Outcomes for Working College Students in Utah

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Abstract

This research found that the number of college students who work while attending school has risen in recent years, making it important to understand the relationship between work and school performance. This study examines the effect of working on college performance for Utah's students by combining quarterly wages reported through the unemployment insurance system at the Department of Workforce Services (DWS) with the Utah System of Higher Education's (USHE) student data. These data were brought together at the Utah Data Research Center (UDRC), which is the state's longitudinal data system. The cohort was defined as bachelor's degree seeking students between the ages of 17 and 54. Using regression modeling to assess the effects of year-round employment on educational outcomes, this report concluded that working four quarters in a year had a significant negative impact on: GPA, retention, graduation, and the number of credits taken compared to not working, even when controlling for factors such as race, ethnicity, ACT score, gender, Pell eligibility, and age.

1 | Introduction

The importance of postsecondary education in the labor market is increasing alongside the cost of education; between 2006 and 2016, the average price of college attendance rose by 31% (NCES, 2017), while at the same time, state spending for higher education has declined (Trombley, 2003). Occupational projections estimated over 10,000 growth openings for jobs that require a bachelor's degree and over 28,000 replacement openings annually (WRA, 2018). This means that while more jobs require a four-year degree, those degrees are more costly to obtain than in previous years. Students who work full-time at the federal minimum wage would be unable to meet the cost of tuition, and many working students must borrow to make up the difference (Georgetown, 2015). For working students attending college part-time, the cost of attendance is even higher. The research conducted for this paper found that in 2016, 73% of Utah's public university students worked, compared to 71% in 2012, with 45% of those students working throughout the year. This illustrates that not only is the number of students who work on the rise, but the number of students who work throughout the year is increasing as well.

While working students may see benefits such as a reduction in student loan debt or an increase in marketable work experience, this research discovered they are also more likely to experience lower average GPAs, lower rates of retention, a longer time to graduation and a decrease in the number of credits taken per semester compared to those who do not work. Dividing time between work and education can have negative effects on a student's quality of sleep, relationships with supervisors, and can put a strain on social and family ties (Wood et al., 2016). This is particularly true for low-income and minority populations who are more likely to lack supportive networks such as social capital services like guidance counseling, which are associated with more selective and costly universities (Georgetown, 2015).

Recognizing the challenges faced by working learners is crucial in preparing students to be successful in college and the workforce. Much of college curriculum is designed to cater to a student population that works part-time or less. For example, many undergraduate classes are held during the day, which may prove burdensome for students who work a traditional 9-5 schedule. Faculty office hours are often held within this time frame, making seeking assistance difficult for students who may be in the most need (Perna, 2010). This research will not only benefit students who want to holistically understand the impacts of working on college outcomes, but aid universities in understanding the experience of this growing population of students. This research will also highlight some of the impacts the financial burden of college has on the performance of students who balance work and school. Furthermore, it is important to observe the effects of working while learning on a variety of populations including gender, institution, age, Pell eligibility, and different racial and ethnic groups to better understand how working while learning fosters or inhibits students' success in college and likelihood of degree completion - these being crucial metrics for Utah's universities and colleges.

1.1 | Literature Review

More jobs require a college degree than ever before, however the U.S. has fallen behind other developed nations in educational attainment (Baum & Ma, 2007). Postsecondary education benefits not only the individual, but promotes economic growth, fosters civic engagement, improves income distribution, and lowers the use of social welfare programs (Baum & Ma, 2007). While tuition assistance exists in the form of grants, gifts, and aid, that assistance is not rising in tandem with the associated costs of education, resulting in an unmet need for many students. While Pell grants are typically sufficient in covering a low income students' tuition and fees, they may not cover their entire cost of living expenses (Curtin, 2017). Many families' incomes are failing to bridge the gap between aid and education costs as well. A study by the College Board (2008) found that average tuition and fees increased in constant dollars by 50% at public four-year institutions; over the same period, family income increased by 2% for the bottom quintile and 5% for families in the second lowest quintile.

