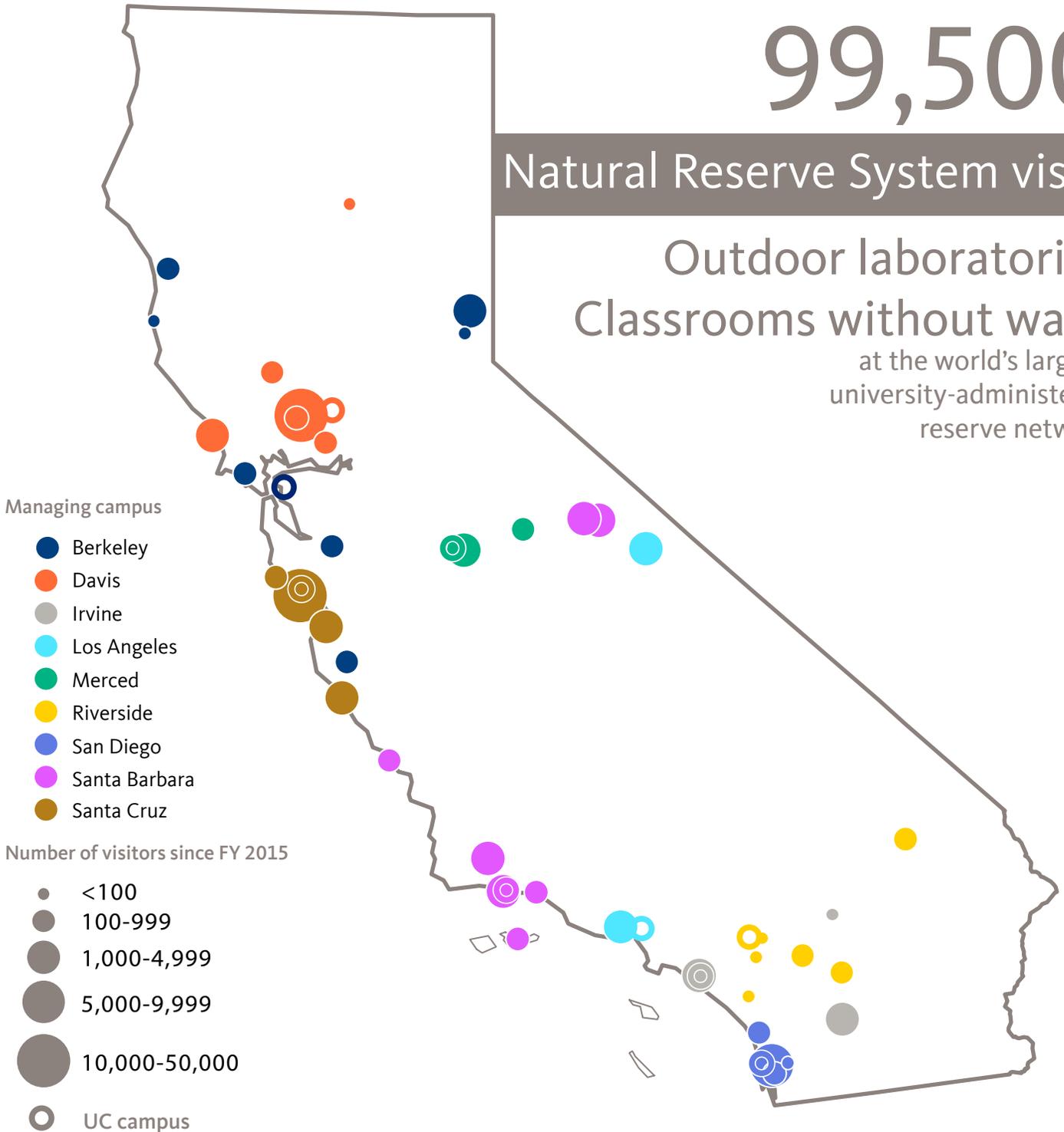# TEACHING AND LEARNING

99,500

Natural Reserve System visits

Outdoor laboratories
Classrooms without walls

at the world's largest
university-administered
reserve network

Managing campus

- Berkeley
- Davis
- Irvine
- Los Angeles
- Merced
- Riverside
- San Diego
- Santa Barbara
- Santa Cruz

Number of visitors since FY 2015

- <100
- 100-999
- 1,000-4,999
- 5,000-9,999
- 10,000-50,000

○ UC campus

source: UC Natural Reserve System

TEACHING AND LEARNING

Overview

The University of California provides its students with a rich learning environment created by faculty engaged in both teaching and academic research. Student learning at UC involves classes, seminars, and lab sections enhanced by collaboration with faculty and researchers. Through these activities, faculty and students engage in a learning process that helps develop critical thinking, communication, and problem-solving skills, as well as discipline-specific knowledge.

Educating students and the public

UC's faculty are principally responsible for maintaining UC's academic excellence and promoting student success. Student retention, graduation rates, and measures of effectiveness are presented in Chapter 3. This chapter focuses on the learning experience of UC's undergraduate and graduate students, reporting what skills they have learned, their engagement with faculty and their peers, and satisfaction with their UC experience. A majority of both undergraduate and graduate students report improvement in academic skills. This chapter also reports on the composition and workload of instructional staff across different academic disciplines and professional programs.

Expanding learning opportunities beyond students on campus demonstrates the connection between the teaching and the public service missions of the University. UC Extension offers adult professional and continuing education programs to Californians and people around the world, enrolling hundreds of thousands of Californians in its programs each year.

