

Office of the President

TO MEMBERS OF THE BOARD OF REGENTS:

DISCUSSION ITEM

For Meeting of March 18, 2021

BEYOND ECONOMIC IMPACT: UNDERSTANDING SOCIETAL IMPACTS AND PUBLIC VALUE OF A UC DEGREE

EXECUTIVE SUMMARY

A recent independent economic analysis of the University of California's fiscal and economic impacts on California quantifies UC's contributions to the state's economy and workforce but noted that UC's broader societal impacts are more difficult to quantify. This discussion item elaborates on many of UC's societal impacts and the public value of a UC degree, including UC contributions to advance economic mobility, job creation, public service occupations, and an engaged citizenry (e.g., community service, volunteering, voting) with a goal of receiving feedback to inform future work.

BACKGROUND

A recently released independent economic analysis on UC's fiscal impact¹ to California documents how UC is a major contributor to the state's vitality, generating \$82 billion in economic activity each year and supporting more than half a million jobs (or 1 in 45 jobs in the state).

The report looks at 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). That spending initiates a ripple effect in which UC suppliers can 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. These measures, expressed both in total or per dollar of state support, show:

In total, UC-related spending generates:

- \$82.1 billion in economic impact
- \$55.8 billion in value added
- \$37.6 billion in labor income

Every \$1 of state funding helps generate:

- \$21.04 in economic output
- \$14.32 in value added
- \$9.65 in labor income

¹ The Economic Impact Report covers all UC general and health campus operations, Lawrence Berkeley National Laboratory, UC Hasting College of the Law, UC Office of the President, and Agriculture and Natural Resources.

As UC advocates for restoration of prior state budget cuts, along with investments in critical areas, the economic impact report illustrates one major aspect of UC's impact—its return on investment.

National data show increased lifetime earnings associated with postsecondary degree attainment, with the public value of a degree most frequently defined in economic terms, focusing on post-graduation earnings and employment outcomes. UCOP leveraged alumni earnings data from the California Employment Development Department (EDD) to illustrate both the personal return on investment to students and the public value of advancing economic mobility, particularly for lower-income students. This data shows:

- The majority of UC Pell grant recipients go on to earn more than their parents within five years of graduation and the majority of UC first-generation students do so within seven years
- By five years after graduation, students from almost all of UC's baccalaureate programs have student loan debt-to-earnings ratios of less than 10 percent (i.e., manageable level of debt)
- Across disciplines, undergraduate degree recipients tend to double their earnings between two and ten years after graduation (i.e., demonstrating continued earnings growth)

The Office of the President has incorporated systemwide findings in the UC Accountability Report, with data by campus, majors, and graduate degree attainment in a UC Information Center dashboard on UC Alumni at Work (<https://www.universityofcalifornia.edu/infocenter/uc-alumni-work>).

UC is among a select group of institutions conducting research on post-graduation earnings, making it difficult to obtain comparable data, although it is provided where possible. For example, as seen in figure 1,

- UC bachelor degree recipients earn more than the median for all California graduates within five years of graduating
- UC bachelor degree recipients that earn a graduate degree exceed the median for all other graduate degree holders in California ten years after receiving their UC bachelor's degree

