Engagement and Employment Outcomes of Undergraduate Students at University of California

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Presentation Outline

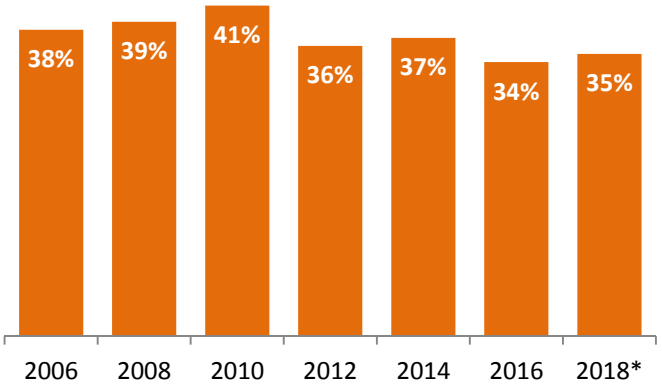
- A brief overview of UCUES (University of California Undergraduate Experience Survey)
- How we report and use UCUES data
- Three examples of research on engagement, soft skills and employment outcomes
- Next steps

UCUES (UC Undergraduate Experience Survey)

- First administered in the spring of 2002 as a sample
- First administered as a census, online survey on all UC campuses in 2004 and since then once every two years

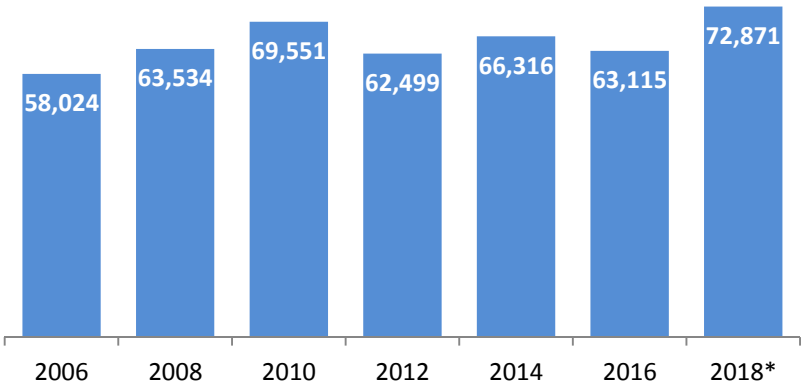
UCUES (UC Undergraduate Experience Survey)

UCUES response rates



The following groups are less likely to respond (2016 response rate)

- Students in Humanities (22%)
- Male students (27%)
- International students (25%)
- Freshmen (26%)



UCUES respondents (including partials)

Note: The 2018 numbers are estimated.

How we report and use UCUES data—examples

- UCUES data dashboard by UCOP
  (https://www.universityofcalifornia.edu/infocenter/ucues-data-tables-main)

Academic Engagement | Time Allocation | Educational Experience | Campus Climate | Major Evaluation | Co-Curricular | Acad

Academic Engagement

Please select a characteristic first and then filter on the selected characteristic. "All" option shows everyone.

Campus: (All) | Display # or %: Both | Select a characteristic: Birth Sex | Filter by selected characteristic: (All)

How frequently have you engaged in the following activities so far this academic year?	Never	One Time	Two Times	Three or More Times	Total
Chosen challenging courses	2,196 3%	8,547 14%	17,711 28%	34,312 55%	62,766 100%
Taken a small research-oriented seminar with faculty	43,285 69%	11,840 19%	4,681 7%	3,041 5%	62,847 100%
Worked with a faculty member on an activity other than coursework	37,264 59%	12,345 20%	6,035 10%	7,206 11%	62,850 100%