Perna and DuBois (2010) found that dependent students worked regardless of parental income; however the number of hours worked varied by income bracket. Overall, 75% of students whose parents made less than $30,000 per year worked, with 20% working more than 35 hours per week. Students whose parents fell within the $30,000-$59,999 yearly income range were more likely to work (79%), while 19% worked 35 or more hours per week. Students whose parents made $60,000-$89,999 per year had similar rates of employment with 78% employed overall and 18% working 35 or more hours per week. However, students whose parents made $90,000 or more a year worked less often at 75%, with only 14% working 35 or more hours per week.

Studies examining the effects of working while attending college on educational outcomes have produced mixed results, with different conclusions based on the number of hours worked. A study by Georgetown University (2015) found that nearly 70-80% of college students nationwide are employed while formally enrolled in some form of postsec-

ondary education or training. The same study found that the average student worked regardless of characteristics such as socioeconomic status, type of institution, age, or race/ethnicity. More importantly this study found that students who worked more than 15-20 hours per week experienced negative academic performance outcomes as a result. Importantly, adverse effects were unequally distributed across populations, impacting economically disadvantaged students at a greater rate than those of a higher socioeconomic status.

The National Center for Education Statistics (2016) found that students who worked between 1 and 15 hours per week had significantly higher GPAs than students who worked 16 or more hours, or who did not work at all. A study by Salamonson and Andrew (2006) found a similar relationship between working and academic outcomes, with 15 hours per week as the cutoff between improved and declining performance. The effects of working on rates of retention and graduation differed by number of hours worked as well, Orszag et al (2001) found that full-time employees were 10% less likely to complete a degree compared to students who worked either part-time or who were not employed. Riggert et al (2006) found a positive relationship between student employment and retention, with a rise in rates of retention alongside an increase in the number of hours worked up to 25 hours per week.

The U.S. Department of Education (1999) examined rates of retention for students entering college in 1995-1996 and found that 32% of students dropped out with no degree by the spring of 1998. Students who were the least likely to drop out were those who lived on campus, studied full-time, and worked less than 14 hours per week. Low income students experienced higher dropout rates as well, particularly those who worked more than 15 hours per week.

King (2002) found that while working part-time and taking on student loans was associated with higher retention rates, students did not believe this was the best approach. Conversely, she found that 44% of entering students chose to work more than 15 hours per week instead of borrowing student loans, regardless of income. King argued that while students may believe that by not accruing debt for their degrees they are improving their future outcomes; this may not be the case as working students are more likely to drop out when the pressure of work and school becomes too great. Students who work also take longer to graduate, delaying post-secondary income.

One explanation for inconsistent findings between these studies is that consideration is not given to the length of student employment in addition to the number of hours worked. The influence of work on education is also a function of the time commitment required for the specific degree a student is pursuing. Many of these studies observed outcomes for the student population as a whole, combining certificate, associate, and bachelor's degree programs. Given that these programs require differing levels of time commitment and place varying degrees of responsibilities on the student, the impact of work on education outcomes is certain to differ greatly when viewed by program type. This study builds on existing research by measuring the effects of working throughout the year on students pursuing a single degree intent in order to provide a more nuanced understanding of the challenges faced by college students today.

2 | Methods

This study observed students who attended a USHE university or college between the years 2012 and 2016, totaling over 357,000 students. Data are collected through a mixture of self-reported information via college application forms and reports submitted by individual USHE institutions. This data was joined with wages reported through unemployment insurance (Appendix A), capturing Utah's civilian workforce. The age range for this study is students 17 to 54, with the majority of outcomes measured by separating this cohort into two subcategories: ages 17- 29 (younger) and ages 30 -54 (older). Separating students into these two groups mitigates for the increased likelihood that an older student has experience in the labor market, as well as differences in child care responsibilities by age cohort.

