

UNIVERSITY
OF
CALIFORNIA

Fiat Lux: What is the value of a UC degree?

Institutional Research & Academic Planning
University of California Office of the President

2021

A pair of hands is shown from the bottom, holding a glowing lightbulb. The lightbulb is illuminated from within, casting a warm glow. The background is a dark blue gradient. The text is overlaid on the image.

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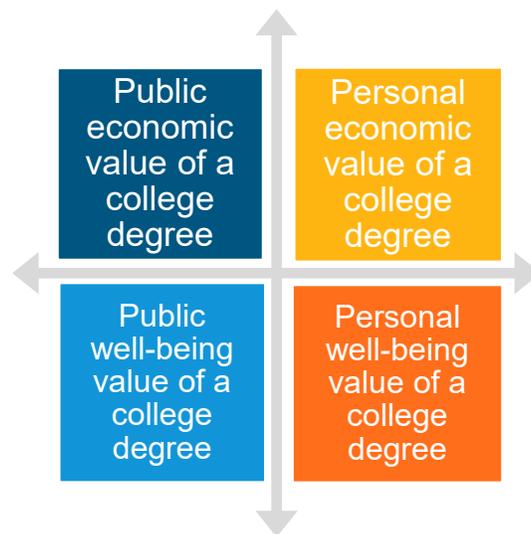
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EXECUTIVE SUMMARY

Colleges and universities are under increasing pressure to demonstrate the value of higher education. The value proposition of a college degree is often measured in economic terms, such as earnings post-graduation compared to loan debt incurred; however, this presents a narrow picture. Non-economic benefits, such as the development of 21st century skills - critical thinking, communication and collaboration, civic engagement, psychosocial change, and other contributions to personal well-being are often missing from the discussion. Furthermore, earning a college degree not only benefits the individual, but college degree earners also bring public benefit - through contributing to tax revenues, by working in public service, or by fueling innovation and technological advances to address 21st century global challenges. To encourage investment, higher education leaders need to equip themselves with data that represent the benefits that their institution brings to its graduates and the public. This report offers examples of data for leaders in higher education can use to discuss the value proposition of college degrees.

A multidimensional approach is necessary to encapsulate the value of earning a college degree



Many data sources are necessary to tell the full story of the value of a college degree. Higher education has made tremendous gains by linking student data to labor market outcomes through state wage data, tax records, and even Census data to tell the economic impact story. But these data leave out crucial information on other valuable aspects, like occupation, career and life satisfaction, productivity, innovations, and skills acquired by graduates. In 2017, the

Institutional Research & Academic Planning Office (IRAP) of the University of California, Office of the President (UCOP) embarked on a quest to identify institutional, state, national, and private industry data that could represent both the economic and non-economic value of a UC degree to graduates and on the broader public. To approach this work, IRAP adjusted a framework proposed by the Institute for Higher Education Policy (IHEP) and by the Post Collegiate Outcomes (PCO) Initiative¹ that divides the value prospects of a college degree into four areas that represent personal, public, economic, and non-economic impact.

Leverage already established data sources in new ways to help explain the value

The following reports highlight the value of a UC degree in the four quadrants of Personal Economic, Public Economic, Public Well-Being, and Personal Well-Being using established data sources that could be acquired by any college or university to understand the value of their institution's degrees. These data serve as examples to help broaden the conversation on the value proposition of college education for the public and individuals.

UCOP identified and gained access to several additional external data sources, such as:

- LinkedIn profile data (for data on alumni occupations and volunteering)
- California Department of Education (for data on UC alumni teaching in K-12 public schools)
- California Department of Consumer Affairs (for data on UC alumni who are licensed doctors, nurses, social workers, and mental health professionals)
- California Secretary of State (for data on alumni voter registrations and participations)
- Collegiate Leaders in Increasing MoBility (CLIMB) research group with access to IRS tax returns (for data on alumni charitable contributions, homeownership, and small business ownership)
- PitchBook (for data on companies founded by UC alumni)
- California Employment Development Department wage data (alumni salaries and industries of work)
- National Student Clearinghouse (data on degree non-completers and graduate degree completions)
- Leadership Directory (UC alumni who are state justices and public officials)

Note: While some of these sources are from the state of California, institutions may seek out similar data sources in their home state or from private industry data. Refer to the [data inventory](#) for a comprehensive list of data resources highlighted in this report.

¹ A collaboration of the American Association of Community Colleges (AACC), the American Association of State Colleges and Universities (AASCU), and the Association of Public and Land-grant Universities (APLU)

Acknowledge that the value associated with a college degree is not always equitably distributed

This report finds that for some post-collegiate outcomes, UC degree recipients who are first-generation college students (students with neither parent having a four-year college degree), low-income (Pell grant recipients), or from underrepresented racial/ethnic groups (URG; Indigenous, Black/African American, Hispanic/Latinx) have similar outcomes compared to their counterparts (i.e., non-first-generation, non-low-income, or non-URG degree recipients). As the majority of California public high school graduates are first-generation, low-income and/or from underrepresented groups, understanding how higher education benefits these student populations is critical, including their experiences compared to their peers. While these students have similar outcomes to their peers on some indicators in this report, the value associated with a college degree is not equitably experienced on all aspects of value discussed. These findings reinforce the importance of equity research, including reducing gaps in four-year graduation rates, which may have impacts on graduate school attendance and loan debt incurred; these are two areas of focus for UC Institutional Research & Academic Planning.

Using a broader perspective, equitable access and success in higher education is critical to the vitality of our economy and democracy. College and universities are well-positioned to bolster social mobility, mediate inequities and unlock the talents and aspirations of students from marginalized groups. Common techniques, such as assessing social mobility rates or value-added, disaggregating data by race, gender, and socioeconomic status and analyzing earnings gaps are all ways to track whether or not institutions are accomplishing this goal.

Additionally, knowing the true value added of earning a UC degree for each group requires more complex analysis that controls for incoming inequities (e.g. those experienced at the K-12 level) and accounts for inequities post-graduation (e.g. discriminatory labor market practices).

Therefore, where possible, post-collegiate outcomes for UC underrepresented groups, first-generation, and low-income students are differentiated and shared in the hopes of engaging consumers in conversations about the equity of value. In addition, this report provides information on UC alumni outcomes as a system, built upon the data from all UC campuses.

HIGHLIGHTS

The following section highlights examples of the value of a UC degree in each of the four quadrants using institutional, state, national, and private industry data.

Note: We have categorized these examples within discrete quadrants, though depending on the context these aspects of value could be represented in more than one quadrant.

Personal economic value of a UC degree

- UC bachelor's degree recipients on average, earn about \$67,000 by six years after graduation, more than the median income for all California bachelor's degree recipients.
- UC bachelor's degree recipients that earn a graduate degree earn on average about \$98,000 by eleven years after graduating UC, exceeding the median income for all other graduate degree holders in California. Median lifetime earnings for UC alumni are greater than other college degree earners in California.
- Most UC Pell grant recipients go on to earn more than their parents within five years of graduation, and most UC first-generation students do so within seven years.
- One out of three UC students who entered UC in the lowest 20 percent of income move to the top 20 percent of income as adults, a rate that is higher than other four-year universities in California and the nation.
- UC graduates are more likely to receive health care and retirement benefits from their employers than non-UC graduates and other similarly aged individuals.
- At least one in four UC graduates (27 percent) owns a home eight years after graduation, compared to one in seven (14 percent) of similarly aged individuals, nationally.

On average, a UC graduate breaks even on their educational investment between four to six years after graduation.

Public economic value of a UC degree

- By fifteen years after graduation, UC graduates are contributing on average \$30K in federal taxes and \$7.6K in state taxes per year, twice as much as the average Californian.
- UC alumni from the graduating classes of 1999 to 2009 contribute about \$3.7B in federal taxes and more than half of a billion in state taxes, in one year.
- 2,500 California companies were founded or co-founded by UC alumni, compared to 2,240 for Stanford, 840 for the University of Southern California, and 1,300 for California State University (CSU) alumni.
- 4,900 UC alumni hold C-suite positions (i.e., senior leadership positions like chief executive or financial officers), and 3,350 are located in California.
- One in five of all UC's bachelor's degree recipients from the graduating classes of 1999 to 2005 owned a small business in 2015, roughly when they were in their mid to late 30s.
- Bachelor's degree earners cost the State of California an estimated \$1.8 billion less in public assistance than high school graduates.

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*UC graduating classes of 1999 to 2009

- UC research-based education spurs economic growth; below are some of the companies UC alumni have started:



Public well-being value of a UC degree

- UC-trained doctors provide care in 60 percent of California towns.
- One in two California state justices and one in three California state-elected officials are UC graduates.
- Over 1,600 UC degree recipients preserve the quality of the environment as civil engineers who ensure the quality of roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and waste and as environmental experts for air quality, hydrology, and geological engineering in one-third of California cities.
- Twenty-five percent of UC faculty and 20 percent of California State University (CSU) faculty have earned their Ph.D. at a UC.
- UC alumni are award-winning landscape architects who transform public spaces into parks.
- 65 percent of UC alumni who registered to vote did so, compared to 48 percent of similarly-aged CA registered voters.

28,000 UC-educated teachers serve in three out of four of California's public K-12 schools.

- Most UC alumni who volunteer do so for health-related causes, such as the American Red Cross, the American Cancer Society, Kaiser Permanente, and other medical centers.
- 89 percent of UC seniors reported that community-focused activity on campus influenced them to continue community-focused activities after graduation.
- UC alumni conduct public-serving research that contributes to advances in medicine, technology, agriculture, and disaster preparedness.

Personal well-being value of a UC degree

- UC seniors reported an enhanced understanding of differences/issues related to gender, race and ethnicity, sexual orientation, and social class from when they started at UC.
- 60 percent of UC seniors reported increases in leadership skills from when they started at UC.
- Job security increases with educational attainment (both pre- and post-COVID-19) and is highest for doctoral/professional degree earners.
- College degree earners are more likely to source health information from written sources rather than television or radio.
- College degree earners marry at higher rates, report higher life satisfaction and more favorable health outcomes, compared to non-college degree earners.

UC seniors reported the greatest gains in critical thinking, information literacy, oral communication skills, and the ability to understand international perspectives, from when they started at UC.

CHALLENGES TO ASSESSING VALUE

More information on college graduates needs to be routinely collected

While researching indicators of value by educational attainment, there were challenges to finding data specifically for UC graduates. Data on job satisfaction and workforce skills needs were available for some UC graduate alumni, but not for undergraduates. Additionally, UC data on 21st century skills and psychosocial change were self-assessments, whereas an external assessment of these skills would further validate the value of a UC degree. Lastly, data on UC alumni happiness, life satisfaction, networking interpersonal relationships, and health outcomes were not available, but could be added as questions to undergraduate and/or graduate alumni surveys. Furthermore, many data sources did not have sufficient coverage of international student outcomes and therefore, results may not reflect these students' outcomes accurately.

There is an even greater need to collect this information from non-college goers

Though there are challenges to collecting information on UC undergraduates or other college degree earners, there are even less data available on people who did not attend college. College students and alumni are more regularly asked about their state of well-being and personal development than high school graduates or high school non-completers. This is also an area of potential research to consider, especially for states who are broadening their longitudinal data tracking systems.

Causal analysis is the next step in understanding value

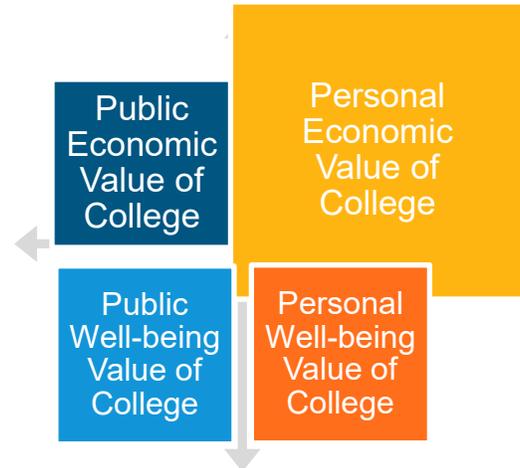
Indicators in this report show that UC and/or college graduates have higher wages, greater psychosocial change, increased development of 21st century skills, enhanced civic engagement or healthier lifestyles; than non-college-degree earners, but this might not necessarily demonstrate the value of a degree. It is crucial to explore if these outcomes would have occurred even without UC or college attendance. Additionally, a college degree can act as a gatekeeper to some of the benefits college-degree earners enjoy: some benefits result from higher earnings and are not directly attributable to increased education. To understand if a UC degree of other college degree plays a role in these outcomes, causal relationships between the UC experience and alumni outcomes must be further explored using statistical techniques (e.g., regression discontinuity, propensity score or coarsened exact matching). UC has found some [causal evidence of the value of a UC degree](#) on personal economic outcomes. However, relationships like these can only be explored after identifying multidimensional data on alumni outcomes.

RECOMMENDATIONS

Higher education leaders have an opportunity to share the value that their institution brings to personal economic, public economic, public well-being, and personal well-being. While this report includes measures of value for a UC degree, it is not an exhaustive list of options to demonstrate value. It means to inspire more research and collection of data in these areas. Metrics highlighted in this report not only help to better tell the story of higher education's impacts, but also are helpful in understanding the areas in which curricula or programs can give more focus. This report invites institutions to be proactive in these pursuits.

Personal Economic Value

The **personal economic quadrant** (top right) encompasses outcomes related to personal financial gain. A typical example of personal economic value is an individual's post-graduation earnings. The value of individual earnings might be assessed through *relative measures*, such as comparing one's previous economic standing before college to economic standing after graduation, otherwise known as economic mobility, or the expected financial gain post-graduation based on tuition invested, also known as a return on investment or rate of return.



Alternatively, *absolute measures* of earnings may be evaluated through buying power, that's the ability of college degree earners to acquire goods and services of personal importance; examples may be the ability to buy a home or to secure non-salaried compensation through employment like health insurance or retirement benefits. The following brief examines the *relative* and *absolute* measures of the personal economic value of a college degree for UC

UC Personal Economic Value Highlights:

- UC bachelor's degree recipients on average, earn about \$67,000 by six years after graduation, more than the median income for all California bachelor's degree recipients.
- UC bachelor's degree recipients that earn a graduate degree earn on average about \$98,000 by eleven years after graduating UC, exceeding the median income for all other graduate degree holders in California.
- Median lifetime earnings for UC alumni are greater than other college degree earners in California.
- On average, a UC graduate breaks even on their educational investment between 4 to 6 years after graduation.
- Most UC Pell grant recipients go on to earn more than their parents within five years of graduation and most UC first-generation students do so within seven years.
- UC graduates are more likely to receive health care and retirement benefits from their employers than UC non-graduates and other similarly aged individuals.
- At least one in four UC graduates (27 percent) owns a home, eight years after graduation, compared to one in seven (14 percent) of similarly aged individuals,

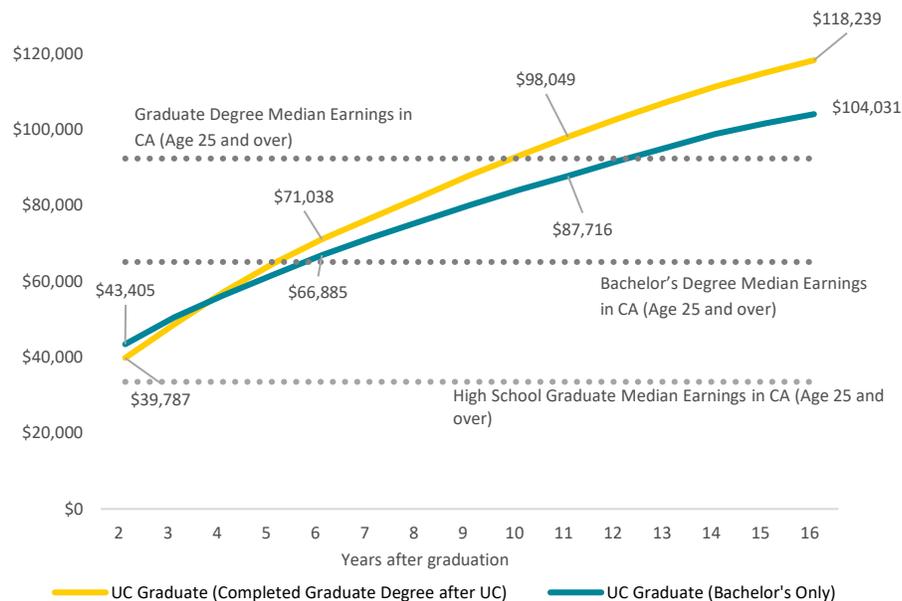
graduates, and investigates, where possible, differences in outcomes for alumni based on institution type, race, gender, and where they started socioeconomically on the economic ladder.

Individual Earnings

UC graduates earn competitive salaries relative to other Californians, and their earning potential increases over time. UC graduates earn about \$43K at two years after graduation, \$88K by ten years after graduation, and \$110K by sixteen years after graduation.

UC graduates earn more than other Californians (age 25 and older) who completed a high school diploma within two years after graduation, more than those who completed a bachelor's degree by six years after graduation, and more than other Californians who completed a graduate degree by ten years after graduation. Figure 1 shows UC graduates earn competitive salaries regardless of whether or not they go on to complete a graduate degree, compared to the median earning of other Californians (aged 25 and older) by education level.

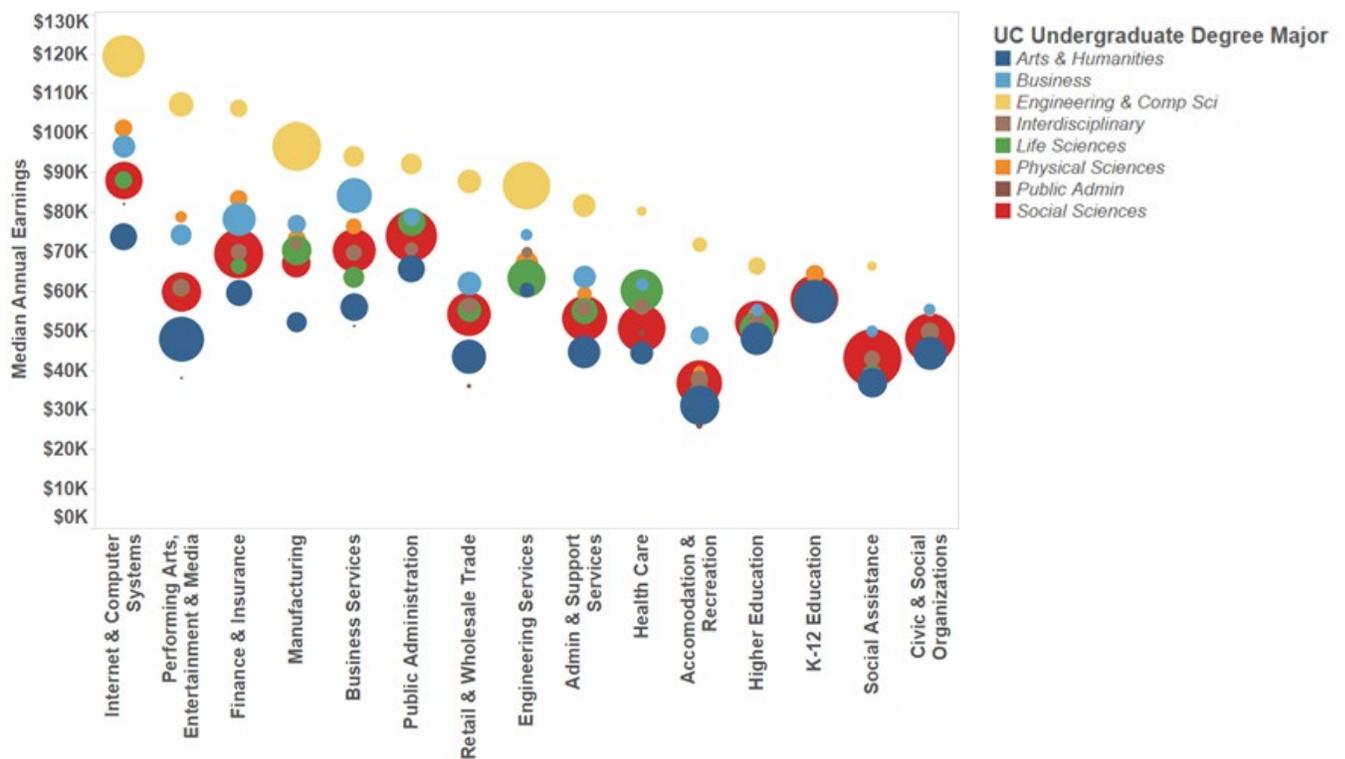
Figure 1. 2019 Median annual earnings of UC graduates by educational attainment, 1999-2017 graduating cohorts



Source: CA Economic Development Department, U.S. Census Bureau, 2019 American Community Survey 5-Year Estimates. CA Median Income (25 and older)

The typical earnings a UC graduate might expect to earn varies by major and industry of work. Figure 2 shows earnings at five years after graduation based on undergraduate major and industry of work. Engineering and computer science majors tend to earn more than other UC alumni, especially Arts & Humanities majors. However, an industry of work also affects earnings. UC alumni working in the Internet and Computer systems industries tend to earn more regardless of undergraduate major. Furthermore, alumni working in K-12 education, social assistance, and civic and social organizations tend to earn less, regardless of undergraduate major.

