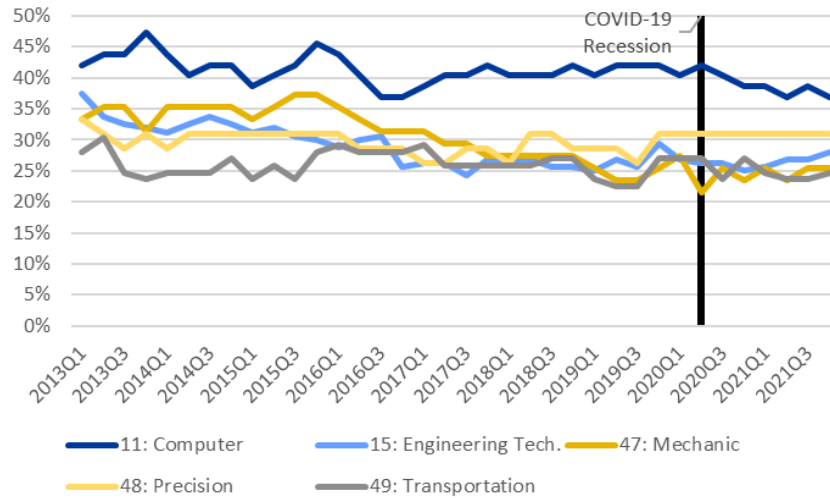


**FIGURE B24:** MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012, REGARDLESS OF THE AWARD TYPE RECEIVED, FOR THE TWO-DIGIT CIP CODES 50 AND 54 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

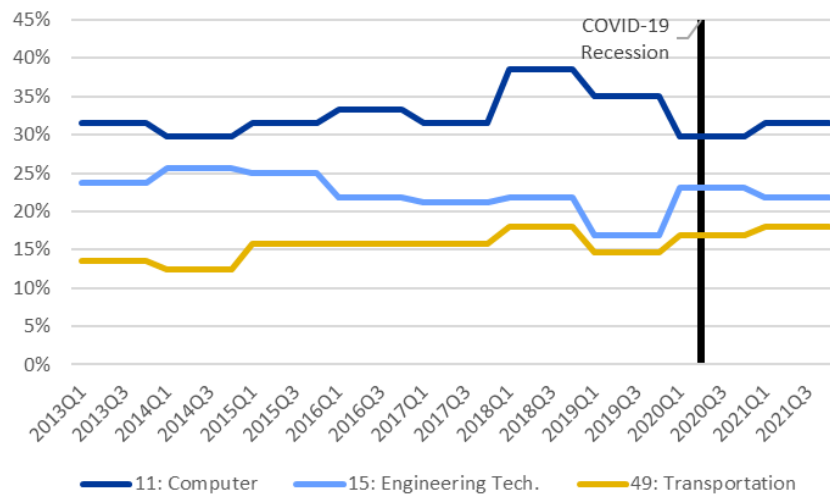




## APPENDIX C: CERTIFICATE RECIPIENTS



**FIGURE C1:** PERCENT OF ALL EMPLOYED USHE POSTSECONDARY CERTIFICATE RECIPIENTS FROM 2012 FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

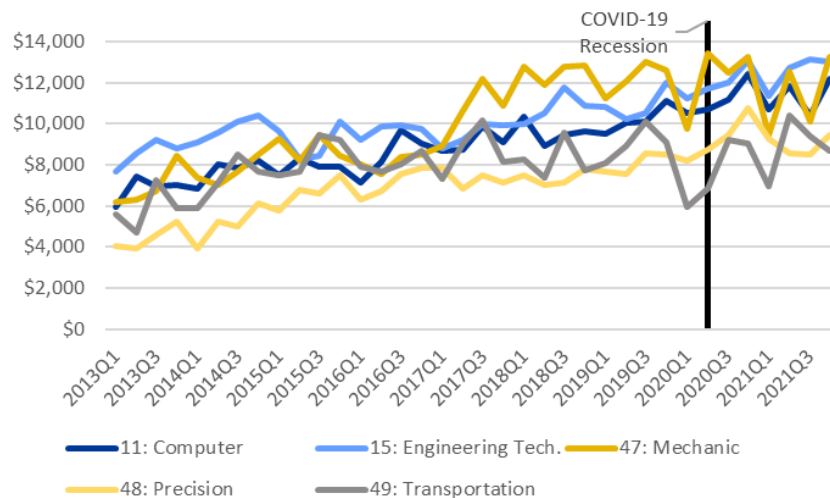


**FIGURE C2:** PERCENT OF STRONGLY ATTACHED EMPLOYED USHE POSTSECONDARY CERTIFICATE RECIPIENTS FROM 2012 FOR THE TWO-DIGIT CIP CODES 11-16 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



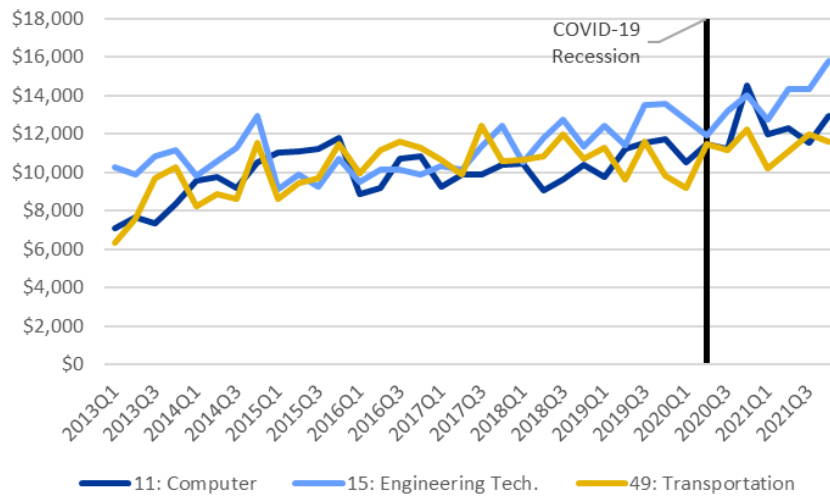
**TABLE C1: RESULTS OF THE PERMUTATION TESTS FOR POSTSECONDARY CERTIFICATE RECIPIENTS FOR ALL AND STRONGLY ATTACHED EMPLOYEES. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
11: Computer	All Employed	\$1,026.57	\$616.49	\$1,090.14	\$1,283.17	\$172.57	\$1,142.33	-\$785.16	-\$198.99
	Strongly Attached	\$748.09	\$234.87	-\$319.77	\$2,844.34	\$1,430.87	\$869.50	\$290.08	-\$1,616.86
15: Engineering Tech.	All Employed	\$418.49	\$1,490.66	\$1,489.84	\$1,067.89	\$146.51	\$984.59	\$1,111.85	-\$15.96
	Strongly Attached	\$286.25	\$516.15	-\$328.35	\$411.98	\$45.55	\$2,443.98	\$1,198.51	\$1,810.00
47: Mechanic	All Employed	-\$1,479.05	\$1,391.73	-\$504.40	\$627.47	-\$287.43	-\$923.11	-\$2,376.23	-\$8.98
	Strongly Attached	*	*	*	*	*	*	*	*
48: Precision Production	All Employed	\$530.79	\$1,184.21	\$890.48	\$2,282.54	\$1,059.99	-\$154.16	-\$964.21	-\$1,295.82
	Strongly Attached	*	*	*	*	*	*	*	*
49: Transportation	All Employed	-\$2,127.08	-\$2,104.12	-\$886.98	-\$51.04	\$998.46	\$3,568.75	\$144.44	-\$352.82
	Strongly Attached	-\$2,105.62	\$1,815.86	-\$451.23	\$2,429.30	\$1,024.80	-\$381.77	\$811.64	-\$619.14
51: Health Professions	All Employed	-\$136.92	\$480.31	<b>\$1,022.52</b>	\$943.66	-\$326.17	\$381.38	\$311.88	\$65.80
	Strongly Attached	\$847.02	<b>\$1,108.30</b>	\$836.59	<b>\$1,531.67</b>	-\$490.56	-\$62.10	\$116.41	-\$408.16
52: Business	All Employed	-\$541.37	-\$1,387.81	\$4,158.05	\$2,146.41	\$2,286.60	\$4,011.06	\$501.11	\$5,570.26
	Strongly Attached	*	*	*	*	*	*	*	*



**FIGURE C3: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED CERTIFICATES FOR THE TWO-DIGIT CIP CODES 11-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

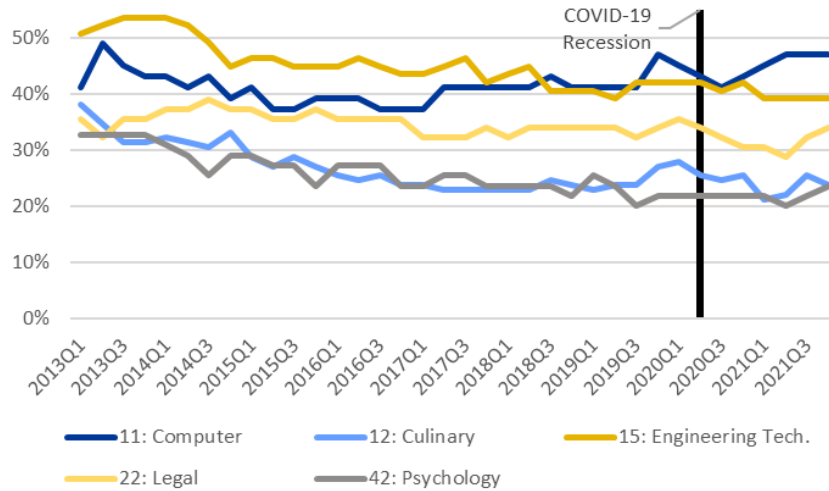




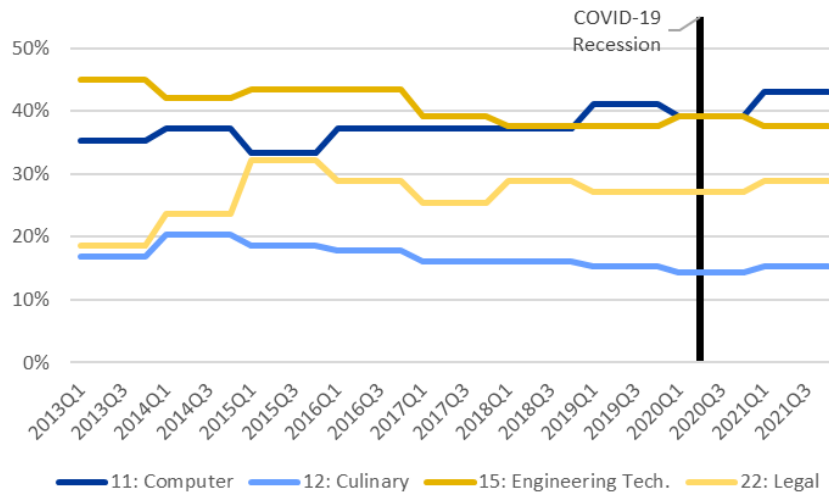
**FIGURE C4: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 THAT RECEIVED CERTIFICATES FOR THE TWO-DIGIT CIP CODES 11-49 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**



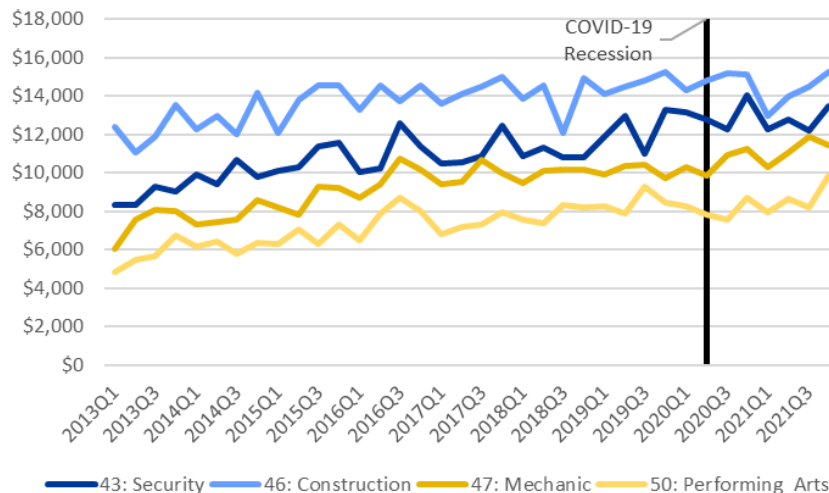
## APPENDIX D: ASSOCIATE'S DEGREE RECIPIENTS



**FIGURE D1:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 11-42 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

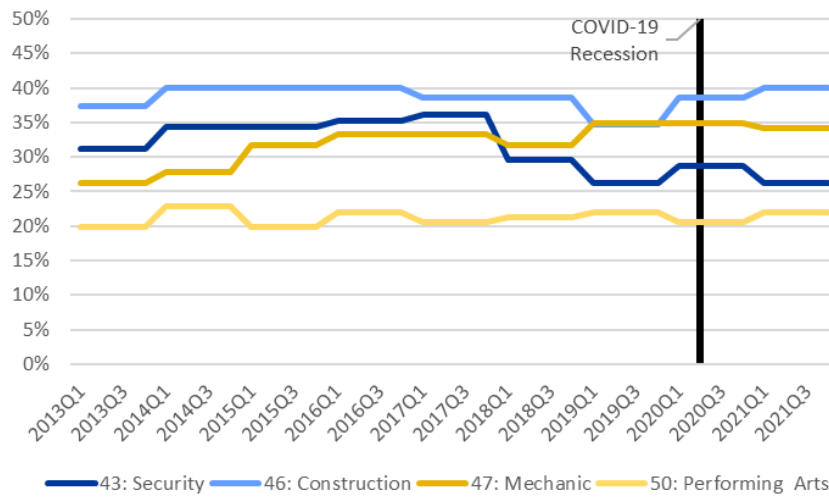


**FIGURE D2:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 11-22 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



**FIGURE D3:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 43-50 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.