For the purposes of this study, employment was defined as a student who worked for four quarters per year to avoid capturing temporary employment such as summer jobs or paid internships, which tend to have a lesser likelihood of negatively affecting educational outcomes. Examining employment across four quarters provides a unique and important perspective of the effects of working on education as dividing time between work and school likely has compounding impacts wherein the longer a student balances both work and learning, the greater the effect managing these two interests will have on education outcomes. A student may be able to engage in both activities for a single semester without adverse effects, but balancing between work and school long term may prove more difficult. Conversely, a nonworking individual was defined as a student who did not work in any quarter of a given year. A comparison is made between students who worked throughout the year versus those who did not. Percentages do not add to 100% as students who work for some, but not all quarters in the year are not included in this study. The outcomes used to

measure the effects of working on education were: retention, GPA, time to graduation, and attendance (full- versus part-time student).

Pell eligibility was used as a proxy for the economic need of a student. Pell grants are funds that typically do not require repayment and are awarded to undergraduate students who displayed financial need. Composite ACT scores were used as a proxy for a student's college preparation as preparedness may be an indicator of a student's academic success (Appendix A). Retention was defined as students who enrolled in a USHE institution for the first time and returned for a second semester. As per this definition, a student may complete a spring semester, skip the summer semester, return for fall, and still be captured in this metric. Graduation within 100% of normal time was defined as a first-time student attending college in 2012 who graduated in 2016. Attendance measured whether or not a student was enrolled in school on a full- or part-time basis for the spring semester of a given year. A student was considered full-time if enrolled in 12 or more credits per semester. Spring semester was chosen, as it aligns closely with the first quarter of unemployment insurance data. This outcome was measured by semester as the number of credits a student takes can change throughout the year.

The effects of working on these outcomes were modeled using regressions. Each model included the following independent variables: ACT score, gender, race/ethnicity, Pell eligibility, and age. These variables were chosen as previous research has shown that each can influence the educational experience of a student. A linear OLS model was used to observe the effects of working on GPA, while retention, graduation, and attendance by semester were analyzed using a logistic regression model (Appendix A). The variables in each model were checked for collinearity using VIFs, there was no significant collinearity found in any model. Regression analyses were chosen as they are easily interpreted by a wide audience, making this research approachable and usable by any stakeholder. Due to the large number of individuals (4,000-357,000) included in every model, standard OLS models were used as the bias in errors from any potential heteroscedastcity would be negligible. This report explores the descriptive statistics of each outcome before examining results of these analyses and significance of independent variables.

2.1 | Limitations

Many students work through college out of necessity; however, some may do so for other purposes. Some students may also work in order to gain employment experience, while others have greater flexibility in their employment, such as students who work on campus. Working students manage their time between two activities; however, the effect of this time management is likely to vary by employment type. While it is important to measure the impact of working on education by length of employment, this research would benefit from knowing the number of hours worked as well in order to provide a more complete picture of working college students. Knowing the time of employment would also provide needed insight. For example, whether or not a student worked an overnight or daytime shift. Other valuable additions to this research would be major of choice and occupation of the student as data may reveal variance in negative impacts based on the rigor of study or work. Unfortunately these data were not available at the time of this report. A student's distance from employer to college or university would also likely influence the negative effects of working on education. This may be particularly true for Utah Valley University which does not offer campus housing and as such, has less opportunities for campus employment compared to the other institutions included in this study.

Comparisons by Pell eligibility status should be considered by age group, as parental income factors into eligibility status until the age of 24. While Pell grants are offered to dependent students based on family income, this does not mean that students who do not qualify are not in need. Pell-eligibility is based on expected family contribution, not actual financial assistance received (Appendix A). Additionally, while ACT scores may be a useful metric for preparedness of the younger cohort, the scores may not be as beneficial of a proxy for the older group, as significant time has passed since they have taken the test. Both the graduation and retention metric require students to be considered first-time enrollees at a USHE institution. As such, these metrics resulted in a smaller cohort for the 30-54 age group who are more likely to be returning to college than younger students. This metric also did not capture students who leave college to engage in an ecclesiastical mission and re-enroll upon their return. While the national average for the completion of a four-year degree is 5.1 years (NSC, 2016), data collection restricted this study to a four-year graduation cohort.