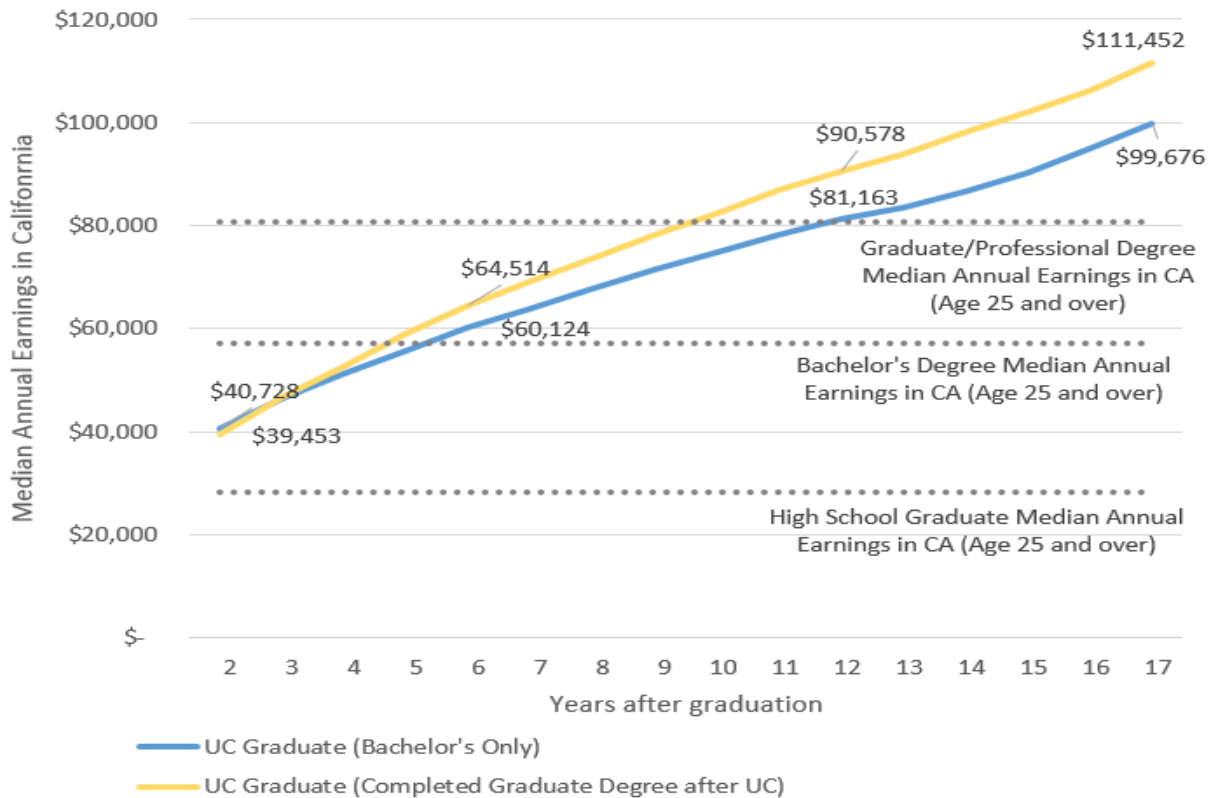


Figure 1: 2016 median annual earnings of UC graduates by educational attainment, 1999-2014 cohorts. (Source: CA EDD, US Census Bureau, and 2016 American Community Survey 5-year estimates.)

These economic and fiscal measures fail to account for UC’s *social* impacts, including the University’s role in advancing economic mobility and enhancing human capital, meeting critical workforce needs, and promoting innovation and business creation. This item demonstrates features of this public value of a UC degree.

To develop this more comprehensive picture of UC’s public impact, UCOP is identifying and gaining access to a growing number of external data sources, including:

- LinkedIn profile data (for data on alumni occupations and volunteering)
- California Department of Education (for data on alumni teaching in K-12 schools)
- California Department of Consumer Affairs (for data on alumni who are licensed doctors, nurses, and mental health professionals)
- California Department of State (for data on alumni voter registrations)
- Collegiate Leaders in Increasing MoBility (CLIMB) research group with access to IRS tax returns (for data on alumni charitable contributions and small business ownership)
- PitchBook (for data on companies founded by UC alumni)

This item shares findings from all of these sources to document more of the public benefits of a UC degree in advancing economic mobility, spurring economic development and job creation, supporting public works, and promoting civic engagement.

Economic mobility: UC is “California’s Upward Mobility Machine”

In 2015, the *New York Times* reported that “the UC’s nine campuses still lead the nation in providing top-flight education to the masses” and commended its “commitment to economic diversity.” In their 2017 College Access Index ranking, the *Times* ranked six UC campuses in the top ten based on having higher shares of freshman entrants that were Pell grant recipients for national universities with at least a 75 percent five-year graduation rate. UC 2030 goals focus on *increasing* economic mobility for these students, along with underrepresented and first-generation students, by eliminating timely graduation gaps that can reduce indebtedness, expand opportunities to attend graduate school, and increase their earnings through earlier entry into the workforce.

UC is directly addressing a top concern of Californians—poverty and income inequality. A January 2020 Public Policy Institute of California (PPIC) poll found that about two in three adults (63 percent) and seven of ten likely voters (68 percent) are concerned that the gap between rich and poor is getting larger.

CLIMB data demonstrates UC’s role in combatting income inequality through enabling low-income students to achieve intergenerational economic mobility. By matching UC students to their IRS tax records, and linking them to their parents’ tax records when they first enrolled at UC, CLIMB researchers show that 36 percent of UC students who entered UC in the bottom 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 (see figure 2).

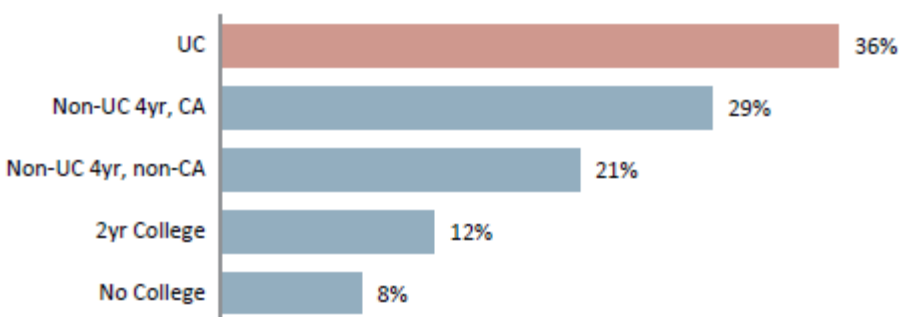


Figure 2: Percentage from the bottom 20 percent of income who move to the top 20 percent, UC alumni and peers from the same age group, 1999-2005 college entry cohorts. (Source: CLIMB)

Californians also are concerned with the state’s housing crisis with homelessness (20 percent adults, 23 percent likely voters) and housing costs and availability (10 percent adults, 11 percent likely voters) cited as the two top issues the governor and State legislature should tackle based on the 2020 PPIC poll.

