

# Predictive Characteristics of Adequate Employment in Baccalaureate-Prepared Graduates

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## ABSTRACT

Underemployment, which occurs when baccalaureate degree holders are employed in occupations that do not require or fully use a college-level degree (Lederman, 2018), challenges the notion that a college degree alone adequately prepares a student for a satisfactory level of employment based on education level. During 2018 and 2019, the higher-ed capstone team conducted this study to identify predictive characteristics of underemployment among undergraduate alumni from a large, public, urban, Tier-1 research university. Although identifying underemployment characteristics was the primary impetus for the research, the team instead discovered three primary predictors of adequate employment from the analysis. Higher education institutions and policy leaders may be able to better ensure students gain employment, particularly during challenging economic times, by encouraging student participation in internships, extracurricular activities, and the selection of STEM majors.

## KEYWORDS

*predictors, employment, undergraduate, internship, STEM*

## INTRODUCTION

As inflation soars to nearly 10 percent and the country faces an unemployment rate of just under 4% (Bureau of Labor Statistics, 2022), current and prospective students and families may ask is it worthwhile to pursue a costly higher education degree as opposed to entering the work force directly and pursuing certificates. In light of the cost of higher education as a percentage of household income, families may have shifted their expectations of higher education from teaching to one of teaching and career placement (National Information Center for Higher Education, 2018). Students, parents, and graduates may expect higher education institutions to assume responsibility for preparing students for jobs - and higher paying jobs - after graduation. And arguably, preparing college graduates to enter the labor market as qualified workers could be seen by society and the marketplace as the most critical responsibility for higher education, especially with the historically low unemployment and the need for employees following COVID-19 (Ferguson, 2022).

Yet, educators themselves listed helping students to find employment as only the sixth of their top ten issues in recent years (Mourshed et al., 2013). Sixty percent of college and university administrators feel they are not responsible for students having professional goals and plans to achieve these goals; less than 40% of chief academic officers believe colleges and universities should be held accountable for the career success of their students (Kelchen, 2016). Plenty of educators care about student success, but as long as educators are not responsible for, evaluated on, or compensated on student employment outcomes, this downward prioritization trend is likely to continue (Mourshed et al., 2013).

There is a caveat, however, to equating every student's graduation directly with one successful employment outcome. As society's relationship with and access to higher education has shifted in the past fifty years, citizens in the United States embrace the notion that everyone who has the desire to attend college - and perhaps get better compensation with this education - should be able to do so (Caplan, 2017). During the early decade of the 21st century,



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nearly 60% of society now has some college education (Carnevale et al., 2010), an astounding increase from the single digit statistics of the 1960s (U.S. Census Bureau, 2012). Institutions of higher learning, once selected by students based on proximity or a preparatory curriculum for a desired profession today, have become mass-producing, degree-granting institutions (Bankston, 2011). As such, graduating with a degree does not translate into a profitable career. Even in a fiercely competitive labor market, underemployment - accepting employment that does not require higher education qualifications - poses a grave long-term threat to college graduates' career success and advancement (Burning Glass Technologies, 2018).

Critically, employers may view underemployed job applicants more negatively than those who have actually been unemployed (Nunley et al., 2017). Nunley et al. (2017) submitted approximately 9,400 fictitious resumes to jobs in the areas of banking, financial services, insurance, management, marketing, and sales positions between January 2013 and July 2013. The researchers discovered that underemployed applicants were 30% less likely to receive a callback from employers; however, they found no negative effect on callback rates for those who were unemployed. In fact, Nunley et al. (2017) concluded underemployment can be perceived as substantially more harmful than unemployment because of the negative signal it sends to employers.