3 | Results

3.1 | Outcomes by age

The portion of students ages 30-54 has declined by 4% since 2012, from 18% to 14% in 2016. Employed students from both age groups attended college part-time at a higher rate than students who did not work; however, working students from the older group were more likely than the young working population to be enrolled in school on a part-time basis. Full-time enrollment was highest for younger

non-working students with 83% enrolled in 12 or more credits per semester compared to 49% of the non-working students from the older group as seen in Table 1. Working students ages 17-29 were also more likely than non-workers to delay enrollment, with 12% more entering college for the first time a year or more after graduating high school.

Among both age groups, students who worked tended toward lower average GPAs, longer time to graduation, lower rates of retention, and higher rates of part-time attendance compared to those who did not work. Older students tended toward higher average GPAs than those from the younger group, but had a longer time to graduation, and lower rate of retention. Within the 30-54 age group, non-working students' retention rate had declined by 10% since 2012 from 71% to 61%. In comparison, the younger working population tended toward lower average GPAs, lower retention rates, longer time to graduation, and higher rates of part-time attendance compared to non-working students of the same age. The largest disparity for any outcome by age was rate of attendance. Fewer working students from both groups attended full-time than their non-working counterparts. Overall, the 30-54 cohort from both employment statuses were more likely to attend on a part-time basis.

3.2 | Outcomes by gender

Male and female students ages 17-29 experienced similar levels of employment while enrolled, however 7% more male students from the older group were employed compared to females of the same age, shown in table 2. Time to graduation differed greatly between younger men and women with 22% of females graduated within four years compared to 15% of males.

Working students tended toward lower average GPAs compared to their non-working counterparts regardless of gender. The average grade point difference was larger for female students compared to males when observed by employment status.

Non-working female students ages 17-29 had an average GPA of 3.140, 0.162 points higher than the working group. The difference in average GPA was lower for the male group by employment status, with an average of 2.832 for working males from the younger cohort compared to 2.899 for non-working. Full-time attendance was lower for working students from all populations compared to non-working students. While there was little difference between employed males and females from the older group, 10% fewer non-working females attended full-time compared to non-working males. As far as attendance was concerned, older females had higher retention rates than males, particularly for the working group wherein rates were 13% higher than non-working. Non-working older male students had the lowest rate of retention at 58%.

3.3 | Outcomes by Pell status

The number of students who qualified as Pell-eligible in 2016 had declined by 5% since 2012, falling from 47% to 42% after peak eligibility following the 2008 recession. More students from the older group qualified for Pell grants compared to the younger cohort (9%) as reported in table 3. Pell-eligible students from the younger cohort worked 8% more than non-Pell-eligible students. Pell-eligible students in both age groups were more likely to work for some, but not all, quarters in a year. Working students of either Pell eligibility status had a lower average GPA than non-working students. Younger non-Pell-eligible students who worked had a higher average GPA than their Pell-eligible counterparts. However, non-working Pell-eligible students of the same age group had a higher average GPA than non-working non-Pell-eligible students. The largest difference in average GPA was for the Pell-eligible group wherein students who worked had an average GPA that was 0.133 points lower than their non-working counterparts. Full-time attendance was higher among Pell-eligible students who worked than Non-Pell-eligible working students. The largest difference in attendance was for work-

Table 1: Students by age

	Population	Average GPA	Graduation	Retention	Full-Time
Students 17-29					
All	86%	2.956	19%	81%	76%
Working	44%	2.900	17%	75%	70%
Non-Working	26%	3.001	18%	85%	83%
Students 30-54					
All	14%	3.033	8%	67%	41%
Working	50%	3.001	7%	71%	34%
Non-Working	33%	3.097	7%	61%	49%

Table 2: Students by gender

	Population	Average GPA	Graduation	Retention	Full-Time
Students 17-29					
Working Females	44%	2.978	21%	76%	73%
Working Males	44%	2.832	14%	73%	69%
Non-Working Females	26%	3.140	22%	88%	83%
Non-Working Males	26%	2.899	15%	83%	83%
Students 30-54					
Working Females	47%	3.134	5%	77%	35%
Working Males	54%	2.890	8%	64%	34%
Non-Working Females	36%	3.272	7%	63%	45%
Non-Working Males	3%	2.895	7%	58%	54%

ing 30-54 aged Pell-eligible students, 45% of whom attend full-time compared to working non-Pell-eligible students, 24% of whom attend full-time. The older group had a much larger difference in retention rates by Pell-eligibility status. Pell-eligible students from this group had higher rate of retention than non-Pell-eligible students, and working students had higher retention than non-working of both Pell statuses.