Figure 2. 2019 Median annual earnings of UC graduates by industry of work for selected majors, five years after graduation, 2000-2014 graduating cohorts



Note: Size of bubble corresponds to percentage of major working within industry.

Source: CA Economic Development Department Data, UC Student Data

Lifetime Earnings

UC graduates' high early-career wages translate into [high lifetime earnings for alumni](#) in the labor market. By their early 50s, UC graduates have median earnings ranging from \$130,000 to

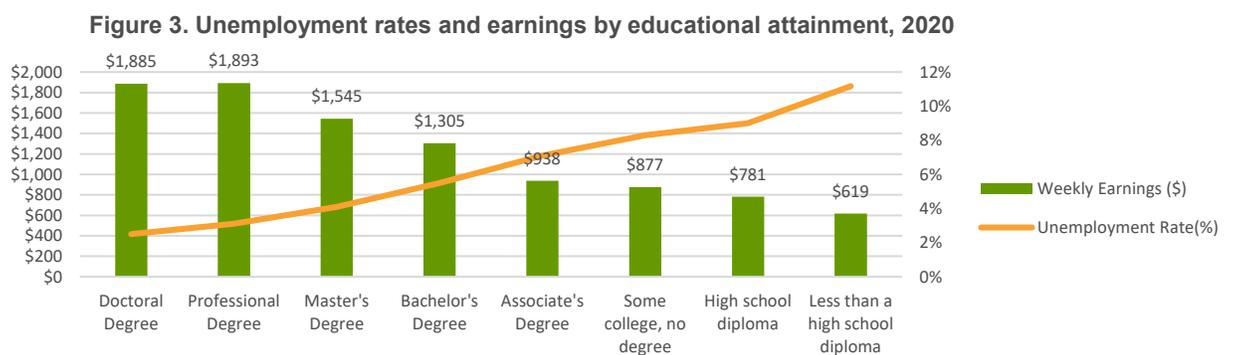
\$150,000, depending on which UC campus they graduated from. These wages substantially exceed the nationwide median earnings of about \$90,000 among Californian college graduates in the same age cohort, as measured by the 2019 American Community Survey. Median wages for alumni of high-earning majors like economics and computer science are even higher, approaching \$200,000 at some campuses. Even UC alumni with degrees in less-remunerative fields like the humanities have considerably higher median wages of about \$100,000, with steady wage growth over the decades of alumni’s working life. These data suggest substantial economic benefits of a UC degree over a lifetime, across the spectrum of majors.^[1]

Earnings by Race and Gender

In addition to undergraduate major and industry of work, demographics may also affect individual earning potential. An [analysis of differences](#) in earnings by race and gender shows UC female, Latinx, and African-American graduates tend to earn less than their male, white and Asian counterparts, even when working in similar industries or graduating with similar majors.² These findings are consistent with other studies³ of college graduates that find evidence of gender and racial pay gaps prevalent in the US workforce.

Economic Mobility

Increased education attainment typically leads to higher earnings and lower levels of unemployment (see figure 3).



Source: U.S. Bureau of Labor Statistics, Current Population Survey. Data are for persons aged 25 and over. Earnings are for full-time wage and salary workers

^[1] Note: Data from 5 UC campuses were available for this analysis: UC Berkeley, UC Irvine, UC Riverside, UC Santa Barbara and UC Santa Cruz.

² University of California. (2018). Is there a gender pay gap among UC graduates?

³Carnevale, A.P., Smith, N., & Gulish, A. (2018). Women can't win.

American Association of University Women. (2017). The simple truth about the gender pay gap.

Simply considering individual earnings post-graduation does not account for prior economic standing. That is, correlating education level with earnings does not address if individuals attending college are more likely to come from well-off families and therefore earn high salaries after graduation because of other factors, such as different social networks. Instead, the personal economic value of a college degree might be best showcased by its ability to facilitate economic mobility, facilitating students from low and middle families to earn high salaries after college.

UC is economically diverse and provides access to students of low, middle, and upper-income backgrounds. UC enrolls a higher than average share of lowest-income students (1st quintile - bottom 20 percent) than other four-year universities and comparable shares of middle and high-income students (see figure 4).

UC students from all income quintiles succeed in earning salaries that surpass their parents, with over 90 percent of the lowest-income students and 50 to 70 percent of middle-income students doing so.

Figure 4. Parental income distribution of entry cohorts

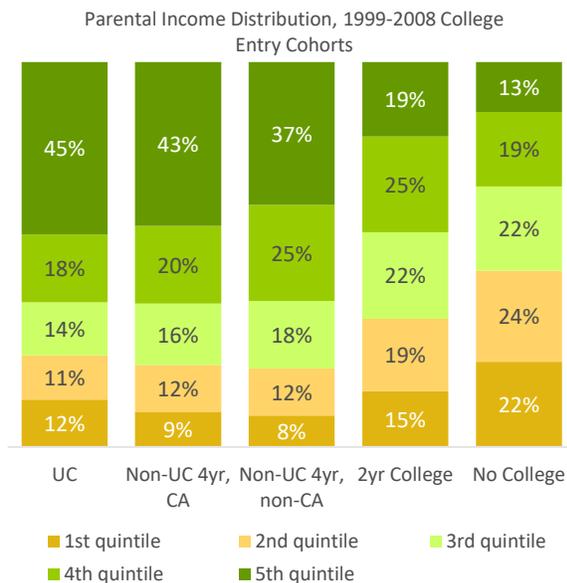
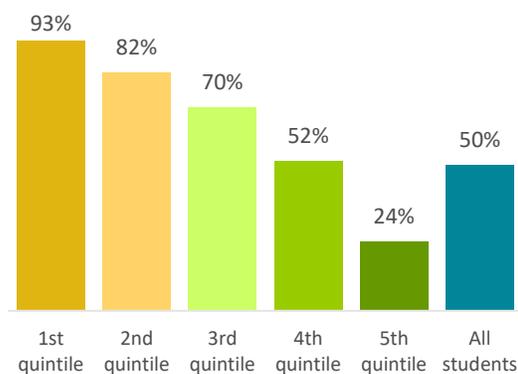


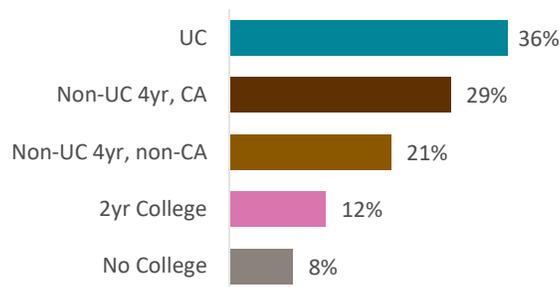
Figure 5. Percentage of UC alumni (who graduated or not) who earn more than their parents, by parental income quintile, 1999-2008 college entry cohorts



Sources: UC Student Data Files, CLIMB Initiative data

In addition, 36 percent of UC's lowest-income students achieve even greater leaps in economic mobility - the percent of UC alumni from the bottom 20 percent of income who move into the top 20 percent of income as adults is higher than other 4-year universities in California and the nation (see figure 6).

Figure 6. Percentage of lowest-income alumni (who graduated or not) moving to the top income quintile by institution type, 1999-2005 college entry cohorts



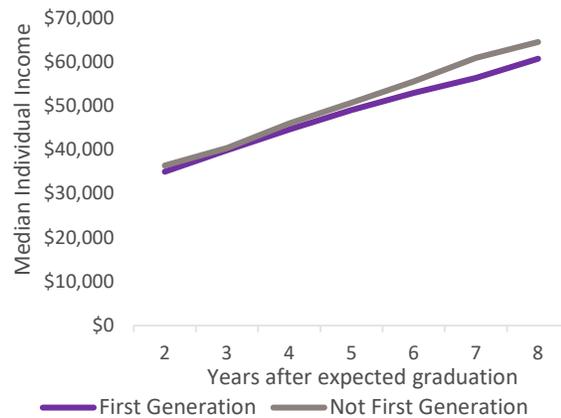
Sources: UC Student Data Files, CLIMB Initiative data

UC low-income and first-generation students have similar post-UC earnings compared to their counterparts (see figures 7 and 8). UC is an equalizer for students who come from the bottom 20 percent of income – they go on to earn as much as students from middle-income families (3rd and 4th quintile). Usually, those earnings double within 10 years of graduation.

Figure 7. Median earnings of UC alumni (who graduated or not) by parental income quintile



Figure 8. Median earnings of UC graduates by parental education and years after graduation



Sources: UC Student Data Files, CLIMB Initiative data

UC first-generation students that complete a degree typically earn about \$50,000, at five years after graduation, which is about the same as a UC graduate who had a parent that graduated from college. However, by eight years after graduation, earnings start to diverge; this may be due to the lower likelihood of first-generation students attending graduate school.

In addition to this analysis, The New York Times has also published a series of articles⁴ leveraging data produced by The Equality of Opportunity Project – a study that sought to determine which colleges contributed most toward helping their students climb the income ladder. The researchers defined economic mobility as graduates moving over time from a lower rung in the income distribution to a higher one. For children born in 1980, if their family was earning \$25,300 or less, that would put them in the bottom one-fifth of the income distribution. At age 34, if the child was earning \$57,700 or more, they would be in the top 20 percent of their peer’s income distribution, indicating upwards mobility.

The researchers defined three critical indicators for each university or college:

- Access: The percentage of students at an institution from the bottom 20 percent
- Success Rate: Out of students from the bottom 20 percent as teenagers, the share who ended up in the top 20 percent as adults
- Mobility Rate: The percentage of all students at an institution who started in the bottom 20 percent and ended up in the top 20 percent (i.e., access × success rate)

The study ranked colleges and universities with the highest upward mobility rates (i.e., from the bottom 20 percent to the top 20 percent). Table 1 shows where UC campuses ranked compared to 2200 other colleges.

Table 1. Rank of UC campuses in college Mobility Report Cards, by mobility rate

Rank		Mobility Rate =	Bottom 20% Access x	Bottom 20% to Top 20% Success Rate
12	Irvine	6.8%	12.2%	55.3%
19	Riverside	6.0%	14.7%	41.0%
24	Los Angeles	5.6%	10.2%	54.6%
39	Berkeley	4.9%	8.8%	55.2%
41	San Diego	4.8%	8.8%	55.1%
53	Davis	4.4%	8.6%	51.8%
151	Santa Barbara	3.1%	6.2%	49.5%
205	Santa Cruz	2.8%	7.4%	37.6%

⁴ Aisch, et al. (2017). Some colleges have more students from the top 1 percent than the bottom 60. Find yours; Leonhardt, D. (2017). America’s great working class colleges

While UC campuses do not make the top ten in mobility rates, most campuses rank in the top 50 and have mobility rates approaching or exceeding five percent and success rates that exceed 50 percent.

In conclusion, data show that UC alumni have higher earnings compared to other similarly educated Californians and experience economic mobility regardless of the socioeconomic status of their parents more often than other four-year institutions. Still, there are associated costs with attending UC. The following section discusses the rate of return for UC alumni based on the expected cost associated with obtaining a UC degree.

Rate of Return

The rising cost of a college degree has pushed many students and their families to think about the financial rate of return for their investment in higher education. The financial rate of return (or simply, “rate of return”) is a commonly used financial metric to estimate the profit of an investment over a specified time period. A higher rate of return indicates greater profits from the investment.

The financial break-even point is another metric to assess personal economic return. The financial break-even point is defined as the time at which profits received equals the costs of the investment. A lower break-even value indicates less time for an investor (i.e., student) to pay off the costs associated with the investment (i.e., cost of attending college).

To evaluate the rate of return, economists use a conceptual framework comprised of two parts; costs and benefits. Within the UC educational context, the cost side might include California resident tuition and fees, books and supplies, and the wages foregone by attending college instead of immediately starting a job after high school. The benefits side would include student financial aid, campus earnings during college years, and expected student earnings after graduation (see table 2).

Table 2. Costs and benefits used in rate of return analysis

Timeline	Cost	Benefits
During college years	<ul style="list-style-type: none"> • Tuition • Books • Wages forgone as a high school graduate 	<ul style="list-style-type: none"> • Financial aid • On-campus earnings
After graduation		<ul style="list-style-type: none"> • Alumni earnings

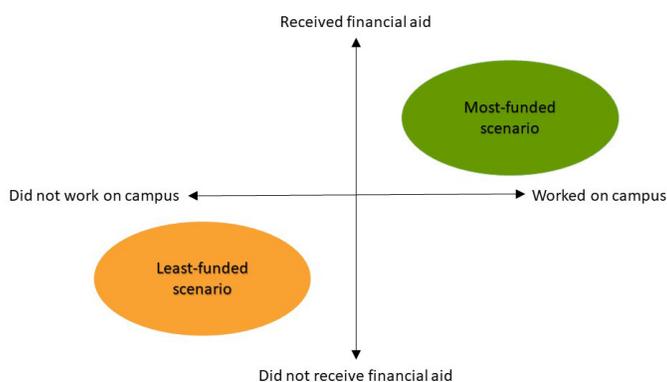
Estimates from this study represent outcomes for a typical UC four-year graduate, which accounts for the majority of UC alumni. However, delays in graduation and graduate school attendance may affect both the rate of return and the break-even point. For example, data show that four year graduates have smaller loan debt, higher earnings and higher cumulative earnings than six year graduates. Table 3 shows these differences in particular for new generation students (first-generation, low-income and/or underrepresented groups).

Table 3 Comparison of student loan debt and earnings for 4- and 6-year UC new generation graduates

	Loan Debt	Earnings 2 years after graduation	Cumulative earnings 16 years after entry
4-year UC graduate	\$ 21,107	\$ 37,000	\$ 640,054
6-year UC graduate	\$ 28,748	\$ 33,948	\$ 422,522

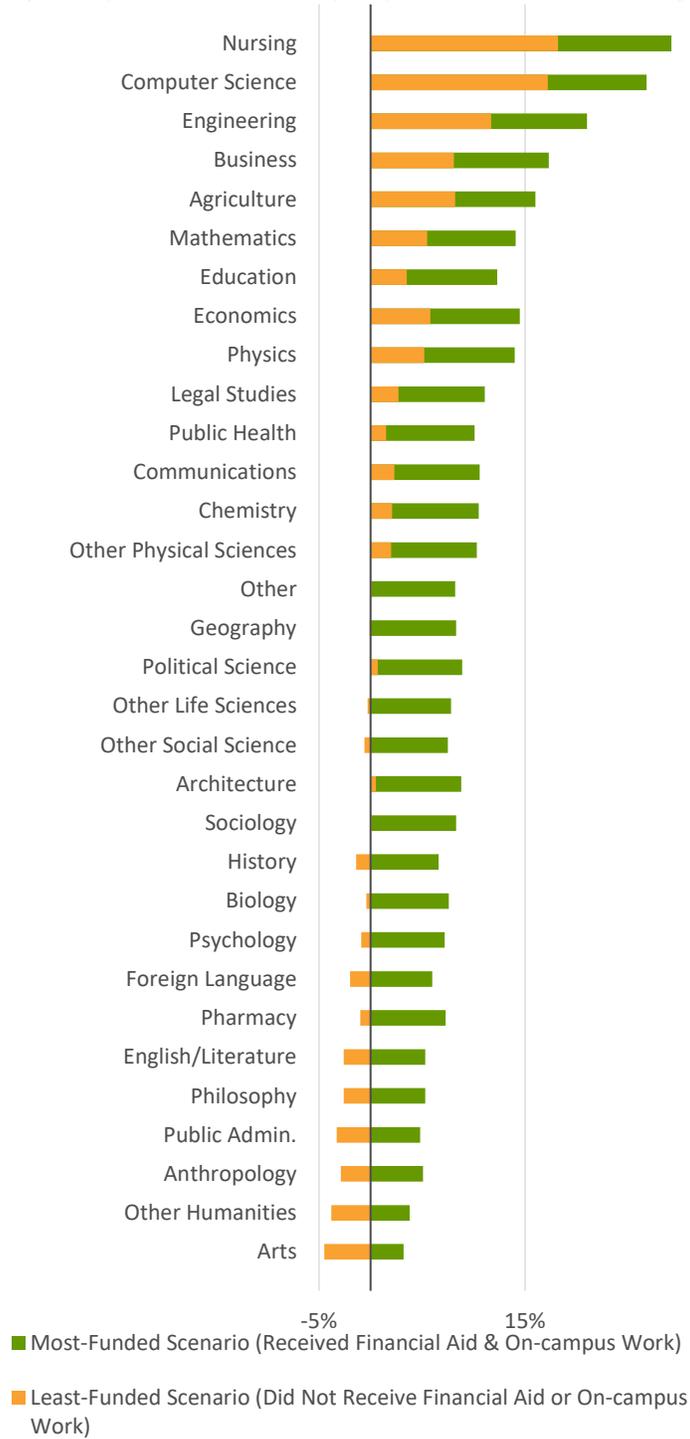
Additional factors can influence the rate of return or break-even estimates, such as the academic major and financial status of the student. Major along with two financial status scenarios are considered in the following analysis. Thus, the “most-funded” scenario in this analysis defined as students receiving financial aid as well as on-campus employment earnings. Conversely, the “least-funded” scenario assumes no student financial aid and no on-campus employment.

Figure 9. Financial Scenarios



Therefore, an estimate for an average rate of return would be somewhere between the most-funded and least-funded scenarios. Findings show that under the most-funded scenario, the five-year rate of return after graduation for UC graduates is between 2.2 percent and 10.6 percent. The return is highly associated with academic majors/disciplines (Figure 10).

Figure 10. The average five-year rate of return by major (2005, 2008, and 2010 graduating cohorts)



Source: UC Student data, California Employment Development Department Data

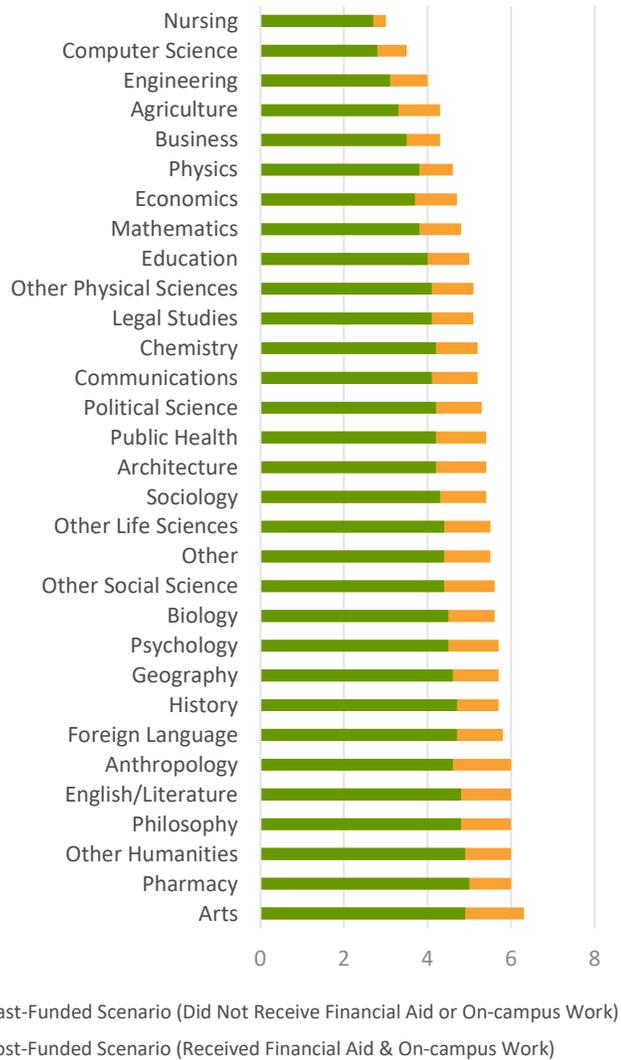
Engineering, Computer Science, and Nursing have a higher rate of return at five years after graduation. On the other hand, Arts, Anthropology, and Philosophy are among the list of academic majors with the lowest returns. Conversely, students who graduate from UC under the least funded scenario may have slightly negative returns by five years after graduation depending on their major. However, these returns become positive by ten years after graduation.