Promoting educational effectiveness

UC is committed to continuous improvement of instruction and employs a range of pedagogical and assessment strategies to enhance and support student learning. Campuses offer pedagogical development and training for faculty and teaching assistants to promote the use of evidence-based teaching practices and improve the quality of teaching and learning. UC's teaching and learning centers and offices of instructional development train hundreds of instructors each year, improving the quality of education for students in all disciplines across all ten campuses.

UC promotes educational effectiveness by supporting assessment of student learning. Assessment strategies include the development of program-level student learning outcomes and integration of evidence of student learning into academic program reviews. Programs across UC are undertaking curriculum redesign and improvement as a result of assessment work. Much of this aligns with the expectations of regional accrediting agencies, in particular the WASC Senior College and University Commission (WSCUC). As part of WSCUC accreditation, UC campuses assess five main core competencies of student learning: writing, oral communication, quantitative reasoning, information literacy, and critical thinking. Each UC campus posts its WSCUC accreditation reports online.

Innovative instructional offerings

UC faculty develop and teach an ever-expanding catalog of online courses and programs, expanding learning opportunities for UC and non-UC undergraduates, graduates, and professional students. Through the UC cross-campus enrollment system, UC provides undergraduates access to high-demand courses offered at other UC campuses, increasing flexibility and opportunities for degree completion.

For non-UC students considering matriculation at a four-year university or resuming their studies, UC offers for-credit online courses that may transfer to other colleges and universities. UC Online provides courses that span a wide range of disciplines. UC Extension offers online continuing education courses, professional certificates and post-baccalaureate programs for those seeking to advance their education and to enhance their professional skills.

In addition to online courses, UC leverages instructional technologies to enhance instruction and promote success. UC continues to develop and refine hybrid courses using multimedia resources, videos, podcasts, e-books, and other technology-based tools. UC follows best instructional practices to embed innovative technologies into course design and focuses on creating online and face-to-face learning experiences that encourage collaboration and maximize faculty-student and peer-to-peer interactions. Increasingly, UC courses utilize a flipped model of instruction, where lectures and other traditional classroom content are provided online, and classroom time is dedicated to group discussions, problem-solving activities, and other experiential exercises.

Ongoing assessment and data-driven approaches to teaching and learning are integral parts of UC's use of technology. Several UC campuses have adopted assessment systems that use online conceptual models and adaptive learning tools to determine students' knowledge quickly and accurately. Based on responses to questions, the software determines concepts or topics where each student needs to focus. Assessment and LEarning in Knowledge Spaces (ALEKS) uses web-based adaptive tools to provide students with individualized feedback and learning pathways in entry-level math and chemistry courses. As part of the 2015 state budget framework agreement, three UC campuses engaged in a pilot study of the impact of adaptive learning technologies on student success and as a mechanism to strengthen instruction. The primary finding of the study was that when students use adaptive learning technology as intended, results are positive in relation to a student's overall performance in the course to which it is applied.

UC is enhancing student learning opportunities and success by expanding summer course offerings (in-person and online) to reduce students' time to degree and enrich their academic experience. Offering bridge experiences and orientation during summer also helps incoming students transition to campus life and prepare them for the rigorous courses at the undergraduate level.

The impact and lessons of the pandemic

As a result of the COVID-19 pandemic, UC campuses shifted almost all of Spring 2020 courses to remote instruction and most courses remained remote during the academic year 2020–21. Faculty and staff did an historic and commendable job adapting almost all courses to remote in a matter of days or weeks. Campuses ramped up efforts to provide students the necessary technology, along with academic and counseling support to help students succeed in this environment. UC has been collecting and will continue to collect data and research about learning outcomes during this period. Among the most significant impacts of remote instruction is that students, on average, increased the number of units they were taking per term and enrollment in summer session increased dramatically.

To keep the University community informed of the impact of this transition on instruction, a series of Regents items were presented with the most up-to-date information that was available at the time of presentation. In addition, remote instruction provided the opportunity for Regents' presentations that focused more generally on best practices available within the University to improve pedagogy and student success with the goal of reducing equity gaps in learning. Next year's Accountability Report will seek to include some of the data and indicators that were used in the following Regents' items:

> *Update of Covid-19 Impact on the University of California: Academic and Student Issues*, May 20, 2020,
> regents.universityofcalifornia.edu/regmeet/may20/a1.pdf

Planning and Evaluation of Covid-19 Academic and Student Impacts, September 16, 2020, regents.universityofcalifornia.edu/regmeet/sept20/a1.pdf

Twenty-First Century Skill Development for University of California Students, November 18, 2020, regents.universityofcalifornia.edu/regmeet/nov20/a1.pdf

The Future of Instruction: Designing Equitable Classrooms and Technology-Enhanced Learning at the University of California, January 20, 2021, regents.universityofcalifornia.edu/regmeet/jan21/a4.pdf

Using Curricular Innovations and Enhancements to Address Equity Gaps, March 17, 2021, regents.universityofcalifornia.edu/regmeet/mar21/a1.pdf

The Institutional Research and Academic Planning department at UCOP created a specific dashboard that included the results of last year's UC Undergraduate Experience Survey (UCUES) questions that were specific to remote instruction and other accommodations due to the pandemic: universityofcalifornia.edu/infocenter/ucues-covid-19

For more information

Campus websites: universityofcalifornia.edu/uc-system/parts-of-uc

Summer enrollment: universityofcalifornia.edu/infocenter/summer-enrollment

UC Education Abroad Program: universityofcalifornia.edu/infocenter/uc-eap

Undergraduate research experiences: universityofcalifornia.edu/infocenter/uc-undergraduate-student-research

Adaptive Learning Technology Pilot Report: ucop.edu/institutional-research-academic-planning/_files/BFI-Adaptive-Learning-Technology-Report.pdf

UC undergraduates experienced significant improvement between their freshman and senior years in multiple areas, including reading and comprehension, critical thinking, research competency, and understanding of their chosen field of study.

