UTAH DATA RESEARCH CENTER

Workforce Participation for Stacked Awardees in Utah

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Abstract

Utah students who obtain sequentially higher levels of awards in the same Classification of Instructional Programs (CIP) families may participate in the workforce between degrees. Stacking credentials may be an effective way for students to integrate education with work experience. This research uses 2011 to 2020 data from the Utah System of Higher Education (USHE) and the Department of Workforce Services (DWS) to investigate workforce participation for stacked awardees after the completion of the lower-level degree and the beginning of the higher-level degree. Workforce participation measures include the number of quarters students received wages, the number of full-time quarters worked, and the number of quarters students worked for multiple employers. The most frequently studied (CIP) families and the most frequent North American Industry Classification System (NAICS) codes from employment between degrees were examined. The three most common paths of stacking awards were associate degrees to bachelor's degrees, certificates to higher degrees, and bachelor's degrees to graduate degrees. Except for bachelor's to graduate degree stacked awardees, the majority of the stacked awardees did not take time away from school. The results further suggest that while some differences exist among students from various demographic backgrounds, students' beginning and ending levels of attainment play a bigger role in how students participate in the workforce between degrees.

Keywords

stacked credentials, workforce participation, Utah System of Higher Education, State of Utah, Department of workforce services

1 | Introduction

This study examines students who stacked awards in Utah and how they participated in the workforce between degrees. Stacked awardees are students who obtain sequentially higher levels of awards within the same CIP family. Using nursing programs as an example, coursework required for Certified Nursing Assistant (CNA) is part of the required coursework in the longer-term credentials, such as Licensed Practical Nurse (LPN). The key to the stacked credential model is that students do not have to repeat coursework if they have already completed a shorter-term program when they enroll in a longer-term program within the same CIP family. With data from USHE and DWS, the Utah Data Research Center (UDRC) can identify the CIP families of the awards received by students as well as the NAICS codes of students' employment if students received wages in Utah between degrees. In the nursing example, it may be expected that the students earned wages from the health care sector between degrees.

Education attainment has been linked to increased productivity as well as higher long-term wages (Heckman, Humphries, & Gregory, 2018; Becker, 1964). Past research from the UDRC has found the completion of any postsecondary program is associated with higher wages, higher savings, and increased general consumption (Scott, 2020). Individuals with higher education attainment can save higher portions of earnings as a lower percentage of the income is needed for basic needs. Graduate degree holders can save more than 10 times as much as those with a high school education. Stacking credentials allows students to obtain postsecondary awards in smaller chunks that could be building blocks on the path to obtaining higher educational attainment.

Stacking credentials, such as certificates and degrees, can ease pathways to education attainment by ensuring students' access to multiple entries and exits through postsecondary education and the workforce. Furthermore, stackable credentials may be an attractive option for individuals to build upon their industry expertise and integrate education with work experience.

Students may enter the workforce after completing a lower-level degree and before enrolling in a higher-level degree. This study examines individuals' employment status between degrees to gain insight into the groups of students that spent more time in the workforce before enrolling in a higher-level degree. Students are grouped by the paths taken to stack credentials and demographic data, such as gender, race, and age. The difference in workforce participation among these groups could indicate a difference in access to guidance or resources to support students whose goals are to obtain higher-level education.

Policymakers providing students with increased opportunities to earn credentials for higher education may focus on the impacts of stacked credentials. Stacked credentials may encourage adult and underserved students to obtain lower-level degrees that align with workforce needs and provide paths to obtaining higher education attainment. It is essential to understand the demographics of the stacked awardees and how they participate in the Utah workforce between degrees to provide better guidance and support as these students pursue their higher-level degrees.

With students' demographic, graduation, and enrollment data from USHE and quarterly wage data from DWS, the goal of this study includes the following objectives. Objective 1 is to analyze the paths taken by Utah students to stack postsecondary awards, the most frequently studied CIP families for students who stacked awards, the amount of time spent between degrees, and the workforce participation between degrees. Workforce participation measures include the amount of time spent in the workforce between degrees, the amount of full-time employment for those who worked, and the NAICS sector code in which students were employed between degrees. Objective 2 is to identify patterns in how students from different demographic backgrounds participate in the workforce between degrees.

1.1 | Literature Review

In labor economics, the human capital model (Becker, 1964) views human capital as investments and wages earned as return on investment. Education is an important component of human capital and could potentially increase productivity as well as wages earned. Having higher levels of educational attainment could contribute to higher wages for individuals. Individuals with higher incomes may spend more in the form of consumption, which could benefit the economy through Gross Domestic Product (GDP) growth, including sales tax collected. Having a highly educated workforce could be beneficial for the economy and the individuals participating in the workforce.

Using nursing programs at the same school in Utah as an example, the CNA program offered at Davis Technical College requires 115 hours (Davis Technical College, 2022). According to a model-based estimation method using three years of Occupational Employment and Wage Statistics (OEWS) survey data, the average annual wages for a CNA in Utah was $ 30,630 (U.S. Bureau of Labor Statistics, 2021). Applicants to the Practical Nurse

Program at the same school must have a current CNA state certification, which requires 900 hours (Davis Technical College, 2022). Using the same method that estimated the average CNA annual wages, the annual average wages for Licensed Practical Nurses (LPNs) in Utah was $50,740 (U.S. Bureau of Labor Statistics, 2021). Weber State University offers an Associate Degree in Nursing, which offers a pathway for PNs to leverage their previous academic and work experiences toward a nursing degree with 68-86 credit hours, depending on the type of degree pursued (Weber State University, 2022). The annual average wages for Registered Nurses (RNs) in Utah was $72,790 (U.S. Bureau of Labor Statistics, 2021). As students can stack these programs sequentially, the annual average wages increases. This pattern shows stacking awards in nursing could be an effective way to combine work experience with formal education to obtain higher wages over an individual's lifetime.

The US Department of Labor (DOL) defines "stackable credential" as "part of a sequence of credentials that can be accumulated over time to build up an individual's qualifications and help them to move along a career pathway or up a career ladder to different and potentially higher-paying jobs" (U.S. Department of Labor, 2010). The state of Utah offers Talent Ready Utah through USHE. The institutions within USHE created many of the career pathways supported by Talent Ready Utah. These Pathways programs allow high school students to choose various pathways, including required coursework combined with real-world experiences. Utah Works, another program offered through Talent Ready Utah, provides short-term training at USHE institutions for employers seeking to hire quickly (Talent Ready Utah, 2020). The model of stacked credentials delivers education as smaller building blocks that serve as on-ramps to a longer degree program (Austin, Mellow, Rosin, & Seltzer, 2012). This model typically begins with a short-term credential designed to help low-skilled individuals transition into postsecondary education and degree programs. As real-world experiences are part of the stacked credential model, this study aims to examine the workforce participation of stacked awardees.

The stacked credential model was designed to provide access to potential students who may be underprepared. Many traditionally underserved students, such as students who come from low-income families, first-generation college students, and minoritized students, often lack adequate preparation and support. Bragg and Durham (2012) point out that the stacked credential model must be designed to meet the needs of students who otherwise would not have attended college, particularly returning adult students who require flexible options for continuing their education around existing work schedules. Encouraging students to complete credentials along a pathway also benefits colleges in increased completion rates (Bragg & Durham, 2012).

To examine the percentage of USHE graduates who stacked awards, Table 1 compares stacked awardees with USHE graduates over time. Examining previous literature from USHE, the number of USHE graduates was obtained from USHE (Utah System of Higher Education, 2020), and the number of stacked awardees was obtained using definitions described in section 2.1. The number of stacked awardees in Table 1 represent the number of students who later returned to complete a higher level of attainment in the same CIP family.

In general, less than 10% of graduates stacked awards. The lower percentages in recent years could be due to students currently pursuing their second degree but have not yet completed the higher attainment. Another possible explanation for the decrease in stacking degrees may be the COVID-19 pandemic, which may have caused abrupt disruption in students who were completing their second degree at the time (Pillay, 2021; Haelermans et al., 2022; Parker, Morris, & Hofmeyr, 2020).

Table 1: Number and percentage of USHE graduates who stacked awards over time.

Year	Total Graduates	Stacked Awardees	Percentage of Stacked Awardees
2011-12	37,414	1,380	3.69%
2012-13	37,884	2,951	7.79%
2013-14	39,462	3,211	8.14%
2014-15	40,588	3,305	8.14%
2015-16	41,972	3,484	8.30%
2016-17	43,199	3,711	8.59%
2017-18	43,917	3,500	7.97%
2018-19	45,732	2,499	5.46%
2019-20	50,364	1,142	2.27%

2 | Methods

2.1 | Data

Employment data from USHE and DWS were used to study the patterns of workforce participation among students who stacked awards. Graduates from degree-granting institutions were combined with certificate-seeking students from technical colleges who received an award. From USHE data, students' race, gender, and age are obtained. In the race category, the main subgroups are Asian, Black, White, Hispanic, Native American, Multiracial, Pacific Islander, and Unknown race/ethnicity. Students' age values as of the completion of the first award are grouped following the pattern used by the United States Bureau of Labor Statistics (US BLS). The age groups are under 16, 16-24, 25-34, 35-44, 45-54, 55-64, and 65 and older.