Regardless of the academic major, UC graduates break even on their educational investment between four to six years after graduation. Figure 11 shows alumni with the most-funded scenario reached the financial break-even point sooner as compared to UC alumni under the least-funded scenario.

Analyzing the costs of and returns on college education in financial terms is complicated. The above analyses simplify the costs and returns associated with a college degree using averages. Other factors that can affect the rate of return and breakeven point estimates for UC alumni are student debt and the economy. Two of these variables, such as [estimated student debt payments after graduating from UC](#), could be included in the next iteration of the study.

Nevertheless, this initial analysis gives a general estimate of the expected rate of return and breakeven points for a student entering the University of California system.

Figure 11. The financial break-even point on a UC Degree by academic major (2005, 2008, and 2010 graduating cohorts)



Non-Salary Compensation & Purchasing Power

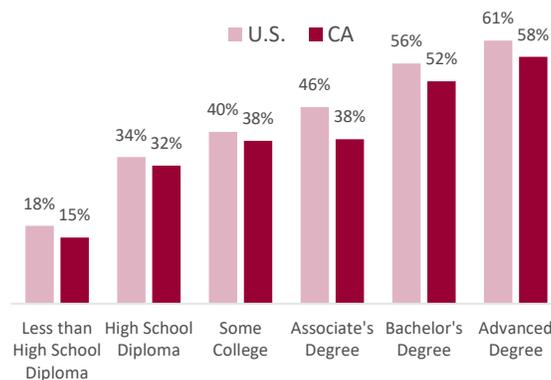
In addition to individual earnings, employed individuals have access to additional financial benefits such as employer-subsidized healthcare and retirement contributions. The next section summarizes the non-salary compensation UC alumni receive compared to national data.

Non-Salary Compensation

Non-salary compensation in the form of benefits such as health insurance, tuition reimbursement, sick leave, and/or retirement benefits can represent a significant share of total work compensation. These benefits can also provide valuable context to earnings in assessing the quality of employment outcomes.

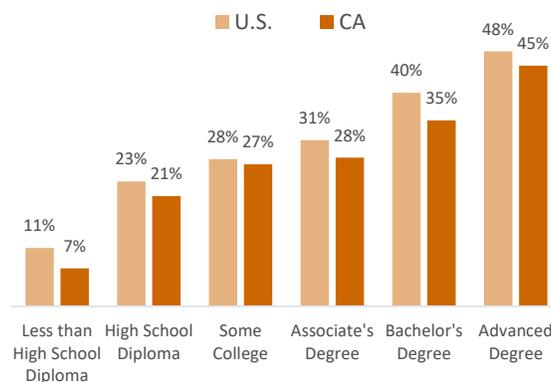
National data suggest as the education level increases, so does the likelihood of receiving employer-supported health insurance and retirement. (see figures 12 and 13).

Figure 12. Health Insurance through employment by educational attainment: US vs. California, 2015



Source: 2016 Social and Economic Supplement of the Current Population Survey, ages 25-39, not enrolled in college in 2015. Responses to if the respondent was a policyholder for group health insurance that was related to current or past employment during the previous calendar year.

Figure 13. Retirement plan through employment, by educational attainment: US vs. California, 2015



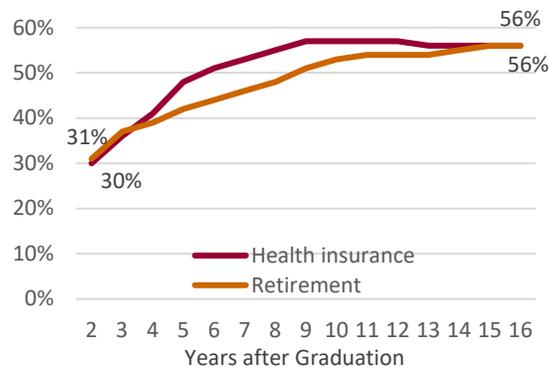
Source: 2016 Social and Economic Supplement of the Current Population Survey, ages 25-39, not enrolled in college and worked in 2015. Responses to working during the preceding calendar year whether the respondent's union or

employer for his or her longest job during the preceding calendar year had a pension or other retirement plan (not including Social Security) for any of the employees, and, if so, whether the respondent was included in the plan.

For UC graduates, the likelihood of receiving such non-salary compensation is higher or at least comparable to other bachelor degree holders in the U.S. and California (see Figure 14). More recent graduates are less likely to receive health insurance and retirement benefits from employer, only about 30 and 31 percent respectively for two years after graduation, but r about sixteen years of graduation, 56 percent of UC graduates had health insurance and retirement contributions from their employers (compared to 52 percent and 35 percent of California bachelor’s degree holders, respectively).

UC graduates have a greater opportunity to assume health care and retirement benefits than UC non-graduates. Figure 15 compares the percentage of UC graduates⁵ who had health insurance and retirement contributions from their employer in 2015 with UC non-graduates and that of the same birth cohorts in the United States.

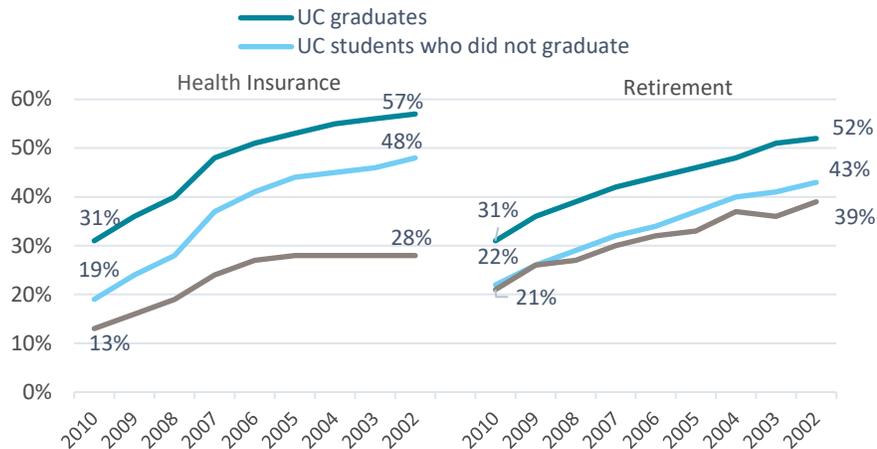
Figure 14. Percentage of UC graduates with employer-supported non-salary compensation by years after graduation, 2015



Source: CLIMB Initiative data

⁵ This data includes entering cohorts. An average of 5 years to graduate to estimate the years after graduation.

Figure 15. Percentage of alumni with employer-supported health insurance and retirement contributions, 2015, by years after graduation, 2002- 2010 college entry cohorts



Source: CLIMB Initiative data

UC alumni who complete degrees are more likely to receive health and retirement benefits from their employer than UC non-graduates. The percentage of UC bachelor’s recipients receiving non-salary compensations is around 8-12 percentage points higher than that of those without a UC bachelor’s degree. Compared to people of the same age in the U.S., those who attended UC are more likely to receive both types of non-salary compensation, especially health insurance.

In financial terms, UC graduates may expect \$2600 in additional non-salary compensation for health insurance per year, the typical employer health insurance contribution for college graduates in California.

UC Pell and first-generation graduates are slightly more likely to have health insurance contributions from their employers than non-Pell and non-first-generation alumni who did not earn a degree from UC. By eight years after graduation, about 50 percent of Pell and first-generation graduates received retirement benefits from work, which is also higher than the California rate of 35 percent for bachelor’s degree holders.

In conclusion, UC alumni are likely to receive non-salary compensation benefits through health insurance contributions and may be more likely to receive retirement benefits through their employers than other California bachelor’s degree holders. The financial impact of these additional compensations contributes to an even greater personal economic value of the UC degree than earnings alone.

Buying Power

In generations past, the idea of achieving the American Dream equates to pulling up one's bootstraps and rising from low-income circumstances into a middle-class existence. An established presence in the middle class historically meant having enough purchasing power to own a home and car. The following section discusses national trends in home ownership and uses evidence from UC alumni IRS tax returns to determine if UC alumni are achieving this version of the American Dream.

Homeownership

Homeownership bestows significant benefits, both personal and public. Personal benefits include growth in financial equity and personal wealth; greater predictability in housing costs than renting; tax benefits from mortgage interest and property tax deductions; and residential stability. In addition, there are public economic benefits of homeownership, including contributions to the local tax base, civic engagement, and increased educational attainment for children of homeowners. Data indicate that both nationally and in California, adults aged 25 to 40 who have a college degree own homes at greater rates than individuals in that age range who do not have a college degree (see table 3). Moreover, Californians are less likely to own homes than the greater U.S. Population.

Table 3. Homeownership rates by educational attainment

Education level	Homeownership Rate	
	California	U.S.
No Bachelor's Degree	37%	48%
Bachelor's Degree or higher	46%	60%
Overall	40%	52%

Source: Current Population Survey, 2015.

To assess if UC alumni are able to purchase homes, a proxy for homeownership (claimed mortgage interest deduction on federal taxes) from a new data source⁶ was utilized. Data from this analysis shows that UC graduates are almost twice as likely to own homes as all similarly aged individuals nationally. For example, UC graduates from the entering cohort of 2002 had a homeownership rate of 27 percent in 2015 (eight years after expected graduation) compared to a rate of 14 percent for all similarly aged individuals nationally.

⁶ Opportunity Insights. (2019). The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative.

Data also show that homeownership rates rise with degree completion and time after college graduation. UC graduates are more likely to be homeowners than UC non-graduates (see figure 16). In 2015, 19 percent of UC graduates owned homes at eight years after graduation, and by sixteen years after graduation 53 percent of UC graduates owned homes (see figure 17). Homeownership rates also vary by race and ethnicity.

Figure 16. 2015 UC alumni homeownership rates by completion status

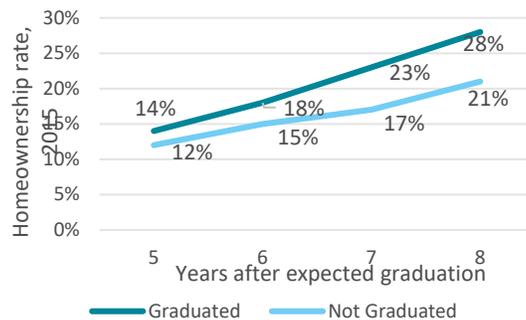


Figure 17. 2015 UC alumni homeownership rates by years after graduation, 2000-2008 graduating cohorts

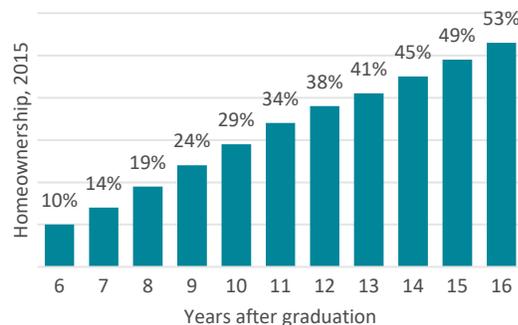
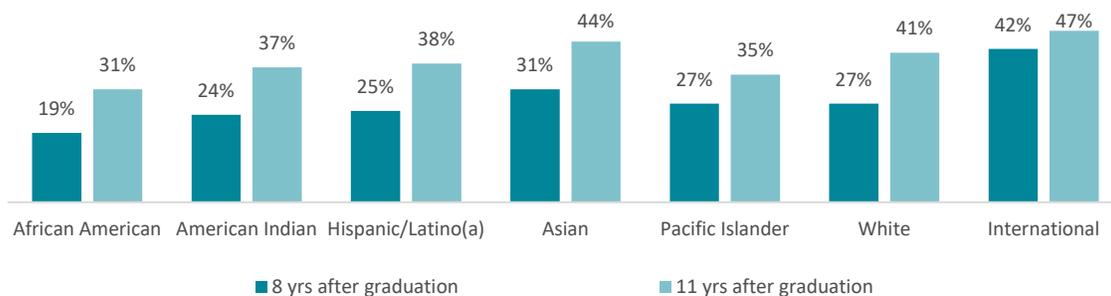
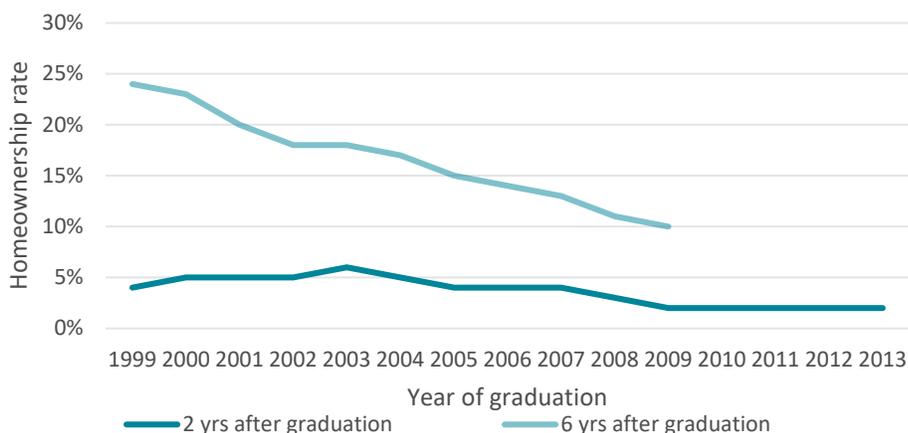


Figure 18. 2015 UC homeownership rates by race/ethnicity



Source: CLIMB Initiative data

Figure 19. UC Homeownership rates at two and six years after graduation, 1999-2013 graduating cohorts



Source: CLIMB Initiative data

For example, at eleven years after graduation from UC, 31 percent of UC African American graduates, 38 percent of UC Hispanics/Latinx graduates, 41 percent of UC White graduates, and 44 percent of UC Asian American graduates own homes (see figure 18).

Finally, it is of note that homeownership rates declined between 2005 and 2017 both in the U.S.⁷ and amongst UC graduates. For example, 24 percent of 1999 UC graduates owned a home in 2005 (at six years after graduating), while only 10 percent of 2009 UC graduates owned a home in 2015 (see figure 19).

Conclusion

In conclusion, UC bachelor's degree recipients can expect personal economic benefits. UC graduates earn competitive salaries compared to other California college degree earners. UC graduates are likely to achieve economic mobility, regardless of parental income. Furthermore, most UC graduates are likely to receive a positive rate of return on their investment in their education within 4 to 6 years after graduation.

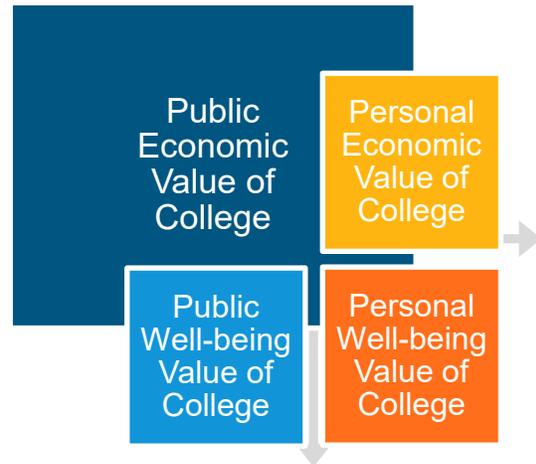
UC graduates are also just as likely as other college degree earners to receive non-salary compensation like health insurance and may be more likely to receive retirement plan options through their employers. While homeownership rates are on the decline nationally, UC graduates are more likely than non-graduates to purchase a home.

The personal economic benefits of earning a college degree and, more specifically, a UC degree are generally positive and show evidence attending UC is a good investment.

⁷ U.S. Census Bureau (2019). Quarterly residential vacancies and homeownership, First quarter 2019.

Public Economic Value

The **public economic quadrant** represents financial outcomes related to the public good. The contribution of college graduates may be measured through tax revenues, consumer spending, increased productivity, entrepreneurship, job creation, and fulfilling workforce needs. Together these aspects contribute to the local, state, or federal economy.



Additionally, the value may be measured in the *reduction of costs* to the local, state, or federal government for lower utilization of social assistance programs (such as Medicaid, SNAP, or

UC Public Economic Value Highlights:

- UC alumni contribute about \$15,500 more per year to the GDP than alumni of other four-year California institutions.
- By fifteen years after graduation, UC graduates are contributing on average \$30K in federal taxes and \$7.6K in state taxes per year, twice as much as the average Californian.
- UC alumni from the graduating classes of 1999 to 2009 contribute about \$3.7B in federal taxes and more than half of a billion in state taxes, in one year.
- 2,500 California companies were founded or co-founded by UC alumni, compared to 2,240 for Stanford, 840 for University of Southern California and 1,300 for California State University (CSU) alumni.
- 4,900 UC alumni hold C-suite positions (i.e., senior leadership positions like chief executive or financial officers), and 3,350 are located in California.
- One in five of all UC's bachelor's degree recipients from the graduating classes of 1999 to 2005 owned a small business in 2015 —roughly when they were in their mid to late 30s.
- UC research-based education spurs economic growth and increase efficiencies, alumni start companies like Lyft, Indiegogo, Fulcrum Bioenergy and Quantumscape.

housing assistance), reductions in incarceration, or reduced labor costs through donated volunteer hours. The following section examines the contributions to the economy and reduction in costs to the government for UC and colleges graduates at large.

Contributions to the Economy

A 2021 report by Beacon Economics⁸ estimated that the University of California generates about \$82 billion in economic activity for the state per year, compared with \$17 billion generated by the California State University system. The University of California is the third-largest employer in the state, an employer of 1 out of 45 jobs. The report focuses on three types of UC-related spending: (1) operational, such as employee compensation, (2) construction, and (3) non-tuition-related spending of students. Through this spending, UC purchases goods and services to support its teaching, research, and public service mission (a direct effect) as well as spending ripple effects in which UC suppliers increase their business-to-business spending (an indirect effect), along with the household spending of UC employees and retirees and suppliers' employees (induced effects). UC's total economic impact is the sum of these direct, indirect, and induced effects. However, the report did not consider the contribution of UC alumni to the Gross Domestic Product (GDP).

While a per capita analysis of alumni to the GDP is not possible given available data, an estimate of some of the components is possible. GDP is given by the equation:

$$\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government spending}$$

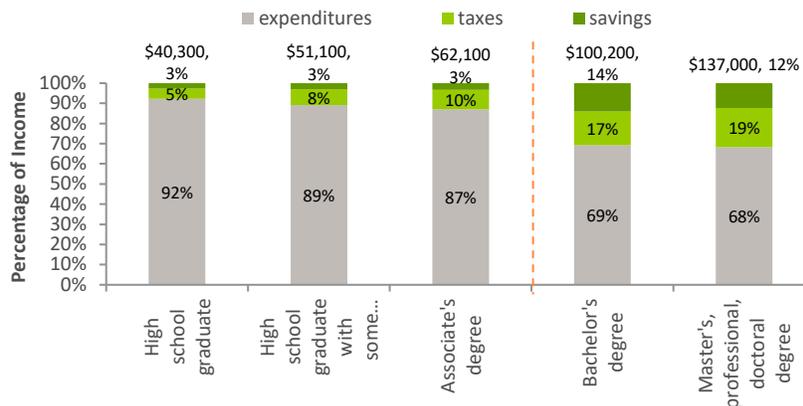
To estimate an individual's contribution to GDP, consumption can be replaced by personal spending, investments by personal savings, and government spending by taxes paid by the individual.

$$\text{GDP}_{\text{Individual}} = \text{Spending} + \text{Savings} + \text{Taxes}$$

The proportion of income that goes to taxes, spending (expenditures), and savings varies by education level and income. As income and education increase, the proportion of household income that goes to taxes and savings increases, and the proportion towards personal spending decreases.