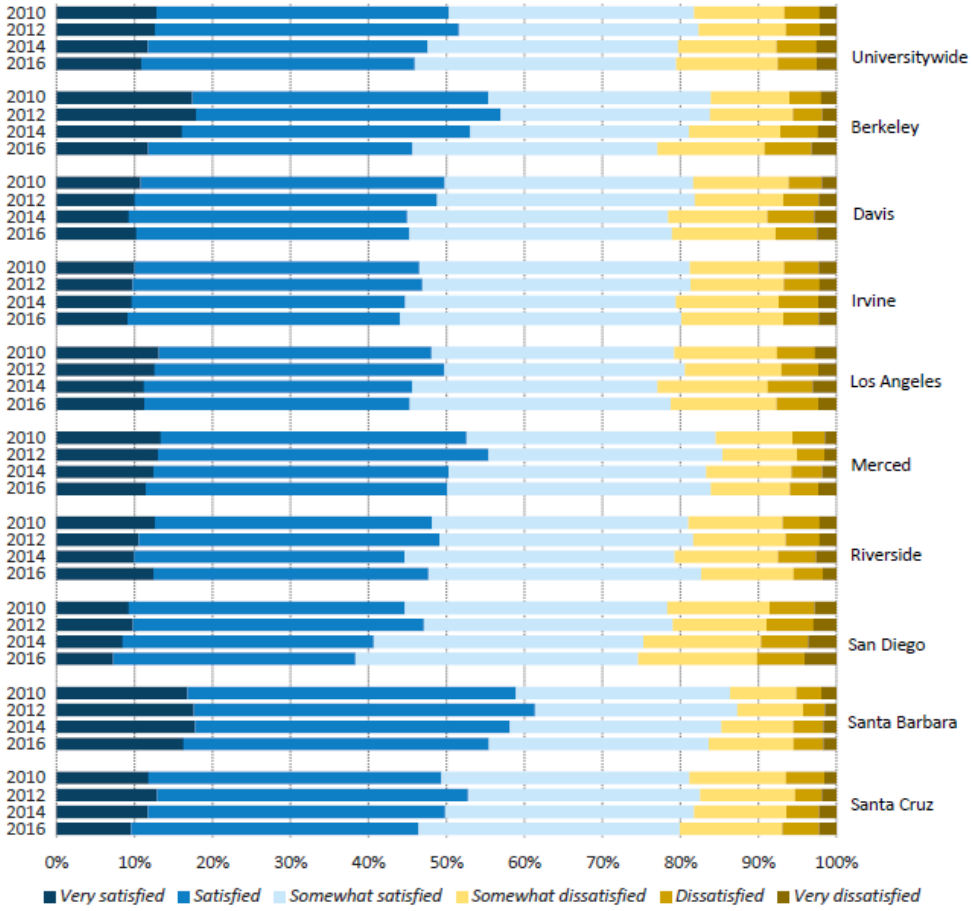
During this academic year, how often have you done each of the following?	Never	Rarely	Occasionally	Somewhat Often	Often	Very Often	Total
Asked an insightful question in class	5,009 8%	14,445 23%	18,280 29%	11,961 19%	8,656 14%	4,347 7%	62,698 100%
Brought up ideas or concepts from different courses during class discussions	3,955 6%	13,070 21%	17,965 29%	12,633 20%	10,078 16%	4,975 8%	62,676 100%
Communicated with the instructor outside of class about issues and concepts derived from a course	7,025 11%	14,957 24%	17,156 27%	11,083 18%	8,025 13%	4,525 7%	62,771 100%
Contributed to a class discussion	1,231 2%	7,996 13%	17,882 29%	13,508 22%	13,544 22%	8,520 14%	62,681 100%

How we report and use UCUES data—examples

- UC Accountability Report by UCOP
  (https://accountability.universityofcalifornia.edu/2017/)