Graduation data are obtained from USHE 2011 – 2020 graduation data. Graduation dates for each student are based on the graduation date of the first award received. As students may be currently pursuing their second award in the same CIP family, graduation data are limited to students who have obtained the first degree by the academic year 2019-20.

This study defines stacked awardees as students who receive awards from the same CIP family at different attainment levels, with the graduation date of the higher attainment later than the lower attainment level. Students who receive multiple awards on the same date are not considered stacked awardees. This study does not consider students who complete degrees in different CIP families . Students who receive a lower-level degree after a higher-level degree, even if in the same CIP family, are not considered stacked awardees. For students who stack awards more than once, their paths are further decomposed. For example, students may complete an associate degree, followed by a bachelor's degree at a later date, and a graduate degree after the bachelor's degree, all in the same CIP family. These students would appear in the final dataset with two records. One record represents the time away from school between an associate degree and a bachelor's degree, and the other record represents the time away from school between a bachelor's degree and a graduate degree.

To transform codes of Integrated Postsecondary Education Data System (IPEDS) to attainment levels, IPEDS 1, 1A, and 1B are coded as USHE certificates requiring less than one year. IPEDS 1 was effective until December 2019, and it represented a postsecondary award, certificate, or diploma of less than one academic year (less than 900 contact or clock hours). IPEDS 2 is coded as USHE certificates requiring one to two years to complete. IPEDS 3 is coded as associate degrees. IPEDS 4, 5, and 6 are coded as bachelor's degrees. IPEDS 7 and above are coded as graduate degrees. For technical certificates, the number of required hours to receive a certificate is converted to the level of attainment. For certificates with less than 300 required hours, the attainment level is coded as 1A. For certificates with 300 to 900 required hours, the attainment level is coded as 1B. For certificates with more than 900 required hours, the attainment level is coded as 2.

Records from DWS are matched with stack awardees' time away from school. Wage records are collected from the Unemployment Insurance (UI) program, a division of DWS. Employers across the state of Utah are required to report employee wages quarterly. If students earned wages for the quarters they were away from school, they were considered employed for that quarter. The number of employed quarters is summed for each student to represent one component of workforce participation.

The following conversion is performed to align the academic calendar year with quarterly wage reports. Wage reports are collected by DWS quarterly on January 1, April 1, July 1, and October 1. Students' first award date is truncated to the month of the award. For students whose second award begins in the summer semester, the beginning date of the second award is coded to April 1. For students whose second award begins in the fall semester, the beginning date of the second award is coded to July 1. For students whose second award begins in the spring semester, the beginning date of the second award is coded to January 1. The number of quarters between students completing the first degree and beginning the second degree is defined as the gap between the two awards. It approximates the amount of time students are away from school.

If a student has wages from multiple employers in any given quarter, these wages are summed to compute students' quarterly wages. Because the number of hours worked for each individual is not available in wage records, a 40-hour work week full-time status for the students is not available. To overcome this limitation, a quarterly full-time workforce participation status is approximated by UI wages no less than wages for individuals working 40 hours a week, earning at least the federal minimum wage of $7.25 per hour for a quarter, or $3,770 per quarter. The numbers of full-time quarters are summed for each student to further illustrate students' workforce participation during the gap between the two awards.

If a student had two distinct employers in a given quarter during the gap, the quarter is coded as a multiple employer quarter for the student. The numbers of multiple employer quarters are summed for each student to examine whether

students held multiple jobs or mainly worked for the same employer during the gap.

Finally, to study the industries in which students held employment, the NAICS code of the highest wages was obtained for each student during the gap if the student earned wages. The NAICS code is further truncated to the first two digits to represent the industry sector (U.S. Bureau of Labor Statistics, 2016). The NAICS industry can aid in the investigation of whether students obtain employment in the sectors that align with the CIP families in which they are stacking awards.

2.2 | Data Preparation

The following paths were observed at the initial inspection of the various paths taken by stacked awardees: associate degree to bachelor's degree, bachelor's degree to graduate degree, certificate one to two years to associate degree, certificate less than one year to associate degree, certificate less than one year to bachelor's degree, certificate less than one year to certificate one to two years, certificate one to two years to bachelor's degree. To group these paths more effectively, students who started with a certificate and moved on to higher degrees were placed in a category called "certificate to higher," so three main paths remained. By grouping these students, this study can examine students with three different beginning degrees—certificates, associate degrees, and bachelor's degrees. The number of students in each of the original path categories can be found in Appendix Table A.

Furthermore, initial exploration of the data revealed long tail distributions for the numbers of gap quarters and workforce participation quarters. To effectively summarize students' experiences between completion of the first degree and the beginning of the second degree, these numeric variables of the gap, quarters worked, full-time quarters, and multiple employer quarters were further converted to three categorical variables: zero quarters, less than one year, and one year or more. For example, zero quarters in the gap would represent a student who did not have a gap between the first and the second degree. The histograms of students in each of the original gap and workforce participation quarters can be found in Appendix Figures A – D, as well as kurtosis statistics in Appendix Table B. After visual inspections of the histograms, non-parametric analyses, such as Kruskal-Wallis tests were applied subsequently.

2.3 | Limitations

The current study is limited in a few ways. First, USHE data only include Utah's public technical colleges and degree-granting institutions. Data from private postsecondary institutions such as Brigham Young University and Westminster College are not available for this study. In addition, awards data are not available for students who receive awards outside of Utah. A student who completes one of the two awards outside of Utah would not be included in this study. Though aggregated data for private institutions are available through IPEDS, no method exists to explicitly identify individual students who stacked awards. Without identifying the group of stacked awardees who attended private institutions, connection between education and workforce participation cannot be made.

Similarly, workforce participation outside of Utah is not available. If a student enters the workforce outside of Utah after completing the first degree and returns to Utah to obtain the second degree, the workforce participation of the student is not captured. Wage data from UI records do not capture all income by graduates. For example, income from self-employment, federal agencies, black market transactions, non-profit employment, and agriculture may not be subject to UI wage reporting requirements. In addition, UI wage records provide no detail on hours worked. The full-time status of workforce participation is an approximation described in section 2.1.

Furthermore, graduation data for the first degree and enrollment data for the second degree follow an academic calendar with summer, fall, and spring semester timelines, while wage data are reported by employers quarterly. The misalignment of these two calendars offers an imperfect calculation of time away from school and workforce participation during the gap, though academic calendars are approximated to the closest calendar quarter beginning date as described in section 2.1.

In addition, recent graduates may not be included in this study as they may be currently pursuing a second degree. Without a higher attainment graduation date, these students would not be included in this study.

Finally, though CIP families and top NAICS sector codes are examined, the matching between CIP codes and NAICS sectors is inexact. The top five from each only provide an overview of the most frequently studied and worked sectors for the stacked awardees. Furthermore, NAICS codes are not always the occupations of the stacked awardees. NAICS sectors indicate the industry of the employer rather than the actual job title of the stacked awardees. For example, an accountant employed by a hospital may appear as employed in the healthcare sector, though the employee has not studied a CIP related to healthcare.

3 | Results

3.1 | Stacked awards by type and demographics

The sample for this study consists of students who received sequentially higher degrees in the same CIP family or 20,178 unique students who completed their

higher education in Utah. Table 2 shows the makeup of the demographic backgrounds of these students. Each student in the sample may stack awards in multiple CIP families or receive more than two awards in the same CIP family. For these students, awards are further separated by the CIP family or the paths taken. For example, if a student stacks awards in two CIP families, two records are created for this student in the final dataset with two different CIP families, so the student is represented in both CIP families. If a student receives an associate degree, a bachelor's degree, and a graduate degree in that order, in the same CIP family, two records are created to represent the student's experience from associate to bachelor's degree, and subsequently, bachelor's degree to graduate degree.

Using the final dataset, the stacked awards paths from the most frequent to least frequent are listed in Table 3. The average and median ages at the completion of the first degree for the paths are also listed. Because the median age is lower than the average age for all three types, the distribution is positively skewed.

Using the final dataset, the five CIP families with the most stacked awardees are listed in Table 4. These five CIP families accounted for 74.9% of the stacked awards.

Overall, the average gap between the completion of the first award and the beginning of the second award is 1.6 quarters. The average number of quarters students worked is 0.9 quarters. The average number of quarters students worked full time is 0.7 quarters. The average number of quarters students had multiple employers is 0.6 quarters. Using the final dataset, the top five NAICS sectors with the most stacked awardees are listed in Table 5. These five sectors accounted for 65.6% of the stacked awards for students who worked between finishing their first award and beginning the second award.