CLIMB research data show that a UC degree helps students from across the income spectrum to achieve home ownership (see figure 3). *UC students who come from low-income families (1st quintile of family income) are about as likely as students from the highest family incomes to go on to own a home.* These data illustrate UC's ability to advance economic mobility and to keep the California dream alive, particularly in regards to lower-income students out-earning their parents and their ability to achieve home ownership.

Percentage of UC students (graduated and not graduated) with home mortgage deductions, by family income distribution and years after expected graduation, 1999-2005 entry cohorts

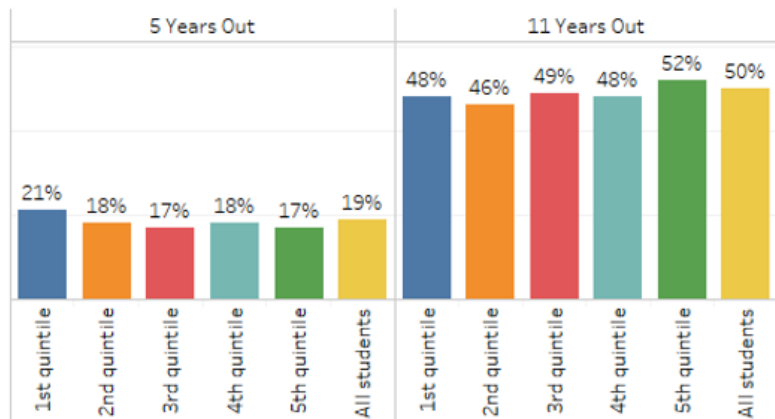


Figure 3: UC homeownership rates by parent income quintile (Source: CLIMB)

Economic development: UC alumni not only get jobs, they create them

UC alumni go on to serve as executive business leaders in major companies, critical to the creation of jobs and founding of new companies. While California EDD data show the industries in which UC alumni work, sources such as LinkedIn and PitchBook provide insight into the companies they work for, their occupations, and the jobs they are responsible for creating. PitchBook reports more than 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.

LinkedIn profiles highlight the range of occupations that UC alumni hold at major companies such as Google (see figures 4a and 4b). The majority of UC alumni working for technology global giant Google are STEM bachelor degree recipients in engineering and technical roles, *but* graduates of UC social science and humanities, along with Masters of Business Administration and Doctoral (PhD) programs work at Google in a range of roles, including critical leadership positions.