⁸ Beacon Economics. (2021) The University of California Systemwide Economic, Fiscal, and Social Impact Analysis

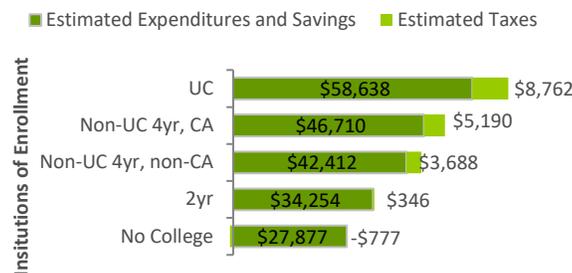
Figure 20. Expenditures, savings and taxes by education level



Bachelor's degree earners contribute about 17 percent of their incomes to taxes (see figure 20). In contrast, high school graduates contribute about 8 percent to local, state, and federal taxes.⁹ It is not clear if the different proportions of income devoted to expenditures and savings is due to education or income level, more research is needed in this area. However, it may be assumed that the proportion of income that goes to taxes is based mainly on income.

Using the proportion of taxes paid by income level¹⁰ and the median income of alumni from different institution types¹¹, figure 21 shows estimates of individual contribution to taxes, savings, and spending for students for alumni from different institution types. Using these proportions, students who attended UC would contribute about \$8,700 per year in taxes at fifteen years after entry compared to \$5,200 for students who attended another four-year institution in California and \$346 per year for those who attended a two-year college.

Figure 21. GDP and tax contribution estimates based on income and institution type, fifteen years after entry



⁹ Survey of Consumer Expenditures. (2016). Average expenditure, share, and standard error tables.

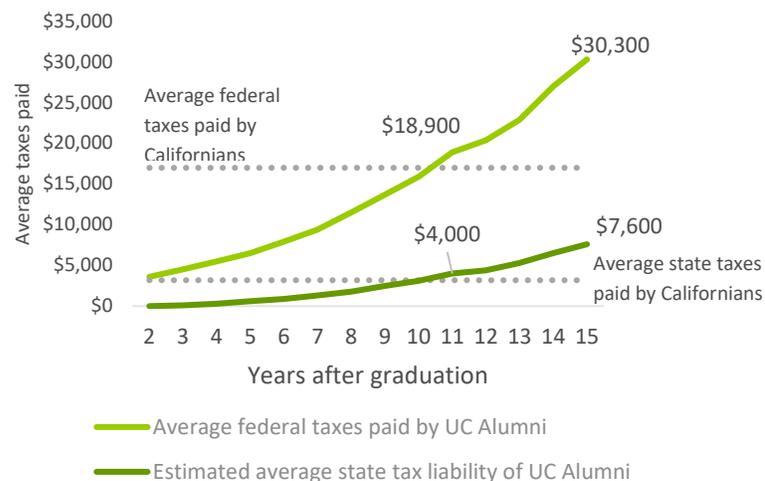
¹⁰ Consumer Expenditures Public Use Microdata

¹¹ Source: Collegiate Leaders in Increasing Mobility (CLIMB) Initiative

Because UC alumni earn more, the estimated GDP contribution (spending, savings, and taxes) for a student who attends UC is \$67,500 per year compared to \$52,000 per year for a student who attended another 4 year California institution or about \$34,000 for a student who attended a community college.¹²

Extending the analysis of tax contribution, students who graduate from UC contribute, even more, IRS data show the median taxes paid by UC graduates is \$13,200 in federal taxes and \$3,400 in State taxes per year¹³ by fifteen years after graduation. To put these tax contributions in perspective, the average tax (instead of median) contributions of UC graduates are compared to the average tax contributions of other Californians. Figure 22 shows that by 11 years after graduation, UC graduates contribute more in state average (\$3,183) and federal average (\$16,992) in taxes than the average Californian and contribute double that amount by fifteen years after graduation. Cumulative taxes paid in 2015 show that UC alumni from the graduating classes of 1999 to 2009 contributed about \$3.7B in federal taxes and more than half of a billion in state taxes in one year.

Figure 22. Actual federal and estimated state taxes paid by UC graduates with CA averages, by years after graduation



Source: CLIMB Initiative Data

¹² GDP estimates do not incorporate whether a student graduated, and therefore underestimate GDP contributions for college graduates.

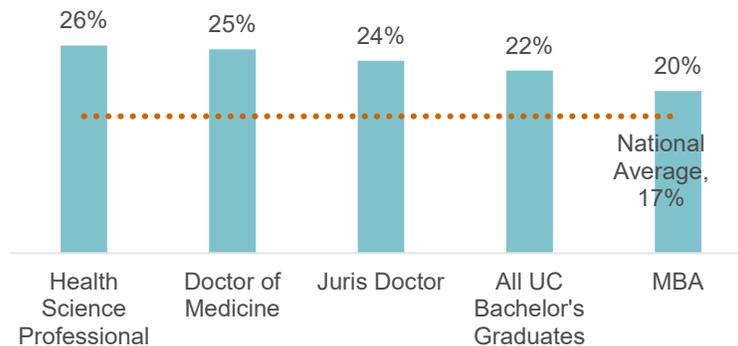
¹³ Source: Collegiate Leaders in Increasing Mobility (CLIMB) Initiative

Entrepreneurship and Job Creation

In 2012, over 22 million Americans, or 9 percent of the adult U.S. population, were business owners. Educational attainment isn't a barrier to business ownership, as over half of all business owners do not have a bachelor's degree or higher. However, educational attainment appears to play more of a role in the ability of business owners to employ others¹⁴ 31 percent of the population 25 and older had a bachelor's degree or higher¹⁵, but more than 50 percent of all business owners with paid employees have at least a bachelor's degree.

Federal tax data provides evidence of the role UC alumni play in the creation and ownership of small businesses. Tracking the filing of federal Schedule C tax returns (the profit or loss from a sole proprietorship) provides an estimate of small business ownership. In 2015, about 17 percent of all federal tax filers nationwide filed a Schedule C return. Data from UCOP's CLIMB partnership shows that in 2015 more than 22 percent (about 1 in 5) of all UC's bachelor's degree recipients from the graduating classes of 1999 to 2005 owned a small business as measured by Schedule C filings—roughly when they were in their mid to late 30s (see figure 23).

Figure 23. Proportion of UC bachelor's degree recipients reporting small business ownership in 2015 by type of graduate degree obtained, 1999-2005 graduating cohorts



Source: CLIMB data

UC alumni businesses also attract investors. In 2018, PitchBook ranked the top 50 universities producing venture-capital (VC) backed undergraduate alumni entrepreneurs. The seven from California included five UC campuses (Berkeley, UCLA, San Diego, Santa Barbara, and Davis),

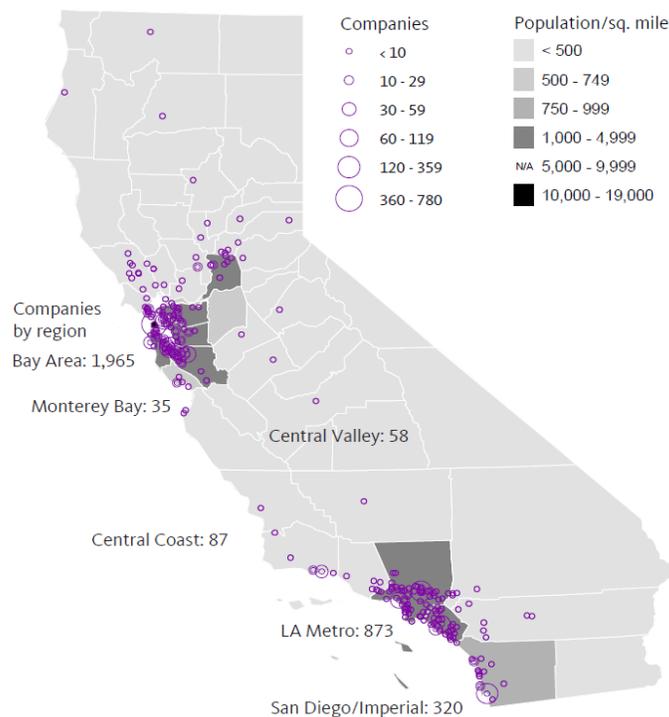
¹⁴ 2012 Survey of Business Owners (Note: survey does not give data with regards to the age of the sample, a comparison in educational attainment between business owners and the general population was not done.)

¹⁵ U.S. Census Bureau (2012). Current Population Survey, 2012 Annual Social and Economic Supplement.

along with Stanford and USC.

In addition, PitchBook reported that as of 2021, there were 2,500 California companies founded or co-founded by UC alumni across California (see figure 24), compared to 2,240 for Stanford, 840 for USC, and 1,300 for California State University (CSU) alumni.

Figure 24. Companies founded by UC alumni by geographic region in California



Source: PitchBook

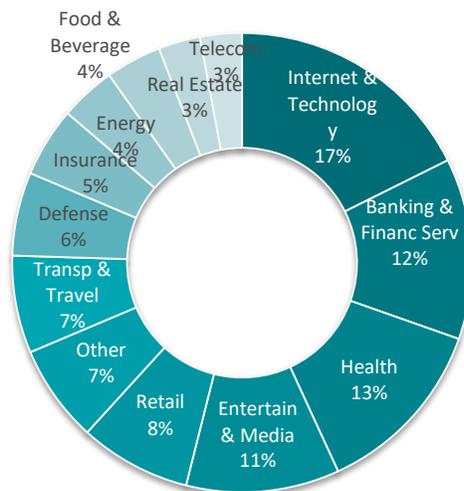
In early 2018, Crunchbase News identified CEOs of U.S. companies that have raised at least \$100 million in total venture financing in the last three years, revealed that 44 of those CEOs had attended UC Berkeley and 27 CEOs attended UCLA.¹⁶

In addition to founding companies, UC graduates obtain executive-level positions in some of the nation's largest corporations. The term "C-Suite" describes the most senior positions within a corporation (e.g., chief financial officer, chief executive officer). Pitchbook data show that 4,900 UC alumni hold C-suite positions (i.e., senior leadership positions like chief executive or

¹⁶ Glasner, J. (2018). These schools graduate the most funded startup CEOs.

financial officers), and 3,350 are located in California. Currently, 102 UC alumni hold a C-Suite level position at one of the top 500 largest revenue-generating corporations¹⁷. Seventeen percent work in the internet and technology sector, while 12 percent work in banking and financial services (see figure 25).

Figure 25. UC Alumni Classified as C-Suite Executives by Sector



Source: Derived from data queried from the Leadership Directory on UC alumni in C-Suite roles.

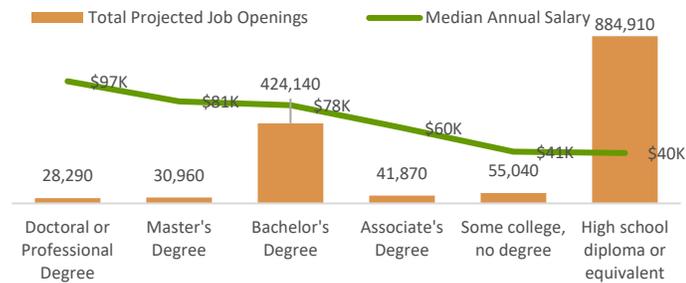
Fulfilling State Workforce Needs

Aside from job creation and entrepreneurship UC alumni help fulfill workforce needs by joining California's workforce. In 2018-19, UC contributed about 57,000 bachelor's degree recipients, 14,000 master's degrees, and 4,100 doctoral degrees to the workforce, representing 26 percent, 16 percent, and 47 percent of degrees conferred in California, respectively.

Figure 26 shows EDD short-term employment historic projections estimated about 424,000 job openings in California would require a bachelor's degree by 2019. While there were more predicted openings for high school graduates, the estimated annual earnings are much higher for occupations that require a bachelor's degree or higher.

¹⁷ The Leadership Directory

Figure 26. Projected Occupations by Entry Education Level, California (2019)



Source: CA Employment Development Department

Reductions in Cost

Incarceration

Research shows an association between increased educational attainment, lower rates of incarceration, and lower utilization of social assistance programs. A 2005 report from UC Berkeley’s Survey Research Center estimated that even some college cuts the probability of incarceration in half. Furthermore, the likelihood of incarceration decreases by 85 percent for those with a college degree.

Given the high—and increasing—costs of incarcerating individuals, even small decreases in incarceration can yield considerable savings in public expenditures. The California Legislative Analyst’s Office estimated the 2016-17 cost per inmate at over \$70,000.¹⁸ Given average lengths of incarceration, this equates to an average cost of more than \$200,000 per individual. Between 2010 and 2015, California incarceration spending had increased¹⁹ approximately 6.2 percent annually. In contrast, there was virtually no change in the total UC cost of attendance for CA resident undergraduates.

Public Assistance

Adults with a college degree or some college education rely less on public assistance programs, such as Medicaid, housing assistance, foods stamps, than adults with only a high school diploma or less. According to a report by The College Board, 47 percent of adults with less than

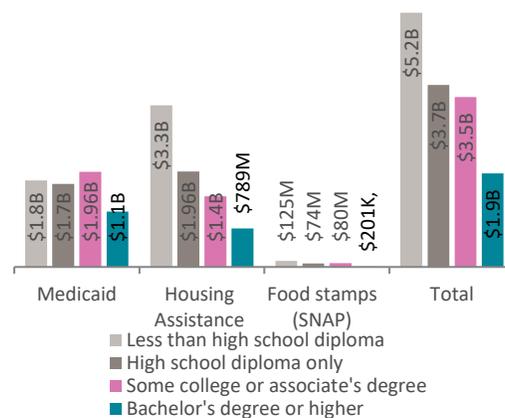
¹⁸ California Legislative Analyst’s Office. (2017). California’s annual cost to incarcerate an inmate in prison.

¹⁹ Calculated based on increases in incarceration costs (Mai & Subramanian, 2015)

a high school diploma live in households that rely on Medicaid, while only 12 percent of adults with a college degree or higher live in households that rely on Medicaid.²⁰

The difference in reliance on public assistance between high school graduates and college graduates holds true for other government-funded social programs, including housing assistance and food stamps. The public economic value of a college degree in terms of reliance on public assistance programs is in the billions of dollars and amounts to an enormous return on investment for taxpayers and the state.

Figure 27. Estimated costs in California for administration of public assistance programs by level of education



Source: Estimates from Education pays 2016: The benefits of higher education for individuals and society;

Figure 27 estimates the costs of public assistance in California for residents age 25 to 54 by the level of education. For example, the total cost of public assistance (from Medicaid, housing assistance, and food stamps) for recipients with only a high school diploma only is \$3.7 billion, while those with a college degree cost the state \$1.9 billion. The difference in savings amounts to \$1.8 billion. This difference is not due to larger percentages of the population without college degrees; 32 percent of California's population age 25-64 has at least a bachelor's degree, and only 20 percent have a high school diploma only.

In 2016, approximately \$1.7 billion was spent on Medicaid recipients with a high school diploma, which is \$800 million more than recipients with a college degree or higher. In comparison,

²⁰ Ma, J., Pender, M., & Welch, M. (2016). Education pays 2016: The benefits of higher education for individuals and society.

housing assistance recipients with only a high school diploma received \$1.9 billion in assistance, while recipients with a college degree received \$790 million. Furthermore, in 2017 food stamp recipients with a high school diploma received \$73 million in benefits while food stamp recipients with a college degree or higher received \$201,000.

Volunteer Labor

In the 2016 UC Undergraduate Experience Survey, over 89 percent of the respondents indicated that participation in community-focused activities at the campus influenced their desire to continue community-focused activities after their graduation. Using data from the Current Population Survey, the Lumina Foundation found that those who volunteer spend about the same number of hours a year volunteering (122 hours) regardless of educational attainment. On the other hand, the percentage of people who volunteer increases with education.²¹ Incorporating both the likelihood to volunteer and the average volunteer hours, people with bachelor's degrees volunteer an average of about 46.5 hours a year, while those with graduate degrees volunteer 59.5 hours a year.

From this data, we estimate for the UC graduating classes of 2000 to 2010 that the 437,000 alumni are responsible for about 22.3 million volunteer hours annually, or the equivalent of 11,200 full-time workers. If we extend this methodology to all 2 million UC alumni, the number of volunteered hours equates to 50,000 full-time workers.

Improved Efficiencies and Productivity

College graduates can benefit the economy around them. One framework from Lundvall is that higher education graduates act as both *innovators* and *equilibrators*.²² Innovators bring new ideas into a marketplace, and the effect has been shown most clearly for engineering graduates. Whereas, one could also think about management and social science graduates as equilibrators, those who can adapt and promote the use of techniques more widely to encourage economic growth.

Historically UC alumni have contributed as equilibrators, for example, William Vere Cruess, chair of the Division of Fruit Products at UC Berkeley and inventor of the fruit cocktail, established the technology of fruit dehydration and pioneered the uses of fruits in juices, syrups, and canned products. These innovations greatly expanded the market for these products and created value out of the fruit that would previously have been wasted and creating numerous jobs in the picking and packing industries. On the equilibration side, UC runs a network of over

²¹ Trostel, P. (2015). It's not just the money: The benefits of college education to individuals and to society.

²² Lundvall, B. (2008). Higher education, innovation, and economic development.

100 highly trained cooperative extension specialists that train farmers across the state of California in best practices coming out of cutting-edge research for pest management, crop yield, water usage, and more.

UC alumni also start companies that advance California's agriculture industry, including:

- Farmland LP (UCSD) – an investment fund advancing large-scale sustainable agriculture instead of commercial agriculture
- Farm Sense (UCR) – a smart insect monitoring system that improves crop yields
- Verdical (UCSC) – an indoor system to grow greens and herbs for homes and restaurants
- Henlight (UCD) – a solar-powered lighting system for pasture-raised poultry
- Planting Justice (UCSC) – an edible garden program that employs formerly incarcerated individuals to provide low-income families access to fresh food
- UAV-IQ Precision Agriculture (UCLA) – an AgTech company that leverages drones and other technology to help growers make farming more sustainable

In addition to these increased efficiencies from UC alumni produce products through companies such as

- Quantumscape, a manufacturer of vehicle batteries with high energy and power densities and a higher life cycle than standard lithium-ion batteries
- Fulcrum Bioenergy, a provider of facilities to convert municipal solid waste products into renewable transportation fuels intended to reduce reliance on imported oil
- Auris Surgical robotics, a developer of robotic microsurgical devices designed for surgical applications that require very fine movements, improving healthcare for all patients who need medical intervention.

UC alumni also innovate through technology to create businesses that forge new markets (and new opportunities for all), save the planet in style, and connect people in new ways:

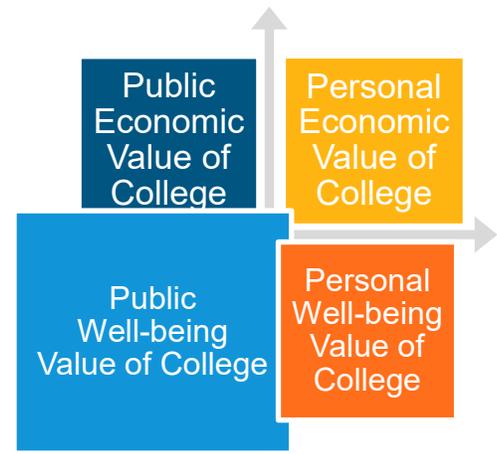
- Lyft (UCSB) – on-demand transportation company in 644 US and 12 Canadian cities
- Doordash (UCB) – on-demand food delivery service that started in Palo Alto and is now nationwide
- Lime (UCB) – an electric scooter/bike rental company in more than 120 cities and 30 countries
- Wooded (UCD) – sustainable wooden sunglasses
- Allbirds (UCB) – comfortable shoes made with natural materials

- Nextdoor (UCB) – a social network service for neighborhoods to exchange information, goods, and services that was founded in San Francisco and now operates worldwide

Public Well-Being Value

The **Public Well-being** quadrant represents outcomes related to the public good, defined primarily in non-financial terms. UC alumni may contribute to the public good through working in a profession or industry that contributes to the well-being of others, such as social work, education, or healthcare. Contributions to the public good may also come in civic engagement like serving as a public official, voting or volunteering, or conducting research to address California’s challenges.

UC alumni make advances in medicine, agriculture, and disaster preparedness—through the use of technology and research. UC alumni involvement in all of these areas leads to greater quality of life and well-being for local communities and the state of California.



To assess the impact of UC alumni on public well-being, IRAP has enlisted several data sources, such as LinkedIn data (for alumni occupations and volunteering), California

UC Public Well-being Value Highlights:

- 28,000 UC-educated teachers serve in 3 out of 4 of California’s public K-12 schools.
- UC-trained doctors provide care in 60 percent of California towns.
- One in two California state justices and one in three California state-elected officials are UC graduates.
- Over 1,600 UC alumni build infrastructure and preserve the environment in 177 California cities.
- UC Humanities and Social Science alumni are more likely to work in public well-being professions.
- UC underrepresented and female alumni are slightly more likely to work in a public well-being industries.
- 65 percent of UC alumni registered to vote did so, compared to 48 percent of similarly-aged CA registered voters.
- UC alumni are more likely to volunteer for health- related causes, such as American Red Cross, the American Cancer Society, Kaiser Permanente and other medical centers.
- 89 percent of UC seniors reported that community-focused activity on campus influenced them to continue community-focused activities after graduation.