Table 2: Demographic summaries for students who stacked awards. N=20,178

Demographic group	Number of students	Percentage
Men	9,572	47.44%
Women	10,606	52.56%
Asian	541	2.68%
Black	180	0.89%
Hispanic	828	4.10%
Native American	124	0.61%
Multiracial	1,275	6.32%
Pacific Islander	76	0.38%
White	16,497	81.76%
Unknown	657	3.26%

Table 3: Paths taken by students who stack awards. N=25,184

Path taken	Number of students	Percentage	Average Age	Median Age
Certificates to higher	7,915	31.43%	27	25
Associate to Bachelor's	10,591	42.05%	27	25
Bachelor's to Graduate	6,678	26.52%	27	25

Table 4: Top five CIP families studied by students who stack awards. N=25,184

CIP Family	Number of students	Percentage
Health professions and related clinical sciences (51)	9,646	38.30%
Business, management, marketing, and related support services (52)	4,369	17.35%
Computer and information sciences and support services (11)	2,013	7.99%
Liberal arts and sciences, general studies and humanities (24)	1,712	6.80%
Engineering (14)	1,125	4.47%

Table 5: Top five NAICS worked by students who stack awards and worked during the gap. N=7,537

NAICS	Number of students	percentage
Health care and social assistance (62)	2,093	27.77%
Educational services (61)	1,196	15.87%
Professional, scientific, and technical services (54)	756	10.03%
Administrative and support and waste management and remediation services (56)	510	6.77%
Public administration (92)	388	5.15%

Table 6: Demographic summaries for students who stacked awards by paths taken. N=25,184

Demographic Group	Certificates to higher (N=7,915)	Associate to Bachelor's (N=10,591)	Bachelor's to Graduate (N=6,678)
Women (N)	4,676	5,994	2,878
Women (%)	59.08%	56.60%	43.10%
Men (N)	3,239	4,597	3,800
Men (%)	40.92%	43.40%	56.90%
Asian (N)	225	243	228
Asian (%)	2.84%	2.29%	3.41%
Black (N)	58	98	68
Black (%)	0.73%	0.93%	1.02%
Hispanic (N)	474	365	180
Hispanic (%)	5.99%	3.45%	2.70%
Native American (N)	61	58	27
Native American (%)	0.77%	0.55%	0.40%
Multiracial (N)	501	688	361
Multiracial (%)	6.33%	6.50%	5.41%
Pacific Islander (N)	28	35	16
Pacific Islander (%)	0.35%	0.33%	0.24%
White (N)	6,360	8,764	5,548
White (%)	80.35%	82.75%	83.08%
Unknown (N)	208	340	250
Unknown (%)	2.63%	3.21%	3.74%

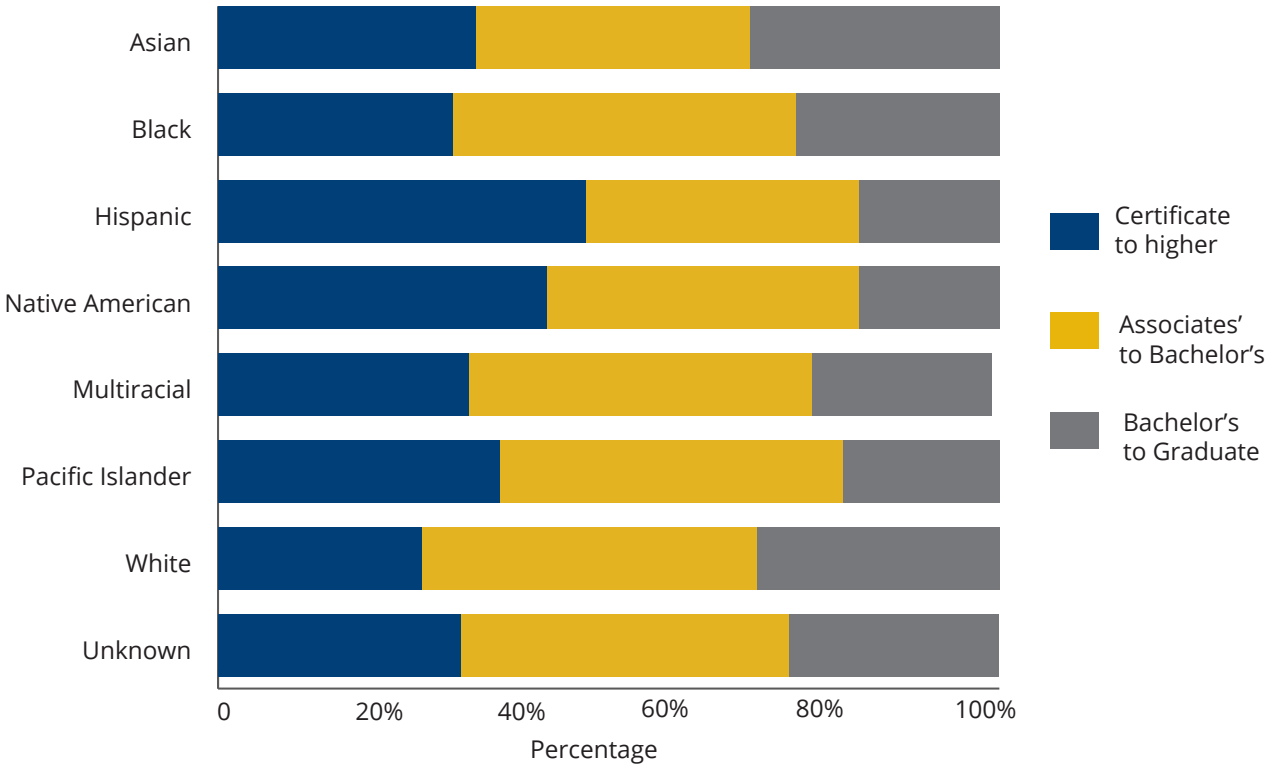

Figure 1: percentage of students from different backgrounds in each path to stack degrees

3.2 | Demographics by paths to stacking awards

Among the various paths taken to stack awards, the most frequently taken path was from associate to bachelor's degrees, followed by any path that began as a certificate. The path from a bachelor's degree to a graduate degree was the least frequently taken (Table 3). Table 6 shows the percentage of students from each demographic background who took the path to stack degrees. Figure 1 illustrates the percentage of students from each demographic group who took different paths to stack awards.

3.3 | CIP families studied by paths to stacking awards

For each of the three paths taken by students who stacked awards, the top CIP families are investigated next. For those who first obtained a certificate, the top five CIP families studied account for 89.3% of the students. The five CIP families with the most stacked awardees who first obtained a certificate are listed in Table 7.

For those who obtained an associate degree followed by a bachelor's degree, the top five CIP families studied account for 73.0% of the students. The five CIP families with the most stacked awardees from associate degrees to bachelor's degrees are listed in Table 8.

Finally, for those who obtained a bachelor's degree followed by a graduate degree, the top five CIP families studied account for 79.8% of the students. The five CIP families with the most stacked awardees who received a graduate degree followed by a bachelor's degree are listed in Table 9.

3.4 | Gaps by the paths taken by stacked awardees

Table 10 lists the amount of time between students completing the first award and beginning the second award by the three paths taken by students, while Figure 4 illustrates the proportion of time between degrees by the paths taken to stack awards. Kruskal-Wallis Test was performed to study the statistical significance in the number of quarters away from school among the three groups of students. With the resulting p-value less than 0.001, the number of quarters between degrees was statistically significantly different for the students who took different paths to stack awards.

Table 7: Top five CIP families studied by students who first obtained a certificate. N=7,915

CIP Family	Number of students	Percentage
Health professions and related clinical sciences (51)	4,104	51.85%
Computer and information sciences and support services (11)	1,100	13.90%
Business, management, marketing, and related support services (52)	301	3.80%
Precision production (48)	218	2.75%
Homeland security, law enforcement, firefighting and related protective services. (43)	194	2.45%

Table 8: Top five CIP families studied by students who obtained an associate degree followed by a bachelor's degree. N=10,591

CIP Family	Number of students	Percentage
Health professions and related clinical sciences (51)	4,502	42.51%
Business, management, marketing, and related support services (52)	1,434	13.54%
Computer and information sciences and support services (11)	730	6.89%
Psychology (42)	533	5.03%
Security and protective services (43)	528	4.99%

Table 9: Top five CIP families studied by students who obtained a bachelor's degree followed by a graduate degree. N=6,678

CIP Family	Number of students	Percentage
Business, management, marketing, and related support services (52)	2,634	39.44%
Health professions and related clinical sciences (51)	1,040	15.57%
Engineering (14)	641	9.60%
Public administration and social service professions (44)	570	8.54%
Education (13)	447	6.69%

Table 10: Amount of time between degrees by stacked awardees. N=25,184

Amount of Time	Certificates to higher (N=7,915)	Associate to Bachelor's (N=10,591)	Bachelor's to Graduate (N=6,678)
No Gap (N)	5,592	7,611	2,734
No Gap (%)	70.65%	71.86%	40.94%
Less than one year (N)	1,779	2,164	1,831
Less than one year (%)	22.48%	20.43%	27.42%
One year or longer (N)	544	816	2,113
One year or longer (%)	6.87%	7.70%	31.64%

3.5 | Workforce participation by the paths taken to stack awards

Among students with a gap between completing the first degree and beginning the second degree, workforce participation patterns are studied. Table 11 illustrates the amount of time spent in the workforce between degrees for those with at least a one quarter gap, while Figure 3 provides a visual demonstration of the proportion of employment status by the paths taken to stack awards. Kruskal-Wallis Test was performed to study the statistical significance in the length of employment among the three groups of students with at least one gap quarter. With the resulting p-value less than 0.001, the number of quarters employed between degrees was statistically significantly different for the students who took different paths to stack awards.