**FIGURE D4:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 43-50 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

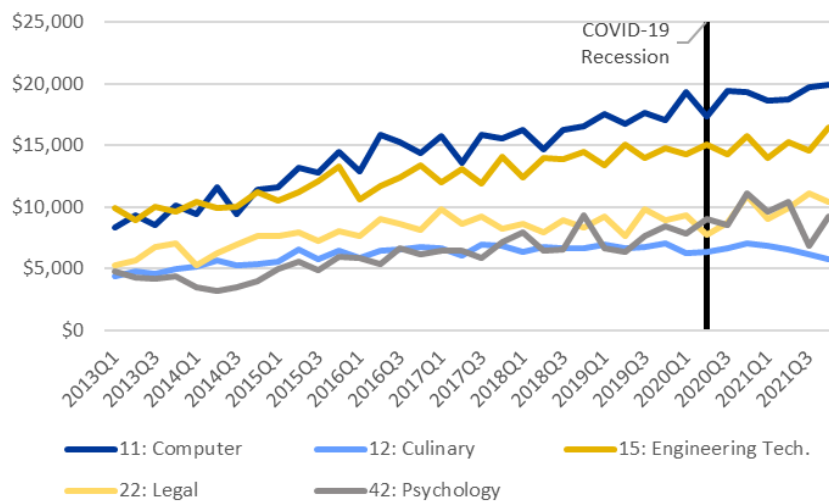
**TABLE D1:** RESULTS OF THE PERMUTATION TESTS FOR ASSOCIATE DEGREE RECIPIENTS FOR ALL AND STRONGLY ATTACHED EMPLOYEES. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.

	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
11: Computer	All Employed	\$1,768.42	\$628.05	\$1,790.16	\$2,334.12	-\$734.23	\$1,380.54	\$300.65	\$525.34
	Strongly Attached	\$1,921.76	\$1,125.01	\$1,981.01	\$2,115.02	-\$1,422.72	\$1,052.19	\$354.14	\$353.67
12: Culinary Services	All Employed	-\$737.36	-\$238.49	-\$17.39	-\$2.68	\$664.70	\$155.79	-\$555.27	-\$1,226.89
	Strongly Attached	*	*	*	*	*	*	*	*
13: Education	All Employed	\$230.78	\$825.32	\$787.72	\$914.33	-\$654.31	\$480.41	-\$1,194.92	-\$16.83
	Strongly Attached	*	*	*	*	*	*	*	*
15: Engineering Tech.	All Employed	\$912.34	\$14.08	\$348.07	\$1,043.66	-\$325.87	\$254.30	\$306.45	\$690.41
	Strongly Attached	\$744.62	-\$152.03	-\$537.79	-\$571.38	-\$555.10	\$370.30	\$704.67	\$576.25
22: Legal	All Employed	\$112.81	\$89.79	-\$1,075.10	\$2,044.10	-\$311.49	\$2,187.64	\$2,363.35	-\$489.42
	Strongly Attached	-\$76.87	-\$1,554.45	-\$223.60	\$2,560.71	-\$114.09	\$1,945.56	\$1,492.92	-\$343.85
24: Liberal Arts	All Employed	\$480.06	<b>\$1,035.52</b>	\$651.02	\$534.57	-\$238.22	\$48.54	\$217.26	\$480.33
	Strongly Attached	\$671.21	\$719.86	\$755.71	<b>\$1,454.23</b>	\$102.48	\$166.98	\$529.53	-\$72.14
42: Psychology	All Employed	\$1,156.80	\$2,628.26	\$881.57	\$2,678.40	\$1,761.35	\$1,385.17	-\$1,662.77	-\$1,933.07
	Strongly Attached	*	*	*	*	*	*	*	*
43: Security	All Employed	\$1,285.45	-\$153.21	\$1,309.03	\$744.13	-\$899.35	-\$0.44	-\$75.94	-\$529.85
	Strongly Attached	\$1,784.04	-\$365.76	\$1,755.85	\$1,498.57	-\$460.81	\$834.45	\$1,047.49	-\$711.05
46: Construction Trades	All Employed	\$154.19	\$359.52	\$423.62	-\$158.27	-\$1,291.36	-\$839.92	-\$722.56	\$134.05
	Strongly Attached	\$814.64	\$350.29	\$332.23	\$1,628.35	-\$923.26	-\$509.16	-\$1,211.80	-\$2,058.82

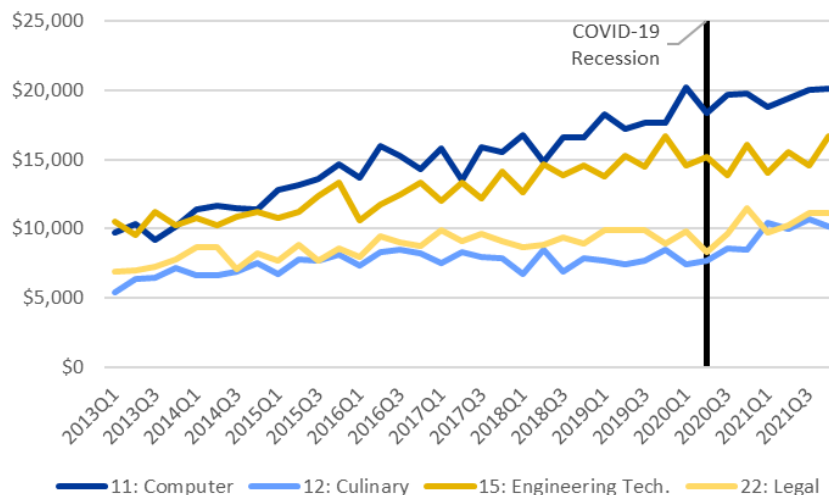


**TABLE D1 (CONTINUED): RESULTS OF THE PERMUTATION TESTS FOR ASSOCIATE DEGREE RECIPIENTS FOR ALL AND STRONGLY ATTACHED EMPLOYEES. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
47: Mechanic	All Employed	\$360.88	-\$478.04	\$506.80	\$1,530.48	\$26.91	\$1,213.21	\$905.73	\$164.27
	Strongly Attached	\$668.44	-\$337.49	\$163.19	\$1,428.97	\$84.87	\$1,333.35	\$1,346.67	\$583.73
50: Performing Arts	All Employed	\$59.65	-\$71.56	-\$1,667.35	\$224.74	-\$362.66	\$838.19	\$610.26	\$1,141.26
	Strongly Attached	\$377.77	-\$151.42	-\$286.54	\$883.60	-\$1,439.54	\$655.78	-\$386.52	-\$258.30
51: Health Professions	All Employed	\$21.31	\$21.37	\$295.43	<b>\$1,536.20</b>	\$822.01	\$465.13	\$985.89	\$708.02
	Strongly Attached	\$382.99	<b>\$1,183.91</b>	\$44.74	<b>\$2,222.09</b>	<b>-\$1,278.40</b>	-\$441.23	\$1,111.51	\$887.35
52: Business	All Employed	\$261.32	-\$34.94	\$413.59	\$2,128.82	\$916.35	\$59.67	\$635.09	-\$74.75
	Strongly Attached	\$351.71	\$385.08	\$184.55	\$778.90	\$1,139.04	\$204.97	\$956.53	\$281.53

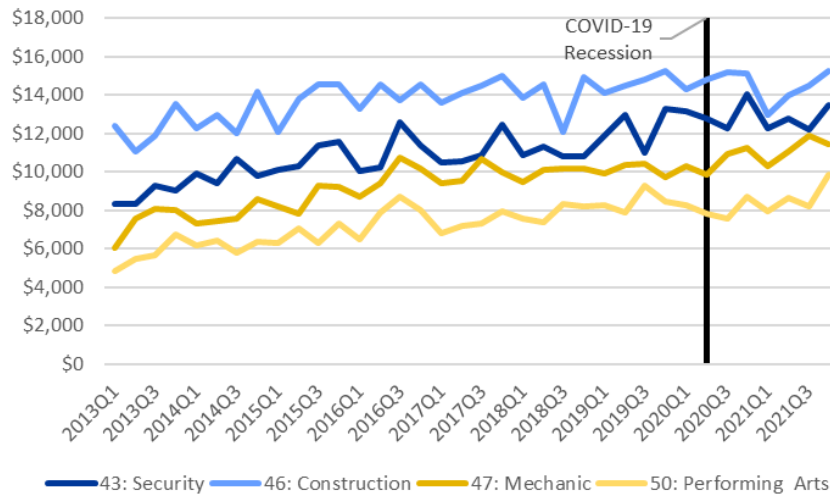


**FIGURE D5: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 11-42 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**

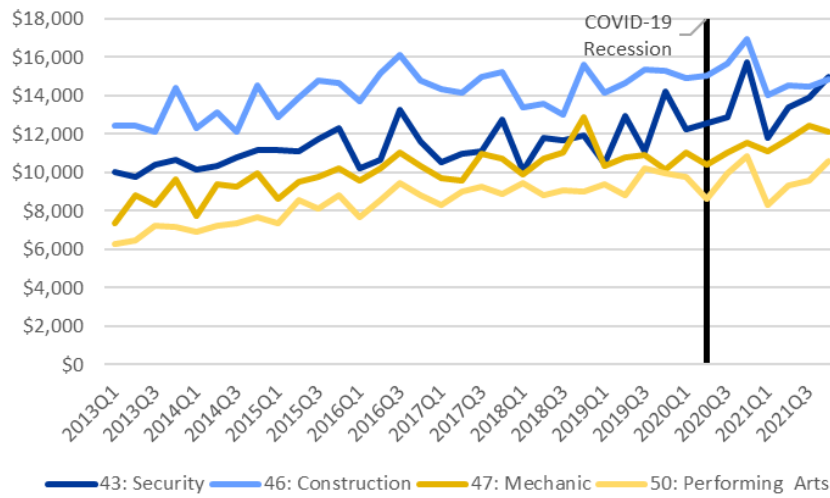


**FIGURE D6: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 11-42 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.**





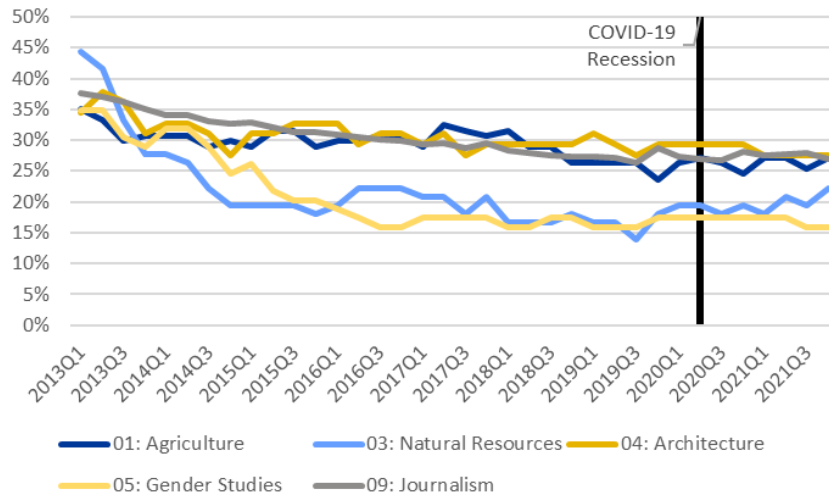
**FIGURE D7:** MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 43-50 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



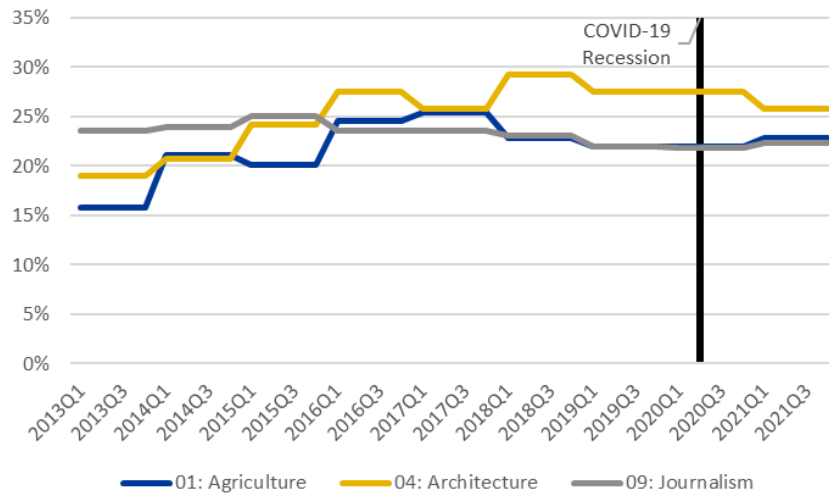
**FIGURE D8:** MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED ASSOCIATE DEGREES FOR THE TWO-DIGIT CIP CODES 43-50 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



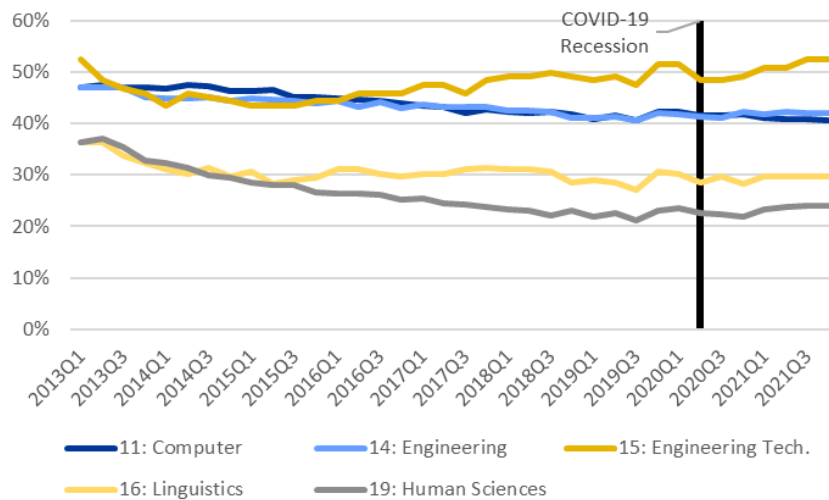
## APPENDIX E: BACHELOR'S DEGREE RECIPIENTS