Department of Education (for alumni working as public school teachers), CA Department of State (for alumni voter registrations), and CA Department of Consumer Affairs (for alumni who are licensed doctors, nurses, and mental health professionals). LinkedIn data is helpful to estimate percentages of alumni working in certain professions, as it has coverage rates of about 31 percent of bachelor's degree recipients, which is similar to an alumni survey. Other data sources like the state records can provide the number of registered voters, teachers, and licensed health professionals in California. This brief shares the findings using these sources to dates that demonstrate the public well-being benefits of a UC degree.

Public-Serving Professions

"We would lose a tremendous amount of society if each individual sets as his or her life goal maximizing lifetime income."

-Ma, J., Pender, M., & Welch, M. (2016)

From Education pays: The benefits of higher education for individuals and society.

It is essential that UC alumni earn incomes that are sufficient for supporting themselves or family. However, 91 percent of UC undergraduates said preparation for a fulfilling career was an important factor in deciding their major, compared to 64 percent who said leading to a high-paying job was important.²³ Many UC alumni go on to work that supports the public good, and employment data from the CA employment development department and LinkedIn on UC alumni bear this out.

While there may be some debate about which professions serve public well-being, the following professions are categorized as in service to public well-being for the purposes of this paper: teachers and principals, doctors and nurses and other health professionals, tutors, advisors and counselors, education support professionals, mental health professionals, community care and safety professionals, coaches, activities & physical education professionals, architects and civil engineers, epidemiologists, environmental experts, public officials, dentists, and veterinarians.

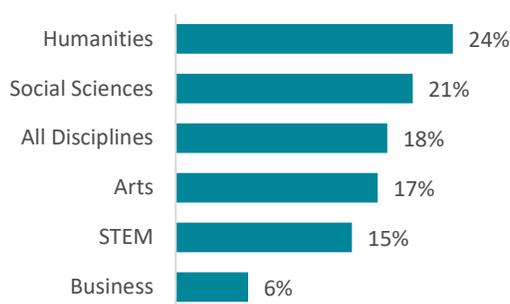
The value of professions that contribute to public well-being may not be reflected in earnings. For example, UC humanities alumni typically have lower earnings than UC STEM alumni (\$49,000 vs. \$76,000 at five years after graduation²⁴); however, humanities and social science alumni are more likely to work in professions that more traditionally contribute to public well-

²³ UC Information Center. (2020). UCUES data tables 2018.

²⁴ Source: University of California Alumni-At-Work Dashboard, CA Employment Development Department (EDD) wage data

being. Figure 28 shows the percentage of UC alumni working in public-serving professions by discipline²⁵. Approximately one in four humanities graduates and one in five social science graduates are working in professions that contribute to public well-being compared to one in six STEM graduates and one in sixteen business graduates.

Figure 28. Percentage of UC alumni working in public-serving professions by discipline, all degree types, 2000 to 2018 graduating cohorts



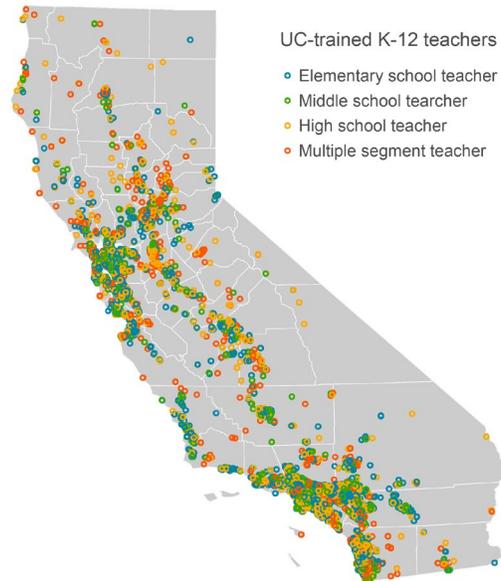
Source: LinkedIn, UC Student data

Estimates using LinkedIn data show about 80 percent of UC alumni working in public-serving professions are working in education or healthcare-related professions: 24 percent are teachers or principals, another 21 percent are doctors and nurses, and the remaining 35 percent work as other broad health professionals (e.g., acupuncturists, pharmacists, nutritionists) or professions that support education, such as high school counselors and tutors or mental health professionals.

While LinkedIn provides estimates of the distribution of UC alumni in education and health-related jobs, data from the California Department of Education (CDE) and data from the California Department of Consumer Affairs (DCA) can identify the number of [UC-trained teachers](#) and [licensed health professionals in California](#). CDE show over 28,000 UC- educated teachers from all of UC graduating cohorts serve in 77 percent of California’s K-12 schools from all of the UC graduating cohorts (see figure 29).

²⁵ Source: LinkedIn User Profiles, excludes self-employed, current students, and uncategorized jobs

Figure 29. UC-trained K-12 school teachers in California

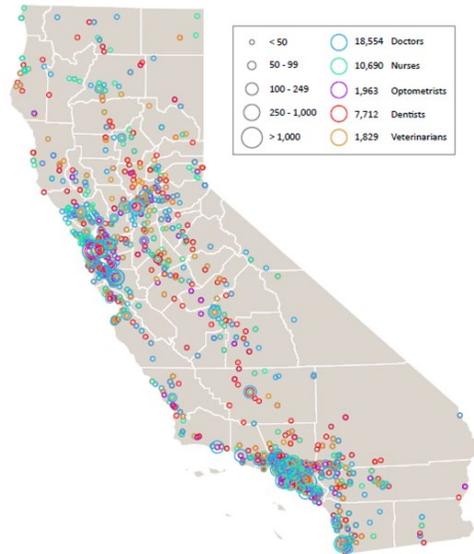


Source: California Department of Education, UC Student

UC trains faculty who teach in higher education. Twenty-five percent of UC faculty and 20 percent of CSU faculty have a Ph.D. from the University of California. Higher education leaders also leverage their UC education to set educational policy for the state of California, UC's President Michael V. Drake, California Community Colleges Chancellor Eloy Ortiz Oakley and California State University Chancellor Joseph I. Castro are all UC graduates.

Licensure data from the California DCA shows more than 18,000 doctors, 7,000 dentists, and more than 5,000 optometrists and veterinarians in California with their graduate degrees from the University of California. The doctors practice in 670 different towns, or 60 percent of all towns in California that have at least one doctor (see figure 30). Similarly, 57 percent of California towns with at least one dentist have a dentist trained by UC, along with 61 percent of towns with optometrists and 58 percent of towns with veterinarians. UC is the single largest provider of health sciences training not only in California's large cities but also statewide.

Figure 30: Location of doctors, nurses, dentists, optometrist and veterinarians trained by UC since 1999 and currently licensed in California



Source: CA Department of Consumer Affairs

Approximately 72 percent of UC health science students and 61 percent of medical residents are expected to remain in the state after completing training or education.

This high rate of retention makes UC Health one of the principal sources for the training of health professionals for California.²⁶

Licensure data also show UC-educated psychologists, marriage and family therapists, and social workers are strengthening interpersonal relationships and families in 32 of California's 58 counties²⁷.

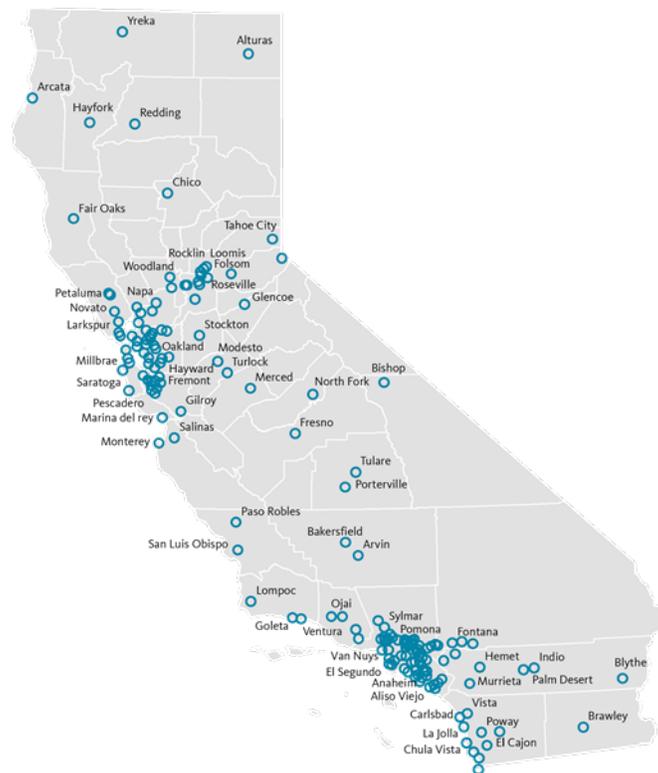
Education and healthcare are areas that typically represent public service. Still, other professions contribute to the quality of daily life of the public. UC alumni work as community care & safety professionals, such as epidemiologists and public microbiologists, ensuring public health and emergency medical technicians and firefighters. They help promote physical wellness by being coaches, lifeguards, and yoga instructors.

²⁶ Based on the 2017 locations of the practice of 2005-2010 graduates of UC health sciences' schools and residency programs

UC alumni preserve the quality of the environment. They are civil engineers who ensure the quality of roads, buildings, airports, tunnels, dams, bridges and ensure systems for water supply and sewage treatment are safe and functioning correctly. They serve as environmental experts for air quality, hydrology, and geological engineering.

They are landscape architects that create public spaces to enjoy. UC Berkeley Alumnus and Professor, Walter Hood is known for creating “ecologically and sustainable urban spaces... that enrich the lives of current residents while honoring communal histories.”²⁸ His firm, Hood Design, designed the new De Young Gardens in San Francisco’s Golden Gate Park and the Broad Museum plaza in downtown Los Angeles, California, and many other outdoor spaces. Over 1,600 UC alumni serve in these roles in 177 cities throughout California (see figure 31).

Figure 31. California cities UC alumni work in as civil engineers, architects, and environmental experts all degree types, 2000 to 2018 graduating cohorts



²⁸ MacArthur Foundation. (2019). Walter Hood, landscape and public artist: 2019 MacArthur Fellow.

Source: LinkedIn, UC Student data

Note: Not all cities are labeled due to space constraints

Finally, UC alumni can also be faith leaders: Pastors, Imams, Rabbis, Ministers, and Chaplains. While the estimated number of UC graduates who work as faith leaders is relatively small (about 150), an individual's impact may be high. Faith leaders support the public through life events through eulogies at funerals and marriage officiating. In addition, faith leaders, like Chaplains, can help guide those coming to the end of life in hospice care, provide food and shelter to the homeless, offer counseling and guidance to mend relationships and families, and serve as community leaders for marginalized populations. In addition to personal interactions of faith leaders—the houses of worship they oversee are sanctuaries, shelters, community gathering places, and venues for celebrations.

These are some of the many ways that UC alumni contribute to public well-being through their professions.

Jobs in Public Well-being Industries

Alumni who are not in public-serving professions may still work to support public well-being industries, such as healthcare or education. One in five mid-career UC undergraduate alumni employed in California work in these sectors—ten percent work in education (five percent in K-12 education and five percent in higher education), seven percent work in healthcare, and two percent work in social assistance²⁹. These industries create a foundation for the physical, mental, and intellectual well-being of society.

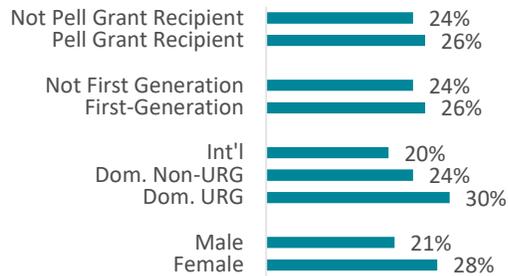
LinkedIn data show that approximately half of the alumni working in higher education are professors, scholars, and lecturers. Another 25 percent of alumni working in higher education are researchers or scientists. For those working in hospitals & healthcare, 33 percent are doctors or nurses, and another ten percent are researchers & scientists, six percent also teach as professors, scholars & lecturers.

UC student data were matched to LinkedIn data to see differences in the likelihood of working in a public well-being industry by gender, race, or Pell grant status. Figure 32 shows female alumni are slightly more likely to work in a public well-being industry than male alumni, 28 percent compared to 21 percent. UC underrepresented groups (URG)³⁰ alumni are also more likely than their domestic non-URG and international counterparts to work in public well-being industries.

²⁹ UC Information Center. (2020). Alumni-at-work dashboard, CA Employment Development Department Data

³⁰ Includes African-American, Native American and Latinx alumni

Figure 32. Percentage of UC alumni working in public well-being industries by demographics, graduating cohorts 2000 to 2018



Source: LinkedIn. UC Student data

Civic Engagement

UC Alumni Volunteering

National surveys find that college graduates are more likely to volunteer than those completing only a high school diploma.³¹ UC alumni work in public-serving professions or industries, and they also volunteer.

UC students volunteer more on average than other college students. While enrolled at UC, 42 percent of students participate in community service³², which is twice the rate of college students volunteering in California (26 percent) and nationally (25 percent)³³

For example, during the COVID-19 pandemic, UC students joined the “Leave it to Us” effort in which students bought and delivered groceries to senior citizens unable to venture out during the shelter-in-place order. One UCLA molecular biology student volunteer, Eljie Bragasin, said, “I think a lot of us at UCLA are pretty used to being involve[d] with the community...And not being able to do that, really affected us. And we just wanted to be able to offer what we had.”³⁴

Volunteering while on campus can encourage UC students to continue contributing after graduation. 89 percent of UC undergraduate seniors reported that community-focused activities

³¹ Of those 25 years or older, 19% of high school graduates volunteered in 2017, compared to 42% of those with a bachelor’s degree (Ma, Pender, & Welch, 2019).

³² UC Information Center. (2020). UCUES Data Tables 2018.

³³ Source: Corporation for National Community Service (CNCS) Survey 2015

³⁴ Tobin, K. (2020). College students shop for senior citizens free of charge with ‘Leave it to Us’ Program.

on campus influenced them to continue community-focused activities after graduation³⁵ Using data from UC alumni LinkedIn user profiles, it is estimated that 10 percent of UC undergraduate alumni volunteer. Figure 6 shows the top ten organizations in which UC alumni volunteer. Organizations are mainly focused in the fields of medicine, health, and overall humanitarian assistance. Data from LinkedIn show the American Red Cross, American Cancer Society, and the Boys & Girls Club, Habitat for Humanity, along with medical center programs, as top places where UC alumni volunteer.

Many alumni volunteer in organizations within the UC system, such as UCLA UniCamp, UC Davis Medical Center, and UCLA Health (see figure 33). UC alumni volunteer for a range of causes (see figure 34). 47 percent volunteer for children & education-related causes, 28 percent for civil/human rights, social action, and economic empowerment, and 24 percent for health. UC alumni volunteer causes align with other California volunteers,³⁶ as educational or youth service is the second highest cause for volunteers in California. However, UC alumni are more likely to volunteer for health causes than other California volunteers, hospital & health is ranked eighth most volunteered-for-cause in California,³⁷ but is the third most volunteered-for-cause by UC alumni.

Figure 33. Top 10 organizations for UC alumni who volunteer

Volunteering Organization	Rank
American Red Cross	1
American Cancer Society	2
Kaiser Permanente	3
UCLA UniCamp	4
Boys & Girls Clubs of America	5
UC Davis Medical Center	6
Habitat for Humanity International	7
UCLA Health	8
Global Brigades, Inc.	9
Reading Partners	10

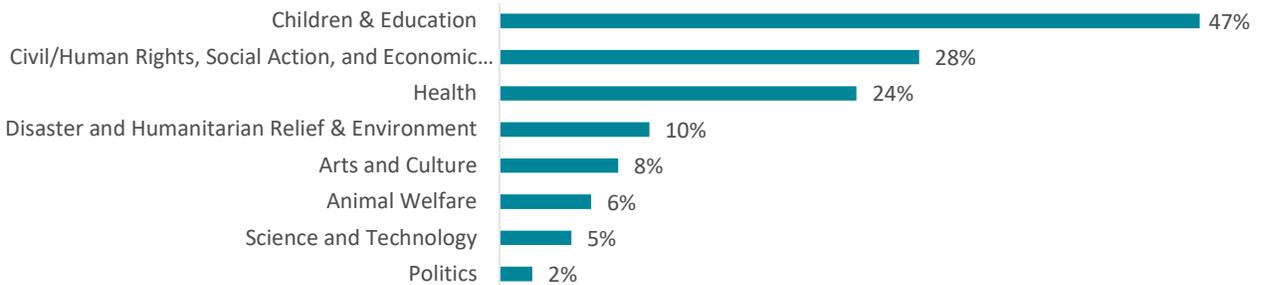
Source: LinkedIn data

³⁵ UC Information Center. (2020). UCUES Data Tables 2018.

³⁶ Source: Corporation for National Community Service (CNCS) Survey 2015

³⁷ Source: Corporation for National Community Service (CNCS) Survey 2015

Figure 34. Percentage of UC alumni volunteers by cause



Source: LinkedIn data

UC alumni volunteer in a range of roles. The top 10 volunteering roles for UC undergraduates are volunteer, mentor, tutor, teaching, student volunteer, member, intern, counselor, board member, and hospital & emergency caregiver. By volunteering in these roles, UC alumni are civically engaged and support public well-being.

UC Alumni Public Officials and Voting

UC alumni play a significant role in state policy and legislation. One out of three California state-elected officials³⁸ and one out of two state justices is a UC graduate.³⁹ Leaders like Lieutenant Governor Eleni Kounalakis, Senator Kamala Harris, State Controller Betty Yee, and Chief Justice Tani Cantil-Sakauye all graduated from UC.

College graduates are also more likely to be civically engaged in other ways. UC alumni shape public policy by voting. The national voting rate of 25- to 44-year-olds with at least a bachelor's degree is 73 percent, which is almost twice that of the voting rate of high school graduates, 41 percent, in the same age group.⁴⁰

UC alumni living in California vote at higher rates than similarly-aged populations in the state. Matching 800,000 UC alumni records from the graduating classes of 1999 to 2018 to California voter records from the California Secretary of State shows that 65 percent of UC alumni ages 22 to 41 who were registered to vote participated in the 2018 midterm elections. For comparison, 48 percent of similarly-aged registered voters who voted in 2018⁴¹.

³⁸ UC State and Government Relations

³⁹ Leadership Directory

⁴⁰ Ma, J., Pender, M., & Welch, M. (2019). Education pays: The benefits of higher education for individuals and society.

⁴¹ UCOP analysis of California voter registration data obtained from the California Secretary of State.

Public Serving Research

Finally, UC alumni contribute to public well-being by doing research to address California's challenges, advancing technology for use in disaster preparedness, climate change, and sustainability, agriculture, and health.

Disaster Preparedness

UC alumni are redefining disaster preparedness. In October 2019, the MyShake app, developed by a team at UC Berkeley included Ph.D. alumnus Qingkai Kong. MyShake became the nation's first earthquake early warning system. Governor Newsom announced California's implementation of this tool, stating, "I encourage every Californian to download this app and ensure your family is earthquake ready."⁴² UC alumni are preparing for the next pandemic. Jacob Glanville is a pandemic scientist who earned his Bachelor's in Genetics Genomics at UC Berkeley. Glanville and his company, Distributed Bio are featured on Netflix's Pandemic series. Distributed Bio uses computationally-guided immunoengineering methods to identify a universal flu vaccine that would prevent all future pandemics and any re-surfacing of historical cases of flu.

Climate Change & Sustainability

The two largest California wildfires on record occurred within the last three years⁴³. These fires have claimed the lives and homes of California residents and pose dangerous conditions for firefighters working to extinguish them. UC Irvine alumnus, Mark James, was a lead scientist for the Assistant for Understanding Data through Reasoning, Extraction, and sYnthesis (AUDREY) system, developed at NASA Jet Propulsion Laboratory and designed to keep first responders safe in situations like wildfires. AUDREY uses "AI" and machine learning to provide real-time positioning and hazard information to firefighters, EMTs, and law enforcement personnel on the ground."