8.1.1   Self-reported skill levels from first year to senior year
Seniors who entered as freshmen
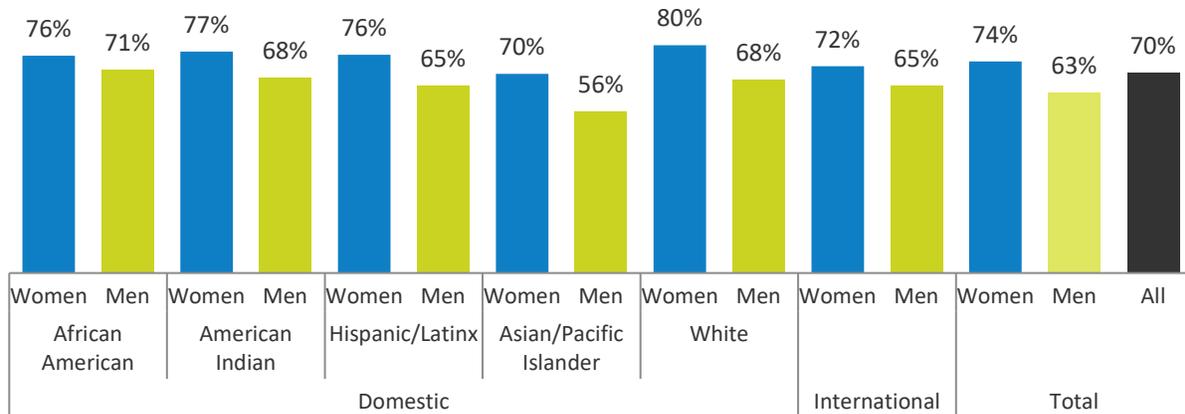Universitywide, Spring 2020
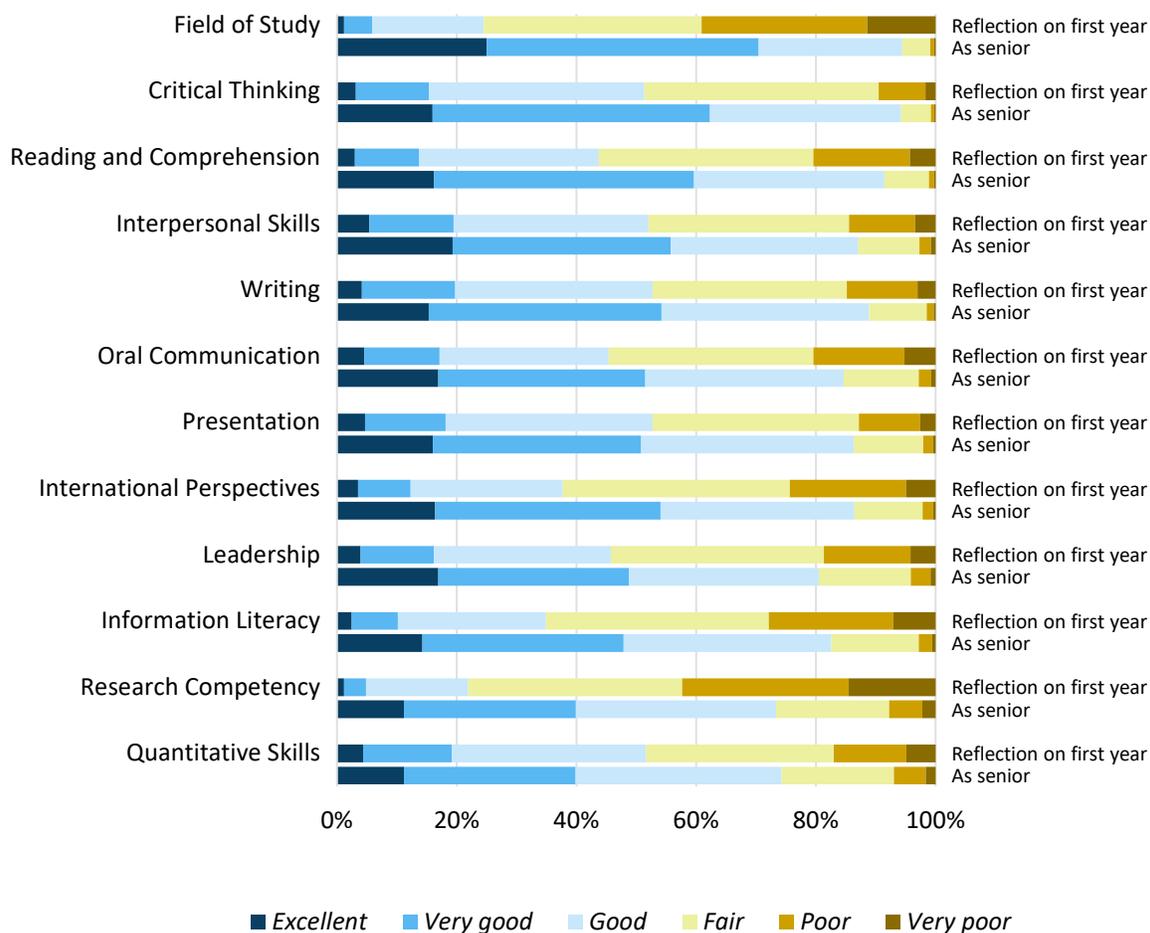
Source: UCUES

The University of California Undergraduate Experience Survey (UCUES), which is conducted every two years, provides a valuable source of information on how UC undergraduates view their educational experience. These indicators also show students' perception of how much they have developed core competencies of student learning. In UCUES, students are asked to reflect on their skill levels between their freshman and senior years. During this period, UC students self-reported significant improvements in all areas, including reading and comprehension, critical thinking, research competency, understanding international perspectives, and understanding of their chosen field of study.