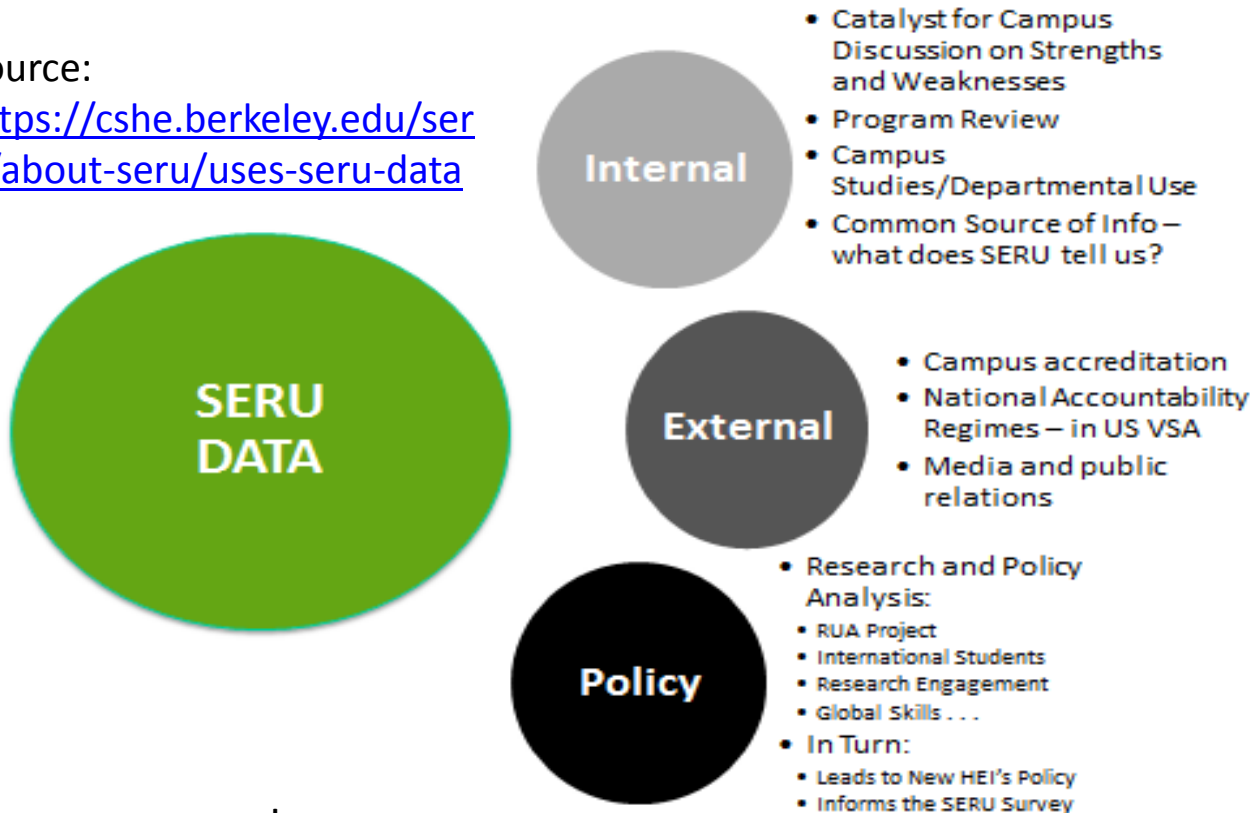
Bachelor's degree recipients' satisfaction with overall experience

Note: included those who entered as freshmen and graduated in spring 2010-2016



How we report and use UCUES data

Source:
https://cshe.berkeley.edu/seru/about-seru/uses-seru-data



UC campus examples:

- UCLA: Connecting students in courses to success
- UC Berkeley: UCUES departmental results and summary for program review
- UC Santa Barbara: UCSB Portrait

Example 1

Engagement indicators and employment outcomes

1. What are the different aspects of student engagement? Is there any significant difference by selected demographics?
2. What is work experience of UC undergraduate students while still enrolled in their degree programs? Do they work in fields related to their majors?
3. What are the employment patterns and outcomes of UC bachelor's degree recipients?
4. Does student participation in academic and civic activities have any impact on their employment outcomes?

The original presentation: https://www.ucop.edu/institutional-research-academic-planning/_files/Getting-engaged-CAIR.pdf
Topic Brief: https://www.ucop.edu/institutional-research-academic-planning/_files/survey-documents-undergraduate/Report_College_Engagement_Undergraduate_Employment_Outcomes.pdf

Student engagement

1. Classroom participation and interactions with faculty
2. Research involvement or paid employment
3. Efforts toward academic work
4. Coursework preparedness
5. Participation in study abroad programs
6. Participation in internship programs
7. Civic engagement