The increased intensity of wildfires is likely due to climate change. Professor LeRoy Westerling of UC Merced, who received his bachelor's degree from UCLA and his Ph.D. from UC San Diego, co-directs the Center for Climate Communication and writes extensively on climate change and its effects on wildfires. In addition to his influential research on fires in the western United States, Westerling's work with the Center for Climate Communication elevates facts and debunks fictions in climate change research and news reporting.⁴⁴

⁴²Sanders, R. (2019). California rolls out first statewide earthquake early warning system.

⁴³ California Department of Forestry and Fire Protection. (2020). Top 20 largest California wildfires.

⁴⁴ Climate Feedback website: <https://climatefeedback.org/>

Other companies started by UC alumni to address climate change with sustainability include:

- Water Planet (UCLA) – next-generation water purification, reuse, and desalination solutions
- Mosaic (UCSC) – a solar fin-tech company that offers financing for commercial and residential solar projects, democratizing the social and environmental benefits of clean energy
- Next Energy Technologies (UCSB) – cutting edge solar technology that transforms windows into energy-producing assets
- Exergy Systems (UCB) – reduces material and resource consumption in manufacturing by providing revolutionary water and material recycling solutions and technologies
- Gridworks (UCSB) – convenes, educates, and empowers stakeholders working to decarbonize electricity grids
- CleanWorld (UCD) – a leading North American innovator in advance, high-solids anaerobic digestion (HSAD) technology

Agriculture

UC Davis Alumnus, Professor Michael Cahn, is innovating to adapt California's agriculture to climate change and water challenges. CropManage, developed at UC Cooperative Extension by Professor Cahn, is a software tool for optimizing farms' irrigation systems and fertilization, which boosts crop yields while reducing both water and fertilizer usage by 20 to 40 percent. This tool, which builds on years of UC agricultural research and modeling, is available for free to the public. According to Gabriel Youtsey, Chief Innovation Officer of UC Agriculture and Natural Resources (ANR), "CropManage could change how we grow food in California and the world... This is the University of California turning science into solutions at its finest."⁴⁵

Other agricultural advancing companies started by UC alumni include:

- Farm Sense (UCR) – a smart insect monitoring system that improves crop yields and hopes to reduce food insecurity
- Hip Chick Farms (UCSC) – a certified organic and humanely- raised chicken farm that distributes to 18,000 locations across California
- Planting Justice (UCSC) – an edible garden program that employs formerly incarcerated individuals to provide low-income families access to fresh food

⁴⁵ CropManage website: <https://cropmanage.ucanr.edu/>

Health and Medicine

UC alumni also contribute lifesaving and groundbreaking research and development in health and medicine. UC Berkeley alumna, Jennifer Cook, leads, Grail, a company that aims to develop a blood test to detect cancer before symptoms appear. E, early clinical studies “demonstrate GRAIL’s multi-cancer early detection test is able to detect more than 50 cancer types across all stages, with a very low false-positive rate of less than one percent.”⁴⁶

UC doctors use research to make a difference in the lives of families. In, 2019 Dr. Eliot Stieglitz (a former UCSF postdoc fellow) proposed a new treatment for a rare form of leukemia that saved the life of a four-month old baby boy named, Quincy. He correctly identified the cancer using an advanced molecular test known as the UCSF 500 Gene Panel developed by UCSF former postdoc fellow, Boris Bastian, founder and director of the Clinical Cancer Genomics Laboratory at UCSF. Reflecting on the “miracle treatment” that saved her son, Quincy’s mom, Lara, who is a registered nurse at another health care center, said of the treatment ““We hit the geographical jackpot by having UCSF in our backyard.”⁴⁷

Dr. Justin Barad, a UC Berkeley and UCLA alumnus, similarly operates at the intersection of technology and medicine for the public good. His virtual reality platform is revolutionizing surgical training, dramatically improving surgeons’ performance and patient outcomes.⁴⁸

Innovations developed by UC-trained professionals and academic researchers contribute invaluable to public well-being.

Other companies started by UC alumni to improve healthcare are:

- Tradewind Bioscience (UCSF) – developing antibody therapeutics for ovarian cancer
- Tergis Technologies (UCM) –an improved infant respirator and an arterial catheter deployment device that prevents hospital-caused infection
- Aluna (UCSF) – a portable spirometer that helps kids manage asthma by measuring lung health anywhere and any time
- PillPack (UCB) – an online pharmacy distribution option that simplifies prescriptions

Conclusion

UC alumni contribute to public well-being through their professions, volunteering, civic engagement, and using research-based advances to enhance the quality of life. UC alumni from

⁴⁶ GRAIL. (2020). GRAIL initiates first interventional study using its multi-cancer early detection test to guide clinical care.

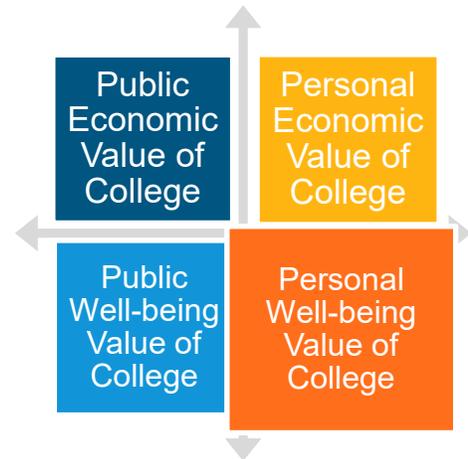
⁴⁷ Goodrich, J. (2019). Baby diagnosed with rare blood cancer saved by miracle treatment.

⁴⁸OssoVR website: <https://ossovr.com/>

all disciplines contribute to public well-being. The benefits of a UC education extend beyond the individual to other Californians, including those who do not attend UC.

Personal Well-Being Value

The **Personal well-being** quadrant includes outcomes that demonstrate personal or individual value not defined in financial terms, such as expanded opportunities, job security, satisfaction with one’s career, and social networks. Learning outcomes such as 21st century skills: critical thinking, collaboration, written communication, and information literacy can also promote well-being outcomes and improve decision making. All of these aspects affect life satisfaction, interpersonal relationships, and health. This brief recognizes that personal income is related to many of these aspects of personal well-being. However, studies show that once a “subsistence level” of income is met, education continues to correlate with measures of well-being while income does not⁴⁹.



UC Personal well-being value highlights:

- Job security increases with educational attainment (both pre- and post-COVID-19) and is highest for doctoral/professional degree earners.
- UC seniors reported increases in 21st century skills for work, life and citizenship; with the greatest gains in critical thinking, information literacy, oral communication skills, and the ability to understand international perspectives.
- UC seniors reported enhanced understand of differences/issues related to gender, race and ethnicity, sexual orientation, and social class from when they started UC.
- 60 percent of UC seniors reported increases in leadership skills from when they started UC.
- College degree earners are more likely to source of health information from written sources, rather than television or radio.
- College degree earners marry at higher rates, reported higher life satisfaction and more favorable health outcomes.

⁴⁹ Camfield, L., & Skevington, S. M. (2008) On subjective well-being and quality of life.

Job security & expanded opportunities

A primary goal of college and university education, in contrast to technical school education, is to empower students with a wide range of skills applicable to various fields. These skills can enable degree earners to pursue careers in different fields because they are not content-specific. College education can therefore enhance job security.

In January 2020, unemployment rates were almost twice as high for high school graduates also college graduates, 3.8 percent versus 2.0 percent.⁵⁰ By June 2020, the COVID-19 pandemic highlighted this disparity, 12 percent of high school graduates were employed compared with 7 percent of those with a bachelor's degree or higher.⁵¹

A graduate degree provides even more job security than a bachelor's degree alone. Four percent of those with a professional degree or doctoral degree were unemployed compared with twelve percent of high school graduates and eight percent of bachelor's degree holders. Only one percent of professional/doctoral degree recipients were unemployed before the COVID-19 pandemic.

UC graduates are likely to pursue graduate degrees. 37 percent of UC undergraduates wish to pursue a graduate degree after graduation⁵². [Data](#) from the national student clearinghouse (NSC) show that UC undergraduate education prepares students to go to [graduate school and complete graduate degrees](#).

Almost 40 percent of UC undergraduate alumni earn graduate degrees within fifteen years of graduating from UC⁵³. The majority, 54 percent of graduate degree earners, complete a Master's degree, including academic and professional master's, sixteen percent complete a health science professional degree, eleven percent a law degree, and eleven percent complete an MBA. About eleven percent complete an academic doctorate.

Figure 35 shows UC African-American alumni are the most likely to complete a graduate degree (41 percent), followed by white (38 percent) and Asian/Pacific Islander alumni (37percent). Native American students are the least likely to complete a graduate degree (33 percent).

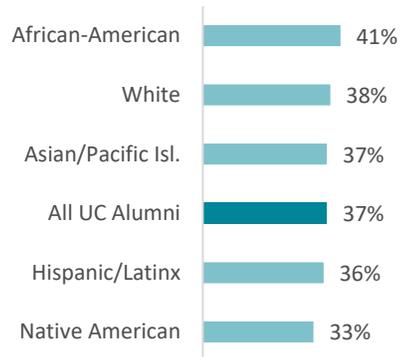
⁵⁰ Bureau of Labor Statistics, U.S. Department of Labor. (2020). Unemployment rate 2.0 percent for college grads, 3.8 percent for high school grads in January 2020.

⁵¹FRED Economic Data. (2020), Unemployment rate by educational attainment and age, monthly, not seasonally adjusted: 25 years and over.

⁵²University of California. (2016). University of California Undergraduate Experience Survey (UCUES) data tables, 2016.

⁵³ University of California. (2018). Graduate degree aspirations and outcomes of UC Students.

Figure 35. Percentage of UC undergraduate alumni completing graduate degrees as of spring 2020, 2000-2012 Graduating Cohorts



Source: National Student Clearinghouse, UC alumni graduate degree outcomes dashboard

While the majority of UC undergraduates choose to enter the workforce directly without pursuing a graduate degree, a significant share continues on to graduate school to expand their knowledge and skillset toward a more specialized area of expertise. Given the academic qualifications and research experience required for admission to most graduate programs, this speaks to the quality of the educational preparation that UC provides.

Job satisfaction

Nationally, college degree holders have slightly higher job satisfaction than high school graduates: 92 percent of those with a college degree or higher are very satisfied or somewhat satisfied with their jobs versus 87 percent of high school graduates.

UC does not have access to undergraduate alumni career satisfaction data. However, these data exist for Ph.D. alumni. UC Ph.D. alumni reported high levels of job satisfaction: according to the 2017 Survey of Doctorate Recipients, 88 percent of UC Ph.D. alumni reported that they were very satisfied or somewhat satisfied with their job (see figure 36). Job satisfaction increases as alumni progress further along in their careers. 92 percent⁵⁴ reported that they were very satisfied or somewhat satisfied with their job compared to 84 percent of recent UC Ph.D. alumni.

Job satisfaction for UC Ph.D. alumni also varies by job sector. A greater proportion of UC Ph.D. alumni working in the private sector (90 percent) reported that they were very satisfied or

⁵⁴ Ph. D. Alumni who graduated between 1965 and 1999

somewhat satisfied with their job compared to UC Ph.D. alumni working in colleges and universities (86 percent). In addition, when compared to Ph.D. alumni at other colleges and universities, UC Ph.D. alumni reported similar levels of job satisfaction (see figure 37).

Figure 36. Job satisfaction of Ph.D. alumni by institution type and graduation year, working in colleges and universities

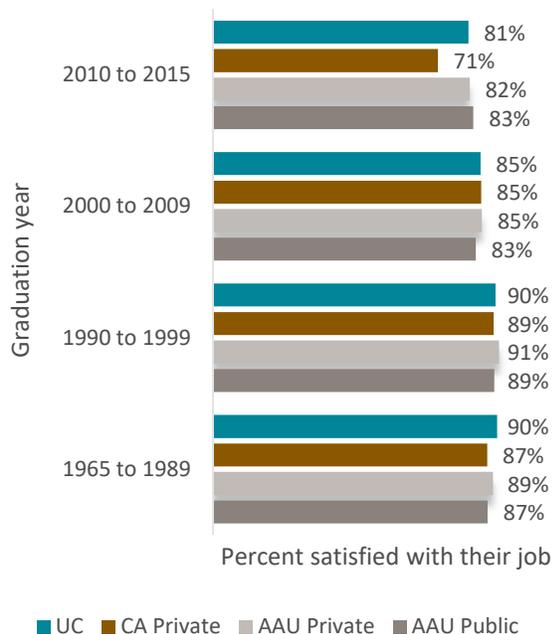
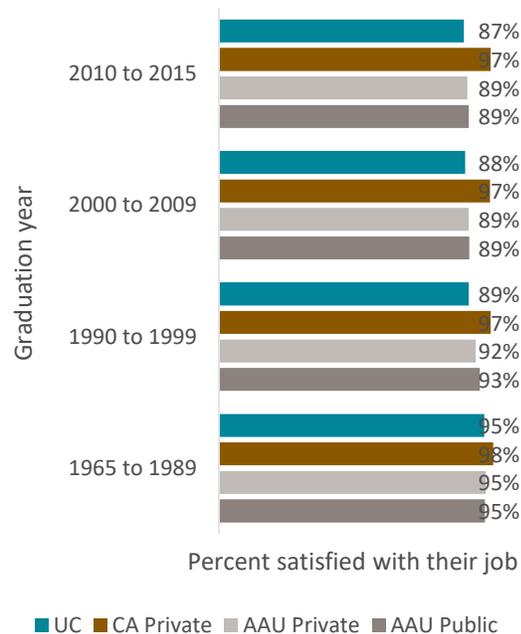


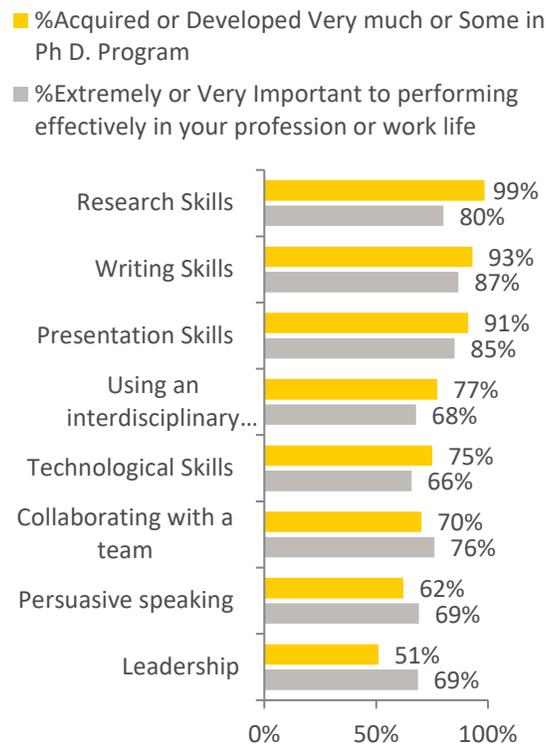
Figure 37. Job satisfaction and Ph.D. alumni by institution type and graduation year, working in the private sector



Source: 2017 Survey of Doctorate Recipients

In addition to job satisfaction, UC Ph.D. alumni were also asked about the kinds of skills they acquired in their program at UC and how that aligned with workforce needs. Figure 38 shows that skills in research, writing, presentation, and technology were extremely or very important to performing effectively in the workplace and that UC prepared them very much or some in these areas. UC Ph.D. alumni also said collaborating with a team, persuasive speaking, and leadership skills were important to performing effectively in the workplace, though the Ph. D. programs prepared them to a lesser extent in these skill areas. Data like these might be helpful for academic programs to understand areas that could be strengthened in curriculum planning.F

Figure 38. UC Ph.D. alumni skills alignment with workforce needs, University of California Ph.D. Alumni Survey



Source: UC Ph.D. Alumni Survey

Networking

A 2016 LinkedIn [survey](#) showed 85 percent of all jobs are found through networking. In the UC Ph.D. Alumni Survey, 60 percent of UC Ph.D. alumni, reported acquiring or developing networking and relationship-building skills while at UC, and 70 percent reported this being extremely or very important to performing effectively in their work-life and profession.

Interactions with coworkers while on the job may be related to educational attainment. According to the 2016 General Social Survey, when asked if coworkers took a personal interest in them, 90 percent of those with a bachelor's degree or higher reported that this was true, versus 86 percent of high school graduates and 76 percent of those with less than a high school diploma.

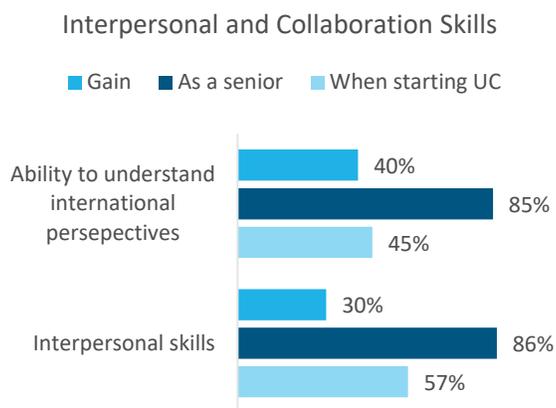
“The most meaningful learning experience I have had at UCSB comes from the constant access to networking opportunities. I learned how to connect with people, follow up, offer value, and make the most of professional and interpersonal relationships, on and off campus.”

– First Generation, Social Sciences Major, UC Santa Barbara

Interpersonal skills & collaboration

UC seniors were asked about their perceived levels of interpersonal skill growth on UCUES. 86 percent of seniors rated their interpersonal skills as good, very good, or excellent compared with 57 percent when they started UC (see figure 39). Perceived gains in understanding international perspectives were even higher: seniors reported a 40 percentage point increase in developing these perspectives while at UC.

Figure 39. Percentage of UC seniors who rated interpersonal and collaboration skills as good, very good, or excellent, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

When considering demographics, Latinx and first-generation students reported the greatest gains, followed by Pell grant recipients and Asian-American students, while African American and white students reported the lowest gain, but all were greater than 30 percentage point increases.

“One of the most meaningful learning experiences that I had ..the class focused on political and immigration beliefs, and we learned about the unheard stories of immigrants who came to America. It allowed me to see a different take on immigration laws, pointing out the negative and positive things that resulted from them. I am more aware of what is going on in the world now.”

- White, Engineering & Computer Science Major, UC San Diego

At the graduate level, 77 percent of UC Ph.D. alumni reported acquiring skills to interact with others from different backgrounds, while at UC, and 75 percent reported this being extremely or very important to performing effectively in their work.

21st Century Skills Development

Both enhanced interpersonal skills and understanding diverse perspectives can aid in collaboration. Collaboration is one of a group of 21st century skills⁵⁵ that have been identified as essential for work, life, and citizenship.

Furthermore, the Western Association of Schools and Colleges' Senior College and University Commission (WSCUC) advances 21st century skill development in higher education institutions through “Core Competencies” which include written and oral communication, critical thinking, information literacy, and quantitative reasoning. The National Association of Colleges and Employers (NACE) 2019 survey finds that 91% of employers look for problem-solving skills, 86% for ability to work on a team/collaboration, 79% for analytic/quantitative skills, 78% for written communication, 73% leadership, 70% for oral communication skills, and 70% initiative in prospective employees, compared with 63% for technical skills and 55% looking for computer skills.

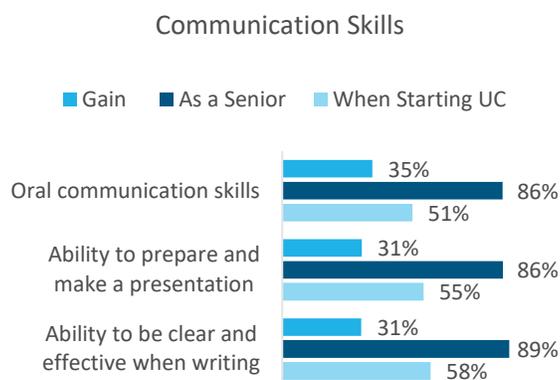
University of California Undergraduate Experience Survey (UCUES) offers indirect measures of written and oral communication, critical thinking, information literacy, and leadership skills by asking about perceived gains in skill development. In this survey, seniors are asked about their perceived level of skill in each of these areas compared to when they started at UC. The next section discusses student-perceived gains in these 21st century skills.

⁵⁵ Partnership for 21st Century Learning (P21)

Communication skills

UC seniors reported increases in communication skills over their time at UC (see figure 40). 86 percent of UC seniors reported their oral communication skills and ability to prepare and make a presentation were good, very good, or excellent compared with only 51 and 55 percent their freshman year, respectively.

Figure 40. Percentage of UC seniors who rated communication skills as good, very good, or excellent, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

Additionally, 89 percent of UC seniors reported their written communication skills were good, very good, or excellent compared with only 58 percent their freshman year.