## THE CLIENT CHALLENGE

In light of the economic threat that underemployment poses to graduates and to society, the doctoral capstone team's client asked: How might institutions in the Commonwealth of Virginia identify predictors of underemployment in baccalaureate-prepared graduates? Ultimately, the capstone team sought to identify factors of baccalaureate graduates and actions that higher education institutions may take to help graduates avoid underemployment. In doing so, the capstone team hoped that the institutions could better prepare a skilled workforce, with the intent that a more skilled workforce could provide better wages for employees and could serve to attract and sustain employers in an internationally competitive labor market. Economically, an adequately employed workforce could contribute more consumer dollars to the tax base.

## FRAMING THE PROBLEM THROUGH A REVIEW OF LITERATURE

While the literature highlighted numerous factors that may contribute to underemployment, the capstone team sorted the factors into two categories: uncontrollable and controllable predictors that may contribute to underemployment in baccalaureate-seeking college students.

### Uncontrollable Predictors

The uncontrollable predictors include: the economy the students entered upon graduation and the demographics of the students, including race, gender, or first-generation status of the students.

## The Economy

The effects of entering the workforce during an economic recession, for example, are short-lived and long-lasting, including recession after-shocks. Short-lived, adverse market conditions can also impact workers as long as ten years. In a study following Canadian men for ten years following college graduation, Oreopoulos et al. (2012) determined that the effects of a weak job market are strongest for new graduates with little or no work experience.

As well, a depressed economy can have long-lived effects on graduates. Entering the labor market in a skill-appropriate role rather than accepting and suffering through a perpetual low wage job may actually behoove workers in a recession-like economy (Kahn, 2010). In a study seeking to understand the effects of the early 1980s recession on graduates entering the workforce, Kahn (2010) tracked 513 workers from 1979 to 1994 and concluded that their wage losses ranged from 1% to 20% each year when compared to pre-recession graduates' wages. Thus, Kahn's (2010) results support forgoing a year or two of wages and accepting a job commensurate with a graduate's education and skill level - rather than trying to overcome low pay across a career from an initial entry-level role.

## Demographic Factors

The team examined many demographic factors including gender, race, socioeconomic levels, and first-generation status in the literature. First-generation status, like race, is a byproduct of parental circumstances, and is, ostensibly, an uncontrollable factor for students. First-generation college students are likely to be Hispanic (27%) or Black (14%), and they are more likely to come from lower socioeconomic backgrounds than continuing generation students (Redford & Hoyer, 2017). Even before enrolling, first-generation, college-bound students are often at a disadvantage among prospective college students. The parents of first-generation college students often have little understanding of higher education and are, therefore, often unable to assist their college-bound children in the college decision-making process (Olson, 2016; Tate et al., 2015).

Without family members who previously navigated college, first-generation college students are often left with little guidance on how to develop career plans. Moreover, they often do not understand who, within the college setting, they can turn to for assistance. First-generation college students are particularly at risk of missing relevant experiential learning in college, whether because they are unaware of the opportunities and the importance of them, or they must work to pay for tuition and living costs and are forced to miss out on more extracurricular, unpaid activities. Hence, first-generation students are more often underemployed years following graduation as a result of limited professional preparation (Hirudayaraj & McLean, 2018).

Additionally, first-generation college students often come from low-income families (Redford & Hoyer, 2017), and their awareness of career aspirations is typically defined by their parents' experiences (Olson, 2016; Tate et al., 2015). In an effort to encourage their children to have a better financial foundation than they had, parents often push students to choose a practical major - one that leads to a specific career such as engineering or nursing - further limiting the options that students consider or that might be a more optimal fit with their interests (Olson, 2016; Tate et al., 2015).



## The Controllable Predictors

The following are the controllable predictors found in the literature: experiential learning, extracurricular activities, academic pursuits, academic advising, and career support.

### Experiential Learning

Mentoring partnerships, internships, and cooperative educational jobs can provide valuable means to offset underemployment for new graduates. As part of a curriculum in higher education, experiences and a network of employed individuals can enhance students' professional skill-building and allow for applying academic learning beyond the classroom (McEvoy, 1998; Raelin, 2007). Students' work experiences outside the classroom may signal to employers their qualifications for employment after academia (Caplan, 2017; Moret, 2016).