Research participation is high among UC's seniors across racial/ethnic and gender groups. Seventy percent of students completed research as part of their coursework and one-third assisted faculty in research.

8.1.2   Students completing a research project or research paper as part of their coursework
Universitywide seniors
Spring 2020

Source: UCUES

8.1.3   Students assisting faculty in conducting research
Universitywide seniors
Spring 2020
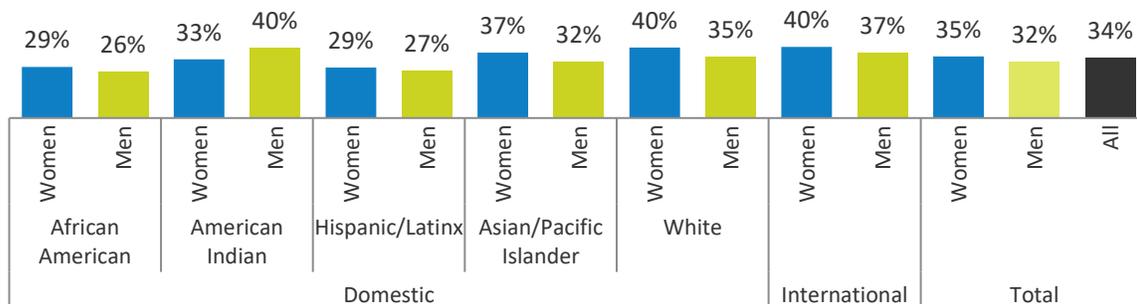
Source: UCUES

One of the benefits of attending an academic research university is the opportunity for undergraduates to conduct research, both through class research projects and by assisting faculty with their research. Overall, a high percentage of undergraduates reported that they participated in research. Women were more likely than men to indicate research coursework and participation.

Engagement varies by discipline, with Arts and Humanities showing higher levels of engagement.

8.1.4   Student responses to questions about areas of engagement
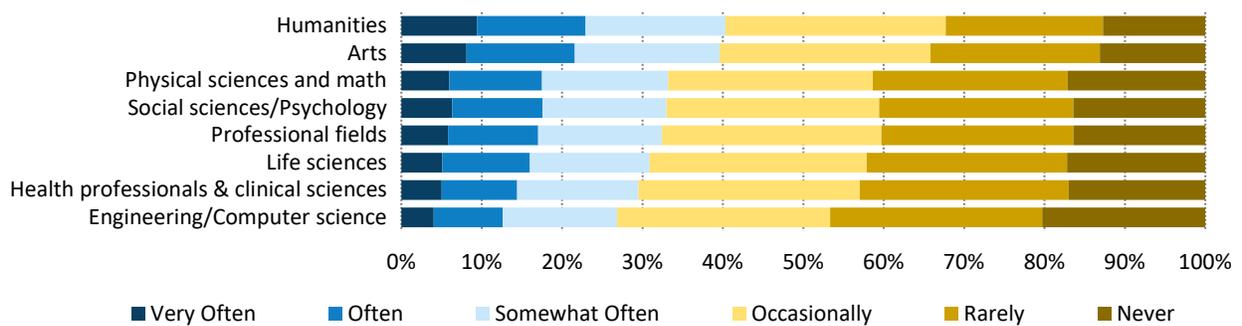Universitywide
Spring 2020