Next, stacked awardees are further narrowed down to students with workforce participation. Table 12 demonstrates the amount of full-time employment by stacked awardees, while Figure 4 offers a visual illustration of the proportion of full-time employment status by the paths taken to stack awards. In addition, Kruskal-Wallis Test was performed to study the statistical significance of

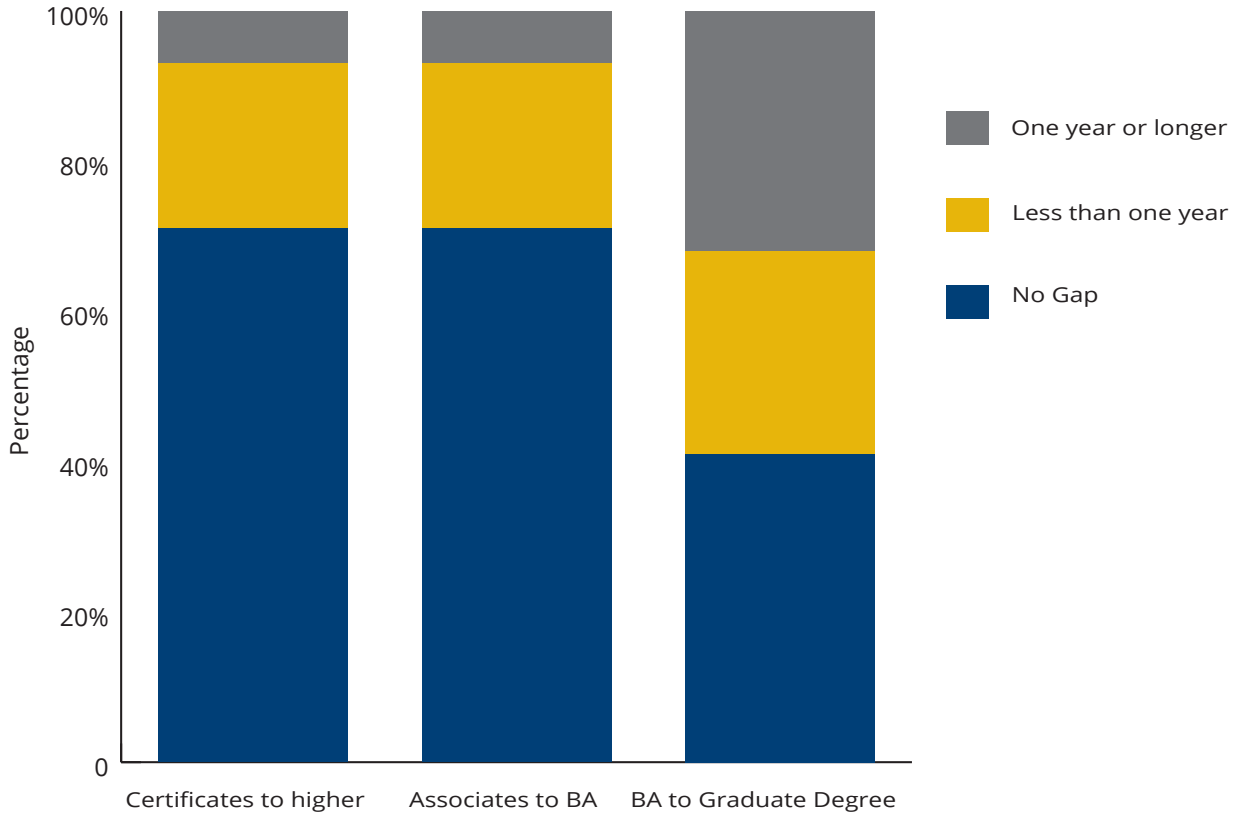

Figure 2: Length of time between degrees for stacked awardees from different paths

Table 11: Amount of time employed between degrees by stacked awardees. N=9,247

Amount of Time	Certificates to higher (N=2,323)	Associate to Bachelor's (N=2,980)	Bachelor's to Graduate (N=3,944)
No workforce participation (N)	474	638	598
No workforce participation (%)	20.40%	21.41%	15.16%
Less than one year employed (N)	1,606	1,939	2,161
Less than one year employed (%)	69.13%	65.07%	54.79%
One year or longer employed (N)	243	403	1,185
One year or longer employed (%)	10.46%	13.52%	30.05%

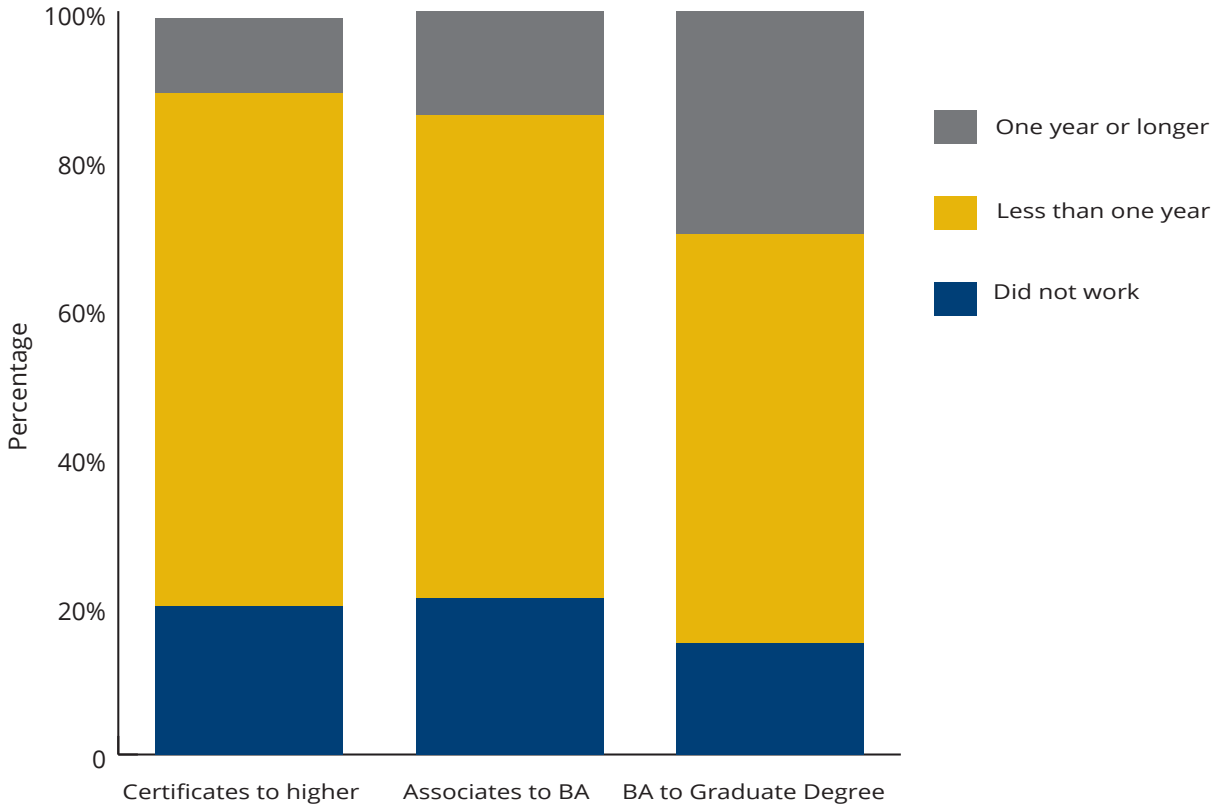

Figure 3: Length of time worked between degrees for awardees with at least one gap quarter

Table 12: Amount of full-time employment between degrees by stacked awardees with workforce participation. N=7,537

Full-time Employment	Certificates to higher (N=1,849)	Associate to Bachelor's (N=2,342)	Bachelor's to Graduate (N=3,346)
No full-time employment (N)	577	540	540
No full-time employment (%)	31.21%	23.06%	16.14%
Less than one year full-time (N)	1,082	1,446	1,695
Less than one year full-time (%)	58.52%	61.74%	50.66%
One year or longer full-time (N)	190	356	1,111
One year or longer full-time (%)	10.28%	15.20%	33.20%

full-time employment among the three groups of students for those who worked at least one quarter. With the resulting p-value less than 0.001, the number of full-time employment quarters between degrees was statistically significantly different for the students who took different paths to stack awards.