**FIGURE E1:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



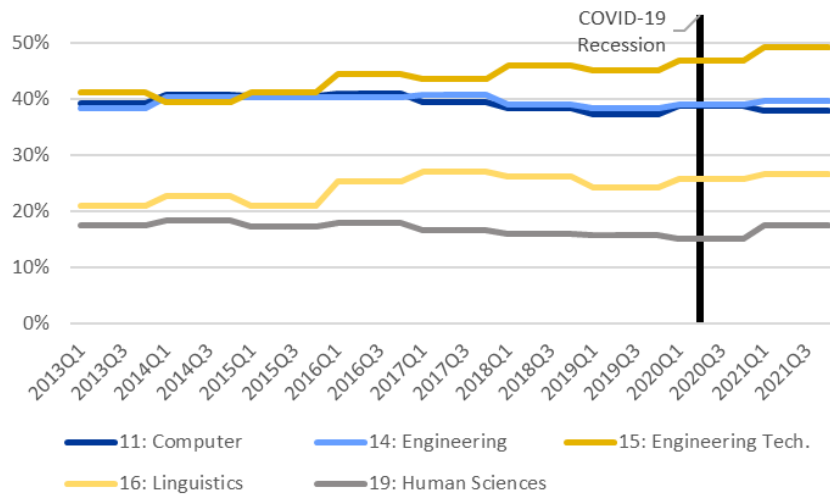
**FIGURE E2:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FOR THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



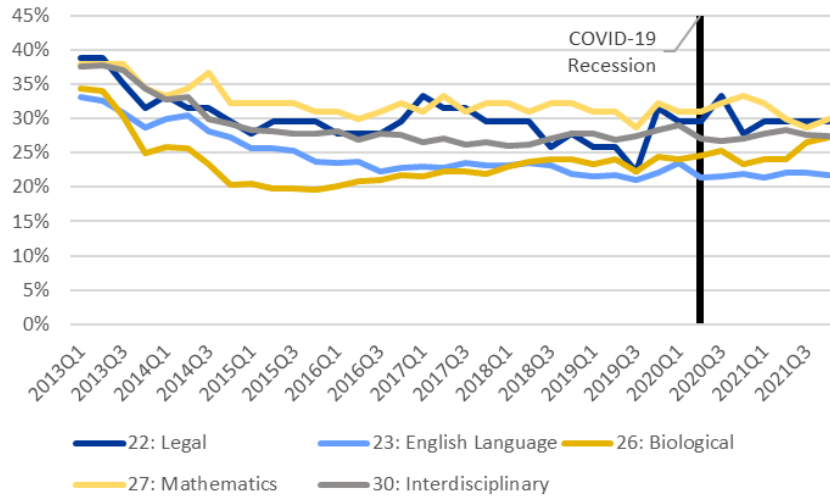
**FIGURE E3:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FOR THE TWO-DIGIT CIP CODES 11-19 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



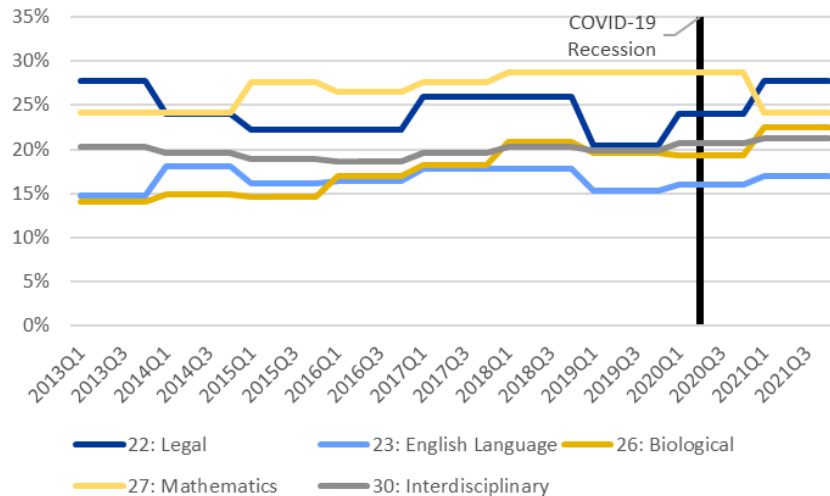




**FIGURE E4:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FOR THE TWO-DIGIT CIP CODES 11-19 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

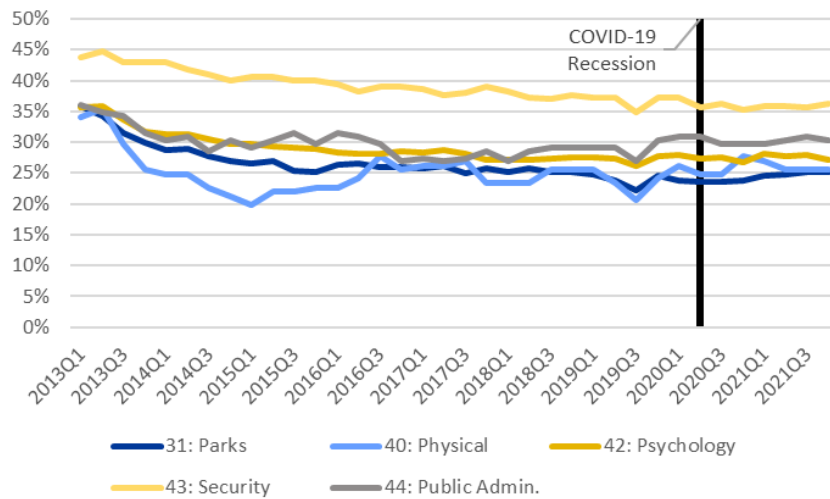


**FIGURE E5:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FOR THE TWO-DIGIT CIP CODES 22-30 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

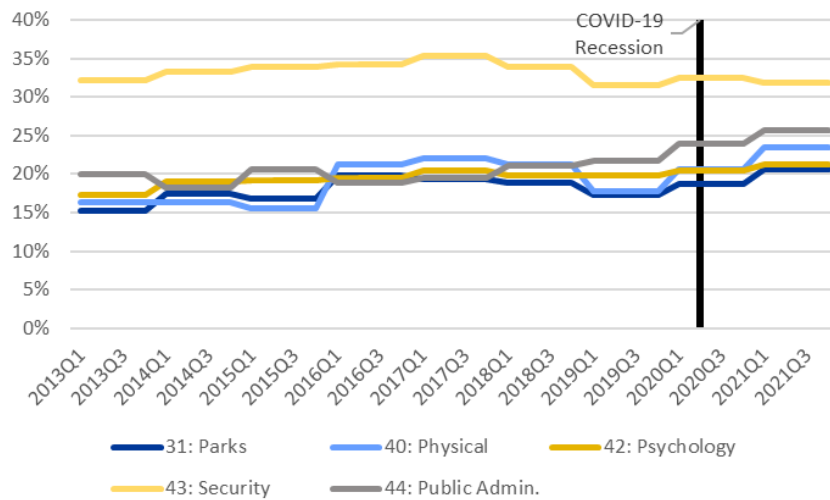


**FIGURE E6:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES IN THE TWO-DIGIT CIP CODES 22-30 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

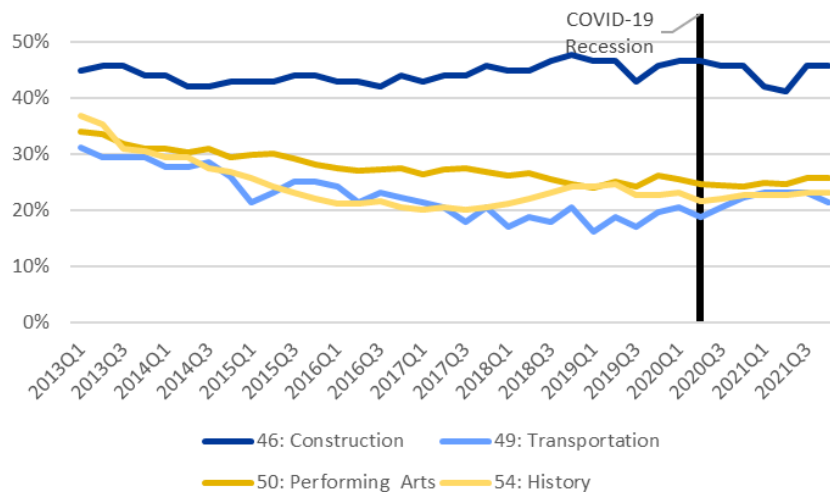




**FIGURE E7:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES IN THE TWO-DIGIT CIP CODES 31-44 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

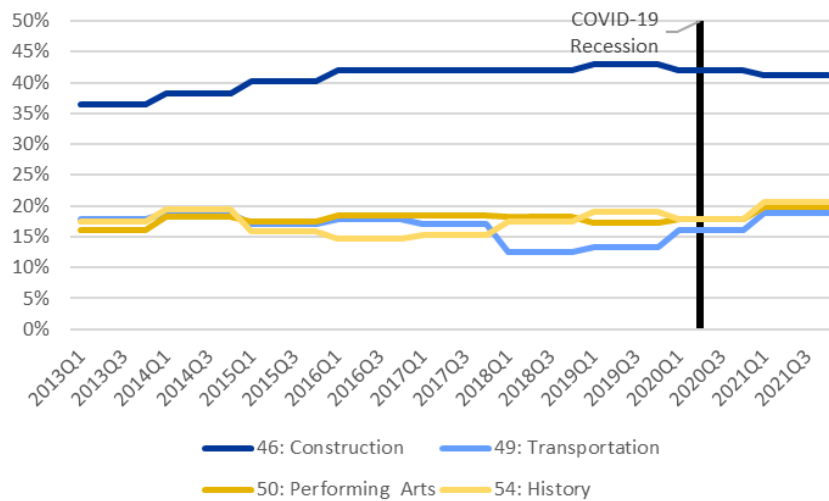


**FIGURE E8:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES IN THE TWO-DIGIT CIP CODES 31-44 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



**FIGURE E9:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES IN THE TWO-DIGIT CIP CODES 46-54 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.





**FIGURE E10:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES IN THE TWO-DIGIT CIP CODES 46-54 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

**TABLE E1:** RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AND STRONGLY ATTACHED EMPLOYEES WHO RECEIVED BACHELOR'S DEGREES FOR ALL AREAS OF STUDY. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.

	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
01: Agriculture	All Employed	-\$525.24	-\$501.88	-\$2.05	-\$131.58	\$610.66	\$1,308.20	-\$707.57	-\$1,163.14
	Strongly Attached	-\$430.32	\$1,665.96	\$52.08	\$2,680.36	\$748.81	\$3.10	-\$1,773.22	-\$1,506.49
03: Natural Resources	All Employed	-\$307.62	-\$1,286.03	\$230.58	\$1,661.25	-\$573.21	\$1,024.13	-\$314.28	-\$170.69
	Strongly Attached	*	*	*	*	*	*	*	*
04: Architecture	All Employed	\$2,436.19	-\$1,067.41	\$1,644.23	\$1,511.20	-\$390.83	\$1,655.69	-\$10.25	-\$527.87
	Strongly Attached	\$1,273.61	-\$1,456.61	\$1,845.78	\$1,201.54	-\$147.29	\$1,753.46	-\$21.70	-\$402.55
05: Gender Studies	All Employed	-\$275.16	\$630.15	-\$817.22	\$1,552.76	\$628.32	\$511.51	\$2,019.83	\$1,197.79
	Strongly Attached	*	*	*	*	*	*	*	*
09: Journalism	All Employed	\$90.41	<b>\$1,501.41</b>	\$565.02	<b>\$1,801.29</b>	\$355.06	\$556.85	\$626.93	-\$6.94
	Strongly Attached	\$772.19	\$1,245.81	\$400.02	<b>\$2,052.04</b>	\$1.13	\$547.44	\$1,993.72	\$800.08
11: Computer	All Employed	\$1,099.13	\$1,827.10	\$938.74	\$1,427.73	\$157.51	-\$627.73	-\$167.99	-\$156.53
	Strongly Attached	\$2,028.80	\$2,032.19	\$573.25	\$1,633.10	-\$357.67	-\$1,114.23	\$188.81	-\$381.80
13: Education	All Employed	<b>\$593.47</b>	<b>\$816.67</b>	<b>\$969.26</b>	<b>\$1,234.06</b>	<b>\$1,412.88</b>	\$297.28	\$576.63	-\$60.14
	Strongly Attached	<b>\$608.17</b>	<b>\$1,273.51</b>	<b>\$667.84</b>	<b>\$1,274.99</b>	<b>\$1,697.40</b>	\$424.34	\$569.21	-\$111.75
14: Engineering	All Employed	\$455.04	\$824.34	\$816.12	<b>\$1,470.53</b>	-\$472.18	\$675.71	\$328.79	\$760.06
	Strongly Attached	\$440.40	<b>\$738.25</b>	\$874.57	<b>\$1,630.10</b>	-\$395.54	\$807.57	\$353.73	\$761.58
15: Engineering Tech.	All Employed	\$653.99	\$205.81	\$150.74	\$806.70	-\$11.81	\$507.24	\$1,145.56	\$1,196.12
	Strongly Attached	\$499.03	\$315.22	\$994.04	\$1,167.60	-\$156.41	\$295.31	\$357.95	\$1,613.85
16: Linguistics	All Employed	\$1,342.09	\$369.06	-\$104.46	\$1,285.79	\$181.96	-\$148.93	-\$385.79	-\$521.78
	Strongly Attached	\$315.04	\$214.55	\$376.80	\$1,773.90	\$702.89	\$151.09	-\$863.41	-\$514.45