UC UG Alumni Working at Google by Major

Occupations of UC Undergraduate Alumni Working at Google

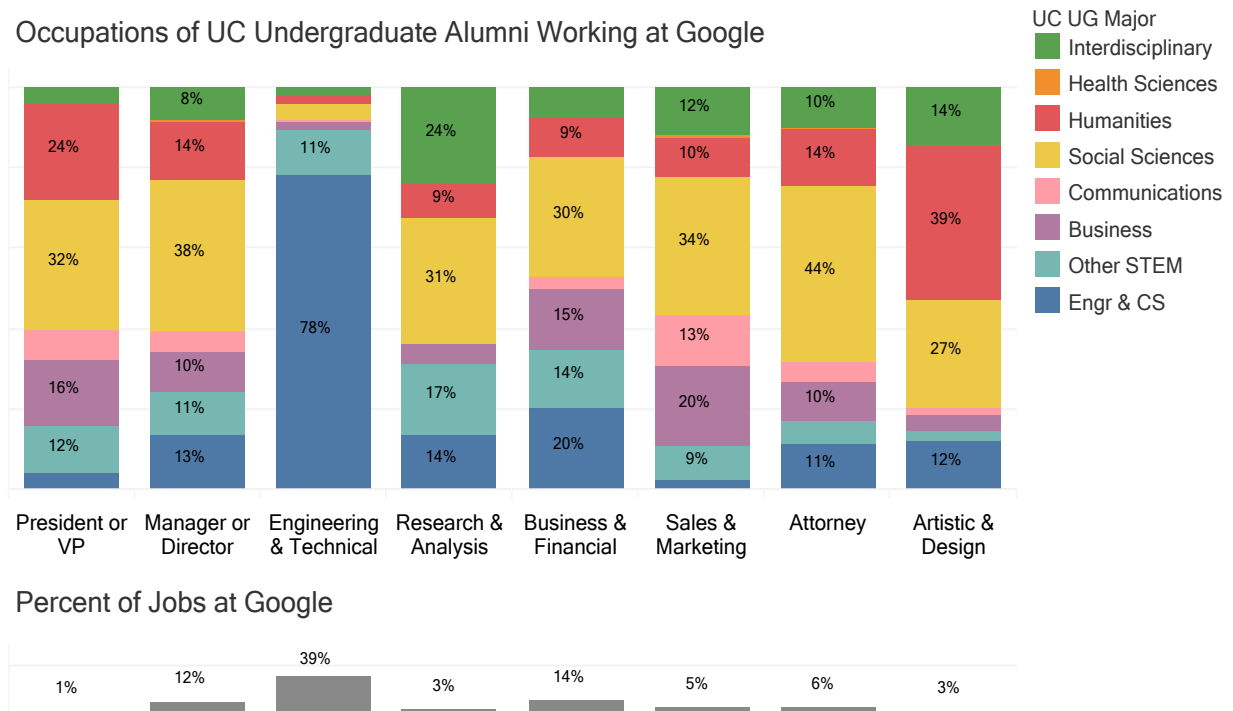
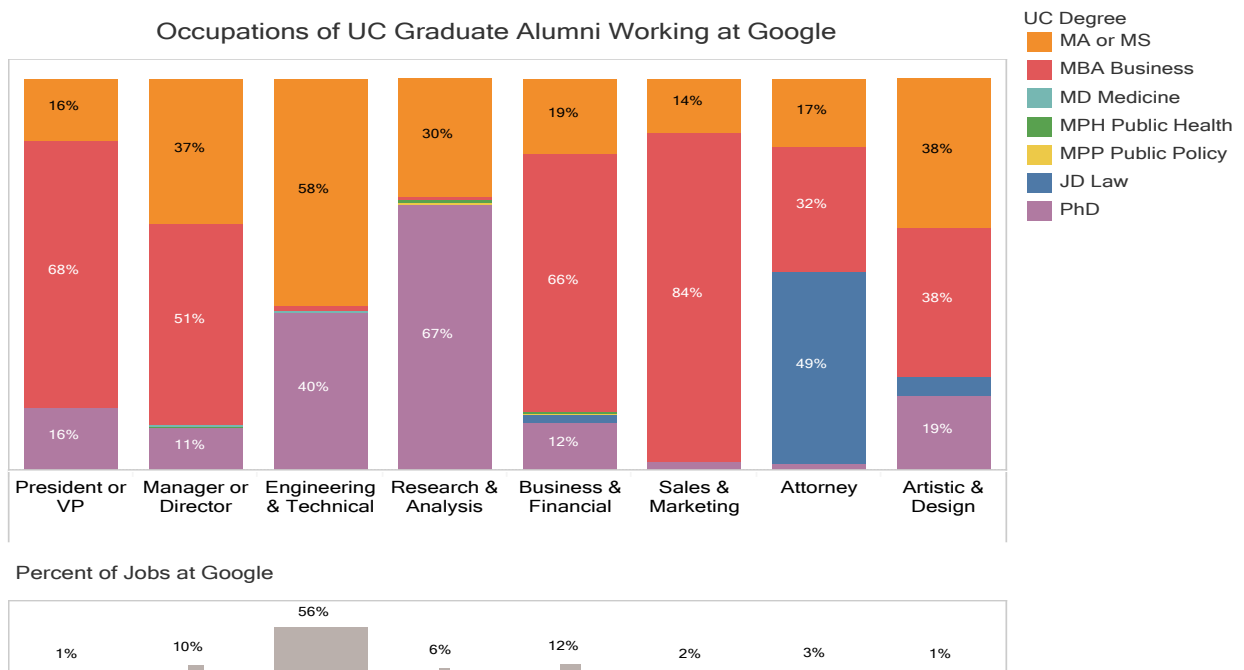


Figure 4a: Google employees by position for UC bachelor degree recipients

Occupations of UC Graduate Alumni Working at Google



UC alumni also make important contributions to the small business landscape. 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 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 5).

Proportion of UC bachelor’s degree recipients owning a small business in 2015 by type of graduate degree obtained, 1999-2005 UC graduating cohorts

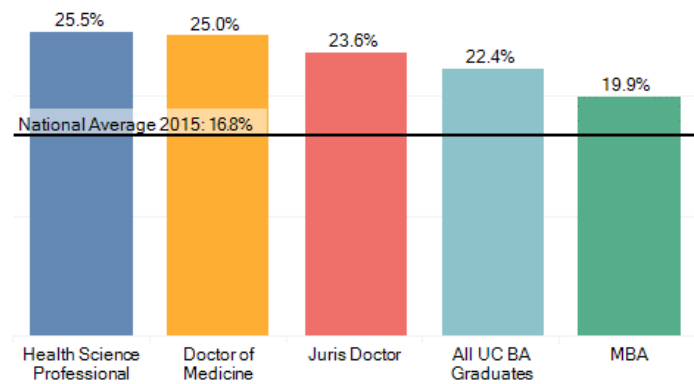


Figure 5: UC bachelor's degree recipients reporting small business ownership (Source: CLIMB)

UC bachelor degree recipients who also completed a graduate degree in law, medicine or health sciences (at UC or elsewhere) were even more likely to own a small business. This highlights how UC alumni contributions to the labor force extend beyond traditional employment and into small business ownership and job creation.

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), along with Stanford and USC.

In addition, PitchBook reported that as of 2019, there were 3,400 California companies founded or co-founded by UC alumni across California (see figure 6), compared to 2,240 for Stanford, 840 for USC and 1,300 for California State University (CSU) alumni.