Finally, Table 13 illustrates the amount of time students were employed by multiple employers while participating in the Utah workforce. Figure 5 demonstrates the proportion of employment with multiple employers by the paths taken to stack awards. A Kruskal-Wallis test was performed to study the statistical significance in quarters students worked for multiple employers among the

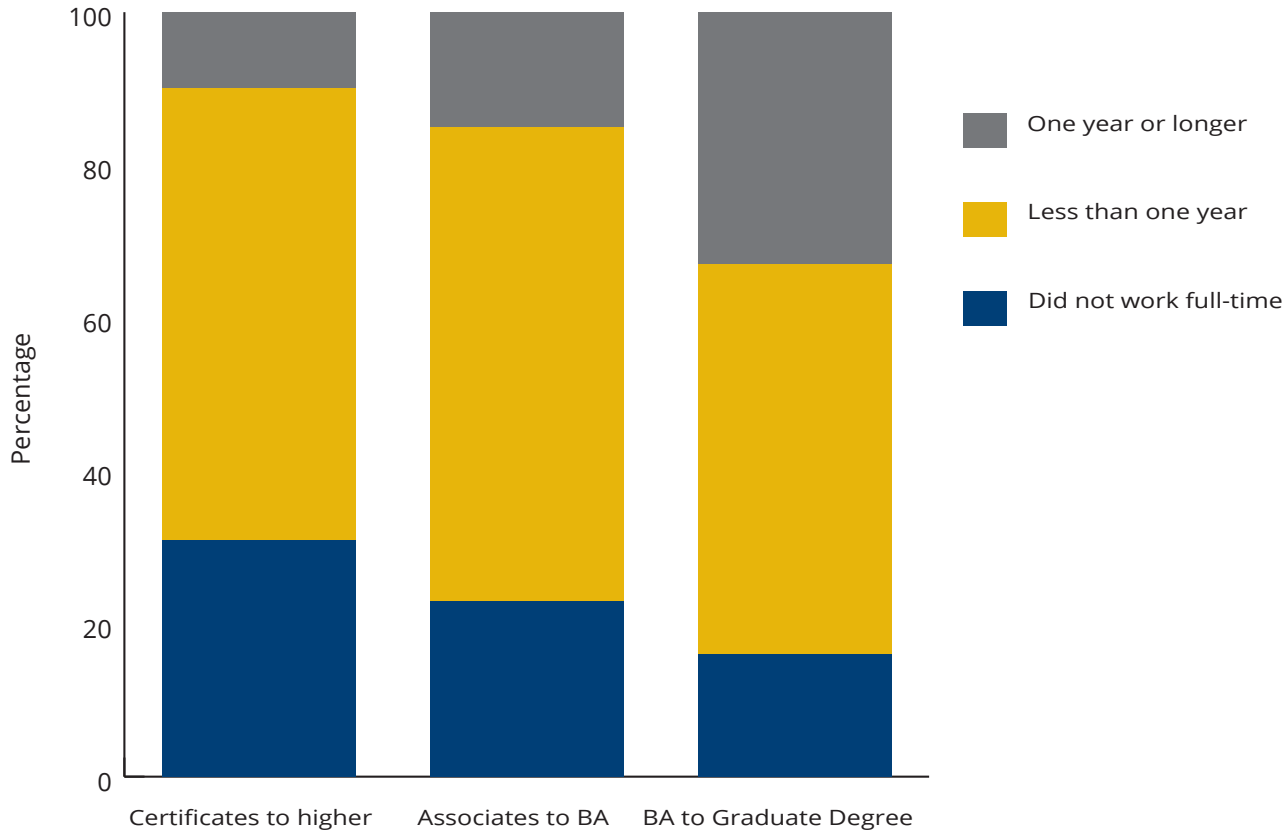

Figure 4: Length of time worked full-time between degrees for awardees who worked

Table 13: Amount of workforce participation from multiple employers between degrees by stacked awardees with workforce participation. N=7,537

Multiple employer employment	Certificates to higher (N=1,849)	Associate to Bachelor's (N=2,342)	Bachelor's to Graduate (N=3,346)
No multiple employers (N)	1,192	1,585	1,893
No multiple employers (%)	64.47%	67.68%	56.58%
Less than one year with multiple employers (N)	626	684	1,288
Less than one year with multiple employers (%)	33.86%	29.21%	38.49%
One year or longer with multiple employers (N)	31	73	165
One year or longer with multiple employers (%)	1.68%	3.12%	4.93%

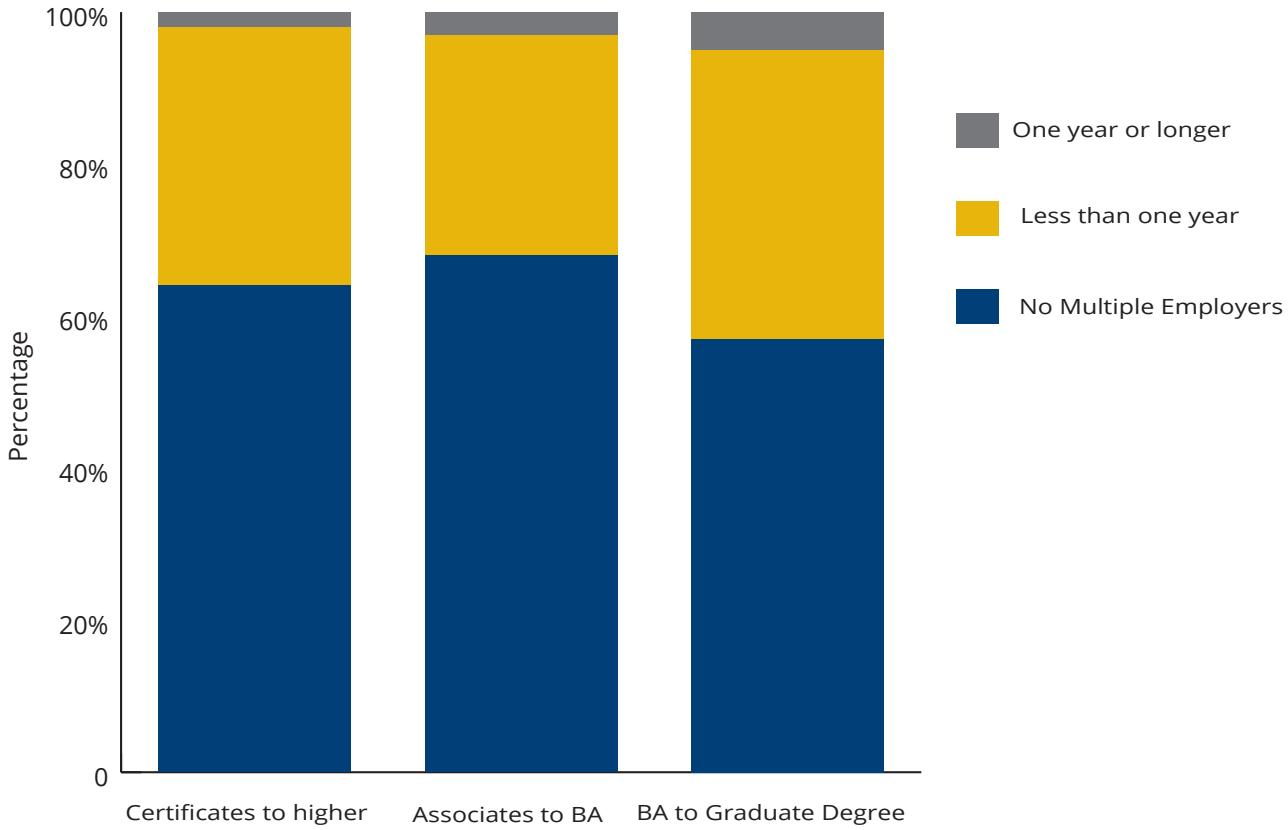

Figure 5: Length of time with multiple employers between degrees for awardees who worked

Table 14: Top five NAICS worked by students who first obtained a certificate. N=1,849

NAICS	Number of students	Percentage
Health care and social assistance (62)	756	40.89%
Educational Services (61)	139	7.52%
Administrative and support and waste management and remediation services (56)	121	6.54%
Accommodation and food services (72)	113	6.11%
Retail Trade (44)	106	5.73%

Table 15: Top five NAICS sectors worked by students who received an associate degree followed by a bachelor's degree and worked during the gap. N=2,342

NAICS	Number of students	Percentage
Health care and social assistance (62)	820	35.01%
Educational Services (61)	297	12.68%
Administrative and support and waste management and remediation services (56)	156	6.66%
Professional, scientific, and technical services (54)	142	6.06%
Public administration (92)	123	5.25%

Table 16: Top five NAICS worked by students who obtained a bachelor's degree followed by a graduate degree. N=3,346

NAICS	Number of students	Percentage
Educational Services (61)	760	22.71%
Health care and social assistance (62)	517	15.45%
Professional, scientific, and technical services (54)	513	15.33%
Finance and insurance (52)	255	7.62%
Administrative and support and waste management and remediation services (56)	233	6.96%

three groups of students for those who worked at least one quarter. With the resulting p-value less than 0.001, the number of quarters with multiple employers was statistically significantly different for the students who took different paths to stack awards.

3.6 | Top sectors worked by the paths taken to stack awards

Among students who worked between completing the first degree and beginning the second degree, the top sectors worked according to NAICS are studied. For those who first obtained a certificate, the top five NAICS sectors studied account for 66.8% of the students. The five NAICS sectors with the most stacked awardees who first obtained a certificate are listed in Table 14.

Table 15 lists the top five sectors worked during the gap between the first and second degree by students who obtained an associate degree followed by a bachelor's degree. The top five NAICS sectors account for 65.7% of those who worked.

Finally, for those who obtained a bachelor's degree followed by a graduate degree, the top five NAICS sectors studied account for 68.1% of the students. The five NAICS sectors with the most stacked awardees who received a bachelor's degree followed by a graduate degree are listed in Table 16.