During this academic year, how often have you contributed to a class discussion?
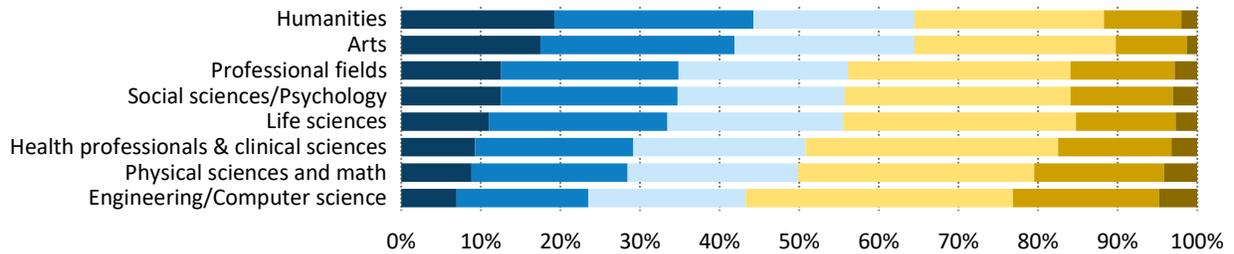
During this academic year, how often have you found a course so interesting that you did more work than was required?
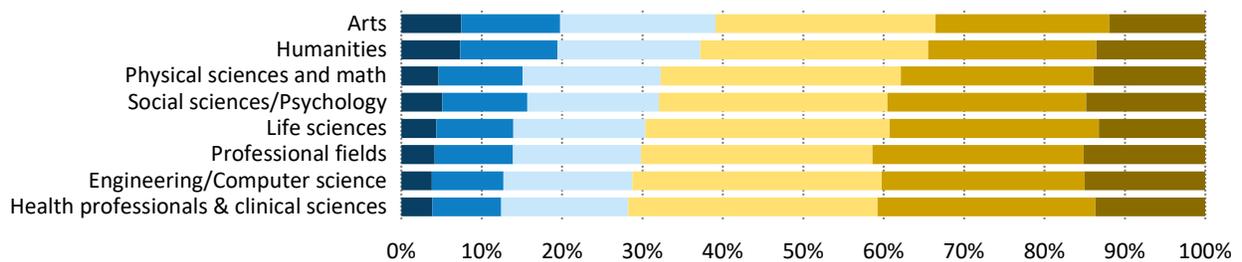
During this academic year, how often have you worked with a faculty member on an activity other than coursework?
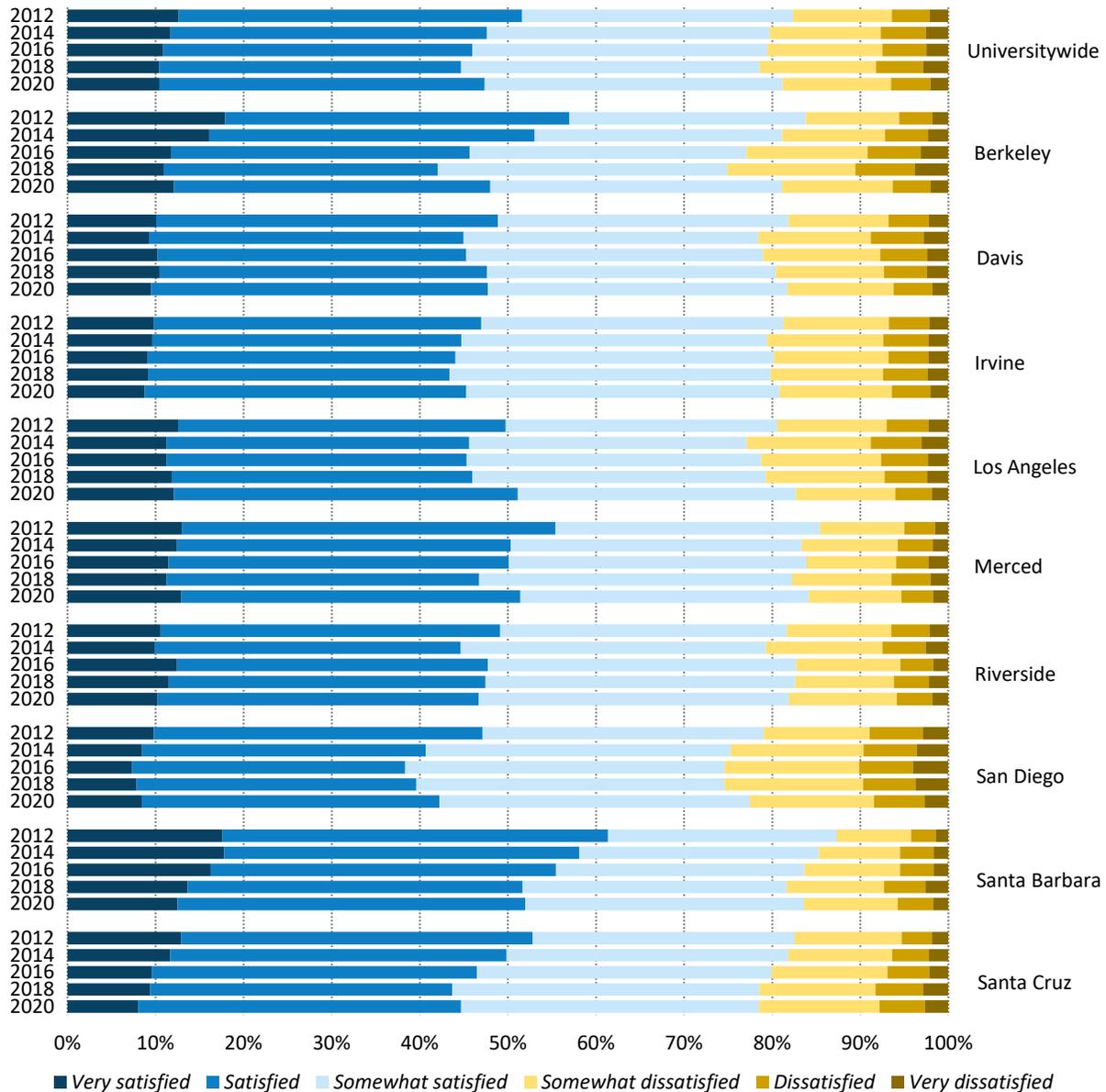

■ Very Often   ■ Often   ■ Somewhat Often   ■ Occasionally   ■ Rarely   ■ Never

Source: UCUES

Satisfaction with the overall academic experience, particularly strong satisfaction, has been declining Universitywide.

8.1.5   Student satisfaction with overall academic experience
Universitywide and UC campuses
Spring 2012 to 2020

Legend: Very satisfied | Satisfied | Somewhat satisfied | Somewhat dissatisfied | Dissatisfied | Very dissatisfied

Source: UCUES.