Some UC alumni continue the land grant tradition by starting companies that advance California’s agriculture industry, including:

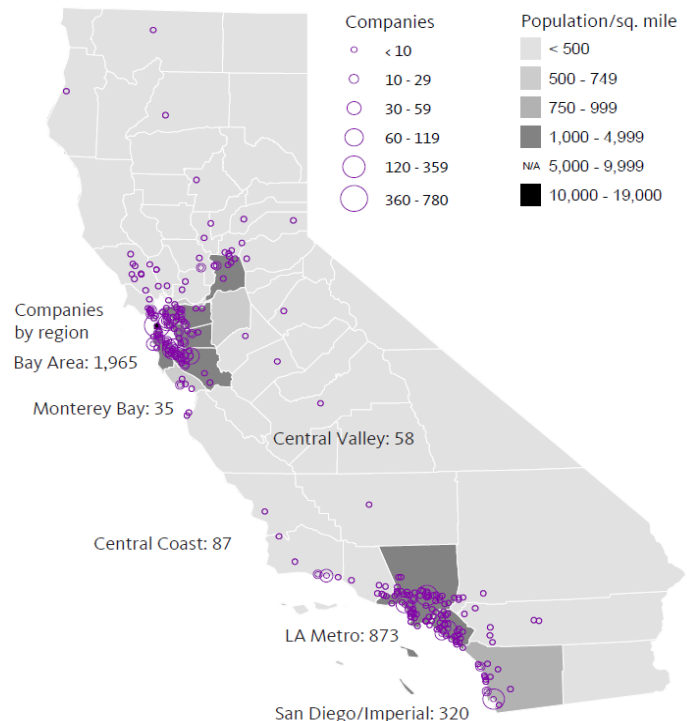


Figure 6: Companies founded by UC alumni (Source: PitchBook)

- 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

UC alumni are also leveraging 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 started in Palo Alto and 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
- Stitch Fix (UCB) – changing the way people find clothes they love by combining technology with the personal touch of seasoned style experts
- 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 works: UC alumni contribute to the public good

The 2020 UC Undergraduate Experience Survey (UCUES) found 91 percent of respondents felt 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. Many UC alumni go on to work that supports the public good, and employment data from EDD bear this out. Over 20 percent of UC bachelor's recipients go on to work in public service fields (i.e., education, health care, public administration, and social welfare) immediately after graduation, rising to 30 percent after 15 years.

Educating California's students

A significant portion of UC Ph.D. recipients work in higher education, with 25 percent of UC faculty and 20 percent of CSU faculty having received their Ph.D.s from UC. But there has been less sight into the role UC alumni play in K-12 schools.

California EDD data shows almost ten percent of UC undergraduate alumni work in K-12 education a decade after graduation, including 16 percent of Arts & Humanities and 11 percent of both Social Science and Physical Science bachelor degree recipients. The proportion of graduate degree recipients going into K-12 education is three percent overall, with ten percent of

graduate degree recipients in the Arts & Humanities going into K-12 education.

While CSU plays a major role in producing teachers, UC's contribution to the state's public schools may be surprising. UC-trained teachers work in more than 7,200 California public schools, or three out of four schools in the state serving 72 percent of public elementary schools, 89 percent of public middle schools and 85 percent of public high schools (see figure 7). UC alumni work in schools in every county, with the exception of Alpine County (California's least populated county, with approximately 1,100 residents). In addition, 11 percent work in the Inland Empire, which holds 12 percent of California's population and 12 percent teach in the Central Valley, which hold 19 percent of California's population.

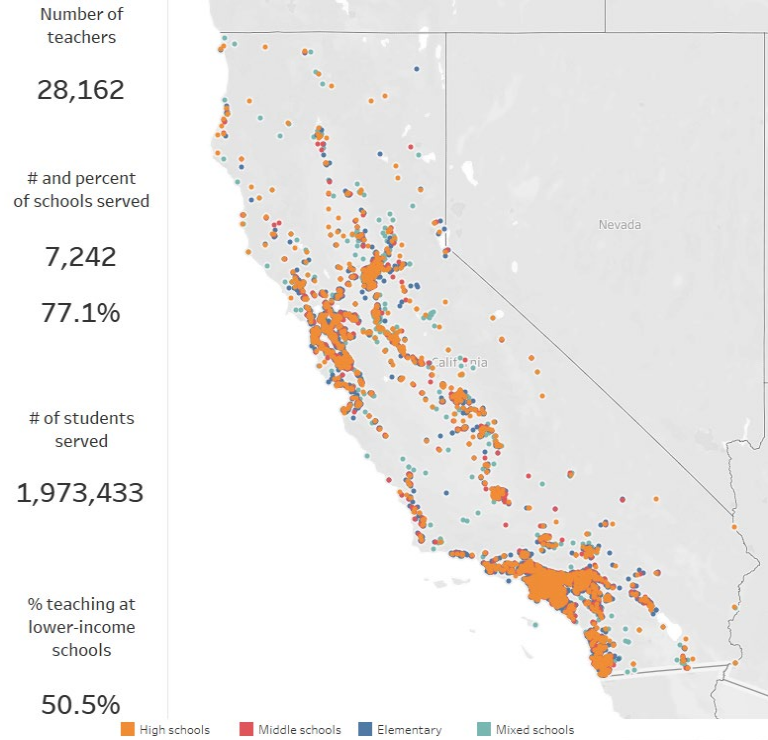


Figure 7: UC-educated California public school teachers (Source: CDE)