3.4 | Outcomes by Institution

Weber State University had the largest percentage of students from the older cohort as well as the largest population of working students from both age groups. Southern Utah University had both the highest percentage of young students (92% of the population) and the highest portion of non-working young students at 34%.

Outcomes by institution were reported for the entire cohort, ages 17-54, instead of dividing students into two age groups - some institutions had small numbers of students in the older group, and reporting small numbers would lead to unreliable estimates. Working students at all institutions tended toward lower average GPAs than non-working students (Table 4). Utah Valley University and Weber State University had the lowest average GPA; they also had the largest working student population. Utah Valley University had the largest difference in GPA for working and non-working populations with an average of 2.788 for working students and 3.068 for non-working students. Dixie State University had a negligible difference in average GPA.

Weber State University had the highest rate of part-time attendance, followed closely by Utah Valley University, both had the highest percentage of working students. The University of Utah had the largest percentage difference in attendance by

employment status (16%). Southern Utah University had the highest rate of full-time attendance for both employment statuses. Retention rates for working students were lower across all institutions. Weber State University and Utah Valley University had the lowest retention rates for the working population. The University of Utah had the highest rates of retention: 92% for non-working students and 86% for working students.

3.5 | Outcomes by Race & Ethnicity

All racial and ethnic groups had an increase in the percentage of working students since 2012, and an increase in the number of students from each racial/ethnic group attending college, with the exception of Black/African American students. Hispanic/Latino students had the highest rate of working learners: 48% of the younger population and 49% from the older group. Hispanic/Latino students also had the largest increase in percentage of young working students since 2012 at 9%. White students had the highest rate of working students from both age cohorts (Table 5). White students also accounted for 83% of the overall population. Asian students accounted for the largest portion of the population ages 17-29 with 91%. Asian students also had the largest percentage of the young enrollees who did not work.

Outcomes by race and ethnicity were reported for the entire population, ages 17-54, instead of dividing students into younger and older groups. This is to mitigate for the small number of students in many racial and ethnic groups. Working students of any race/ethnicity had a lower average GPA than non-working students. White students had the largest difference in average GPA by working status at 0.168 points, as they had the largest difference in the percentage of working and non-working populations.

Table 3: Pell-Eligible students

	Population	Average GPA	Graduation	Retention	Full - Time
Students 17–29					
All	41%	2.932	14%	76%	78%
Working	50%	2.887	13%	69%	75%
Non-Working	20%	3.020	11%	83%	85%
Students 30–54					
All	50%	2.994	7%	68%	51%
Working	48%	2.967	7%	70%	45%
Non-Working	32%	3.050	5%	63%	59%

Table 4: Students by institution

	Population	Average GPA	Graduation	Retention	Full-Time
Dixie State Working	52%	3.058	15%	69%	69%
Dixie State Non-Working	25%	3.061	4%	77%	81%
Southern Utah Working	32%	2.846	25%	76%	86%
Southern Utah Non-Working	34%	2.956	17%	80%	92%
UofU Working	43%	3.045	25%	86%	65%
UofU Non-Working	27%	3.106	20%	92%	81%
Utah State Working	34%	2.948	17%	81%	70%
Utah State Non-Working	33%	3.068	26%	90%	77%
Utah Valley Working	53%	2.788	10%	65%	61%
Utah Valley Non-Working	21%	3.068	7%	71%	71%
Weber State Working	54%	2.865	11%	66%	60%
Weber State Non-Working	23%	2.969	14%	74%	72%

3.6 | Regression Analysis

The effect of working on average GPA was estimated using the equation:

$$\pi = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + ... + \beta_k\chi_k$$

wherein $E(Y) = \pi$ is the dependent variable GPA.