For the UC system overall and for most campuses, the percent of students who were satisfied (somewhat through very satisfied) has remained as high as about 80 percent.
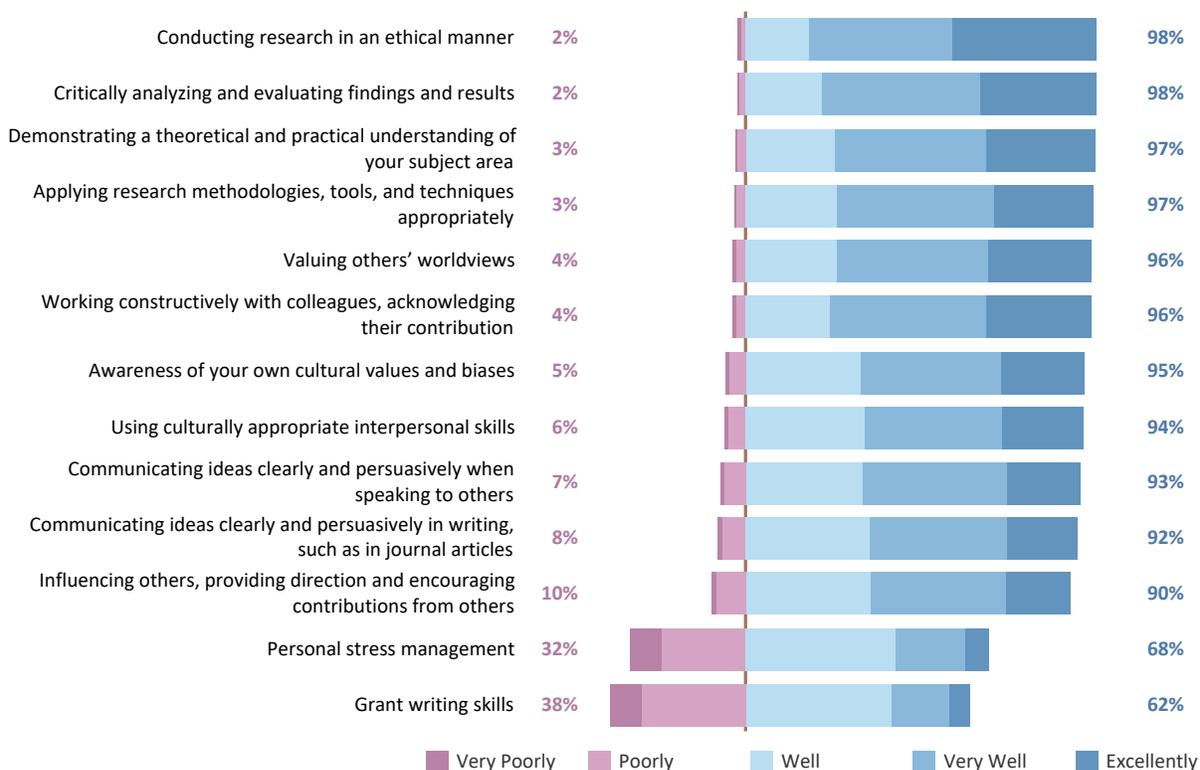
However, student satisfaction has generally declined since 2012.

UC doctoral students credit their doctoral programs with having strengthened multiple skill sets.

8.2.1   Preparation by skillset
Universitywide
2018 and 2019 combined

How well prepared do you feel you are in the following skillsets?

Skillset	Poorly		Well
Conducting research in an ethical manner	2%		98%
Critically analyzing and evaluating findings and results	2%		98%
Demonstrating a theoretical and practical understanding of your subject area	3%		97%
Applying research methodologies, tools, and techniques appropriately	3%		97%
Valuing others' worldviews	4%		96%
Working constructively with colleagues, acknowledging their contribution	4%		96%
Awareness of your own cultural values and biases	5%		95%
Using culturally appropriate interpersonal skills	6%		94%
Communicating ideas clearly and persuasively when speaking to others	7%		93%
Communicating ideas clearly and persuasively in writing, such as in journal articles	8%		92%
Influencing others, providing direction and encouraging contributions from others	10%		90%
Personal stress management	32%		68%
Grant writing skills	38%		62%

Very Poorly   Poorly   Well   Very Well   Excellently

Source: UC Ph.D. Career Pathways Student Survey

The Ph.D. Career Pathways Student Survey, a collaboration between the University of California and the Council of Graduate Schools, was administered in the spring 2018 and 2019 terms. As more years of the survey are administered, this report can track trends over time.

UC doctoral students responded overwhelmingly positively about the preparation received in their programs along the skillsets in the survey, with the exception of stress management and grant writing skills.

Additional data from the survey can be found here: universityofcalifornia.edu/infocenter/doctoral-experience-survey

Over time, the student-faculty ratio has deteriorated, especially for ladder-rank and equivalent faculty, as faculty hiring has not kept pace with increasing student enrollment.

8.3.1   General campus student-faculty ratio
Universitywide
2003–04 to 2019–20
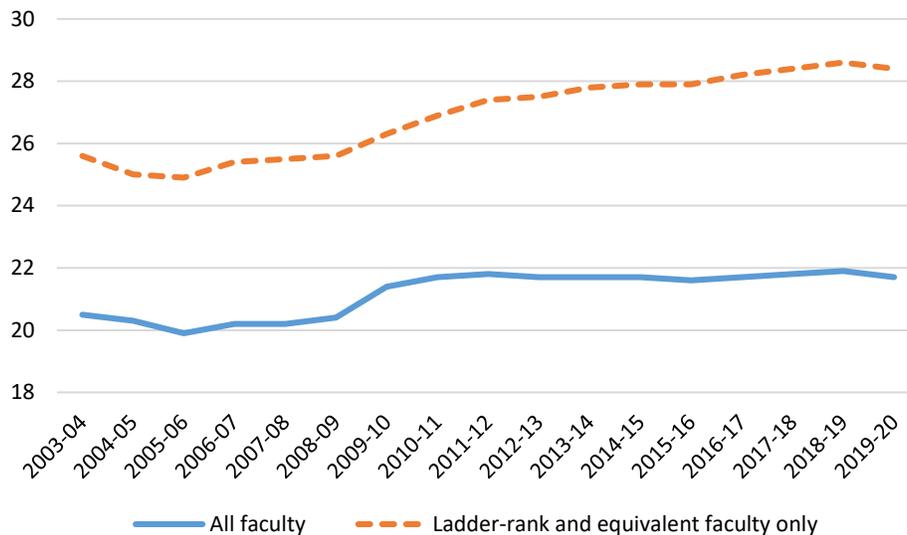
Source: UC Information Center Data Warehouse