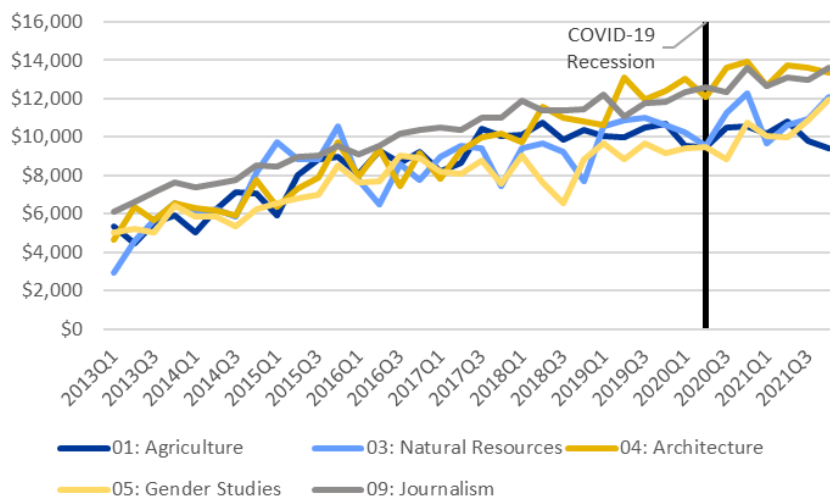
**TABLE E1 (CONTINUED): RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AND STRONGLY ATTACHED EMPLOYEES WHO RECEIVED BACHELOR'S DEGREES FOR ALL AREAS OF STUDY. STATISTICAL SIGNIFICANCE: BOLDED MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
19: Human Science	All Employed	\$231.55	\$835.98	\$358.01	\$1,555.03	-\$129.81	-\$885.56	-\$414.71	-\$617.05
	Strongly Attached	\$1,529.32	\$1,702.37	\$430.89	\$2,025.81	-\$613.40	-\$383.68	-\$288.09	-\$1,503.54
22: Legal Professions	All Employed	\$645.37	-\$24.02	\$841.07	\$154.66	\$1,012.24	\$549.35	\$585.64	\$2,342.96
	Strongly Attached	\$951.82	-\$341.90	\$665.31	\$871.45	\$965.48	\$1,199.71	\$434.39	\$1,709.89
23: English Language	All Employed	\$933.74	\$1,642.13	\$1,175.09	\$934.54	\$270.29	-\$640.33	\$296.55	\$565.55
	Strongly Attached	\$866.92	\$1,144.98	\$373.84	\$715.72	-\$200.30	-\$541.52	-\$309.57	-\$124.56
24: Liberal Arts	All Employed	-\$2,641.26	-\$2,558.58	-\$416.92	\$1,146.87	\$530.43	-\$247.17	-\$595.95	\$238.99
	Strongly Attached	-\$1,132.39	-\$2,446.90	-\$2,439.56	\$1,906.25	-\$3,231.53	-\$2,681.25	-\$420.15	-\$2,236.24
26: Biological Sciences	All Employed	\$16.23	\$361.12	\$105.40	\$644.55	-\$489.86	\$1,081.63	\$71.90	\$1,884.75
	Strongly Attached	-\$179.61	-\$283.90	-\$424.28	-\$28.45	-\$422.49	\$514.01	\$1,050.96	\$1,224.36
27: Mathematics	All Employed	\$348.06	\$2,708.69	\$331.29	\$1,646.24	\$2,298.50	-\$562.57	-\$4,142.51	\$65.48
	Strongly Attached	-\$1,093.78	\$3,016.75	\$2,062.86	\$2,167.64	\$2,132.68	-\$468.20	-\$2,329.34	-\$491.09
30: Interdisciplinary	All Employed	\$271.28	\$599.05	\$225.15	\$420.84	-\$63.68	\$74.16	\$369.55	\$1,089.18
	Strongly Attached	-\$296.66	-\$647.41	-\$633.85	\$463.63	\$583.13	\$1,524.18	\$766.85	-\$431.56
31: Parks	All Employed	\$763.37	\$1,413.09	-\$103.41	\$843.77	-\$774.61	\$533.86	-\$156.56	\$1,443.67
	Strongly Attached	\$277.61	\$700.58	\$283.69	\$1,722.66	\$1,268.66	\$773.66	\$53.77	\$1,378.29
40: Physical	All Employed	-\$392.43	\$392.70	-\$2,009.66	\$729.22	\$2,387.67	\$1,913.73	\$3,860.77	\$1,391.66
	Strongly Attached	\$422.58	-\$359.29	\$749.65	\$468.40	-\$749.48	\$1,307.76	\$1,451.62	\$2,185.49
42: Psychology	All Employed	\$704.03	\$690.80	\$933.83	\$596.05	-\$89.04	\$81.10	\$707.60	\$501.79
	Strongly Attached	\$461.05	\$420.78	\$60.05	\$670.68	\$157.54	\$879.19	\$675.66	\$72.17
43: Security	All Employed	-\$367.40	\$702.90	\$770.41	\$1,517.22	-\$632.17	-\$170.87	\$400.73	-\$45.86
	Strongly Attached	\$181.78	\$511.16	\$625.89	\$1,393.35	-\$762.15	\$433.32	\$737.18	\$243.56
44: Public Administration	All Employed	\$289.30	-\$187.93	\$581.79	\$377.10	\$992.18	\$1,323.83	\$453.07	\$1,865.63
	Strongly Attached	-\$318.10	\$460.62	\$234.14	\$664.51	\$1,056.62	\$668.89	\$643.39	\$1,055.57
45: Social Science	All Employed	\$1,397.63	\$671.28	\$513.02	\$1,481.82	<b>-\$345.75</b>	\$479.85	\$413.12	\$38.10
	Strongly Attached	\$1,115.60	\$581.02	\$442.16	\$1,911.23	\$151.24	\$1,335.14	\$740.39	-\$155.19
46: Construction	All Employed	\$334.78	<b>\$2,298.36</b>	\$740.82	\$2,767.73	\$1,137.64	\$254.85	\$1,103.11	-\$34.85
	Strongly Attached	\$816.02	\$1,990.91	\$1,239.68	\$3,644.57	\$788.85	\$490.23	\$1,248.75	-\$923.11
49: Transportation	All Employed	-\$1,135.41	-\$526.39	-\$345.32	\$182.63	\$606.46	\$87.31	\$2,908.10	\$2,404.08
	Strongly Attached	\$369.90	-\$64.16	-\$231.08	-\$342.96	\$771.64	\$68.85	\$2,696.60	\$2,282.42
50: Performing Arts	All Employed	\$696.66	\$873.23	\$878.95	\$1,113.41	\$823.43	\$1,351.44	\$29.03	\$642.77
	Strongly Attached	\$62.83	\$631.30	\$579.19	\$1,485.66	\$1,284.28	\$335.63	\$683.05	\$321.40

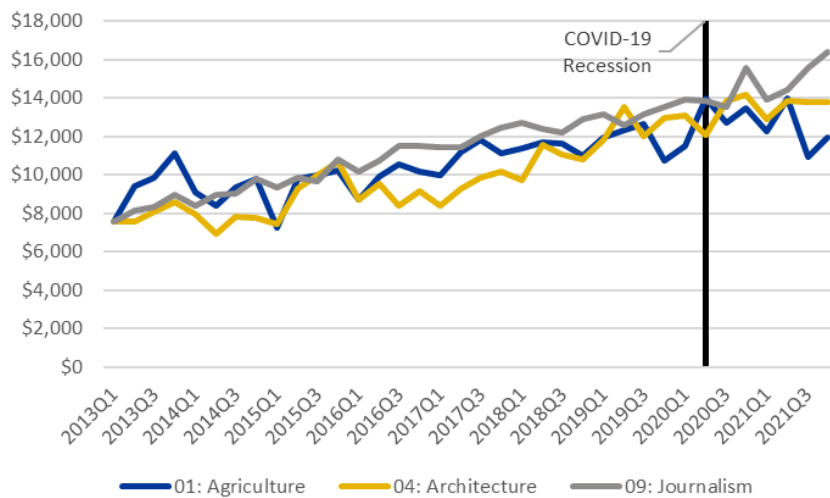


**TABLE E1 (CONTINUED): RESULTS OF THE PERMUTATION TESTS OF MEDIANS FOR ALL AND STRONGLY ATTACHED EMPLOYEES WHO RECEIVED BACHELOR'S DEGREES FOR ALL AREAS OF STUDY. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
51: Health Professions	All Employed	\$238.52	\$422.55	<b>\$1,059.54</b>	\$217.75	-\$670.44	\$57.62	\$64.98	<b>\$2,176.15</b>
	Strongly Attached	-\$421.96	\$209.35	-\$415.16	<b>\$1,107.25</b>	-\$870.45	\$226.73	\$1,385.38	<b>\$1,572.47</b>
52: Business	All Employed	\$825.24	\$886.51	\$373.32	<b>\$1,404.53</b>	\$719.58	<b>\$1,043.91</b>	\$821.59	\$336.31
	Strongly Attached	\$1,025.10	\$670.38	\$580.77	<b>\$1,275.49</b>	\$625.95	\$901.49	\$889.49	\$674.20
54: History	All Employed	\$1,215.99	\$2,418.27	\$1,535.14	\$2,113.68	\$1,178.31	\$241.49	-\$12.72	-\$384.27
	Strongly Attached	\$855.08	\$1,162.90	\$1,617.65	\$516.40	\$961.34	-\$379.12	-\$391.01	\$208.00

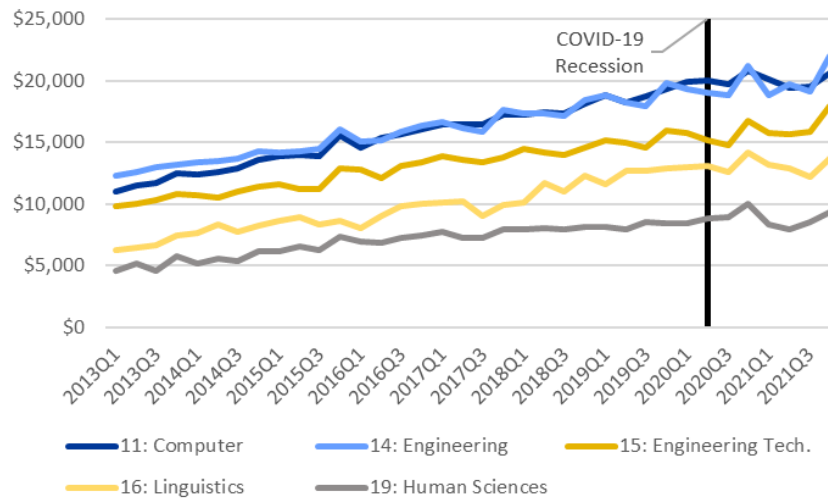


**FIGURE E11: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

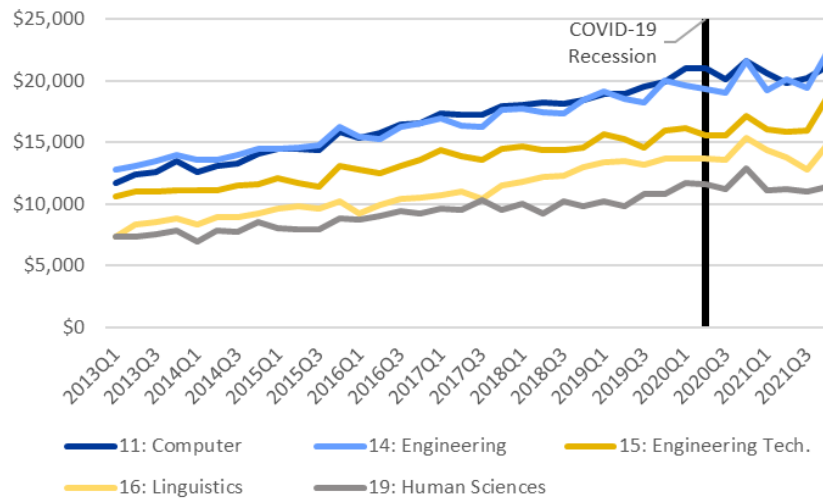


**FIGURE E12: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 01-09 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

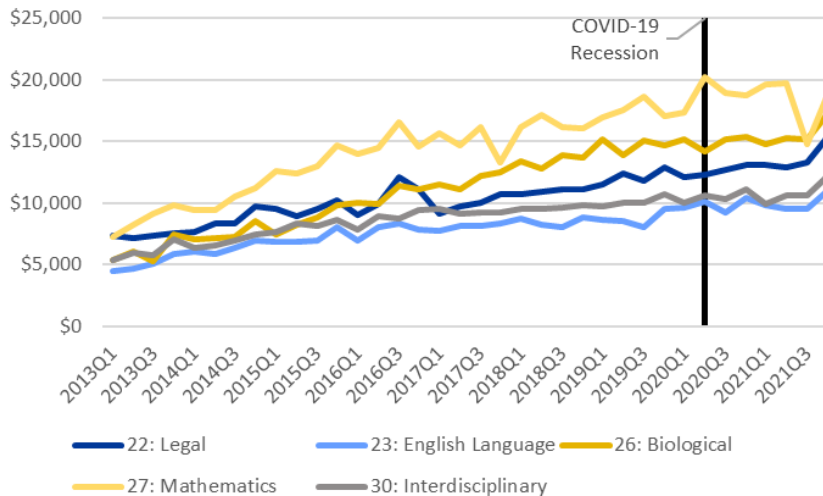




**FIGURE E13: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 11-19 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

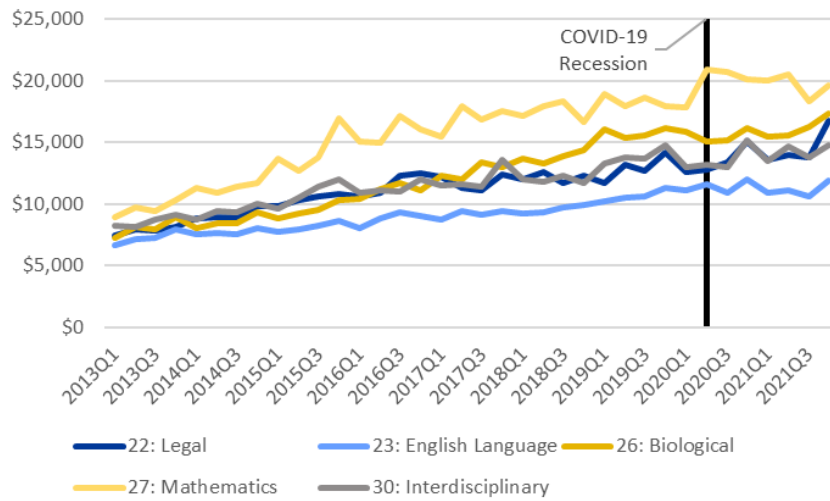


**FIGURE E14: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 11-19 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