3.7 | Gap and workforce participation by demographics

Next, the amount of time away from school is examined for students from different backgrounds. For those with at least one quarter gap between degrees, the amount of time students participate in the workforce is studied. Students were first grouped by the paths taken to stack awards and demographic backgrounds. Table 17 includes the average number of quarters students were away from school. See Table 6 for the number of students in each path category by racial group.

To examine students' workforce participation, Table 18 studies the students with at least one quarter gap between degrees and investigates the average number of quarters these students received UI wages. See Table 6 for the number of students in each path category by racial group.

Finally, to study the workforce participation for students from different backgrounds, Table 19 examines the number of full-time quarters worked for students with at least one quarter of workforce participation between degrees. See Table 6 for the numbers of students in each path category by racial group.

Table 17: Average number of quarters away from school between the completion of the first degree and the beginning of the second degree. N=25,184

Race	Certificates to higher (N=7,915)	Associate to Bachelor's (N=10,591)	Bachelor's to Graduate (N=6,678)
Asian	0.67	1.13	3.64
Black	1.03	1.59	5.29
Hispanic	1.16	0.73	3.31
Native American	0.79	0.93	3.70
Multiracial	0.81	0.94	3.03
Pacific Islander	0.18	0.86	3.13
White	0.82	0.94	3.47
Unknown	0.46	0.90	2.53

Table 18: Average number of quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one gap quarter. N=9,232

Race	Certificates to higher (N=2,308)	Associate to Bachelor's (N=2,980)	Bachelor's to Graduate (N=3,944)
Asian	1.43	2.08	2.78
Black	1.94	1.43	3.09
Hispanic	1.65	1.44	3.47
Native American	2.21	1.83	4.07
Multiracial	1.51	1.62	3.00
Pacific Islander	0.80	1.00	1.73
White	1.65	1.92	3.30
Unknown	1.32	1.94	2.36

Table 19: Average number of full-time quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one quarter worked. N=7,537

Race	Certificates to higher (N=1,849)	Associate to Bachelor's (N=2,342)	Bachelor's to Graduate (N=3,346)
Asian	1.57	2.19	2.91
Black	1.79	1.44	2.98
Hispanic	1.55	1.77	3.72
Native American	2.50	2.71	3.77
Multiracial	1.35	1.68	3.08
Pacific Islander	1.00	1.25	2.00
White	1.46	2.00	3.47
Unknown	1.60	1.92	3.36

3.8 | Gap and workforce participation by gender

To study whether men and women take time away from school and participate in the workforce in similar manners, students were first grouped by the paths taken to stack awards to further investigate their workforce participation patterns. Table 20 includes the average number of quarters students were away from school.

Table 20: Average number of quarters away from school between the completion of the first degree/certificate and the beginning of the second degree. N=25,184

Gender	Certificates to higher (N=7,915)	Associate to Bachelor's (N=10,591)	Bachelor's to Graduate (N=6,678)
Men	0.85	0.78	3.22
Women	0.81	1.07	3.72

To examine students' workforce participation, Table 21 studies the students with at least one quarter gap between degrees and investigates the average number of quarters these students received UI wages.

Finally, to study full-time workforce participation, Table 22 examines the number of full-time quarters worked for students with at least one quarter of workforce participation between degrees.Table 22 examines the number of full-time quarters worked for students who had at least one quarter of workforce participation between degrees.

Table 21: Average number of quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one gap quarter. N=9,232

Gender	Certificates to higher (N=2,308)	Associate to Bachelor's (N=2,980)	Bachelor's to Graduate (N=3,944)
Men	1.75	1.58	3.55
Women	1.56	2.10	2.99

3.9 | Gap and workforce participation by age group

Adult students may face financial responsibilities that require longer working hours. To inspect whether age plays a role in the amount of time away from school and the workforce, stacked awardees are grouped by the paths taken and age. Table 23 includes the average number of quarters students were away from school.

Table 22: Average number of full-time quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one quarter worked. N=7,537

Gender	Certificates to higher (N=1,849)	Associate to Bachelor's (N=2,342)	Bachelor's to Graduate (N=3,346)
Men	1.74	1.69	3.29
Women	1.29	2.18	3.59

Table 23: Average number of quarters away from school between the completion of the first degree and the beginning of the second degree. N=25,184

Age Group	Certificates to higher (N=7,915)	Associate to Bachelor's (N=10,591)	Bachelor's to Graduate (N=6,678)
under 16	--	--	--
16-24	0.82	0.87	3.18
25-34	0.84	1.10	3.86
35-44	0.84	0.83	2.88
45-54	0.81	0.74	2.48
55-64	0.57	0.24	2.79
65 and older	--	--	--

Note: "--" denotes insufficient sample size.

To examine students' workforce participation, Table 24 studies the students with at least one quarter gap between degrees and investigates the average number of quarters these students received UI wages by age group.

Table 24: Average number of quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one gap quarter. N=9,232

Age Group	Certificates to higher (N=2,308)	Associate to Bachelor's (N=2,980)	Bachelor's to Graduate (N=3,944)
under 16	--	--	--
16-24	1.57	1.78	3.03
25-34	1.85	1.99	3.40
35-44	1.43	1.92	3.45
45-54	1.38	1.59	3.21
55-64	0.96	0.36	2.27
65 and older	--	--	--

Note: "--" denotes insufficient sample size.

Finally, to study the full-time workforce participation, Table 25 examines the number of full-time quarters worked for students with at least one quarter of workforce participation between degrees by age group.

Table 25: Average number of full-time quarters worked between the completion of the first degree and the beginning of the second degree for students with at least one quarter worked. N=7,537

Age Group	Certificates to higher (N=1,849)	Associate to Bachelor's (N=2,342)	Bachelor's to Graduate (N=3,346)
under 16	--	--	--
16-24	1.20	1.67	3.08
25-34	1.89	2.16	3.64
35-44	1.67	2.33	4.02
45-54	1.38	2.06	3.46
55-64	0.93	--	--
65 and older	--	--	--

Note: "--" denotes insufficient sample size.

4 | Discussion

This study examined 20,178 unique students who stacked awards. Each student may stack awards more than once. For example, a student may stack awards multiple times in the same CIP family or in multiple CIP families. The unique number of occurrences of stacking awards in this study was 25,184. If multiple students took the same path in the same CIP family, the students are each counted as one unique occurrence of the path taken.

The initial inspection of the demographic backgrounds of the stacked awardees reveals a similar proportion as the general USHE graduation data. In the USHE 2020 Data Book (Utah System of Higher Education, 2020), the top demographic groups were white (76.3%), followed by Hispanic (8.7%), unknown race/ethnicity (3.6%), and Asian (2.5%). Table 2 highlights that the top demographic groups of stacked awardees were white (81.8%), followed by multiracial (6.3%), Hispanic (4.1%), unknown (3.3%), and Asian (2.7%). The higher percentage of white students stacking awards when compared to the general study body suggests the existence of a racial transfer gap, a term used by Crisp and Nuñez (2014) to identify inequity in vertical transfer rates based on race. Findings from research conducted by Crisp and Nuñez suggest that the factors that contribute to students taking pathways from two- to four-year institutions may be very different for White and underrepresented

students. The authors suggested disaggregating the data to further examine the experiences of each racial minority.

Consistent with a slightly higher percentage of women graduates at USHE, 52.6% of the stacked awardees were women. Studying the median and average ages of the stacked awardees (Table 3), the observation that the average age was higher than the median age suggested that the outliers in this study were older adults. This observation indicated older adults, potentially with work experiences, were returning to postsecondary education to obtain higher levels of education attainment, benefiting from the design of the stack awards model.

The most frequently taken path to stack awards was from associate degree to a bachelor's degree (42.1%), followed by certificates to a higher degree (31.4%), and finally from bachelor's degree to graduate degree (26.5%). When demographics are further inspected by the paths taken to stack awards (Table 6), the proportion of women obtaining a graduate degree after a bachelor's degree decreased to 43.1%, while a higher share of women obtained a bachelor's degree from an associate (56.6%), and a certificate to a higher degree (59.1%). This decrease in the proportion of women obtaining graduate degrees may be linked to cultural influences in Utah and is a possible explanation for the gender wage gap faced by Utah women (Tao & Scott, 2021).

A similar decrease in proportion can be seen for Hispanic students and Native American students who obtained a bachelor's degree followed by a graduate degree. Future research could examine the support and guidance provided to Hispanic students and Native American students to identify opportunities to encourage these students to pursue graduate degrees after obtaining a bachelor's degree. Furthermore, with the pathways organized from certificate to higher, to associate degree to a bachelor's degree, and finally bachelor's degree to graduate degree, representing the vertical structure of stacking awards, the proportion of white students increased (Table 6) from 80% certificate to higher, to 83% associate degree to a bachelor's degree, and finally 83% bachelor's degree to graduate degree. The observation that the proportions of male students and white students increased with each sequential level of pathway suggests further research for insight into equal access to successively higher levels of education.