One measure of academic quality is the student-faculty ratio. The student-faculty ratio reflects resources available for instruction and the average availability of faculty members to every student. Thus, lower ratios are preferable for students in terms of focused resources for instruction.

Because the student-faculty ratio varies considerably by degree, major, and instructional level (lower-division, upper-division, and graduate), student experiences will vary as well. Indicators 8.3.2 and 8.3.3 on student credit hours (SCH) provide additional insight into the student experience.

The student-faculty ratio has increased at various times in the University's history and particularly in the last decade. During the most recent recession, campuses responded to uncertainty in State funding by delaying faculty hiring, or deciding not to fill vacant faculty positions on a permanent basis. While the student-faculty ratio improved slightly in 2019-20, another 1,265 additional faculty would need to be added to restore the 2005-06 ratio.

As part of its multi-year plan, UC is on track to hire 1,100 ladder-rank faculty between 2018–19 and 2022–23. More information on the plan can be found here: universityofcalifornia.edu/infocenter/uc-2030-dashboard

The expanding gap between the student-faculty ratio for all general campuses and the ratio for only ladder-rank and equivalent faculty illustrates the trend of hiring lecturers. Additional data can be found here: universityofcalifornia.edu/infocenter/student-faculty-ratio

At the undergraduate level, full-time permanent faculty and lecturers are teaching increasing numbers of student credit hours.

8.3.2   Student credit hours, by instructional staff and class type
Universitywide
2008–09 to 2019–20
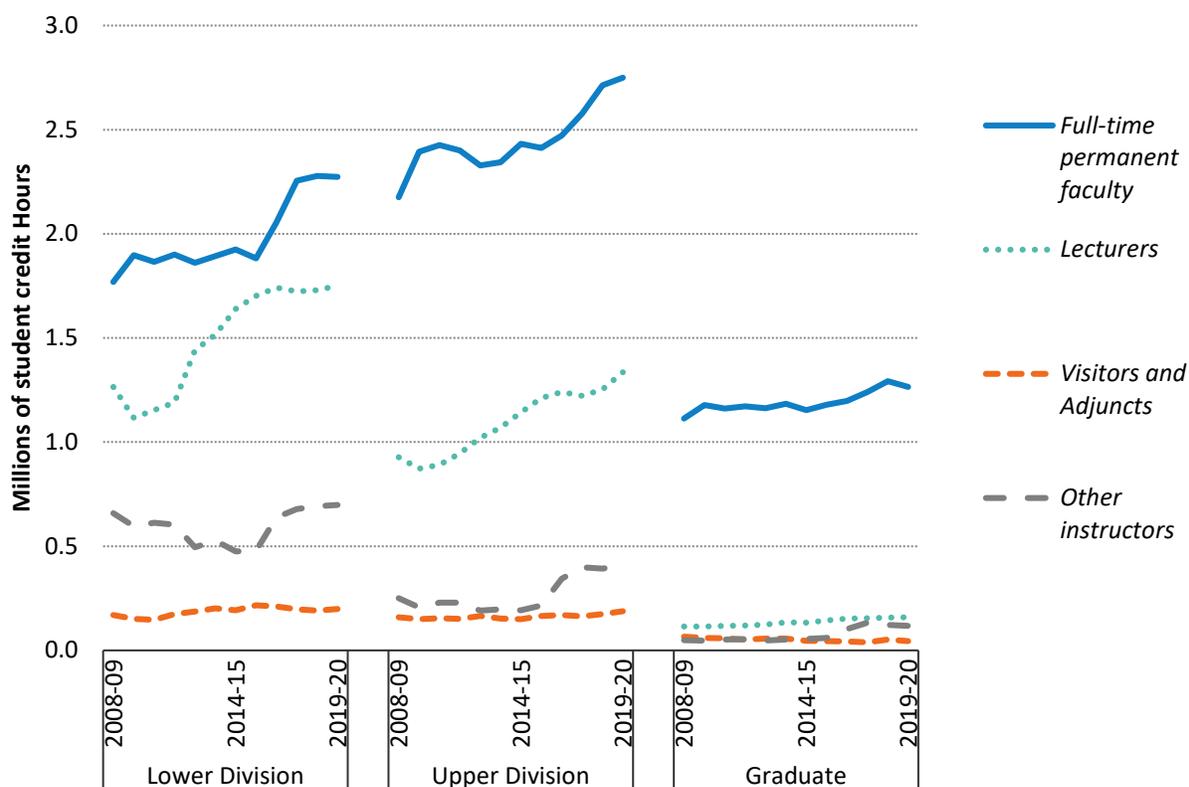
Source: UC Faculty Instructional Activities dataset[1]

Student credit hours (SCH) represent the number of student enrollments in a course multiplied by the number of credits earned from that course. For example, a four-credit class with 50 students generates 200 SCH; a two-credit class of 15 students generates 30 SCH. This measure gives an indication of the relative teaching load across different types of instructors at different levels of instruction.