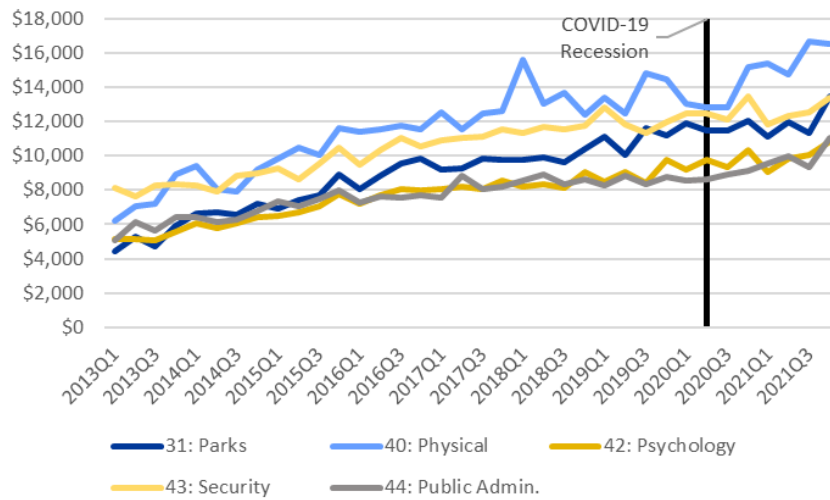


**FIGURE E15: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 22-30 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

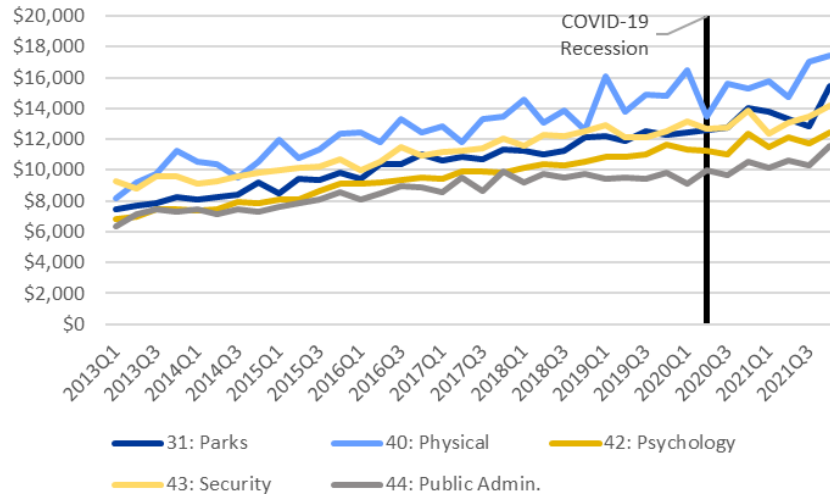




**FIGURE E16: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 22-30 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

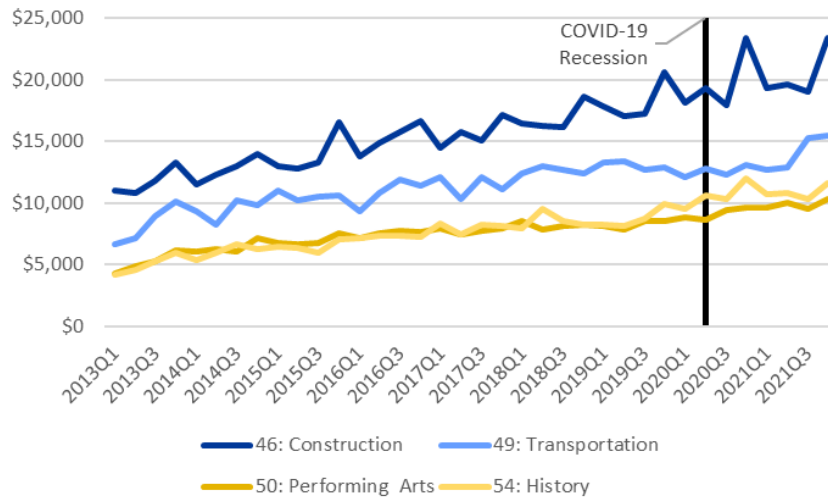


**FIGURE E17: MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 31-44 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**

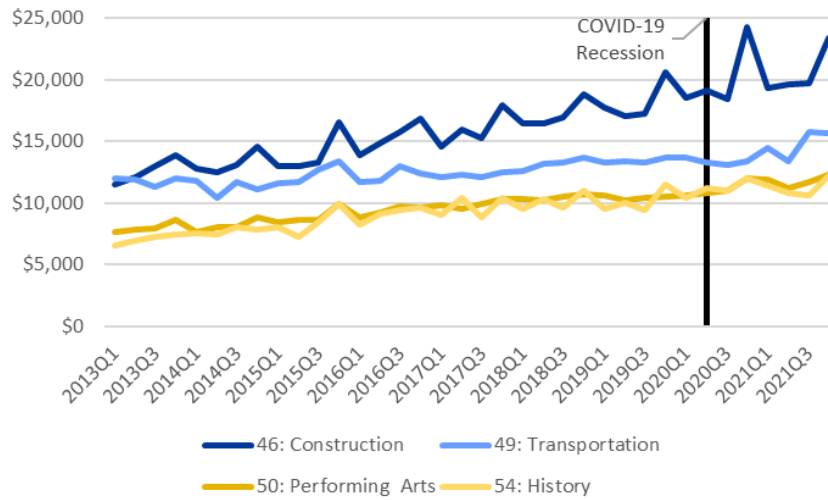


**FIGURE E18: MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 31-44 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.**





**FIGURE E19:** MEDIAN QUARTERLY WAGES FOR ALL EMPLOYED USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 46-54 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.



**FIGURE E20:** MEDIAN QUARTERLY WAGES FOR STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES WHO RECEIVED BACHELOR'S DEGREES FROM THE TWO-DIGIT CIP CODES 46-54 IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4.





## APPENDIX F: GRADUATE DEGREE RECIPIENTS

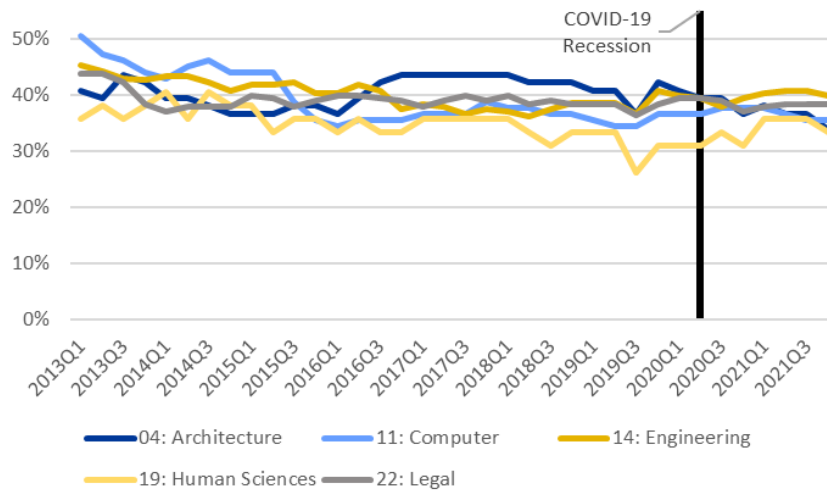
**TABLE F1:** RESULTS OF THE PERMUTATION TESTS FOR GRADUATE DEGREE RECIPIENTS FOR ALL AND STRONGLY ATTACHED EMPLOYEES. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.

Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
04: Architecture	All Employed	\$906.70	\$940.89	\$231.08	\$3,059.88	-\$1,425.15	\$599.11	\$1,025.31	-\$381.41
	Strongly Attached	\$255.66	-\$156.65	\$112.32	\$3,059.88	-\$1,582.56	\$1,558.63	\$1,419.09	-\$381.41
11: Computer	All Employed	\$779.91	\$1,138.98	\$723.58	\$706.74	-\$572.07	\$2,324.67	\$2,354.29	\$2,077.37
	Strongly Attached	\$616.35	\$1,088.53	\$287.37	\$1,072.18	-\$93.27	\$2,988.80	\$2,315.01	\$2,030.06
13: Education	All Employed	\$382.26	\$765.93	<b>\$1,597.80</b>	\$422.31	<b>\$1,298.39</b>	\$30.46	-\$85.69	-\$306.52
	Strongly Attached	\$914.22	\$958.74	<b>\$1,317.42</b>	\$741.71	<b>\$1,258.15</b>	-\$17.47	\$31.87	-\$182.33
14: Engineering	All Employed	\$1,922.75	\$814.17	\$1,026.97	\$2,675.26	\$342.53	\$163.22	-\$18.43	\$1,212.86
	Strongly Attached	\$1,614.55	\$1,067.21	\$574.33	\$2,663.86	\$1,117.48	\$629.40	\$960.01	\$1,379.39
19: Human Science	All Employed	-\$620.73	\$2,447.83	-\$151.44	\$262.27	\$729.97	-\$938.36	\$482.14	\$1,329.67
	Strongly Attached	\$537.24	\$2,446.19	-\$694.74	\$3,682.62	\$240.97	-\$859.08	\$2,002.21	-\$1,137.69
22: Legal Professions	All Employed	\$1,348.92	\$733.55	-\$387.00	-\$1,796.56	-\$942.43	\$2,005.67	\$2,470.81	\$5,335.01
	Strongly Attached	\$271.99	\$452.37	-\$1,626.14	-\$900.95	\$728.40	\$2,988.45	\$2,597.85	\$5,052.63
23: English Language	All Employed	\$60.74	\$225.02	\$781.90	\$103.64	\$968.07	\$1,537.12	\$458.77	\$880.88
	Strongly Attached	-\$116.93	-\$404.52	\$699.49	\$506.27	\$1,997.21	\$2,072.42	\$834.46	\$1,631.72
26: Biological Sciences	All Employed	-\$10.67	\$269.74	-\$176.59	\$937.64	-\$100.70	\$1,127.53	\$1,172.51	-\$351.24
	Strongly Attached	\$828.83	\$427.28	-\$154.01	\$430.40	-\$1,228.35	\$430.28	\$1,625.37	-\$488.89
30: Interdisciplinary	All Employed	-\$2,269.79	\$1,111.58	\$4,436.46	\$748.81	-\$340.90	-\$1,102.93	-\$1,035.64	\$914.95
	Strongly Attached	*	*	*	*	*	*	*	*
31: Parks	All Employed	\$1,470.33	\$571.32	\$698.29	\$512.01	-\$935.60	\$616.92	\$2,808.96	-\$716.25
	Strongly Attached	\$1,300.86	\$864.10	\$444.47	\$1,673.14	-\$713.60	\$1,081.74	\$1,826.68	-\$634.52
40: Physical	All Employed	-\$1,001.58	\$1,184.36	-\$803.20	\$2,506.56	\$503.61	\$309.32	\$1,686.09	-\$170.43
	Strongly Attached	-\$4,358.47	\$1,224.99	-\$1,504.29	\$2,304.03	\$777.80	\$605.43	\$2,014.72	-\$53.43
42: Psychology	All Employed	-\$335.08	\$1,463.21	\$92.25	\$1,596.44	\$1,380.78	-\$241.41	-\$231.06	-\$771.83
	Strongly Attached	\$37.51	\$1,248.81	\$100.05	\$2,251.03	\$1,604.89	\$518.59	\$59.51	-\$1,033.39
44: Public Administration	All Employed	\$331.08	<b>\$1,140.01</b>	\$509.80	<b>\$1,376.13</b>	\$419.68	-\$165.61	\$17.09	-\$482.83
	Strongly Attached	-\$2.44	<b>\$1,396.58</b>	\$24.21	<b>\$1,420.75</b>	\$292.89	-\$244.42	\$567.66	\$509.26
45: Social Science	All Employed	\$1,428.55	\$481.26	\$426.24	\$1,637.51	-\$44.44	-\$705.58	\$1,785.12	\$152.28
	Strongly Attached	\$1,051.77	\$700.13	\$1,502.58	\$2,308.26	-\$370.66	-\$383.45	\$701.76	\$59.01
50: Performing Arts	All Employed	\$1,524.45	\$1,155.62	\$4,232.45	\$537.67	-\$862.82	-\$572.15	\$303.34	\$235.39
	Strongly Attached	\$772.12	\$1,837.09	-\$211.17	-\$20.97	-\$131.70	-\$170.15	\$992.25	\$766.89

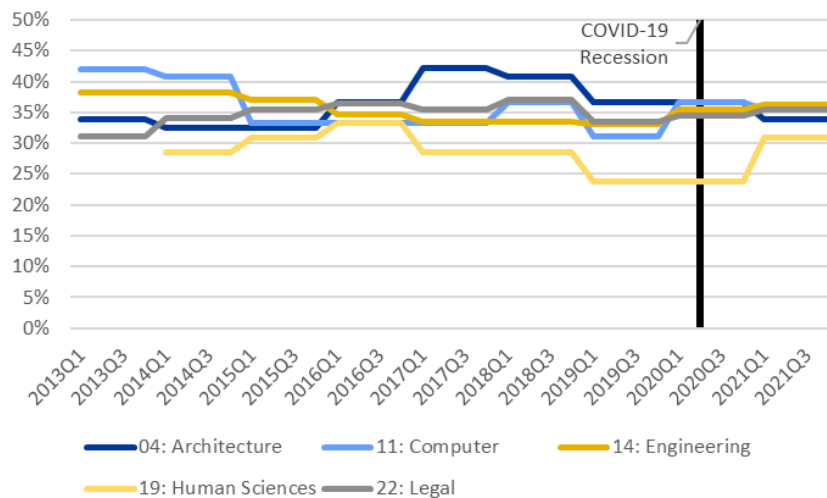


**TABLE F1 (CONTINUED):** RESULTS OF THE PERMUTATION TESTS FOR GRADUATE DEGREE RECIPIENTS FOR ALL AND STRONGLY ATTACHED EMPLOYEES. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.