Students who are matched with mentors, such as alumni or senior students, can informally and formally practice using professional language and decorum by networking (Burning Glass Technologies and Strada Institute for the Future of Work, 2018). Networking has been shown to help career success (Haggard & Turban, 2012). However, some college students lack inherent networking skills and may need guidance to develop their networks (Tate et al., 2015).

Internships and cooperative educational jobs can provide students with valuable skills such as relationship building, networking, and creative thinking that can lead to higher paying job offers and overall job satisfaction (Gault et al., 2000). Internships and cooperative educational jobs also provide a means for individuals to find employment that matches their skill set (Fogg & Harrington, 2011; Maertz et al., 2014). In addition to bringing classroom lessons to live situations, cooperative educational jobs have a positive earnings impact on new graduates (Walters & Zarifa, 2008). Any type of work-program that lets students "learn and earn at the same time" (Pascarella & Terenzini, 2005, p. 410) reinforces classwork and professional learning, while helping reduce students' debt loads. In fact, for low-income students, internships and cooperative educational jobs tend to bring greater financial benefit and awareness of the professional world than these jobs do for higher-income students (Rogers, 2017).

### Extracurricular Activities

Students who engage in formalized, learning-specific, extracurricular activities demonstrate a willingness for new experiences beyond the classroom and indicate an awareness of higher education being more than classroom participation (Bathmaker et al., 2013). In the workforce, career success is often tied to employees' social performance, not solely their job performance. Social capital depends on employees' access to information, access to resources, and having a mentor to champion them on projects or promotions (Seibert et al., 2001).

Extracurricular activities can also provide students with a chance to exercise leadership skills they can use as an employee. Students with strong soft skills express greater confidence in their abilities to interact with others and experience higher job placement rates after graduation than those possessing only academic skills (Winstead et al., 2009). Employers value graduates who exhibit sound professional judgment through strong soft skills (Robles, 2012; Winstead et al., 2009) and deep emotional

intelligence awareness (Joyner & Mann, 2011; Sigmar et al., 2012) because these graduates are more effective in interacting and collaborating with others.

### Academic Pursuits

Skills and interest testing and resources exist that can help guide students to majors aligned with their skills and interests. Yet, universities often are not adequately staffed in career advising areas to guide all students (Auter & Marken, 2017). Thus, it is not surprising that many students, particularly those from low socio-economic backgrounds pursue academic majors that may not fit their talents and skills (Zarifa, 2012). These students may ultimately pursue and accept jobs that are unrelated to their major, but they recognize these jobs because non-degree holding family members and peers hold these jobs (DeOrtentiis et al., 2021). Many students, particularly those from lower social strata, cannot clearly see the pathway from a major to a profession, which is a disadvantage as they apply for jobs (Burning Glass Technologies and Strada Institute for the Future of Work, 2018). As a result, many of these graduates are mismatched in their professional careers (Abel & Deitz, 2015; Cappelli, 2015).

Studies have provided varying evidence on the underemployment outcomes and career outlook associated with various majors, such as science, technology, engineering, and math (STEM) disciplines as compared to liberal arts (Burning Glass Technologies and Strada Institute for the Future of Work, 2018). Carnevale and Cheah (2015) found that underemployment rates were high among baccalaureate majors earning degrees in liberal arts, sociology, and psychology during the Great Recession of 2007 - 2009. Graduates with degrees in other disciplines, such as engineering and health-related sciences and services, had low rates of underemployment during the Great Recession (Carnevale & Cheah, 2015).

### Academic Advising and Career Support

The importance of appropriate academic advising cannot be ignored, as advising has an impact on the retention of students at the undergraduate level, particularly with first-generation students (Swecker et al., 2013). Information regarding a specific academic major and its direct relation with career attainment is often absent from the undergraduate experience (Herndon, 2006). Similarly, academic advising has, until recently, been limited in its scope of highlighting skills and salaries for enrolled students as they explore major selection (Burning Glass Technologies and Strada Institute for the Future of Work, 2018). Research showed that college students reported that they are not satisfied with the academic advising that they received (Allen & Smith, 2008), suggesting a problematic approach in how students are advised.