Working had a significant negative effect on average GPA by 0.105 points ($p<0.001$) as seen in Table 6. Other factors that negatively impact a student's average GPA were being male, Hispanic/Latino, Asian, Black/African American, American Indian, or Pacific Islander, while being White, Pell-eligible, having a higher ACT score, and being in the older cohort were indicators of an increase in average GPA.

The remaining three models employed logistic regression to calculate the odds-ratios for race/ethnicity, gender, working status, and Pell-eligible status on retention, graduation, and attendance, wherein the probability that Y=1 can be derived as:

$$\pi = P(Y=1) = P(Y^*>0) = P(\alpha + \Sigma\beta_k\chi_k + \varepsilon > 0) = P(\varepsilon > -[\alpha + \Sigma\beta_k\chi_k]) = P(\varepsilon < \alpha + \Sigma\beta_k\chi_k)$$

Expressed as the closed form expression:

$$P(Y=1) = \pi = (\exp(\alpha + \Sigma\beta_k\chi_k))/(1 + \exp(\Sigma\beta_k\chi_k))$$

A McFadden's pseudo R-squared was calculated for each model, and predicted probability interpretations were included alongside the odds ratio output in order to provide further understanding of the effects of working on student outcomes. The first

Table 5: Students by race/ethnicity

	Population	Average GPA	Graduation	Retention	Full-Time
American Indian Working	42%	2.561	13%	70%	65%
American Indian Non-Working	29%	2.684	13%	84%	75%
Asian Working	34%	2.854	14%	85%	65%
Asian Non-Working	39%	3.010	22%	77%	82%
Black/African American Working	34%	2.572	3%	75%	65%
Black/African American Non-Working	37%	2.590	13%	81%	78%
Hispanic/Latino Working	48%	2.684	12%	71%	63%
Hispanic/Latino Non-Working	26%	2.839	8%	81%	71%
Pacific Islander Working	39%	2.561	13%	70%	67%
Pacific Islander Non-Working	30%	2.684	13%	84%	76%
White Working	47%	2.949	18%	75%	66%
White Non-Working	23%	3.117	14%	85%	78%

model analyzed the relationship between retention and working (retention=1, non-retention=0). Working decreased odds of retention by 30% (p<0.001) as shown in Table 7, with a McFadden's pseudo R-squared of 0.35. The probability a working student experiences retention is 74% compared to 81% for non-working students. Being Asian, Black/African American, Pell-eligible, and having a higher ACT score significantly increased students' odds of retention, while being male, Pacific Islander or in the older cohort significantly decreased likelihood of retention.

The second model measured the effect of working on the odds of a student graduating within 100% of normal time (graduation=1, non-graduation=0). This was a less robust measurement as it required a student to qualify as a first-time student, and graduation only observes students across four years (2012-2016). As shown in Table 8, working had a significant negative impact on the odds of a student graduating within the four-year window (15.7 %), (p<0.05) with a McFadden's pseudo R-squared of 0.10. The probability that a working student will graduate within the normal time is 38% compared to 43% for non-working students. Other statistically significant variables positively impacting students' probability of graduating within four years were being male and having a higher ACT score. None of the variables that decreased odds of graduating were statistically significant with the exception of being Pell-eligible.