Two-Digit CIP Code	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
51: Health Professions	All Employed	\$58.83	\$112.08	\$1,112.30	-\$434.01	-\$428.06	\$289.41	\$506.41	\$2,190.75
	Strongly Attached	-\$623.40	\$314.47	\$172.40	\$1,493.54	-\$178.90	\$746.67	\$1,798.21	\$909.83
52: Business	All Employed	\$1,513.79	<b>\$1,596.16</b>	\$980.49	<b>\$2,251.48</b>	\$137.24	<b>\$1,495.12</b>	\$1,348.99	\$873.43
	Strongly Attached	\$1,660.68	<b>\$1,435.93</b>	\$966.00	<b>\$1,937.47</b>	\$345.86	<b>\$1,570.95</b>	\$1,637.41	\$748.65

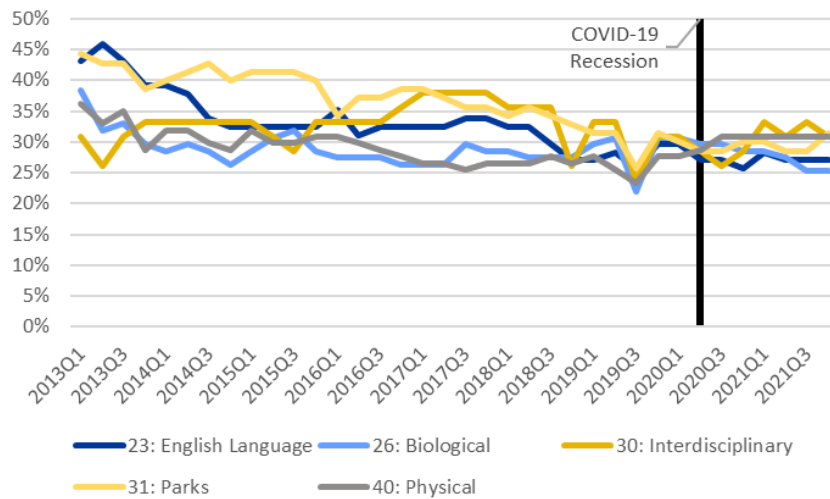


**FIGURE F1:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 04-22 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q1.

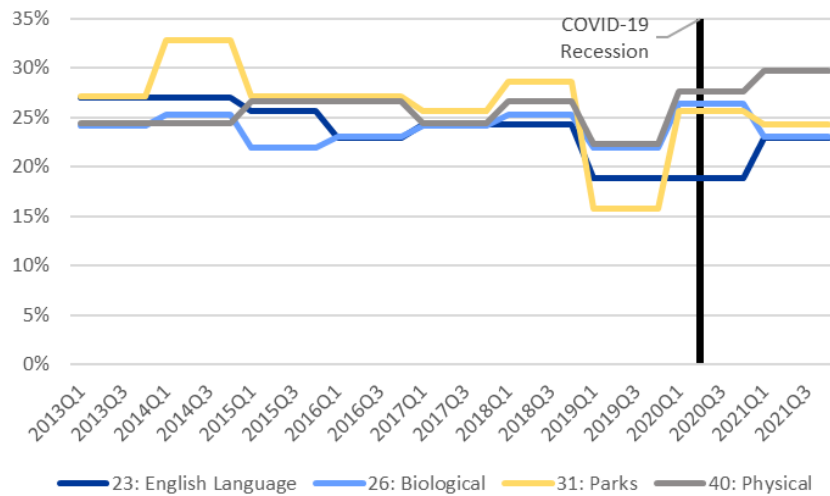


**FIGURE F2:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 04-22 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q1.

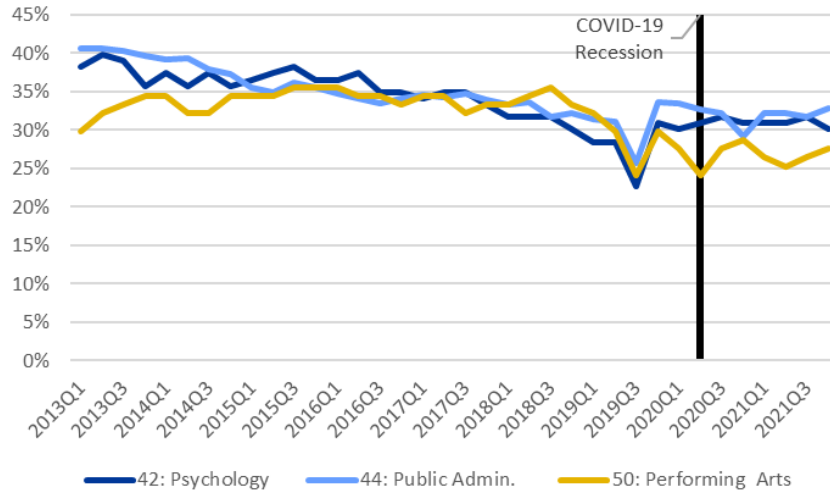




**FIGURE F3:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 23-40 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q1.

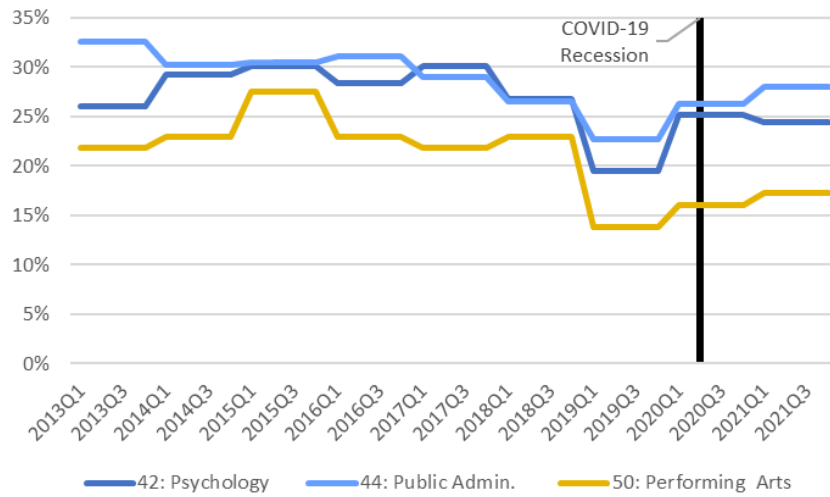


**FIGURE F4:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 23-40 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q1.

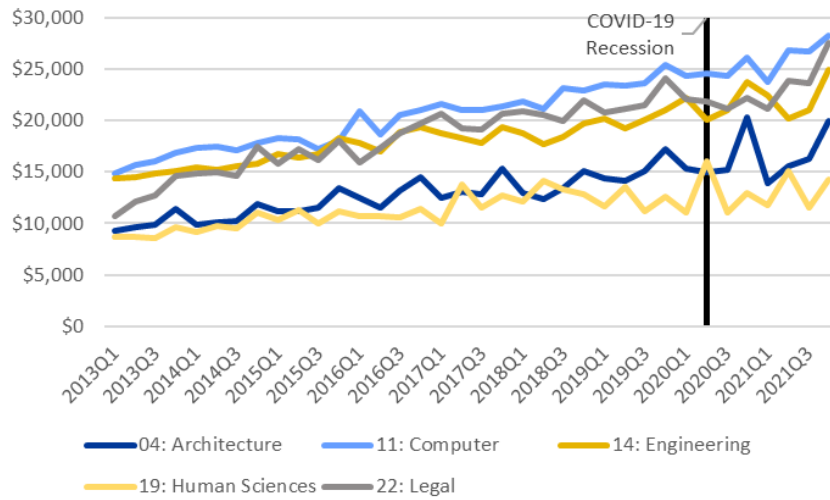


**FIGURE F5:** PERCENT OF ALL EMPLOYED USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 42-50 IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q1.

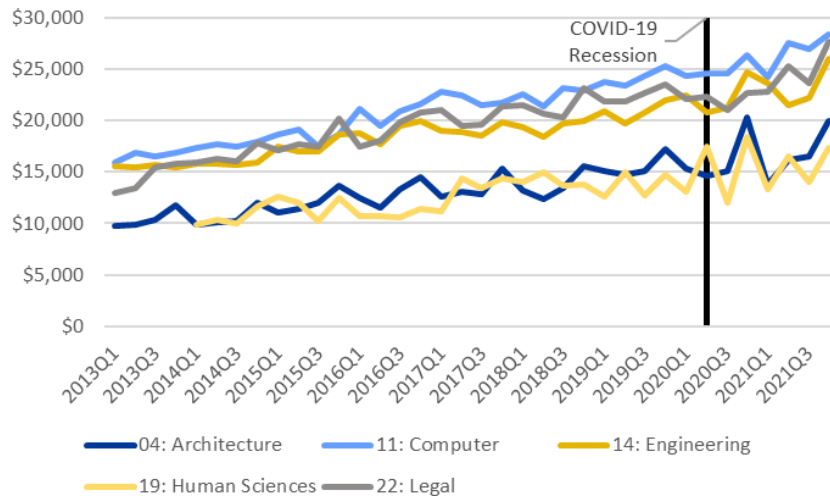




**FIGURE F6:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE USHE GRADUATES FROM 2012 WHO RECEIVED GRADUATE DEGREES IN THE TWO-DIGIT CIP CODES 42-50 IN UTAH’S LABOR FORCE FROM 2013Q1-2021Q1.

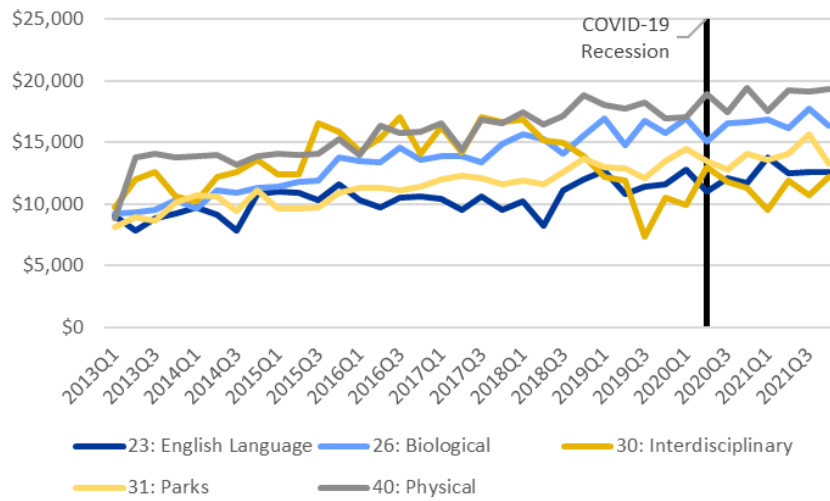


**FIGURE F7:** MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 04-22 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH’S WORKFORCE FROM 2013Q1-2021Q4 FOR ALL EMPLOYEES.

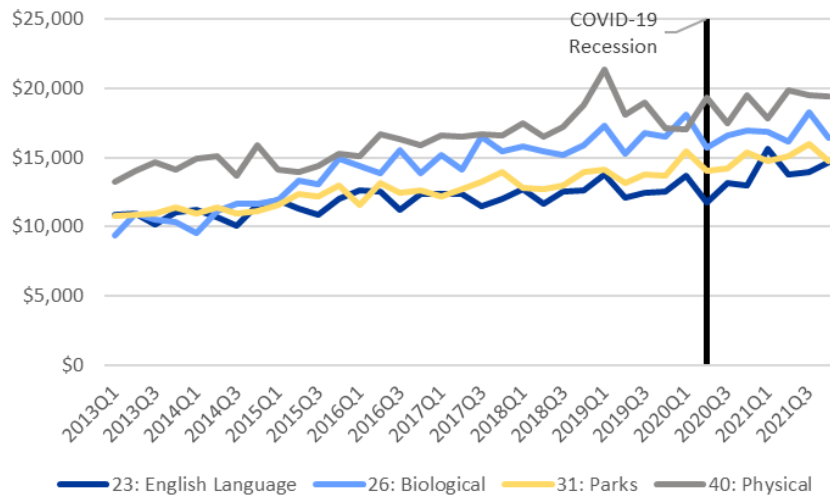


**FIGURE F8:** MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 04-22 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH’S WORKFORCE FROM 2013Q1-2021Q4 FOR STRONGLY ATTACHED EMPLOYEES.

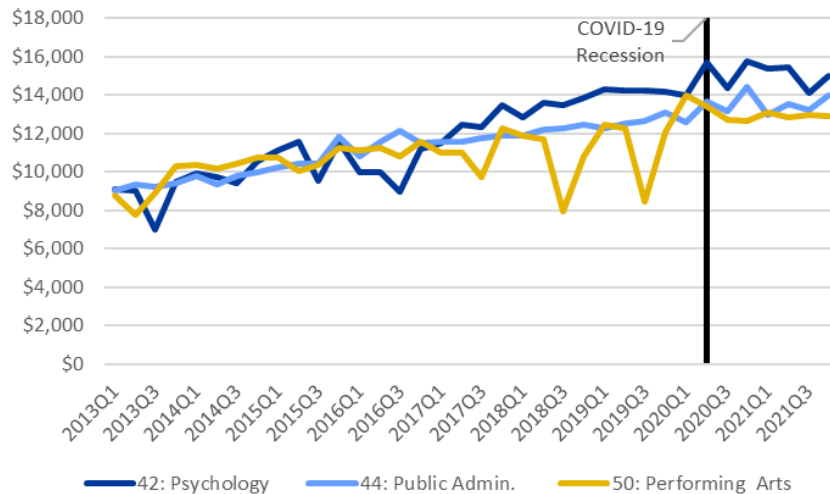




**FIGURE F9: MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 23-40 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH’S WORKFORCE FROM 2013Q1-2021Q4 FOR ALL EMPLOYEES.**

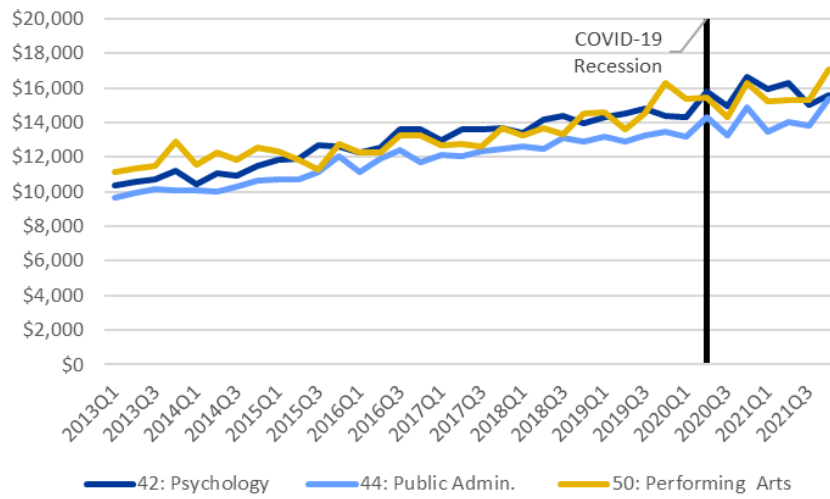


**FIGURE F10: MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 23-40 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH’S WORKFORCE FROM 2013Q1-2021Q4 FOR STRONGLY ATTACHED EMPLOYEES.**



**FIGURE F11: MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 42-50 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH’S WORKFORCE FROM 2013Q1-2021Q4 FOR ALL EMPLOYEES.**





**FIGURE F12:** MEDIAN QUARTERLY WAGES FOR THE TWO-DIGIT CIP CODES 42-50 FOR USHE GRADUATES FROM 2012 THAT EARNED GRADUATE DEGREES IN UTAH'S WORKFORCE FROM 2013Q1-2021Q4 FOR STRONGLY ATTACHED EMPLOYEES.