Early discussions with students around major selection, their receiving regular academic and career advising, as well as their pursuing relevant work experience are critical for students to secure employment (Fogg & Harrington, 2011). Exploration of careers early in the college experience can encourage student participation in conscious career exploration (Savickas, 1999), which can develop into confidence and decisiveness when selecting a major (Shin, 2010). Thus, a greater connection among academic advising, career advising, and the formal curriculum can ultimately help offset underemployment even before a student actively launches a career search (Fishman et al., 2017).

## METHODOLOGY TO TEST PREDICTIVE FACTORS

After the team's extensive review of the literature, the team chose to conduct a research study by administering a survey to baccalaureate graduates. The survey was designed to test which factors might influence or predict underemployment outcomes in baccalaureate graduates.

The team collaborated with the State Council of Higher Education for Virginia (SCHEV), which receives data on graduates from Virginia's higher education institutions and then compiles the data into a repository. While the database could provide valuable demographic and academic information on former students, it did not contain all of the variables the team sought to test as predictors of underemployment in baccalaureate-prepared graduates. To supplement SCHEV's existing data, the team chose to design and administer a survey to gather comparable data across a large population of graduates.

### Research Design

The team designed this quantitative study based on existing literature and research around predictors of employment outcomes. Yet, the team did not test all factors explored through the literature. Instead, the team focused on variables that they believed would return adequate and accessible data from either survey responses or secondary data on a large scale. The participants in this study completed surveys with three primary areas: undergraduate collegiate experiences, post-graduation factors, and demographic factors.

### Context and Participants

The following describes the site of the study, the targeted population, and the demographics of the participants.

#### Research Site

Virginia Commonwealth University (VCU) was the site for the study. VCU, which contributes an estimated \$5.9 billion dollars annually of economic impact to the Commonwealth of Virginia (Accordino et al., 2016), is the fourth largest higher education institution in Virginia. VCU has over 31,000 students, and 92% of the students are residents of Virginia. Fifty-nine percent of the students are female. Twenty-nine percent of the students identify as underrepresented minorities, and 33% are first-generation college students (Institutional Research and Decision Support, n.d.a).

#### Target Population

The target population was the approximately 45,000 VCU baccalaureate graduates from 2006 - 2016. The ten-year cap constricted the time period that graduates were likely to attribute their university preparation as the reason for their finding relevant employment.

#### Participants

Of those 941 respondents who indicated their sex, 60.7% (n = 571) identified as female, while 29.9% (n = 281) identified as male. Of the respondents who indicated their race/ethnicity, 61.2% (n = 556) identified as White, 23.1% (n = 210) identified as Black or African American, 8.6% (n = 78) of the sample identified as Asian or

Pacific Islander, and 4.7% (n = 43) of the sample identified as Hispanics. Respondents identifying as American Indian/Alaska Native (n = 7) or multi-race (n = 12) comprised 2.1% of the sample. The race/ethnicity of the remaining 0.3% of respondents were non-resident alien. A significant majority of the respondents, 83.8% (n = 789), were between the ages of 18 and 24 when they graduated with a baccalaureate degree.

## DATA ANALYSIS

The overarching approach to analysis was testing variables within the three themes that the team identified as possible predictors of underemployment from the literature: undergraduate collegiate experiences, post-graduation factors, and demographic characteristics. The team looked for those respondents who had either participated or not participated in certain undergraduate experiences, in certain majors, as well as their employment outcomes as indicated by their job and income level. The team then determined statistical significance to show possible predictors of underemployment for baccalaureate graduates.