Leadership, critical thinking, and information literacy

Higher education advocates often cite leadership skills, critical thinking, and information literacy as some of the benefits to education beyond high school. Colleges may claim to offer experiences in which these skills can be cultivated or refined. Leadership skills are helpful to the individual as they can bring promotional opportunities or simply aid in navigating the world. In comparison, critical thinking and information literacy enable one to evaluate information and use it to make personal decisions related to health and well-being, finances, and civic matters.

The following section shows UC student perceptions of leadership, critical thinking, and information literacy skills development.

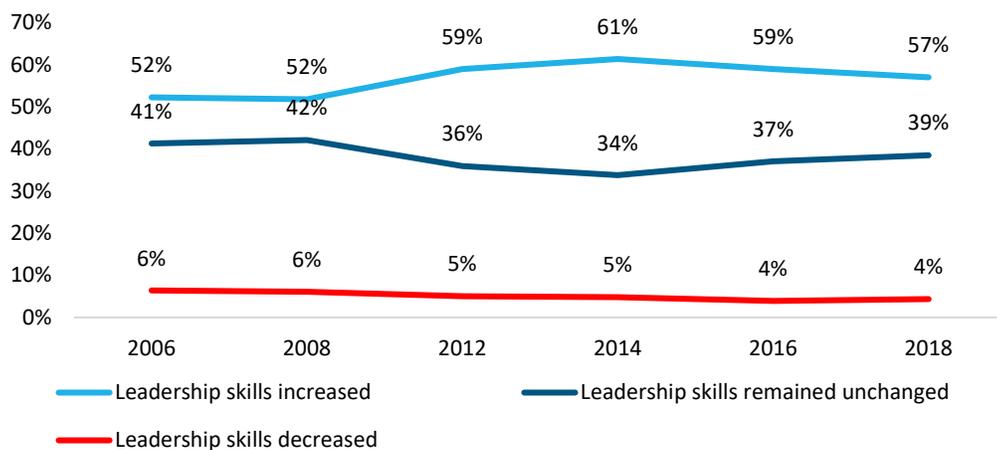
Leadership skills

Leadership skills can be a source of self-worth and personal well-being in professional life. Undergraduate education is a crucial platform to nurture leadership skills. Co-curricular college activities, such as being part of a departmental club, social fraternities, sororities, student government, professional clubs, and organizations, were significant indicators of perceived leadership abilities⁵⁶. Undergraduate students are often motivated to participate in a leadership learning community based on the need for achievement and the need for affiliation⁵⁷.

To understand how a UC degree contributes to developing leadership skills, responses to UCUES questions on leadership skills were analyzed. Respondents rated themselves on the scale: Very poor (1); Poor (2); Fair (3); Good (4); Very good (5); Excellent (6). When seniors reported their current leadership skills proficiency as higher than when they started UC, it is treated as an increase in perceived leadership skills.

About 60 percent of UC undergraduate seniors reported an increase in their leadership skills while at UC. This trend saw a slight increase between 2008 to 2012 (see figure 41).

Figure 41. Percentage of UC seniors who reported an increase in leadership skills, UCUES 2006 to 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2006 to 2018

⁵⁶ Birkenholz, R. J., & Schumacher, L. G. (1994). Leadership skills of college of agriculture graduates.

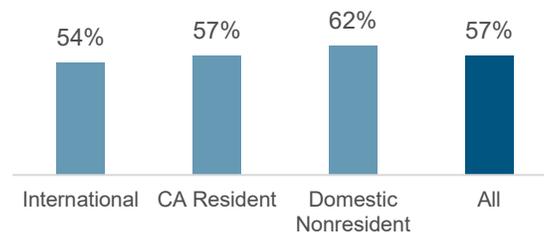
⁵⁷ Moore, L. L., Grabsch, D. K., & Rotter, C. (2010). Using achievement motivation theory to explain student participation in a residential leadership learning community.

The following section discusses gains in leadership skills by student demographics.

By demographics

Domestic students were slightly more likely to report leadership increases compared to their international classmates (see figure 42).

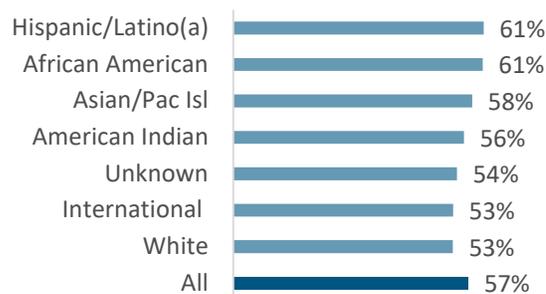
Figure 42. Percentage of UC seniors who reported an increase in leadership skills, by residency, UCUES 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

Students from underrepresented groups report more significant gains in leadership skills from when they started at UC (see figure 43).

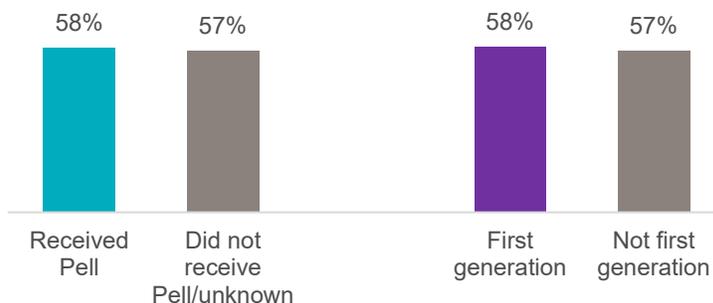
Figure 43. Percentage of UC seniors who reported an increase in leadership skills, by race/ethnicity, UCUES 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

Pell recipient and first-generation college students reported similar gains in leadership skills to their non-Pell and non-first-generation counterparts (58 versus 57 percent, respectively in figure 44)

Figure 44. Percentage of UC seniors who reported an increase in leadership skills, by Pell grant and first-generation status, UCUES 2018

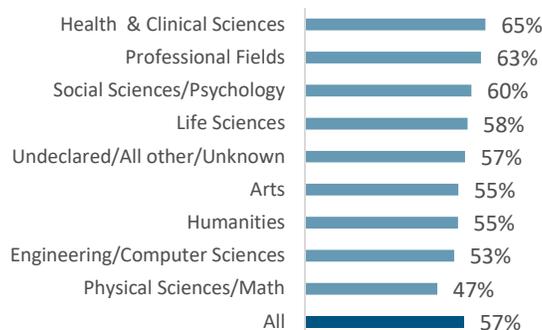


Source: University of California Undergraduate Experience Survey (UCUES), 2018

By Program

Students majoring in health/clinical sciences, professional fields, and social sciences reported more leadership skills increases. Whereas physical sciences, mathematics, engineering, and humanities majors show less frequent leadership skill increases (see figure 45).

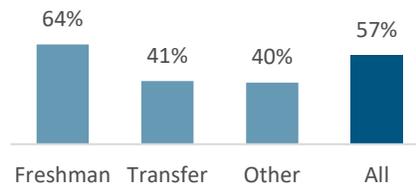
Figure 45. Percentage of UC seniors who reported an increase in leadership skills, by undergraduate discipline, UCUES 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

More time spent with the UC educational experience equates to greater leadership skill gains: freshmen entrants are more likely to increase their leadership skills than transfer entrants (see figure 46).

Figure 46. Percentage of UC seniors who reported any increase in leadership skills, by entry type, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

For all students who reported gains in leadership, over half (51 percent) participated in a research or creative project outside their regular course requirements, 48 percent worked as an officer in a student organization or club and learned what it means to be in a leadership role (see figure 47).

Figure 47. Co-curricular participation of seniors who reported an increase in leadership skills, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

About four out of every ten students participated in learning communities, while a third of them participated in service-learning or community-based learning experiences. These co-curricular

experiences may be supporting UC student leadership experiences, in addition to classroom learning.

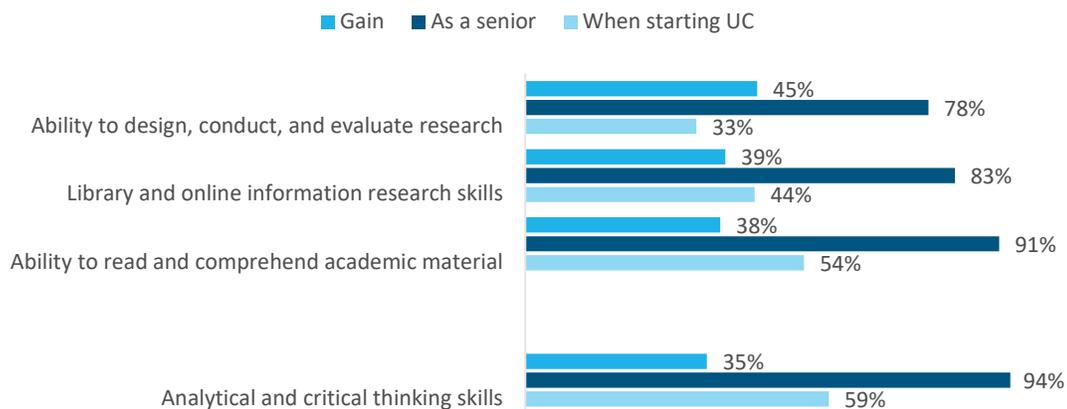
“Joining CALPIRG⁵⁸ at UCSD has allowed me the opportunity to join a larger conversation on campus...My experiences with the organization have greatly benefited me in that I have gained many skills in building campus coalitions to reach common goals, while developing leadership skills myself and for my colleagues as well.”

-Multiracial, Physical Sciences and Math Major, UC San Diego

Critical thinking and information literacy

UC seniors report significant gains in analytic and critical thinking while at UC; 94 percent of UC seniors reported their skills were good, very good, or excellent compared with only 59 percent during their freshman year⁵⁹, which is a 35 percentage point difference (see figure 48).

Figure 48. Percentage of UC seniors who rated critical thinking or information literacy skills as good, very good, or excellent, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

⁵⁸ UC on-campus student public interest activist groups. Primarily focused on protecting the environment, providing hunger relief, and promoting civic engagement.

⁵⁹ University of California. (2018). University of California Undergraduate Experience Survey (UCUES) data tables, 2018

UC seniors report significant increases in skills development of information literacy, particularly in the ability to design, conduct, and evaluate research, a 45 percentage point difference for seniors reporting good, very good, or excellent compared with when they started UC. UC seniors also reported almost a 40 percentage point difference in the ability to comprehend and read academic material and to research information. All of these skills are important for information literacy and, ultimately decision making.

When considering demographics, Latinx, Pell grant, and first-generation students reported the greatest gains, followed by white, Asian-American, and African-American students, who reported the lowest gains in the ability to design, conduct and evaluate research, but all groups had greater than 33 percent point gains. Similarly, regarding the ability to research information online and in libraries, Latinx, Pell grant, and first-generation students reported the greatest gains, followed by African-American, White, and Asian-American students, reported the lowest gains, but all were greater than 30 percentage point gains.

Finally, regarding the ability to read and comprehend academic material, Latinx, Pell grant, and first-generation students reported the greatest gains, followed by Asian-American, African-American and white students, who reported the lowest gains, but all were greater than 27 percentage points. The same pattern by race was found in the gains in analytic and critical thinking, but white students reported only a 21 percentage point gain compared to all other groups reporting at least a 30 percentage point gain in analytic and critical thinking skills.

“..helpful courses were the GE's that give you information on the other nations and their history. These types of classes, along with others, helped my critical thinking skills.”

-Latinx, Physical Science and Math Major, UC Santa Barbara

The relationship of critical thinking and information literacy to health outcomes

Doyle (1992) defines an individual with information literacy as someone who:

- recognizes that accurate and complete information is the basis for intelligent decision making;
- recognizes the need for information;
- formulates questions based on information needs;
- identifies potential sources of information;
- develops successful search strategies;
- accesses sources of information, including computer-based and other technologies;
- evaluates information;

- organizes information for practical application.

Information literacy also has a relationship with life-long learning⁶⁰. Those with information literacy and life-long learning have been found to be better prepared for all kinds of changes and hardships their careers and personal lives may bring.

Information literacy and critical thinking help with decision making. For example, health literacy (information literacy related to health information) is defined by the U.S. Health Resources & Service Administration as “The degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.”⁶¹ Studies have found that health literacy increases with education level and income. Sources of information to aid in decision-making also vary by health literacy level and education levels. This study found:

- Adults with below basic health literacy were less likely to get information about health issues from written sources, including newspapers, magazines, books or brochures, and the internet than adults with basic, intermediate, or proficient health literacy.
- A higher percentage of adults with below basic and basic health literacy received more information about health issues from radio and television than adults with intermediate and proficient health literacy.
- With each increasing level of health literacy, a higher percentage of adults got information about health issues from family members, friends, or coworkers.

Health Outcomes

Aside from the development of 21st century skills, some evidence relates educational attainment to healthier lifestyles. For example, one in five of high school graduates smoke daily, compared to one in twenty bachelor’s degree recipients. The life expectancy of a degree earner (bachelor’s or higher) is seven years longer than those who never attended college.⁶²

⁶⁰ Solmaz, D. Y. (2017). Relationship between lifelong learning levels and information literacy in teacher candidates.

⁶¹ Health Resources & Services Administration (2019) Health Literacy. <https://www.hrsa.gov/about/organization/bureaus/ohe/health-literacy> Accessed June 2021.

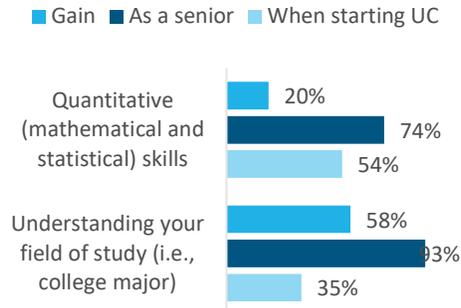
⁶² Trostel, P. A. (2015). It's not just the money: The benefits of college education to individuals and to society.

Other studies have found a strong positive relationship between educational attainment and eating fruits and vegetables, seat belt use, and preventative medical care⁶³. One study⁶⁴ found that while high-income and high educational attainment households bought the most nutritious items for meals, the low income and high educational attainment households purchased more items for nutritious meals than the high income and low educational attainment households. When one considers information literacy as a potential moderator for these outcomes, the relationship between healthier lifestyles and educational attainment becomes more understandable.

Field of study and quantitative reasoning

Studies show a positive impact of college on academic self-concept. However, there is some research that suggests negative impacts on self-concepts related to math ability, particularly for women⁶⁵. Quantitative skills can be essential for financial decision-making after college.

Figure 49. Percentage of UC seniors who rated quantitative skills or understanding their field of study as good, very, good, or excellent, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

UC undergraduates reported a 58 percentage point gain in knowledge in their fields of study. However, there was only a 20 percentage point gain for quantitative skills (see figure 49). Females rated themselves slightly lower than males, with an 18 percentage point gain compared to a 22 percentage point gain.

⁶³ Cutler, D. M. & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education

⁶⁴ Hanbury, J., Rahkovsky, I., & Schnell, M. (2015). Is the focus on food deserts fruitless? Retail access and food purchases across the socioeconomic spectrum.

⁶⁵ Pascarella, E. T., & Terenzini, P. T. (2016). How college affects students: 21st century evidence that higher education works.

Psychosocial change

College usually engages students with a population that differs from their K-12 peers. Thus students may undergo psychosocial change: a change in self-concept through interactions with others and feedback that either confirms or disconfirms self-concepts. Psychosocial change represents one aspect of personal growth.

Several aspects of psychosocial change in college have been studied, such as identity development (racial and ethnic, gender, sexual orientation, religious, and spiritual). There is also some evidence that students rely less on external authorities, have an enhanced internal locus of control, and exhibit increased autonomy after graduating college.

Racial and Ethnic Identity Development

Previous studies suggest limited evidence that college aids racial and ethnic identity development. Although there is limited evidence, there are studies that suggest that some students experience changes in racial and ethnic identity over time during college that are associated with students' exposure to certain experiences in college. More specifically, exposure to diversity, intergroup dialogue, support and validation, and population-specific organizations have positive effects on racial and ethnic identity development⁶⁶

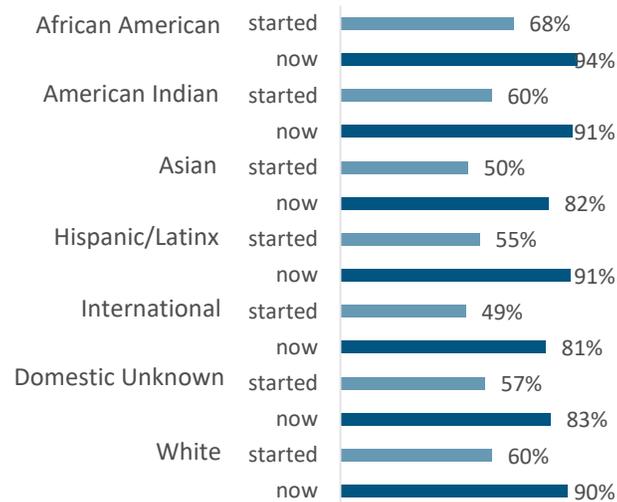
UC seniors reported that their level of awareness and understanding of their own racial and ethnic identity increased from when they started at UC; 64 percent reported that their level of awareness and understanding was good, very good, or excellent when they started at UC versus 83 percent as seniors. When examining this information by race/ethnicity (see figure 50), percent growth ranged from 26 percent (African American and Domestic Unknown) to 36 percent (Hispanic/Latinx).

“[My most meaningful experience was] when I was in a class discussion for my Humanities class and got to engage with students of different backgrounds and discuss sensitive cultural or racial issues.”

– African American, Arts Major, UC Davi

⁶⁶ Farrington, C.A. (2019). Noncognitive outcomes of liberal arts education.

Figure 50. Percent of UC seniors reporting their level of awareness and understanding of their racial and ethnic identity is good, very good, or excellent, UCUES, 2018



Source: University of California Undergraduate Experience Survey (UCUES), 2018

“One of the most enjoyable classes I’ve taken... in the African American Studies department. If it wasn’t for this requirement I would of never taken this excellent class that really opened my eyes to the fundamental racism among minorities within the US and the problems surrounding it. It was incredibly different and eye opening compared to my usual art classes I take here”

– White, Arts Major, UC Berkeley

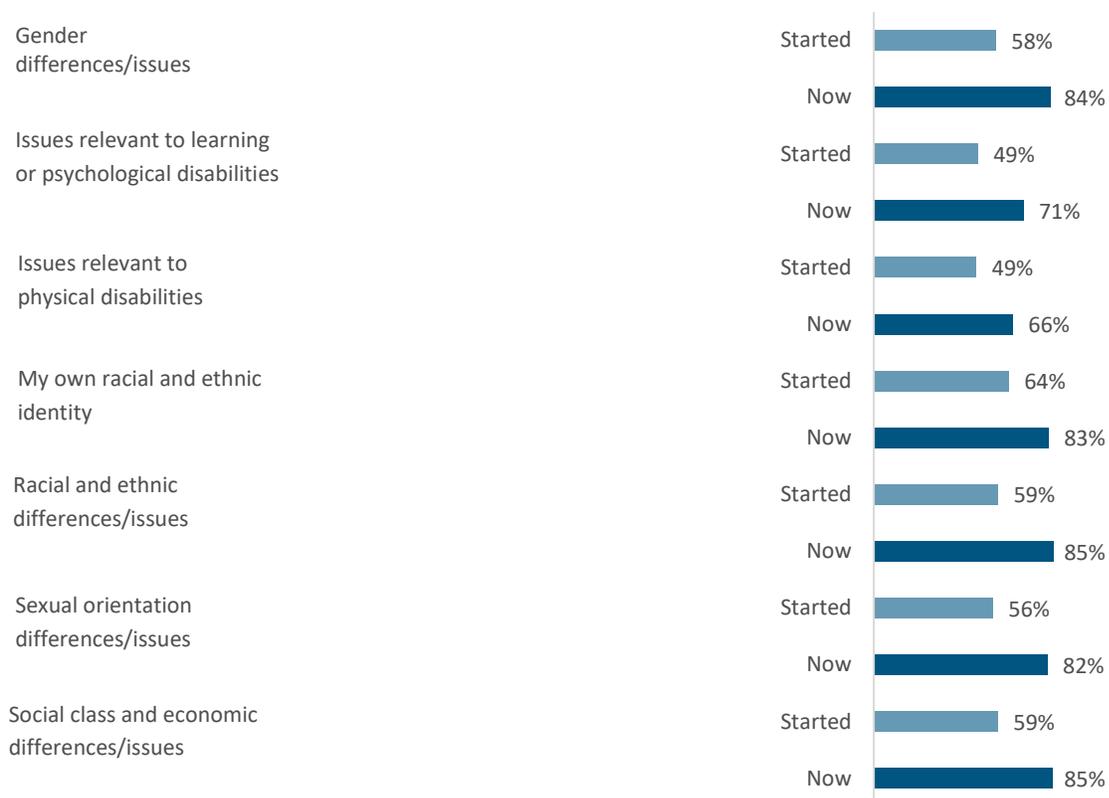
Awareness and understanding of social issues

While at UC, undergraduates’ perceived level of awareness and understanding of social issues increases, UC undergraduates students were asked to reflect on when they started at UC and at the time of taking the survey and rate their awareness and understanding of a range of issues

related to gender, learning or psychological disabilities, their own racial and ethnic identity, race and ethnicity, sexual orientation, and social class.