## APPENDIX G: DISCUSSION

**TABLE G1:** PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY, REGARDLESS OF AWARD TYPE RECEIVED, FOR 2012 USHE GRADUATES.

Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
01: Agriculture	All Employed	44.20%	43.30%	41.30%
	Strongly Attached	37.50%	33.70%	34.60%
03: Natural Resources	All Employed	22.50%	22.50%	23.80%
	Strongly Attached	15.00%	16.30%	18.80%
04: Architecture	All Employed	53.50%	52.30%	48.80%
	Strongly Attached	48.80%	48.80%	45.30%
05: Gender Studies	All Employed	31.60%	35.10%	33.30%
	Strongly Attached	26.30%	28.10%	28.10%
09: Journalism	All Employed	48.10%	48.10%	49.10%
	Strongly Attached	38.50%	39.00%	39.60%
11: Computer	All Employed	58.30%	58.80%	57.90%
	Strongly Attached	52.50%	54.30%	53.80%
12: Culinary Services	All Employed	44.20%	50.00%	40.70%
	Strongly Attached	29.10%	26.70%	29.10%
13: Education	All Employed	49.00%	49.90%	49.10%
	Strongly Attached	36.10%	39.00%	40.20%
14: Engineering	All Employed	45.80%	46.00%	47.30%
	Strongly Attached	41.20%	42.50%	43.30%
15: Engineering Technology	All Employed	54.40%	54.40%	55.20%
	Strongly Attached	45.20%	50.60%	50.60%
16: Linguistics	All Employed	42.80%	43.40%	45.10%
	Strongly Attached	35.30%	38.20%	39.30%
19: Human Sciences	All Employed	37.60%	38.20%	40.40%
	Strongly Attached	26.50%	26.20%	30.60%
22: Legal Professions	All Employed	60.90%	63.00%	60.30%
	Strongly Attached	51.60%	53.80%	56.50%
23: English Language	All Employed	38.90%	38.00%	39.20%
	Strongly Attached	27.30%	28.20%	30.60%
24: Liberal Arts	All Employed	42.00%	41.20%	42.60%
	Strongly Attached	31.20%	30.80%	33.90%
26: Biological	All Employed	35.20%	35.50%	34.90%
	Strongly Attached	27.70%	28.50%	31.70%
27: Mathematics	All Employed	40.00%	38.80%	38.80%
	Strongly Attached	34.10%	36.50%	32.90%
30: Interdisciplinary	All Employed	39.80%	39.80%	42.20%
	Strongly Attached	28.50%	30.80%	31.40%
31: Parks	All Employed	43.20%	41.90%	43.50%
	Strongly Attached	29.20%	33.90%	36.50%
40: Physical	All Employed	25.00%	27.10%	27.90%
	Strongly Attached	20.00%	23.80%	25.80%

**TABLE G1 (CONTINUED): PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY, REGARDLESS OF AWARD TYPE RECEIVED, FOR 2012 USHE GRADUATES.**

Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
42: Psychology	All Employed	43.90%	44.00%	44.30%
	Strongly Attached	31.40%	33.70%	34.20%
43: Security	All Employed	62.40%	59.80%	60.20%
	Strongly Attached	50.80%	53.40%	51.50%
44: Public Administration	All Employed	53.80%	56.50%	55.70%
	Strongly Attached	39.50%	45.10%	48.10%
45: Social Sciences	All Employed	38.80%	39.60%	39.50%
	Strongly Attached	31.30%	32.40%	34.60%
46: Construction	All Employed	73.90%	72.20%	71.30%
	Strongly Attached	65.20%	67.00%	67.00%
47: Mechanic	All Employed	56.40%	54.70%	54.70%
	Strongly Attached	47.90%	47.90%	46.20%
48: Precision Production	All Employed	61.10%	58.30%	63.90%
	Strongly Attached	47.20%	55.60%	61.10%
49: Transportation	All Employed	17.60%	19.10%	19.90%
	Strongly Attached	12.40%	14.60%	16.10%
50: Performing Arts	All Employed	44.10%	43.00%	42.60%
	Strongly Attached	29.80%	30.70%	33.60%
51: Health Professions	All Employed	47.90%	48.30%	48.40%
	Strongly Attached	35.20%	28.20%	41.10%
52: Business	All Employed	57.50%	58.80%	58.90%
	Strongly Attached	50.00%	51.80%	53.70%
54: History	All Employed	37.10%	32.90%	34.30%
	Strongly Attached	28.60%	26.40%	31.40%

**TABLE G2: PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY AND AWARD TYPE RECEIVED FOR 2012 USHE GRADUATES. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

	Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
01: Agriculture	Bachelor's	All Employed	26.30%	27.20%	27.20%
		Strongly Attached	21.90%	21.90%	22.80%
03: Natural Resources	Bachelor's	All Employed	16.70%	19.40%	20.80%
		Strongly Attached	*	*	*
04: Architecture	Bachelor's	All Employed	29.30%	29.30%	27.60%
		Strongly Attached	27.60%	27.60%	25.90%
	Graduate	All Employed	40.80%	39.40%	36.60%
		Strongly Attached	36.60%	36.60%	33.80%
05: Gender Studies	Bachelor's	All Employed	15.90%	17.40%	17.40%
		Strongly Attached	*	*	*
09: Journalism	Bachelor's	All Employed	27.10%	27.00%	27.70%
		Strongly Attached	22.00%	21.90%	22.30%



**TABLE G2 (CONTINUED): PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY AND AWARD TYPE RECEIVED FOR 2012 USHE GRADUATES. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

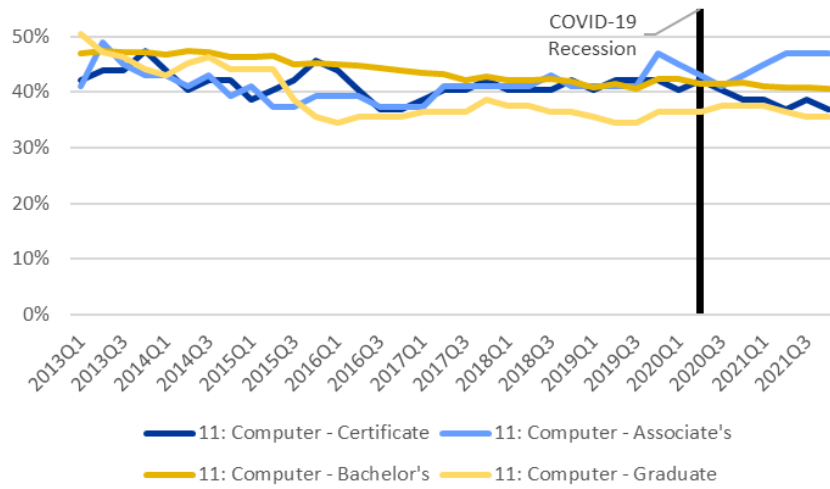
	Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
11: Computer	Certificate	All Employed	42.10%	42.10%	36.80%
		Strongly Attached	35.10%	29.80%	31.60%
	Associate's	All Employed	41.20%	43.10%	47.10%
		Strongly Attached	41.20%	39.20%	43.10%
	Bachelor's	All Employed	41.60%	41.60%	40.90%
		Strongly Attached	37.30%	38.90%	38.00%
Graduate	All Employed	34.40%	36.60%	36.60%	
	Strongly Attached	31.20%	36.60%	35.50%	
12: Culinary	Associate's	All Employed	23.70%	25.40%	22.00%
		Strongly Attached	15.30%	14.40%	15.30%
13: Education	Associate's	All Employed	18.20%	18.20%	18.20%
		Strongly Attached	*	*	*
	Bachelor's	All Employed	24.40%	25.30%	25.00%
		Strongly Attached	17.40%	18.60%	20.00%
	Graduate	All Employed	40.80%	40.40%	39.40%
		Strongly Attached	31.60%	34.70%	33.70%
14: Engineering	Bachelor's	All Employed	41.40%	41.40%	42.20%
		Strongly Attached	38.40%	39.00%	39.60%
	Graduate	All Employed	38.60%	39.40%	40.60%
		Strongly Attached	33.10%	35.50%	36.30%
15: Engineering Technology	Certificate	All Employed	26.90%	26.30%	26.90%
		Strongly Attached	16.90%	23.10%	21.90%
	Associate's	All Employed	39.10%	42.00%	39.10%
		Strongly Attached	37.70%	39.10%	37.70%
	Bachelor's	All Employed	49.20%	48.40%	50.80%
		Strongly Attached	45.20%	46.80%	49.20%
16: Linguistics	Bachelor's	All Employed	28.60%	28.60%	29.80%
		Strongly Attached	24.20%	25.80%	26.60%
19: Human Sciences	Bachelor's	All Employed	22.60%	22.60%	23.70%
		Strongly Attached	15.60%	15.10%	17.40%
	Graduate	All Employed	33.30%	31.00%	35.70%
		Strongly Attached	23.80%	23.80%	31.00%
22: Legal	Associate's	All Employed	33.90%	33.90%	28.80%
		Strongly Attached	27.10%	27.10%	28.80%
	Bachelor's	All Employed	25.90%	29.60%	29.60%
		Strongly Attached	20.40%	24.10%	27.80%
	Graduate	All Employed	38.40%	39.40%	38.40%
		Strongly Attached	33.50%	34.50%	35.50%
23: English Language	Bachelor's	All Employed	21.70%	21.30%	22.20%
		Strongly Attached	15.30%	15.90%	17.00%
	Graduate	All Employed	28.40%	27.00%	27.00%
		Strongly Attached	18.90%	18.90%	23.00%

**TABLE G2 (CONTINUED): PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY AND AWARD TYPE RECEIVED FOR 2012 USHE GRADUATES. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

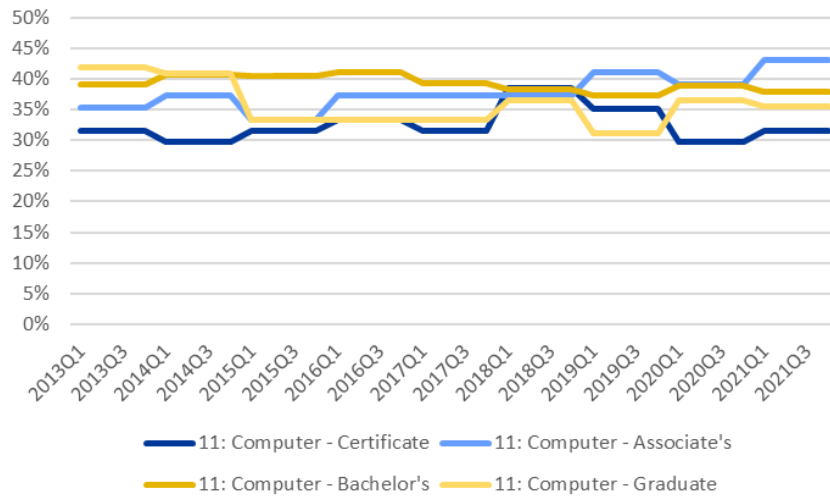
	Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
24: Liberal Arts	Associate's	All Employed	26.00%	25.40%	26.30%
		Strongly Attached	19.20%	18.80%	20.80%
	Bachelor's	All Employed	22.10%	23.90%	23.90%
		Strongly Attached	16.80%	20.40%	19.50%
26: Biological	Bachelor's	All Employed	24.20%	24.60%	24.20%
		Strongly Attached	19.60%	19.40%	22.50%
	Graduate	All Employed	30.80%	29.70%	27.50%
		Strongly Attached	22.00%	26.40%	23.10%
27: Mathematics	Bachelor's	All Employed	31.00%	31.00%	29.90%
		Strongly Attached	28.70%	28.70%	24.10%
30: Interdisciplinary	Bachelor's	All Employed	27.00%	27.20%	28.30%
		Strongly Attached	19.80%	20.70%	21.20%
	Graduate	All Employed	33.30%	28.60%	31.00%
		Strongly Attached	0.00%	23.80%	26.20%
31: Parks	Bachelor's	All Employed	23.90%	23.60%	24.80%
		Strongly Attached	17.30%	18.60%	20.70%
	Graduate	All Employed	31.40%	28.60%	28.60%
		Strongly Attached	15.70%	25.70%	24.30%
40: Physical Scienced	Bachelor's	All Employed	23.40%	24.80%	25.50%
		Strongly Attached	17.70%	20.60%	23.40%
	Graduate	All Employed	25.50%	28.70%	30.90%
		Strongly Attached	22.30%	27.70%	29.80%
42: Psychology	Associate's	All Employed	23.60%	21.80%	20.00%
		Strongly Attached	*	*	*
	Bachelor's Degrees	All Employed	27.40%	27.30%	27.70%
		Strongly Attached	19.80%	20.40%	21.20%
	Graduate Degrees	All Employed	28.50%	30.90%	30.90%
		Strongly Attached	19.50%	25.20%	24.40%
43: Security	Associate's	All Employed	36.10%	34.40%	34.40%
		Strongly Attached	26.20%	28.70%	26.20%
	Bachelor's	All Employed	37.30%	35.60%	35.90%
		Strongly Attached	31.50%	32.50%	31.90%
44: Public Administration	Bachelor's	All Employed	29.10%	30.90%	30.30%
		Strongly Attached	21.70%	24.00%	25.70%
	Graduate	All Employed	31.10%	32.60%	32.20%
		Strongly Attached	22.70%	26.30%	28.00%
45: Social Sciences	Bachelor's	All Employed	28.80%	29.40%	29.30%
		Strongly Attached	23.30%	23.80%	25.50%
	Graduate	All Employed	32.90%	31.60%	32.90%
		Strongly Attached	26.60%	27.80%	31.60%