### Data Analysis Tools

The team first analyzed the respondents' answers through descriptive frequencies and then examined differences by employment status for each variable in the themes of collegiate experiences, post-graduation factors, and demographic characteristics. The Statistical Package for the Social Sciences (SPSS) software was used to conduct the analysis.

### Chi-Square

The team conducted a chi-square test for independence on nominal and ordinal variables to determine if there were differences in employment level by collegiate experience, post-graduation factors, and demographics. The team identified variables within each theme that had a  $p \leq .05$ , which indicated a statistically significant difference in employment levels. If the test indicated a statistically significant difference or relationship, the strength of that association was tested using phi/Cramer's V.

### ANOVA

The team conducted an Analysis of Variance (ANOVA) on interval variables to determine if there were differences in employment level by collegiate experience, post-graduation factors, and demographics. The team identified variables within each theme of collegiate experience, post-graduation factors, and demographics that had a  $p \leq .05$ , which indicated a statistically significant difference in employment levels. If the ANOVA indicated a statistically significant difference, the strength of that association was tested using Eta square.

## FINDINGS BY RESEARCH THEMES

### Research Theme One: Undergraduate Collegiate Experiences

The team wanted to understand which undergraduate collegiate experiences may have had a meaningful impact on graduates'



employment level and thus conducted chi-square tests on each survey response related to undergraduate experiences. The six experiences that showed statistical significance in undergraduate collegiate years are discussed below.

### Relevant Work Experience During Undergraduate Years

Graduates who had been employed in work related to their careers while they were undergraduates were more likely to be adequately employed than those who were not employed in any work related to their careers as undergraduates. This significance highlighted the value of a professional experience over work experience unrelated to a future career.

### Academic Advising

Those respondents who received academic advising during undergraduate years, and thus likely to be the beneficiary of counsel on class, major, or internships, were more likely to be adequately employed graduates than those respondents who did not.

### Career Services

Graduates who utilized career services or the events surrounding career services, such as skills assessment, career fairs, networking events, or resume assistance, were more likely to be adequately employed graduates than those respondents who did not.

### Extracurricular Activities

Graduates who participated in and understood the importance of extracurricular activities, such as serving in affinity groups, major or industry aligned clubs, mentoring, or volunteering, were more likely to be adequately employed than those graduates who did not.

### Majors

Certain majors were more likely than other majors to indicate adequate employment. Whether because of the high demand for STEM graduates or from the indication of a STEM degree that coursework was particularly arduous and challenging, STEM graduates appear favorable to employers. Graduates of a STEM designated degree were likely to be adequately employed graduates.

## Research Theme Two: Post-graduation Factors

The team wanted to understand which post-graduation factors may have a meaningful impact on graduates' employment level and thus conducted chi-square tests on each survey response related to post-graduation factors, such as what economic climate they entered upon graduation, their years of full-time work experience, their willingness to relocate upon graduation, if they had earned an advanced degree, and their total amount of school debt.

The one factor that showed statistical significance was the economic climate the graduates entered upon graduation. In order to determine whether there was a difference in employment level for those graduating during the Great Recession and those who did not, the team recoded graduation years into two separate categories: recession and no recession. Doing so showed that the economic climate impacted these graduates. Therefore, undergraduates who entered the workforce during the Great Recession were more likely to be underemployed.

## Research Theme Three: Demographic Factors

The team desired to understand which demographic factors may have had a meaningful impact on graduates' employment level and thus conducted chi-square tests on each survey response related to demographic factors. The one factor was the respondent's first-generation status.

### First-generation

The only factor that showed statistical significance in respondents was whether they were a first-generation student or not. First-generation students were not as likely as continuing generation students to be adequately employed.

## Forming the Regression Equation

The team entered all variables into the model, regardless of whether they showed statistically significant differences. Yet, four variables from across two of the three research themes made statistically significant contributions to the model as predictors of employment outcomes.