The last model calculated the odds of a working student attending college full-time (full-time=1, part-time=0). Understanding full-time enrollment provides insight related to students who do not graduate within four-years or are not first-

Table 6: GPA

Model Variables	Parameter Estimates (95% CIs)
Working Status	-0.105*** (-0.111, -0.099)
ACT	0.048*** (0.048, 0.049)
Male	-0.191*** (-0.197, -0.186)
Black/African American	-0.241*** (-0.266, -0.216)
Hispanic/Latino	-0.176*** (-0.188, -0.163)
Asian	-0.044*** (-0.061, -0.027)
White	0.096*** (0.085, 0.106)
American Indian	-0.170*** (-0.196, -0.145)
Pacific Islander	-0.292***(-0.321, -0.263)
Older Cohort	0.253*** (0.242, 0.265)
Pell Status	0.030*** (0.024, 0.036)
Constant	2.006*** (1.986, 2.025)
Observations	357, 476
R^2	0.087
Adjusted R^2	0.087

time enrollees. Working significantly decreased a student's odds of attending full-time by 54.5% (p<0.001), as shown in Table 9, with a McFadden's pseudo R-squared of 0.42. The probability that a working student will attend classes full time is 63% compared to 76% for non-working students. Other variables that significantly negatively affect

Table 7: Retention

Model Variables	Parameter Estimates (95% CIs)
Work Status	0.700*** (0.675, 0.726)
ACT	1.075*** (1.070, 1.079)
Male	0.823*** (0.795, 0.853)
Black/African American	1.204*** (1.049, 1.387)
Hispanic/Latino	0.980 (0.914, 1.052)
Asian	1.527*** (1.356, 1.724)
White	1.015 (0.955, 1.078)
American Indian	0.879 (0.765, 1.014)
Pacific Islander	0.851* (0.733, 0.991)
Older Cohort	0.657*** (0.605, 0.691)
Pell Status	1.290*** (1.242, 1.080)
Constant	0.965 (0.863, 1.080)
Observations	83,924
Akaike Inf. Crit.	80,147.31

Table 8: Graduation

Model Variables	Parameter Estimates (95% CIs)
Work Status	0.843* (0.730, 0.973)
ACT	1.018* (1.003, 1.033)
Male	1.152* (1.016, 1.307)
Black/African American	1.089 (0.583, 2.006)
Hispanic/Latino	1.046 (0.774, 1.411)
Asian	0.961 (0.660, 1.394)
White	0.899 (0.706, 1.146)
American Indian	0.679 (0.327, 1.333)
Pacific Islander	1.176 (0.507, 2.682)
Older Cohort	0.424 (0.120, 1.168)
Pell Eligible	0.857* (0.746, 0.983)
Constant	0.529** (0.341, 0.819)
Observations	4,296
Akaike Inf. Crit.	5,829.98

a student's odds of full-time attendance were being male or in the older cohort. Variables that significantly positively impacted chances of attending full-time were having a high ACT score, being Black/African American, American Indian, Pacific Islander and being Pell-eligible.

4 | Discussion

This study measured the effect working four quarters in a year would have on students average GPA, rate of retention, time to graduation, and number of credits taken per semester. The results of the regression analyses and the summary statistics found that overall, working had a negative effect on these outcomes and illustrated the impact of dividing time between work and school. While previous research showed mixed effects of working on educational outcomes by measuring employment solely by the number of hours worked, this study found that working throughout the year produces significant negative effects compared to students who do not work at all.

This research found large differences in outcomes and employment by age cohort as well. Differences in four-year graduation rates by gender for older students were likely attributed to males engaging in ecclesiastical missions, as graduation rates among the older cohort were the same between genders. A structural change in the Latter Day Saints mission

service process shifted the age of service from 19 to 18 for males, and 21 to 19 for females. This resulted in significant drops in college participation for both groups between the 2012 and 2013 academic years. Disparities in full-time attendance by gender for the 30-54 age group who did not work may be due to differences in the distribution of child care by gender, as older students who worked attended full-time at a similar rate. Southern Utah University had the highest rate of full-time attendance for both employment statuses, this may be because they had the youngest student population who is both more likely to attend full-time and less likely to work compared to the older cohort. Differences in outcomes by institution are likely attributed to the selectiveness of the college or university. For example, a selective college may have higher average GPA's than an open admissions college, regardless of a student's working status. Hispanic/Latino students had the lowest rate of full-time attendance for students of either employment status, which may be informed by the high number of working students in this cohort.