**TABLE G2 (CONTINUED): PARTICIPATION RATES IN UTAH'S WORKFORCE IN 2019Q2, 2020Q2, AND 2021Q2 BY AREA OF STUDY AND AWARD TYPE RECEIVED FOR 2012 USHE GRADUATES. \* SUPPRESSED DATA DUE TO PRIVACY REQUIREMENTS.**

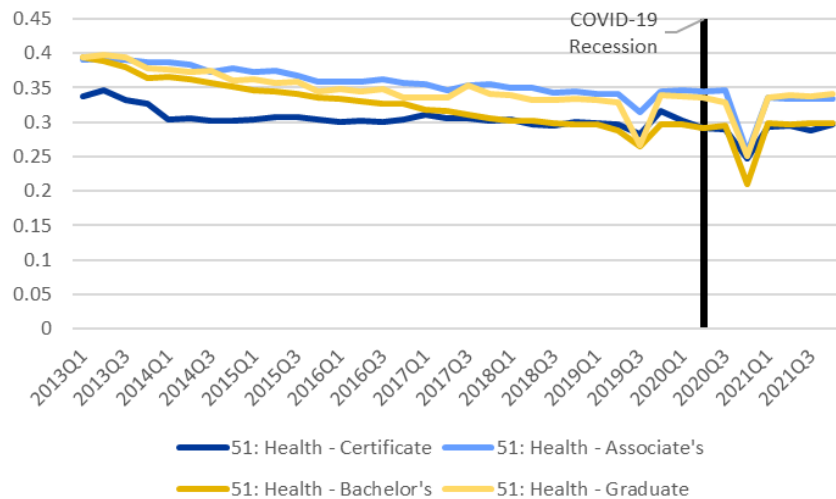
	Tw-Digit CIPs	Employment Type	2019Q2	2020Q2	2021Q2
47: Mechanic	Certificates	All Employed	23.50%	21.60%	23.50%
		Strongly Attached	*	*	*
	Associate's	All Employed	39.70%	39.70%	38.90%
		Strongly Attached	34.90%	34.90%	34.10%
48: Precision Production	Certificates	All Employed	28.60%	31.00%	31.00%
		Strongly Attached	*	*	*
49: Transportation	Certificates	All Employed	22.50%	27.00%	23.60%
		Strongly Attached	14.60%	16.90%	18.00%
	Bachelor's	All Employed	18.80%	18.80%	23.20%
		Strongly Attached	13.40%	16.10%	18.80%
50: Performing Arts	Associate's	All Employed	30.10%	30.90%	27.90%
		Strongly Attached	22.10%	20.60%	22.10%
	Bachelor's	All Employed	25.00%	24.70%	24.60%
		Strongly Attached	17.30%	17.90%	19.70%
	Graduate	All Employed	29.90%	24.10%	25.30%
		Strongly Attached	13.80%	16.10%	17.20%
51: Health Professions	Certificates	29.60%	29.10%	29.50%	29.60%
		19.30%	16.30%	21.20%	19.30%
	Associate's	All Employed	34.20%	34.40%	33.30%
		Strongly Attached	26.70%	20.50%	29.00%
	Bachelor's	All Employed	28.80%	29.20%	29.60%
		Strongly Attached	21.40%	15.80%	25.00%
	Graduate	All Employed	32.90%	33.50%	33.90%
		Strongly Attached	23.80%	22.30%	30.90%
52: Business	Certificate	All Employed	30.80%	35.90%	28.20%
		Strongly Attached	*	*	*
	Associate's	All Employed	37.40%	35.50%	36.00%
		Strongly Attached	30.30%	29.40%	30.80%
	Bachelor's	All Employed	34.10%	35.20%	35.40%
		Strongly Attached	29.30%	30.90%	31.90%
	Graduate	All Employed	45.10%	45.50%	45.50%
		Strongly Attached	40.60%	41.10%	42.70%
54: History	Bachelor's	All Employed	24.70%	21.60%	22.60%
		Strongly Attached	18.90%	17.90%	20.50%



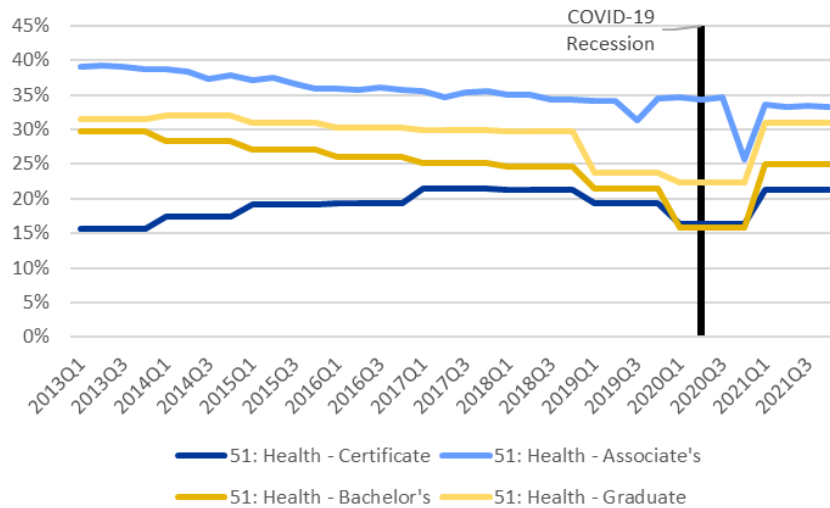
**FIGURE G1:** PERCENT OF ALL EMPLOYED COMPUTER USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



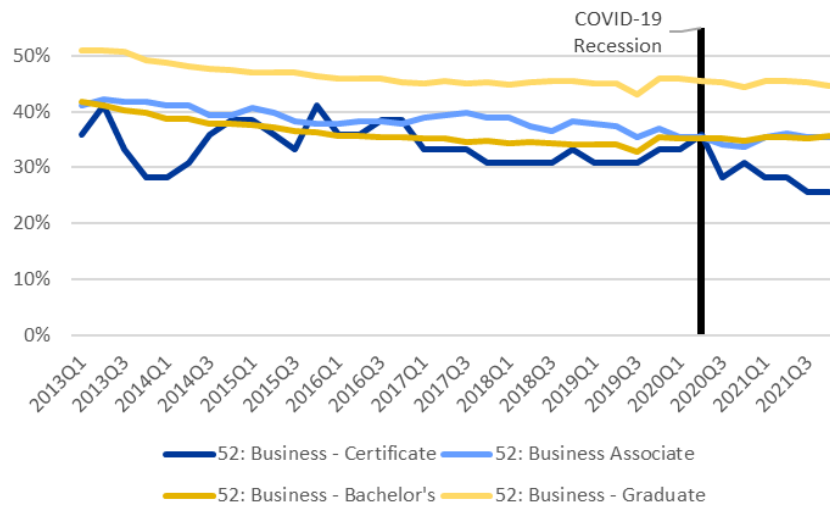
**FIGURE G2:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE COMPUTER USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



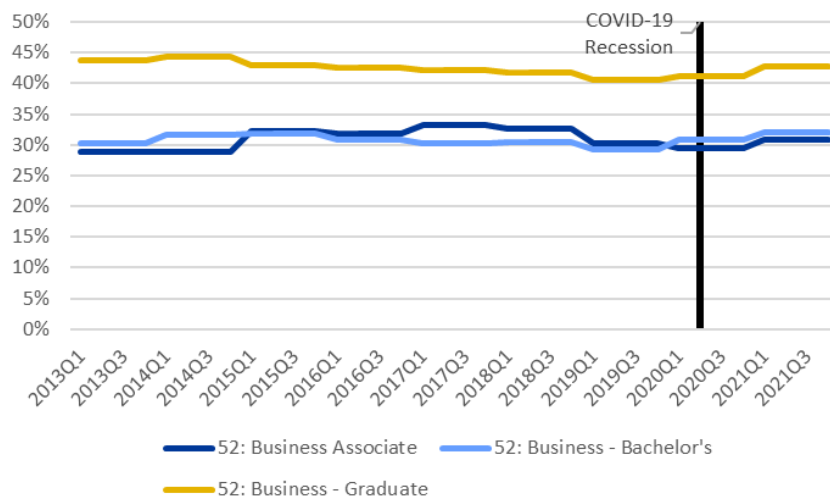
**FIGURE G3:** PERCENT OF ALL EMPLOYED HEALTH USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



**FIGURE G4:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE HEALTH USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



**FIGURE G5:** PERCENT OF ALL EMPLOYED BUSINESS USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.



**FIGURE G6:** PERCENT OF STRONGLY ATTACHED TO THE WORKFORCE BUSINESS USHE GRADUATES FROM 2012, SEPARATED BY AWARD TYPE RECEIVED, IN UTAH'S LABOR FORCE FROM 2013Q1-2021Q4.

**TABLE G3: USHE GRADUATES FROM 2012 SEPARATED BY AREAS OF STUDY AND AWARD TYPE RECEIVED WITH AT LEAST ONE PERMUTATION TESTS OF MEDIAN REJECTING THE NULL HYPOTHESIS. STATISTICAL SIGNIFICANCE: BOLD MEDIAN WAGE DIFFERENCE INDICATE STATISTICAL SIGNIFICANCE AT LEAST AT A 5% LEVEL.**

Two-Digit CIP	Award Type	Employment Type	2019Q1-2020Q1	2019Q2-2020Q2	2019Q3-2020Q3	2019Q4-2020Q4	2020Q1-2021Q1	2020Q2-2021Q2	2020Q3-2021Q3	2020Q4-2021Q4
09: Journalism	Bachelor's	All Employed	\$90.41	<b>\$1,501.41</b>	\$565.02	<b>\$1,801.29</b>	\$355.06	\$556.85	\$626.93	-\$6.94
		Strongly Attached	\$772.19	\$1,245.81	\$400.02	<b>\$2,052.04</b>	\$1.13	\$547.44	\$1,993.72	\$800.08
13: Education	Bachelor's	All Employed	<b>\$593.47</b>	<b>\$816.67</b>	<b>\$969.26</b>	<b>\$1,234.06</b>	<b>\$1,412.88</b>	\$297.28	\$576.63	-\$6.94
		Strongly Attached	<b>\$608.17</b>	<b>\$1,273.51</b>	<b>\$667.84</b>	<b>\$1,274.99</b>	<b>\$1,697.40</b>	\$424.34	\$569.21	-\$111.75
	Graduate	All Employed	\$382.26	\$765.93	<b>\$1,597.80</b>	\$422.31	\$1,298.39	\$30.46	-\$85.69	-\$306.52
		Strongly Attached	\$914.22	\$958.74	<b>\$1,317.42</b>	\$741.71	\$1,258.15	-\$17.47	\$31.87	-\$182.33
14: Engineering	Bachelor's	All Employed	\$455.04	\$824.34	\$816.12	<b>\$1,470.53</b>	-\$472.18	\$675.71	\$328.79	\$760.06
		Strongly Attached	\$440.40	<b>\$738.25</b>	\$874.57	<b>\$1,630.10</b>	-\$395.54	\$807.57	\$353.73	\$761.58
24: Liberal Arts	Associate's	All Employed	\$480.06	<b>\$1,035.52</b>	\$651.02	\$534.57	-\$238.22	\$48.54	\$217.26	\$480.33
		Strongly Attached	\$671.21	\$719.86	\$755.71	<b>\$1,454.23</b>	\$102.48	\$166.98	\$529.53	-\$72.14
45: Social Sciences	Bachelor's	All Employed	\$1,397.63	\$671.28	\$513.02	\$1,481.82	<b>-\$345.75</b>	\$479.85	\$413.12	\$38.10
		Strongly Attached	\$1,115.60	\$581.02	\$442.16	<b>\$1,911.23</b>	\$151.23	\$1,335.14	\$740.39	-\$155.19
46: Construction	Bachelor's	All Employed	\$334.78	<b>\$2,298.36</b>	\$740.82	\$2,767.73	\$1,137.64	\$254.85	\$1,103.11	-\$34.85
		Strongly Attached	\$816.02	\$1,990.91	\$1,239.68	\$3,644.57	\$788.85	\$490.23	\$1,248.75	-\$923.11
51: Health Professions	Certificate	All Employed	-\$136.92	\$480.31	<b>\$1,022.52</b>	\$943.66	-\$326.17	\$381.38	\$311.88	\$65.80
		Strongly Attached	\$847.02	<b>\$1,108.30</b>	\$836.59	\$1,531.67	-\$490.56	-\$62.10	\$116.41	-\$408.16
	Associate's	All Employed	\$21.31	\$21.37	\$295.43	\$1,536.20	-\$822.01	\$465.13	\$985.89	\$708.02
		Strongly Attached	\$382.99	<b>\$1,183.91</b>	\$44.74	\$2,222.09	<b>-\$1,278.40</b>	-\$441.23	\$1,111.51	\$887.35
	Bachelor's	All Employed	\$238.52	\$422.55	<b>\$1,059.54</b>	\$217.75	-\$670.44	\$57.62	\$64.98	<b>\$2,176.15</b>
		Strongly Attached	-\$421.96	\$209.35	-\$415.16	<b>\$1,107.25</b>	-\$870.45	\$226.73	\$1,385.38	<b>\$1,572.47</b>
52: Business	Bachelor's	All Employed	\$825.24	\$886.51	\$373.32	<b>\$1,404.53</b>	\$719.58	<b>\$1,043.91</b>	\$821.59	\$336.31
		Strongly Attached	\$1,025.10	\$670.38	\$580.77	<b>\$1,275.49</b>	\$625.95	\$901.49	\$889.49	\$674.20
	Graduate	All Employed	\$1,513.79	<b>\$1,596.16</b>	\$980.49	<b>\$2,251.48</b>	\$137.24	\$1,495.12	\$1,348.99	\$873.43
		Strongly Attached	\$1,660.68	<b>\$1,435.93</b>	\$965.99	<b>\$1,937.47</b>	\$345.86	\$1,570.95	\$1,637.41	\$748.65