The equation can be written as:  $E = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$  where:

$x_1$  = whether the respondents worked or had an internship as undergraduate in career-related work;

$x_2$  = whether the respondents participated in extracurricular activities;

$x_3$  = whether the respondents graduated during a recession;

$x_4$  = whether the respondents earned a STEM-designated degree;

$E$  = respondent's (adequacy of) employment level.

While the initial study focused on finding predictors of underemployment, the model correctly predicted 98.6% of cases of adequate employment and only 5.8% of cases of underemployment. The two categories of employment level are not necessarily opposite of one another. Therefore, there is not an assumption that the model predicting adequate employment applies in the inverse to predict underemployment.

## Logistic Regression Findings

The logistic regression indicated that undergraduate students who worked at a job or internship in their field while an undergraduate were 1.7 times more likely to be adequately employed than those who did not. The graduates who participated in extracurricular activities as an undergraduate were 2.3 times more likely to be adequately employed than those who did not. The respondents who graduated during the recession were 2.5 times more likely to be adequately employed than those who did not. Additionally, the respondents who graduated with a STEM degree were 1.8 times more likely to be adequately employed than those who did not have a STEM degree.

## LIMITATIONS

Respondents may not be willing to share demographic and economic data. Restricted access to graduates also can be a significant challenge in a highly cyber-securitized world. Although the

team examined employment predictive characteristics through the variables in a graduate's collegiate experience, post-graduation factors, and demographics, the combined variables did not explain a large enough variance to allow the team to provide concrete recommendations. The team could not, thus, identify concretely the predictors of underemployment in baccalaureate students. Yet, the team believes that by shedding light on an important topic and critical undergraduate experiences, a more robust model may emerge that could predict characteristics of underemployment in baccalaureate graduates.

## RECOMMENDATIONS

Undergraduate students should engage in professional development activities before they graduate. Students who participate in activities related to the transition from college to work fare better in finding relevant employment (Blau et al., 2014) and thereby avoid underemployment. Students also need the appropriate tools and support to be adequately employed after graduation. Activities such as speed networking and informational interviews can be established easily as part of a course requirement. Furthermore, establishing mentorships allow students to understand workplace expectations and professional decorum from alumni or senior classmates. In addition, students should be required to develop professional resumes and practice interviewing.

Student awareness of and participation in extracurricular activities and leadership positions should be encouraged by college staff and professors. College students participate in extracurricular activities as a means of establishing informal networks and leadership expertise. Whether these extracurriculars are aligned with certain majors or industries, constitute study abroad, connected to special interests, or are organized through intramural or disciplined athletics, each opportunity allows for practicing skills that employers seek in applicants. First-generation students in particular need to be made aware of non-academic activities as a key employment factor, and activities need to occur during times when working students may also participate.

Participating in internships should be required. Chief academic officers ranked internships as the most important qualification for new graduates finding employment (Kelchen, 2016). Completing internships provides students with an opportunity to gain exposure to various industries and workplace expectations. These students benefit, too, in that they are likely to receive offers to continue to work and understand if their chosen major and pursuit of a chosen career aligns with their perceptions (Saltikoff, 2017). Furthermore, seeking input from employers on their needed competencies and translating those needs into curriculum and extracurriculars can prove beneficial for graduates and employers (Abel & Dietz, 2015).

## CONCLUSION

Adequate employment's impact is noteworthy for individuals and society. Graduates' sense of empowerment, their allegiance to their institution, their ability to repay debt, their spending power, their support of the tax base at a higher level, and the region's ability to attract further economic investment are all key benefits of adequate employment. Ultimately, higher education leaders can help ensure students are well prepared for the job market through the awareness of factors that influence hiring: their selection of major, the

importance of well-roundedness in the collegiate experience, and the necessity of an internship. While 43% of graduates may be underemployed in their first job upon graduation, nearly one-quarter remain underemployed a decade later. (Burning Glass Technologies and Strada Institute for the Future of Work, 2018). Higher education institutions can continue to remain most valuable to society by providing students with both relevant academic preparation and deliberate career preparation.

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