UC alumni are also starting businesses to help improve student outcomes, including:

- ALEKS (UCI) – a web-based, artificially intelligent assessment and learning system
- 7 Generation Games (UCR) – immersive educational video games and interactive apps that teach math, history and language
- Spotlight Education (UCLA) – provides narrative reports and personalized videos to synthesize educational data and improve outcomes in schools
- Emote (UCSD) – school software that enables staff interaction with students
- Nucleos (UCSC) – job-aligned education programming for those in correctional facilities
- Freedom Writers Foundation (UCI) – tools to facilitate student-centered learning, improve academic performance and increase teacher retention

Caring for and curing California’s citizens

UC health science schools and residency program alumni are an important part of California’s future, with nearly 50 percent of medical students and residents in the state trained by UC. In addition, 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.

There are 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. 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.

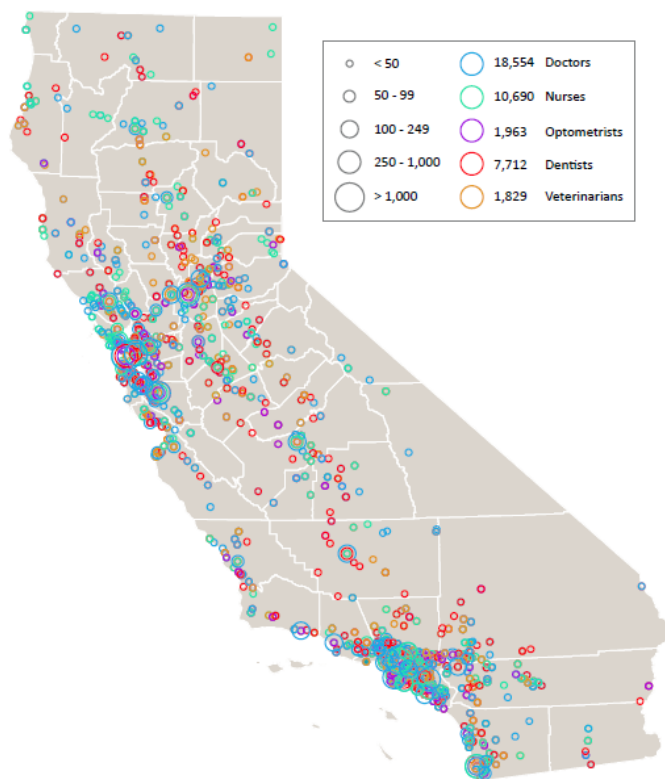


Figure 8: Location of doctors, nurses, dentists, optometrist and veterinarians trained by UC since 1999 and currently licensed in California (Source: Department of Consumer Affairs)

Table 1: Currently-practicing medical professionals by graduate school

	Doctors		Dentists		Optometrists		Veterinarians		Total	
	Number	Towns	Number	Towns	Number	Towns	Number	Towns	Number	Towns
UC Berkeley	-	-	-	-	1884	342	-	-	1884	342
UC San Francisco	4420	427	3487	494	-	-	-	-	7907	596
UC Los Angeles	5110	463	3613	469	-	-	-	-	8723	584
UC Davis	2521	366	-	-	-	-	3617	533	6138	607
UC San Diego	2837	339	-	-	-	-	-	-	2837	339
UC Irvine	3111	409	-	-	-	-	-	-	3111	409
Total	17999	670	7100	626	1884	342	3617	533	30600	858
Total California	127437	1123	77745	1090	9474	562	25355	916	240011	1388
Percent UC	14%	60%	9%	57%	20%	61%	14%	58%	13%	62%

The number of currently-licensed California health professionals with graduate degrees from the University of California, and the number of unique cities and towns in which they practice (identified from their street address). Source: Department of Consumer Affairs.

Many UC medical and health science graduates also create companies, such as

- Inogen (UCSB) – a portable oxygen concentrator

- 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

Strengthening California's infrastructure and environment

UC alumni preserve the quality of the environment by serving as civil engineers who support the state's infrastructure and systems for water supply and sewage treatment and as environmental experts for air quality, as well as hydrology and geology engineers. LinkedIn profiles show UC alumni serving in these roles in more than 175 cities across California (see figure 9).