Lower-division courses such as writing, language, and other required courses are most often taught by lecturers; introductory courses to the major are most often taught by full-time permanent faculty. Upper-division courses, which are core to the student's major, are more likely taught by full-time permanent faculty, as are graduate courses.

[1] Data are for general campus courses only. These data are submitted annually by UC campuses and contain information on all general campus courses taught in that year.
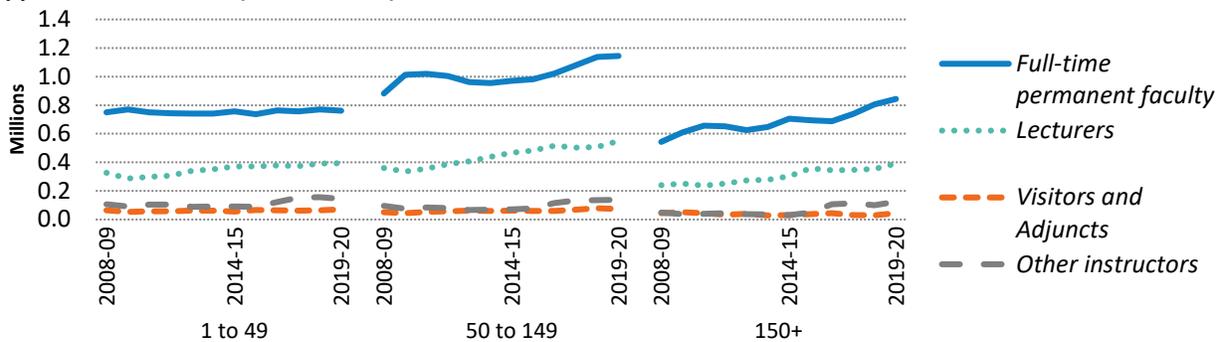
As students enroll in upper-division and graduate classes, they have greater contact with full-time permanent faculty and smaller classes.

8.3.3 Student credit hours, by instructional staff and class type and class size
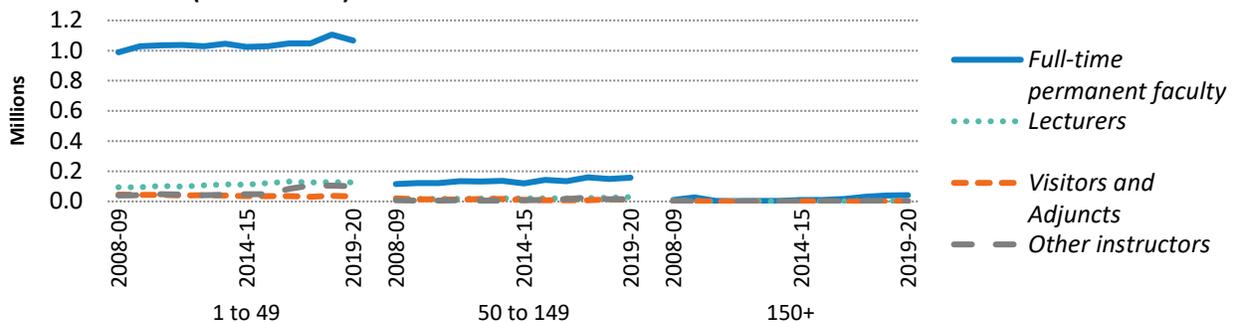Universitywide
2008–09 to 2019–20

Lower-division classes (scale 0–1.8m)
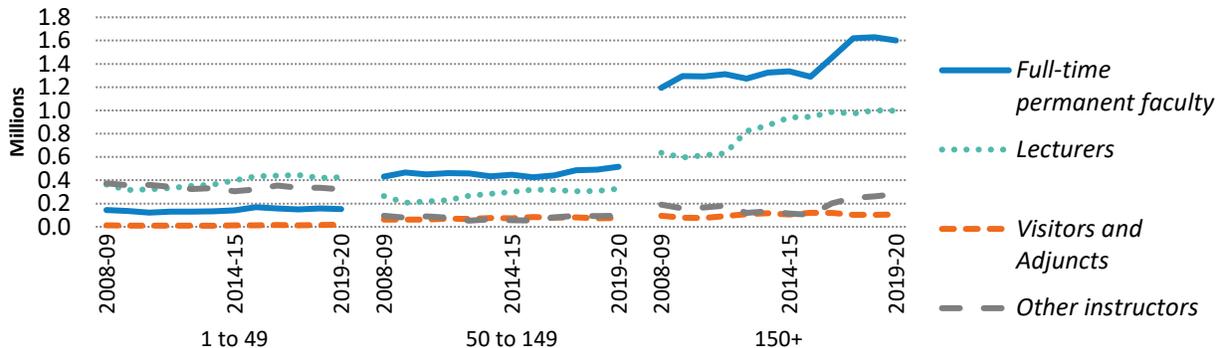
Upper-division classes (scale 0–1.4m)

Graduate classes (scale 0–1.2m)

Source: UC Faculty Instructional Activities dataset

In the lower division, full-time permanent faculty generally teach large lecture classes; lecturers generally teach both large sections and smaller classes. In the upper-division, student contact with full-time permanent faculty is fairly evenly distributed across classes of all sizes.

Graduate academic students are almost uniformly taught by full-time permanent faculty in classes with fewer than 50 students. The large enrollment increases in 2016–17 and 2017–18 resulted in a substantial uptick in SCH being offered in large lower-division lecture classes.