Health care appears to be a frequently studied CIP family for stacked awardees. The most frequently worked NAICS sector while stacked awardees were not enrolled in school is health care and social assistance. This observation suggests that the students are participating in the workforce by utilizing skills and knowledge obtained from educational attainment. This trend supports DOL's definition of stacked credentials, "helping individuals move along a career pathway or up a career ladder." Using nursing as an example, the career pathway may consist of the following interlocking credentials where degrees requiring more hours build upon prior shorter credentials. A student may complete a Certified Nursing Assistant program, followed by a Licensed Practical Nurse program, to an associate degree in nursing, and finally, a Bachelor of Science in nursing. As students complete these credentials, they may participate in the workforce as certified nursing assistants, practical nurses, registered nurses, and nurse practitioners. A 2017 study found that many students who completed short or very short programs in health pathways did go on to earn longer-term credentials (Giani & Fox, 2017).

The amount of time not enrolled in school varies based on the path taken to stack awards. The majority of students who completed an associate degree followed by a bachelor's degree (71.9%), and those whose first degree was a certificate (70.7%), did not take time away from school. In comparison, more than half of the students (59.0%) who completed a bachelor's degree followed by a graduate degree took some time away from school (Table 10). The follow-up investigation on workforce participation suggests that bachelor's degree graduates spent more time in the workforce before returning for their graduate degrees. This group of students had the highest proportion among the three groups of students spending one year or longer in the workforce before returning to school. These students also had the lowest proportion among the three groups in having no workforce participation between degrees (Table 11). Kruskal-Wallis test shows a statistically significant difference in the number of full-time employment quarters between degrees for students who took different paths. Students who obtained a bachelor's degree before a graduate degree had the highest proportion (33.2%) of full-time employment for one year or longer and the lowest proportion (16.1%) without any full-time employment (Table 12). This pattern is consistent with this group of students having the longest gap between degrees and longer workforce participation during the gap. This pattern of bachelor's degree graduates participating longer in the workforce may reflect hiring practices requiring certain academic degrees rather than characteristics of the students who obtained bachelor's degrees before graduate degrees.

For students who completed an associate degree, then a bachelor's degree, and students who started with a certificate before completing a higher-level degree, the majority of the students did not take time away from school between degrees (Table 10). For those who took at least one quarter

away from school, the majority had workforce participation (Table 11). Among those who worked, the majority had full-time employment from a single employer (Table 12 and Table 13). While students who completed a bachelor's degree followed by a graduate degree had the highest percentage of multiple employers (56.58%, Table 13), they also had a longer gap between degrees (Table 10).

To investigate the amount of time away from school and workforce participation for students from different demographic backgrounds, students from the three different paths were further examined by demographic backgrounds. Black students who progressed from associate degrees to bachelor's degrees and from bachelor's degrees to graduate degrees took the longest time away from school between the first and the second degree. Hispanic students who obtained a certificate before obtaining higher degrees took the longest time away from school after completing the certificate (Table 17). Studying students with at least one gap quarter between degrees, Native American students had the highest average number of quarters worked for those who first obtained certificates before obtaining a higher degree as well as those who obtained bachelor's degrees before graduate degrees. Among those who obtained associate degrees before bachelor's degrees and had a gap between degrees, Asian students had the highest average number of quarters worked (Table 18). Furthermore, among students who worked at least one quarter between degrees, Native American students had the highest average number of quarters worked full-time for all three paths possible (Table 19). These workforce patterns in which minority students are spending more time in the workforce could be indicative of the financial burdens minoritized students face. Future research could focus on meeting the needs of minoritized students to prepare them for the second degree.

The workforce participation rates do not appear different for men and women who stacked awards. When decomposed by the types of the path to stacking degrees, the average number of quarters away from school, the average number of quarters worked for those with a gap, and the average number of quarters worked full time for those who worked were all less than one quarter. No consistent pattern was observed in which one gender had a higher average number of quarters in each of the measures.

Students in different age groups taking different paths to stack awards showed slightly different workforce participation. The gap between degrees was the longest for those aged 25-34 for all three paths to stack awards. The average number of quarters between degrees decreased as age increased. The average number of quarters worked between degrees and the average number of full-time quarters worked peaked for age groups 25-34 and 35-44 and began to decrease for age groups 45-54 and 55-64.

Studying the pattern of workforce participation, the differences among the three paths taken to stack degree were greater than the differences within the paths by each demographic group. Figures 2, 3, and 4 respectively demonstrate how students from the three paths engaged in different patterns in the amount of time between degrees, the amount of time worked if the students had at least one quarter away from school, and the amount of time worked full-time for those who worked at least one quarter.

Finally, Figures 2-4 demonstrates that the differences among these three student groups are greater than among students from within each group. Students who completed bachelor's degrees before graduate degrees experienced the longest time between degrees, participated in the workforce the longest, and had the most full-time employment. The difference in employment patterns may be attributed to the minimum education requirements for full-time employment rather than the characteristics of these students.

4.1 | Future Research

Students' household income was not available for this study. Financial resources could be a factor to consider when students decide between workforce participation or enrollment for a higher-level degree, while higher-level education attainment contributes to higher earnings. For example, for students who completed a bachelor's degree before a graduate degree, it is unclear whether having a bachelor's degree plays a role in obtaining employment or if having income contributes to the decision to pursue a graduate degree. Future research could include how individuals' earnings change as the individual enters and exits the school system to provide insight into the interaction between education and income. Furthermore, due to the requirement of completing a second degree for inclusion in this study, students who may be between degrees or currently completing the second degree were not represented in this study. These students may be impacted by COVID-19 in early 2020 compared to students who had completed their second degrees before 2020. Researchers globally have shown COVID-19 has led to concerns about increasing inequality in education (Parker, Morris, & Hofmeyr, 2020; Haelermans et al., 2022; Pillay, 2021). Further research on the impacts of COVID-19 on education and workforce participation patterns may bring insight into the experiences of students from

different backgrounds.

In addition to household income, students' parents' education attainment data were not available for this study. Students' decision to pursue postsecondary education and to stack awards may be influenced by family expectations and the environment the students grow up in. Future research can investigate students who stopped pursuing a higher-level degree after the first degree to determine and reduce systemic barriers students have in achieving their highest potential.

Future research may investigate students' workforce participation while pursuing education. This study primarily focused on students' workforce participation between the completion of the lower degree and the beginning of the higher degree. The differences in workforce participation during this gap for the various demographic groups may indicate that some students work concurrently with their education. If students can maintain employment while attending school, they may have no gap quarter or have a shorter gap between degrees.

This study used a narrow definition of stacked awards. By defining stacked credentials as being in the same CIP family, students whose educational background is diverse may be excluded from this study. Though students may study a different subject, the benefits of continued education, such as networking and life skills, are developed. Furthermore, professionals who may have returned for continued education were not included in this study as they would have received a lower-level credential after their highest attainment. For example, a student with a computer science graduate degree may take on a lower-level credential to stay up-to-date on new technology. According to the human capital theory (Becker, 1964), education is an investment for future returns in the form of earnings. Future research could include these individuals and investigate their workforce participation, and compare them to the stacked awardees from this study to highlight any difference.

Finally, the long-term effects of stacking credentials could be examined. For example, how do stacked awardees whose highest attainment is a bachelor's degree compare with a student who obtained a bachelor's degree without stacking? Investment in tuition and the long-term earnings difference could be identified. What, if any, are the long-term differences in wages between stacked awardees who worked during the gap and those who did not? Qualitative research could be conducted to study the experience of stacked awardees and identify possible resources and support for students who may otherwise not pursue postsecondary education.

5 | Conclusion

Using USHE graduation and enrollment data from 2011 to 2020, this study analyzed the differences in workforce participation between degrees for students who stacked credentials. Three main paths of stacking degrees were identified: associate degree to bachelor's, certificate to higher, and bachelor's to graduate degrees. Bachelor's to graduate degree stacked awardees had the longest gap between degrees, participated in the workforce for the longest, and had the most full-time quarters worked. The current study found little differences in workforce participation patterns for stacked awardees from different demographic backgrounds.

This study further highlighted the most frequently studied CIP families and most frequent NAICS sector codes for employment held by the stacked awardees. Health care was the industry most frequently studied and employed in, suggesting the alignment of education and workforce experiences for students who studied health care.

The findings from this study provide important insight for Utah education policymakers. Understanding the demographic backgrounds, areas of study, entry and exit points to degree programs and the workforce, and the paths taken to stack degrees could serve a practical use in the efforts to bring equitable access to postsecondary education and better integration of education and workforce demands.

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Data Partners

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Appendix Supplementary Information A

Stacked awardees in this study took on seven different types based on the first and the second award received. The seven paths observed in the date are associate degree to bachelor's degree, bachelor's degree to graduate degree, certificate one to two years to associate degree, certificate less than one year to associate degree, certificate less than one year to bachelor's degree, certificate less than one year to certificate one to two years, certificate one to two years to bachelor's degree. Students who started with a certificate as the first award were further grouped as "certificate to higher" stacked awardees. Three main paths to stack awards remained: associate degree to bachelor's degree, bachelor's degree to graduate degree, and certificate to higher. Appendix Table A offers a summary of the original paths taken by students.

Appendix Table A: Paths taken by students who stack awards. N=25,184.