In addition, a number of UC alumni have founded companies that support these goals, including:

- Innovative Construction Solutions (UCI) – general engineering contractor with hazardous waste removal and demolition experience
- Nautilus Environmental (UCSD) – provides toxicity testing for waters, sediments, and soils
- Water Planet (UCLA) – next-generation water purification, reuse and desalination solutions
- Mosaic (UCSC) – a solar fin-tech company that offers financing for solar projects, democratizing the social and environmental benefits of clean energy
- SunTherm Energy (UCM) – providing solar thermal technology to the Central Valley
- Next Energy Technologies (UCSB) – cutting edge solar technology that transforms windows into energy producing assets
- Exergy Systems (UCB) – reduce material and resource consumption in manufacturing by providing revolutionary water and material recycling solutions and technologies
- Gridworks (UCSB) – convene, educate and empower stakeholders working to decarbonize electricity grids
- CleanWorld (UCD) – a leading North American innovator in advance, high-solids

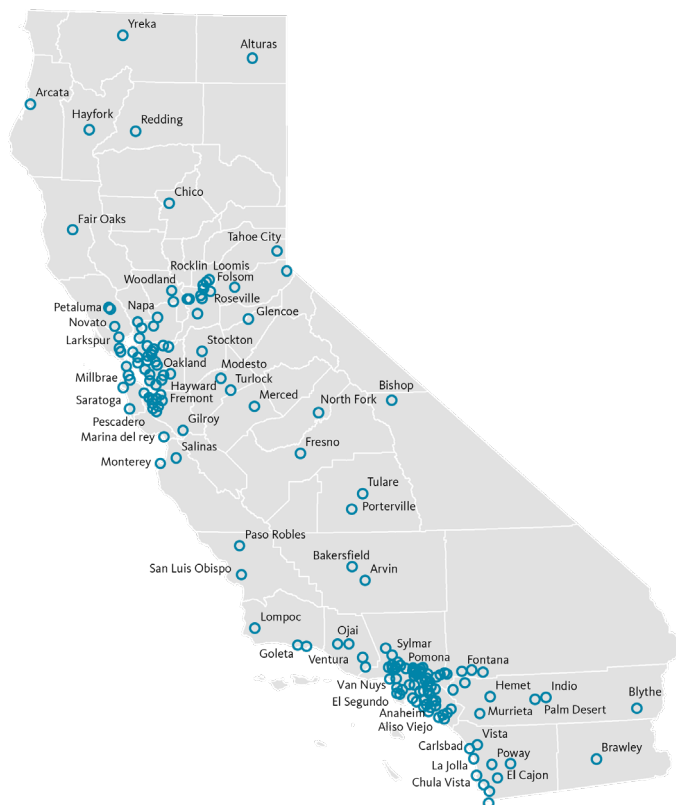


Figure 9: California cities UC alumni work in as civil engineers, architects, and environmental experts all degree types, 2000 to 2018 graduating cohorts. (Source: LinkedIn)

- anaerobic digestion (HSAD) technology
- Conservify (UCR) – open source hardware and software solutions to help democratize conservation technology.

UC alumni are also redefining disaster preparedness. For example, the MyShake app (UCB) has become 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.”²

Civic engagement: UC alumni become active citizens

Another public value associated with a college degree is increased civic engagement, including community and public service, contributing to taxes and charities, volunteering, and voting.

UC alumni serve in important public service leadership roles. For example, Vice President Kamala Harris, Lieutenant Governor Eleni Kounalakis, State Controller Betty Yee, and Chief Justice Tani Cantil-Sakauye all graduated from UC. In addition, one out of three State legislative leaders are UC alumni. Furthermore, UC alumni serve in leadership roles for the State’s public education segments, including as UC President and CSU and California Community College (CCC) Chancellors and as critical members on the UC Board of Regents, CSU Board of Trustees, and CCC Board of Governors.

By fifteen years after graduation, UC graduates are contributing on average \$30,000 in federal taxes and \$7,600 in state taxes per year, *twice as much as the average Californian*. UC alumni are also more likely to give back to their communities in the form of charitable contributions. A higher proportion of UC alumni donate to charities compared to the national average. In 2015, about 24 percent of all federal tax filers claimed a charitable tax deduction. UC alumni, in comparison, achieve that rate of charitable giving within eight years of graduating from UC and reach rates in excess of 60 percent in 16 years after graduating from UC (see figure 10).

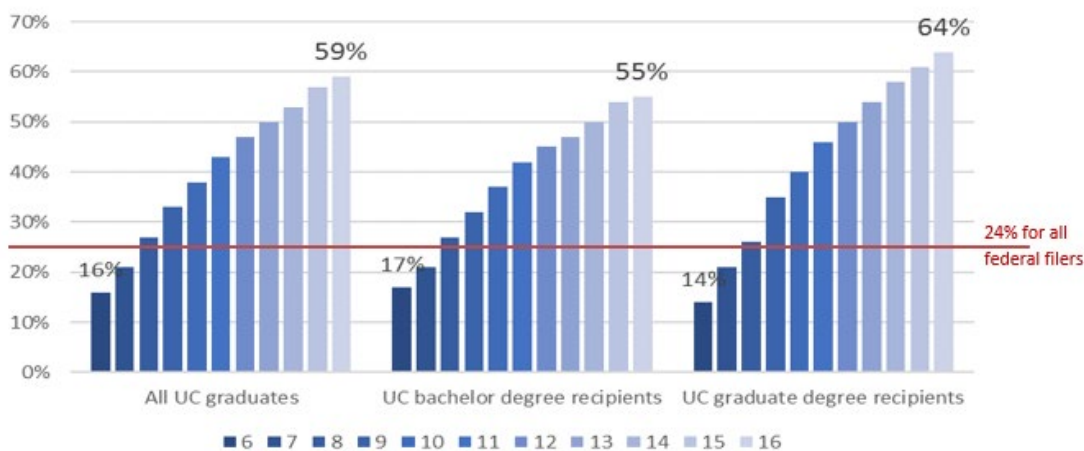


Figure 10: 2015 charitable contributions by year after UC degree, 1999 to 2009 exit cohorts (Source: CLIMB)