Among students who used loans or aid of any kind to help pay for their education, the average amount awarded was lower for students who worked, with the exception of Pell-eligible students. Overall, Pell-eligible students worked at a greater rate than non-Pell-eligible students, suggesting that while these grants help ease the burden of tuition, they

Table 9: Odds of attending school full-time.

Model Variables	Parameter Estimates (95% CIs)
Work Status	0.455*** (0.446, 0.464)
ACT	1.090*** (1.087, 1.093)
Male	0.836*** (0.821, 0.852)
Black/African American	1.411*** (1.291, 1.544)
Hispanic/Latino	1.038 (0.994, 1.085)
Asian	1.058 (0.998, 1.122)
White	1.025 (0.988, 1.063)
American Indian	1.164*** (1.064, 1.273)
Pacific Islander	1.159** (1.049, 1.282)
Older Cohort	0.219*** (0.212, 0.227)
Pell Eligible	1.600*** (1.570, 1.632)
Constant	0.701*** (0.657, 0.748)
Observations	257,969
Akaike Inf. Crit.	272,219.50

are not enough to meet the financial needs of this group. The amount of Pell grants awarded was greater for full-time students. This is also likely influenced by the positive relationship between the amount of Pell aid awarded and number of credits taken.

Separating student outcomes and employment by age cohort also revealed a discrepancy in the consumption of education as well. For example, the decline in the number of students ages 30-54 is likely due to a rise in employment the years following the 2008 recession. The recession may have prompted older students who have a more elastic demand for education to choose work over college. Among students who remained in college, a larger share worked year-round or did not work at all. It may be that non-working students from this age group leave college when they find employment, or that older working students are in a better position to further their future employment by working and attending classes. Another significant distinction by age cohort is the rate of retention for working populations. Students from the younger group had a 10% lower rate of retention compared to non-working students of the same age group. The inverse is true for working students' ages 30-54 wherein non-working students had a 10% lower retention rate. This suggests that many younger students may forgo balancing work and school and instead leave college to focus solely on work. Conversely, older working students were more likely to return for a second semester, further illustrating the differenc-

es in consumption of education by age cohort by employment status. Similarly, outcomes varied by institution due to the average age of the student population. For example, the University of Utah had the youngest student population who is both more likely to attend full-time and less likely to work compared to the older cohort. Thus, the University of Utah had a large difference in attendance rates by employment status

Additional research should be applied to explore this question of education consumption for working students of different age groups. Doing so will provide a more complete understanding as to the cost-benefit analyses students make when deciding to leaving college to focus on employment or staying and engaging in both.

5 | CONCLUSION

As the number of working learners continues to rise, so does the importance of understanding the unique challenges faced by students who balance their time between work and school. Utah's population is growing alongside working students, bringing new questions on how to accommodate both an increase in the student body as well as an increase in the percentage of those students who engage in the workforce.

This study defines employment as working four quarters in a year to understand cumulative effects of balancing work and school on student outcomes. Rates of retention differed by age group with younger working students experiencing lower rates of retention than non-working students of the same age. The inverse is true for the older group wherein working students have a higher rate of retention than non-working students, suggesting that the elasticity of demand for education is different for these populations.

Regression modeling used in this study found that working had a statistically significant negative impact on a student's average GPA, odds of retention, graduation within four years of enrollment, and full-time attendance.

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Appendix A

Duplicates present in data due to changes or in student's race/ethnicity or gender categorization throughout the year.

Duplicates present in data due to changes in student's Pell-eligibility status throughout the year.

While students may be Pell-eligible, they may choose not to receive the award but would still be included in the Pell-eligible cohort.

Parental income factors into Pell award qualification and amount awarded until a student is 24 years of age.

Unemployment insurance (UI) does not capture military, federal, or self-employed individuals.

Working is defined as a student who is employed for all four quarters in a year, while non-working is defined as a student who does not work any quarter in a year. As such, populations will not equal 100%, as some students work less than four, but more than zero, quarters in a year.

ACT scores and a student's average GPA contained missing values for many students. While the values present were sufficient for the purposes of this study, it is recognized that this report would benefit from having these missing values.

Data Partners