Path Taken	**Number of students**	**percentage**
associate degree to bachelor's degree	10,591	42.05%
bachelor's degree to graduate degree	6,678	26.52%
certificate one to two years to associate degree	2,952	11.72%
certificate less than one year to associate degree	1,928	7.66%
certificate less than one year to bachelor's degree	1,133	4.50%
certificate less than one year to certificate one to two years	1,074	4.26%
certificate one to two years to bachelor's degree	828	3.29%

Appendix Supplementary Information B

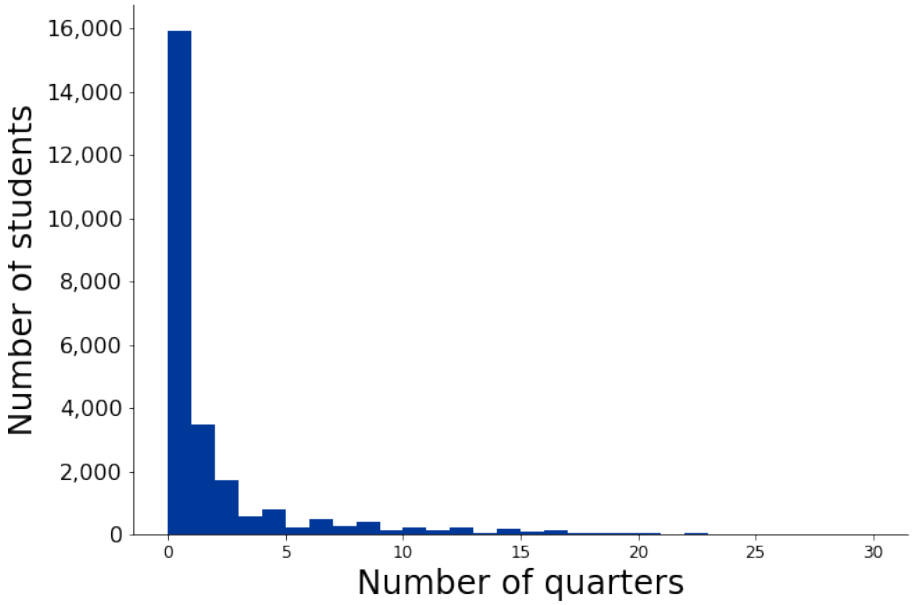
During the data collection stage, for each student, the number of quarters between students completing the first degree and beginning the second degree are summed to create a numeric variable representing the time away from school.

If students had UI wages for the quarters they were away from school, they were considered employed for that quarter. For each student, the numbers of employed quarters are summed to create another numeric variable, representing the number of quarters worked while not in school.

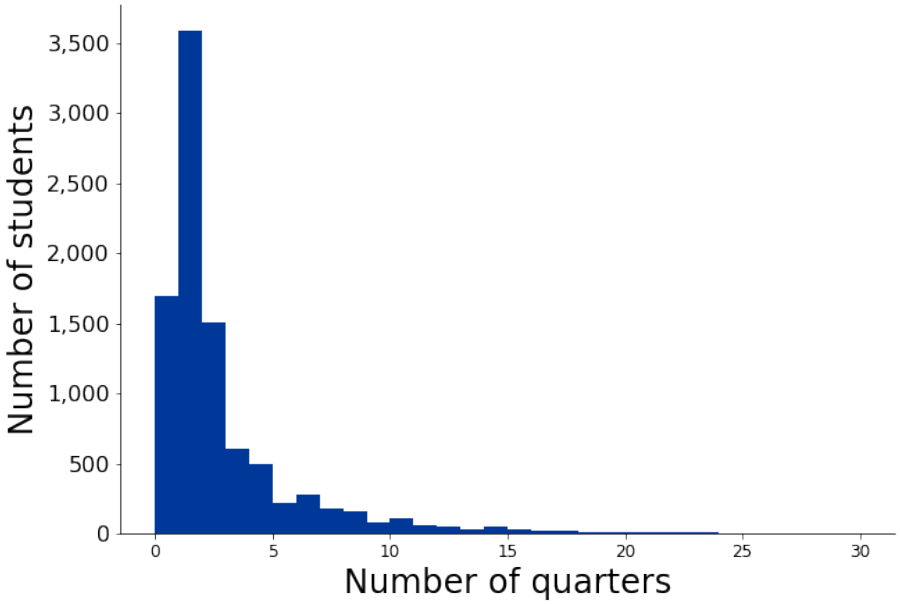
If students had UI wages in a given quarter meeting the full-time quarter approximation described in section 2.1, the quarter is considered full-time. The numbers of full-time quarters are summed for each student, resulting in a numeric variable.

If a student had two distinct employers in a given quarter during the gap, the quarter is coded as a multiple employer quarter for the student. The numbers of multiple employer quarters are summed for each student to create a numeric variable.

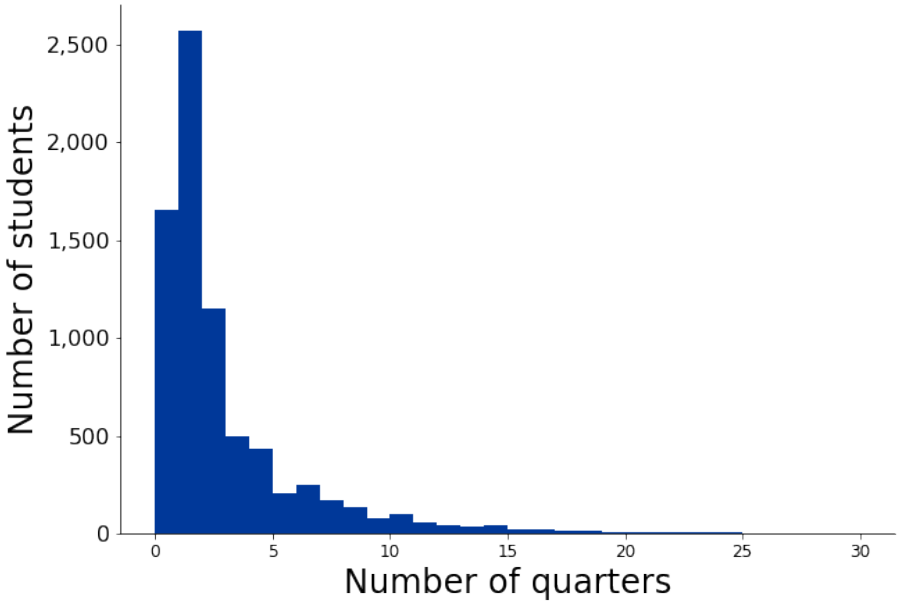
The four numeric variables were transformed into three categorical variables: zero quarter, less than one year, and one year or longer. Appendix Figures A – D illustrates the long tails in the distribution of students using the numeric values from the four variables. Appendix Table B further lists the kurtosis statistics for these variables, confirming the skewness of these numeric variables. Pearson's definition of kurtosis is used.



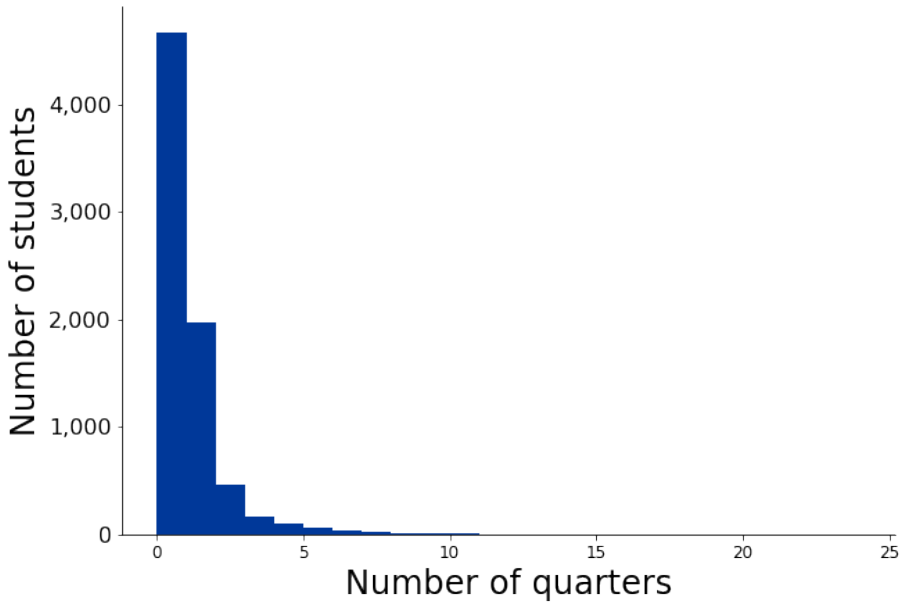
Appendix Figure A: Histogram of numbers of quarters between degrees. N=25,184.



Appendix Figure B: Histogram of the number of quarters worked for those with a gap. N=9,232



Appendix Figure C: Histogram of numbers of full-time quarters for those who worked. N=7,537



Appendix Figure D: Histogram of the number of multiple employer quarters for those who worked. N=7,537

Appendix Table B: Kurtosis Statistics of workforce participation

Workforce Participation	**kurtosis statistics**
Gap quarters, all students	15.060
Quarters worked, students with a gap	29.704
Full time quarters, students who worked	32.645
Multiple employer quarters, students who worked	132.515