Figure 51 shows that UC seniors perceived that their level of awareness and understanding on these issues increased from when they started at UC to when they were seniors. Percent growth differences ranged from 17 percentage points (issues relevant to learning or psychological disabilities) to 26 percentage points (differences/issues related to gender, race and ethnicity, sexual orientation, and social class).

Figure 51. Percent of UC seniors reporting their level of awareness and understanding of social issues is good, very good, or excellent, UCUES 2018



“Being able to connect with other students and peers has been one of the most meaningful experiences I have had at UC Irvine. I learned about others’ circumstances such as cultural/racial backgrounds, religious diversities, sexual orientations, and much more. There is just so much diversity at UC Irvine that I find my experience to be meaningful because I have been able to be surrounded by a wide variety of people.”

-Asian American, Engineering & Computer Science Major,
UC Irvine

Happiness & life satisfaction

Evidence suggests that having a higher salary leads to better living conditions and better health care, which can contribute to less stress and higher reported levels of happiness. However, salaries alone do not tell the whole story. In fact, evidence suggests that people view wealth in relative terms— e.g. when people get richer but do so along with the people around them, they do not necessarily view their situation as inherently better and therefore are not necessarily happier. For this reason, researchers have tried to disentangle wealth and income from measures of happiness. They endeavor to determine if the fact that college graduates are higher earners makes them happier when compared to those whose education ends at the high school level or before, or if there is more to the story.

One such study⁶⁷ utilized the General Social Survey’s data from 1972 to 2000 and found that controlling for income, the strength of the relationship between education and happiness weakens, but is still apparent: high school graduates reported being happy four percentage points more often than high school non-completers and college graduates reported being about two percentage points happier than high school graduates and six points higher than high school non-completers (see table 4).⁶⁸

⁶⁷ Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling.

⁶⁸ Oreopoulos & Salvanes, 2011

Table 4. Percentage happy by educational attainment

Did not graduate high school	81%
High school graduate	89%
College/University graduate	94%

Another study asked the question, “Taken all together, how would you say things are these days: would you say that you are very happy, pretty happy or not too happy?”.⁶⁹ Using this approach, and controlling for income and other factors, they found that years of schooling had a strong positive effect on levels of happiness/life satisfaction—the more educated people were, the higher the happiness score. Each year of education in the United States resulted in 0.017 more happiness points, which means that the difference between completing high school and completing a college degree was slightly greater than 0.06 happiness points⁷⁰

There is compelling and growing evidence that college and university graduates are happier than their counterparts who end their studies with a high school diploma or before, even when accounting for differences in income.

Marriage

College degree earners are more likely to marry, and data shows married people tend to be happier than non-married people. Roughly half of U.S. adults today are married. This number has remained relatively constant over the years but is down nine percentage points from the peak in 1960 of 72 percent.⁷¹ This decline is, in part, due to the fact that Americans are getting married later in life. Some of this decline is also because more Americans are living with a partner and raising children outside of marriage.

Figure 52 shows that bachelor’s degree recipients are more likely to marry than those with some college and the gap widens further when compared to those whose education stopped after high school. In 2015, among adults ages 25 and older, 65 percent with a four-year college or

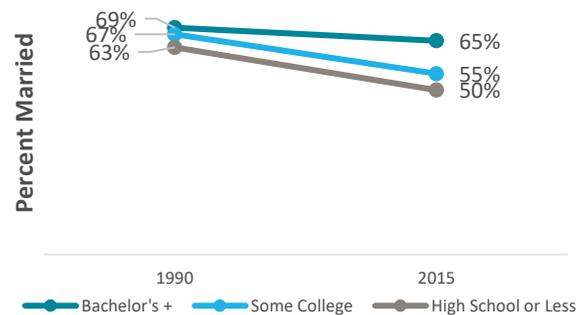
⁶⁹ Blanchflower, D.G., & Oswald, A. J. (2011). International happiness; Researchers created a regression equation to measure the results by using as its dependent variable a cardinal version of people’s answers where “very happy” is coded 3, “pretty happy” is coded 2 and “not too happy” is coded 1.

⁷⁰ Blanchflower & Oswald, 2011

⁷¹ Parker, K., & Stepler, R. (2017). As U.S. marriage rate hovers at 50%, education gap in marital status widens.

university degree were married, compared with 55 percent of those with some college education and 50 percent among those with no education after high school.

Figure 52. Percent Married by Education Level⁷²



Source: Pew Research Center Analysis 1990-2000 decennial censuses and the 2010 and 2015 American Community Surveys (IPUMS)⁷³

The likelihood of getting married has decreased since 1990 regardless of educational level, however, the sharpest declines are for those with a high school diploma or less.⁷⁴

An analysis by the Pew Research Center also shows the education gap in marital status has continued to expand and that marriage rates are more closely linked to socioeconomic status than any previous time.⁷⁵ Lower-income, never married adults are more likely to cite financial instability as a reason they are not married. In particular, non-married non-whites cite financial uncertainty as a primary reason for not marrying.

The link between income and marriage rates partially helps explain why college graduates are more likely to marry. As a consequence, the combining of two incomes through marriage amplifies the disparity of income between college degree earners and those with a high school diploma or less education.

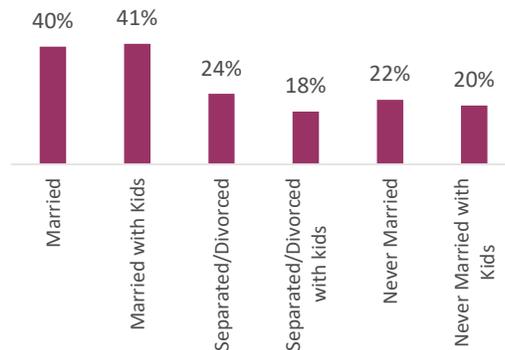
⁷² Parker & Stepler, 2017

⁷³ Note: "Some college" includes those with an associate degree and those who attended college but did not obtain a degree. Adults who are separated are not classified as married.

⁷⁴ Parker & Stepler, 2017

⁷⁵ Parker & Stepler, 2017

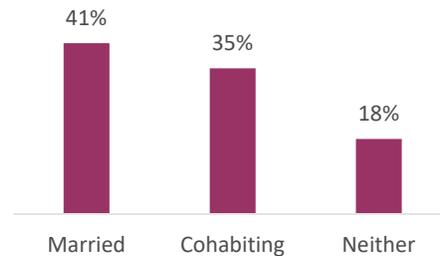
Figure 53. Percent 'happy' by Marital and Parenthood Status⁷⁶



Source: General Social Survey, 2010-2018

Figure 53 shows the relationship between marriage and happiness. Married people ages 18-50 report greater happiness than their non-married, separated/divorced, and never married counterparts. Married people are also more likely to be happy than those in domestic partnerships and significantly happier than those who are not married or cohabitating (see figure 54). Recent research shows that younger adults are more likely to have shared a home with a partner than a spouse. However, the same research also shows that cohabitation does not necessarily mean that those arrangements result in the same levels of happiness that comes with marriage.⁷⁷

Figure 54. Percent "very happy" by relationship status⁷⁸



Source: General Social Survey, 2010-2018

⁷⁶ Wofinger, N. (2019). Are married people still happier?

⁷⁷ Ingraham, C. (2019). Married people have happier, healthier relationships than unmarried couples who live together, data show.

⁷⁸ Ingraham, 2019

Married and cohabitating couples give different reasons for why they chose their relationship. Married people are more likely to cite love and the desire to have children for their choice to get married, while cohabitating partners cite practical reasons, such as convenience and finances for their living arrangements.⁷⁹ Married couples are also more likely to express happiness with the division of household chores, work/life balance, and levels of communication within the relationship.⁸⁰ In summary, college graduates marry at higher rates than those who did not graduate college or university, which can result in higher levels of happiness.

In conclusion, UC undergraduate education equips students with 21st century skills and prepares students for completing graduate degrees. UC graduates can expect higher levels of job security and job satisfaction than non-college degree earners. In turn, these long-lasting benefits can lead to improved interpersonal relationships, informed health decisions, enhanced life satisfaction, and happiness.

Future research

While researching indicators of personal well-being by educational attainment, there were challenges to assessing UC alumni outcomes. Some data on job satisfaction and workforce skills needs were available for UC Ph.D. alumni; however, data for undergraduate alumni were not. Additionally, while UCUES provided some data for students during their time at UC on 21st century skills and psychosocial change, information on undergraduate alumni 21st century skills acquisition and psychosocial change impact on employment outcomes were not available. An undergraduate alumni survey could help better understand how these skills transfer to the workplace post-graduation.

“Measures of both objective and subjective well-being provide key information about people’s quality of life. Statistical offices should incorporate questions to capture people’s life, evaluations, hedonic experiences and priorities”

- Joseph Stiglitz while chairing the Commission on the Measurement of Economic Performance and Social Progress.

Furthermore, data on UC alumni happiness, life satisfaction, and health outcomes were not available but could be added as questions on both an undergraduate and graduate alumni survey. Additionally, administering an external assessment of 21st century skills (rather than self-assessments in student surveys) could be useful to better understand the impact of a UC degree. Direct assessment of 21st century skills would be helpful in understanding the areas that UC programs help students develop and areas that programs could provide more focus on if

⁷⁹ Ingraham, 2019

⁸⁰ Ingraham, 2019

necessary. There is also research underway to use external assessment of 21st century skills, such as critical thinking and information literacy (civic reasoning) in UC Irvine's Next Generation Undergraduate Success Measurement Project, led by Dean Richard Arum and supported by the Andrew W. Mellon Foundation.

It is worth mentioning that even though there is not complete information on UC undergraduates or other college degree earners in these areas of personal well-being, there is even less data on people who did not go to college. College students and alumni are more regularly asked about their state of well-being and personal development than high school graduates or high school non-completers. This is also an area to consider for potential research.

Data Inventory of Resources:

Personal Economic				
Data Point	Coverage	Description	Data Source	Relevant Links:
Annual earnings of UC graduates; Lifetime earnings of UC graduates	UC alumni	Median annual earnings of UC graduates by degree type, undergraduate major, and industry, comparisons of earnings of Californians with degrees	UCOP analysis of CA Employment Development Department (EDD) data and American Community Survey (ACS)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/uc-alumni-earnings
Unemployment rates by educational attainment level	National	Weekly earnings and unemployment rates by education attainment	U.S. Bureau of Labor Statistics	Publicly available data from BLS
Economic mobility	UC alumni	Percentage of UC alumni who earn more than their parents; percentage in bottom income quintile who move to top, also earnings by first-generation and Pell status	The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/climb-mobility-analysis
Mobility Report Cards	UC, National	Ranks of colleges and universities by upward mobility rates; UC compared to other institutions	Equality of Opportunity Project, NY Times analysis	NY Times analysis: https://www.nytimes.com/interactive/projects/college-mobility/
Rate of Return and Breakeven point	UC alumni	Five-year rate of return to undergraduate degrees by major and financial aid status for 2005, 2008, and 2010 UC cohorts; Number of years between graduation and positive financial returns	UCOP analysis of student financial support data and CA Employment Development Department (EDD) data	Internal analysis of sensitive student data
Non-salary Compensation	National, California, and UC alumni	Health insurance and retirement plan through employment, by educational attainment; UC data obtained from CLIMB initiative	Current Population Survey, Economic Supplement; The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative	Health insurance and retirement plan data publicly available via CPS; UC-specific data internal analysis of CLIMB data
Homeownership rates	National, California, and UC alumni	Rates of homeownership; UC data obtained from CLIMB initiative	Current Population Survey; The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative	National and CA rates publicly available via CPS; UC-specific data internal analysis of CLIMB data

Public Economic				
Data Point	Coverage	Description	Data Source	Relevant Links:
Contributions to the economy	UC alumni and California	UC contributions to California GDP, including direct, indirect, and induced effects	The University of California Systemwide Economic, Fiscal, and Social Impact Analysis (January 2021, Beacon Economics)	Beacon Economics report, publicly available here: https://universityofcalifornia.edu/sites/default/files/economic-impact-report-2021.pdf
Expenditures, savings, and taxes by education level	National	Proportion of income put toward spending, saving, and taxes by education level and income	Survey of Consumer Expenditures (2016)	Publicly available data from Survey of Consumer Expenditures
GDP and tax contribution estimates based on income and institution type, fifteen years after entry	UC alumni, California, and National	Estimates of spending, saving, and taxes for UC alumni and other institutions, based on proportions by income level	The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative	UC-specific data internal analysis of CLIMB data
Actual federal and estimated state taxes paid by UC graduates with CA averages	UC alumni	Tax contributions based on income	The Collegiate Leaders in Increasing Mobility (CLIMB) Initiative	UC-specific data internal analysis of CLIMB data
Percent Business Ownership and Percent of Business Owners with Paid Employees by Educational Attainment	National, UC alumni	Business ownership by educational attainment, degree type	American Community Survey (2012); CLIMB Initiative (2015)	Publicly available data from ACS, UC-specific data internal analysis of CLIMB data
Companies founded by UC alumni	UC alumni, California	Number of California companies founded or co-founded by UC alumni	Pitchbook (2018)	Data available via Pitchbook, https://pitchbook.com/
CEOs of US companies raising at least \$100 million	UC alumni	CEOs of US companies raising at least \$100 million	Crunchbase News, Glasner, J. (2018)	Data available in cited source(s)
UC slumni classified as C-suite executives by sector	UC alumni, California	C-Suite executives who are UC alumni, highlight those located in California	Pitchbook (2019)	Data available via Pitchbook, https://pitchbook.com/
Projected Occupations by Entry Education Level, California	California	Projections of state workforce needs and median annual salaries by education level	CA Employment Development Department (EDD, 2019)	Publicly available data from CA EDD
Incarceration and Public Assistance Programs	California	Probability of incarceration by educational attainment, cost per inmate, incarceration spending in California	UC Berkeley Survey Research Center (2005);	Data available in cited source(s)

			CA Legislative Analyst's Office (2016-17)	
Public Assistance	California	Costs of public assistance, i.e. Medicaid, housing assistance, SNAP benefits, by level of education	Ma, J., Pender, M., & Welch, M. (2016)	Data available in the cited source(s)
Volunteer Labor	UC alumni, National	Volunteering hours and community-focused activities by educational level	UCUES (2016); Trostel, P. (2015)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main Other data available in cited source(s)
Improved Efficiencies and Productivity	UC alumni	Examples of innovations and new businesses created by UC alumni	UC inventions dashboard	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/uc-inventions-glance

Public Well-being				
Data Point	Coverage	Description	Data Source	Relevant Links:
Percentage of UC alumni working in public well-being professions by discipline	UC alumni	UC alumni working in public well-being professions by discipline	LinkedIn, UC student data	Internal analysis of LinkedIn data and UC student records
UC-educated California public school teachers	UC alumni	K-12 teachers who graduated from UC	CA Department of Education (CDE)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/uc-trained-california-public-school-teachers
Location of doctors, nurses, dentists, optometrists, and veterinarians trained by UC since 1999	UC alumni	UC alumni (graduate) professionally licensed in California	CA Department of Consumer Affairs (DCA)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/uc-health
California cities UC alumni work in as civil engineers, architects, and environmental experts	UC alumni	Locations of UC alumni who are civil engineers, architects, and environmental experts	LinkedIn, UC student data	Internal analysis of LinkedIn data and UC student records
Percentage of UC alumni working in public well-being industries by demographics	UC alumni	Public well-being work by Pell Grant recipient status, First-generation, Underrepresented Group (URG), and gender	LinkedIn, UC student data	Internal analysis of LinkedIn data and UC student records
UC alumni volunteers	UC alumni	UC students and alumni volunteering	UCUES (2018), LinkedIn, UC student data	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main ; Internal analysis of LinkedIn data and UC student records
UC alumni serving as public officials and voting	UC alumni	State-elected officials, state justices, and key civic leaders who graduated from UC. Voting rates of UC alumni	UC State Government Relations, California Secretary of State	UC internal analysis of state officials; UC Information Center voting dashboard: https://www.universityofcalifornia.edu/infocenter/uc-undergraduate-voting
Disaster Preparedness	UC alumni	Key examples of UC alumni producing public-serving innovations for earthquake, pandemic, and other issue preparedness		Environmental scanning of disaster preparedness work
Climate Change & Sustainability	UC alumni	Key examples of UC alumni conducting public-		Environmental scanning of climate change work

		serving research on climate change issues		
Agriculture	UC alumni	Key examples of UC alumni producing public-serving innovations for agriculture		Environmental scanning of agricultural work
Health and Medicine	UC alumni	Key examples of UC alumni producing public-serving innovations for health and medicine		Environmental scanning of work in health and medicine

Personal Well-being				
Data Point	Coverage	Description	Data Source	Relevant Links:
Job Security	National	Unemployment rates by educational attainment	Bureau of Labor Statistics (2020)	Publicly available data via BLS
Graduate degree attainment	UC alumni	Percentage of UC alumni completing graduate degrees, by race, 2000-2012 cohorts	UC student data, National Student Clearinghouse	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/alumni-grad-outcomes
Job satisfaction (national and Ph.D. Alumni by graduation year and sector)	National, UC alumni	National levels of job satisfaction by education level; UC Ph.D. alumni levels of job satisfaction	Survey of Doctorate Recipients (2017)	Publicly available data via NSF SDR.
Skills alignment with workforce needs	UC alumni	UC Ph.D. alumni ratings of skill acquisition and professional importance	UC Ph.D. Alumni Survey (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/doctoral-experience-survey
Networking	National, UC alumni	Percentage of jobs found through networking, networking skill development while at UC, professional importance of networking	LinkedIn (2016), UC Ph.D. Alumni Survey (2018)	Data available in cited source(s), UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/doctoral-experience-survey
Interactions with Coworkers	National	Ratings of personal engagement with coworkers by education level	General Social Survey (2016)	Publicly available data via GSS
Interpersonal skills and collaboration	UC seniors	UC seniors' ratings of interpersonal skill growth, understandings of international perspectives, by demographics	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Communication skills	UC seniors	UC seniors' ratings of communication skill growth: oral, presentation, and written	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Leadership skills	UC seniors	UC seniors' ratings of leadership skill growth, by demographics, residency, entry-level, and discipline	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Participation in co-curricular activities related to leadership	UC seniors	Participation in co-curricular activities related to leadership	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main

Critical thinking and information literacy	UC seniors	UC seniors' ratings of improvement in critical thinking, information skills, by demographics	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Sources of health information and health behaviors by educational attainment level	National	Likelihood of seeking health information from written sources and other media, relationship between positive health behaviors and educational attainment	US Health Resources and Service Administration, Trostel (2015), Cutler & Lleras-Muney (2010), Hanbury, Rahkovsky & Schnell (2015)	Data available in cited source(s)
Learning in field of study and quantitative reasoning	UC seniors	UC seniors' reported gains in quantitative skills and understanding of their field of study	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Social awareness and ethnic identity development	UC seniors	UC seniors' reported levels of social awareness and understanding racial and ethnic identities, by race/ethnicity	UCUES (2018)	UC Information Center dashboard: https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main
Happiness by educational attainment	National	Happiness and life satisfaction by educational attainment	Oreopoulos & Salvanes (2011); Branchflower & Oswald (2011)	Data available in cited source(s)
Marriage rates by educational attainment	National	Percent married by education level, 1990 to 2015	Pew Research Center analysis (2015)	Data available in cited source(s) and publicly available via ACS
Happiness by marital and parental and relationship status	National	Reported happiness levels by marital and relationship status	General Social Survey, Wofinger (2019), Ingraham (2019)	Publicly available data from GSS and in cited source(s)

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