² <https://news.berkeley.edu/2019/10/17/california-rolls-out-first-statewide-earthquake-early-warning-system/>

UC alumni are among the leaders in California in terms of civic engagement as measured by voter registration and participation. UCOP has acquired voter registration records from the California Secretary of State to compare voter participation for UC alumni to other similarly aged and educated voters. UC alumni are more likely to vote with 65 percent of UC alumni voting in 2018, compared to 48 percent of similarly-aged registered voters (i.e., aged 22 to 41) and 60 percent of those with a bachelor’s degree or higher.

UC students and alumni are also more likely to serve as volunteers in their communities. While enrolled at UC, 42 percent of undergraduates reported in spring 2020 UCUES that they participated in community service, which is twice the rate of college students volunteering in California (26 percent) and nationally (25 percent) as estimated by the Corporation for National Community Service. In the same UCUES survey, 90 percent of undergraduates responded that participation in community-focused activities on their campus has influenced their desire to continue community-focused activities after graduation.

LinkedIn profiles give us some insight into UC alumni volunteer activities, with the majority supporting causes for youth and education, along with human rights and empowerment (figure 11). Data by campus show Habitat for Humanity, Red Cross, and the Boys & Girls Club, along with campus and medical center programs as top places where UC alumni report volunteering (see table 2).

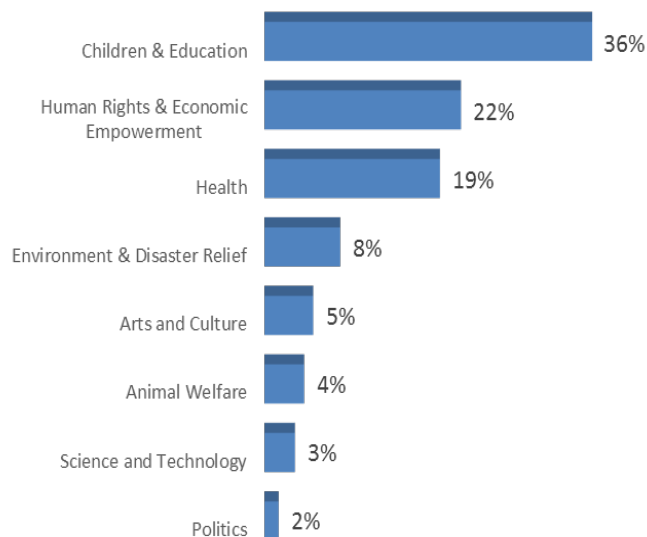


Figure 11: Percentage of UC alumni volunteers by cause. (Source: LinkedIn)

Table 2: Top volunteer organizations for UC undergraduate alumni by campus

UC Berkeley	UC Davis	UC Irvine
Habitat for Humanity UC Berkeley SAGE Mentorship The Berkeley Project Red Cross	Davis Medical Center UC Davis Habitat for Humanity Red Cross Amer. Cancer Society	Irvine Medical Center THINK Together UC Irvine Red Cross Habitat for Humanity
UCLA	UC Merced	UC Riverside
UCLA UniCamp UCLA Health UCLA Habitat for Humanity UCLA Volunteer Ctr	Boys & Girls Club UC Merced Mercy Medical Center Habitat for Humanity Red Cross	BioMedical Engineering Society Society of Women Engineers Society for Hispanic Professional Engineers Accounting Society of UCR American Institute of Chemical Engineers

UC San Diego	UC Santa Barbara	UC Santa Cruz
Habitat for Humanity UC San Diego Red Cross San Diego Health Sys Boys & Girls Club	UC Santa Barbara Habitat for Humanity Sprout Up Red Cross Boys & Girls Club	UC Santa Cruz Habitat for Humanity Boys & Girls Club Red Cross SC Homeless Garden

Communicating the value of a UC degree

UCOP’s Institutional Research & Academic Planning (IRAP) unit has initially focused on publishing topic briefs that demonstrate the approach and data collected to support other university partners to engage in this work. Where possible, IRAP has also published data in the UC Information Center, particularly when detail can be provided by campus (see Attachment 1)

As IRAP continues this work, feedback is being sought on messages that resonate, other ideas on additional research to conduct, and ways to share this information with others.

Key to Acronyms

CLIMB	Collegiate Leaders in Increasing MoBility
CCC	California Community Colleges
CSU	California State University
EDD	Employment Development Department
IRAP	Institutional Research & Academic Planning
IRS	Internal Revenue Service
PPIC	Public Policy Institute of California
UCOP	UC Office of the President
UCUES	UC Undergraduate Experience Survey

Attachment 1: Communicating the Value of a UC Degree