Employment outcomes

Employment data from CA Employment Development Department

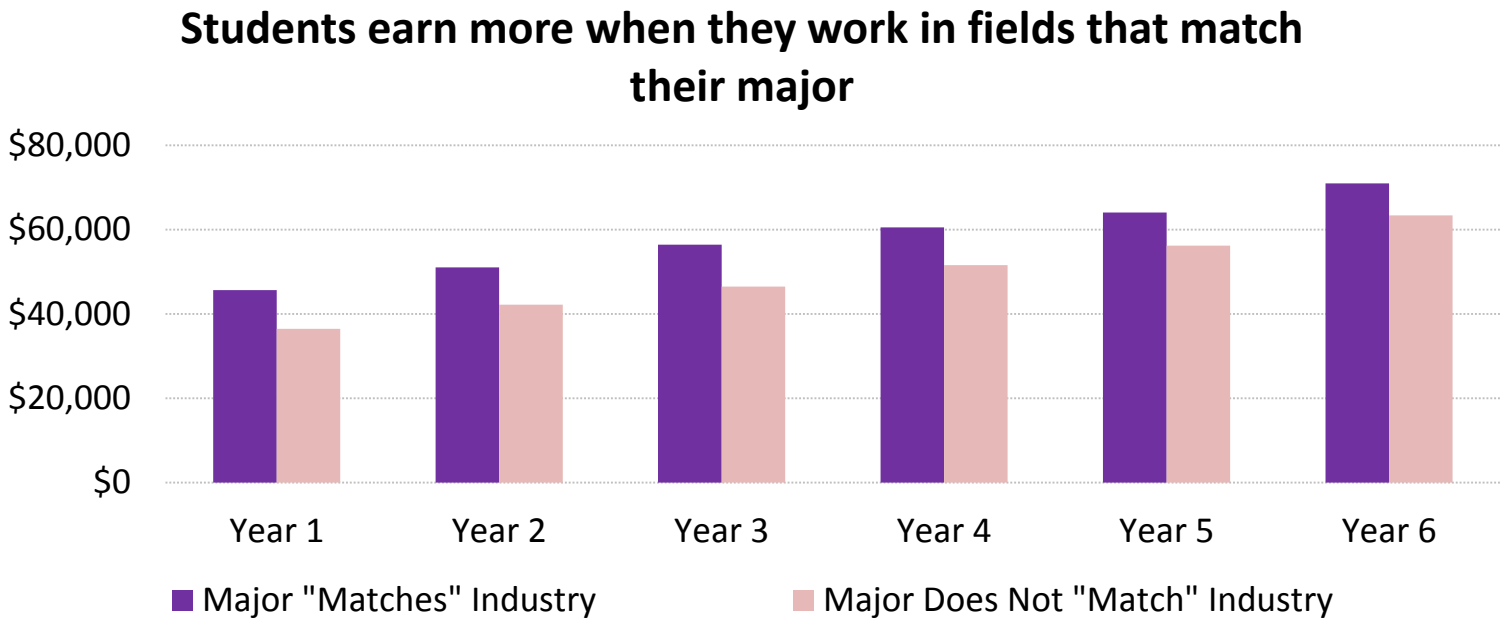
- Reflects earnings in CA only
- NAICS (North American Industry Classification System) industry codes
- No occupation information

Results

Employment pattern– Industries – Major “Match”

Percentage of Alumni Working in an Industry Similar to Their Undergraduate Major

	Years After Graduation					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
All Respondents	43%	43%	43%	44%	43%	44%



Results 4.8. Engagement and Earnings (regression models)

	Model on Year 1 Earnings		Model on Year 1-3 Earnings		Model on Year 1-6 Earnings	
	Estimate	*p* value	Estimate	*p* value	Estimate	*p* value
Intercept	-681	0.8875	-1605	0.9128	-18317	0.5808
Classroom participation and interactions with faculty	-335	0.2210	-851	0.3079	-1405	0.4568
Research involvement or paid employment	67	0.8316	30	0.9754	3600	0.0978
Efforts toward academic work	1071	**<.0001**	3842	**<.0001**	8298	**<.0001**
Coursework preparedness	365	0.1548	2053	**0.0085**	6230	**0.0004**
Graduation GPA	8425	**<.0001**	32156	**<.0001**	76035	**<.0001**
Female	-4497	**<.0001**	-19576	**<.0001**	-44631	**<.0001**
First Generation	-1992	**0.0317**	-6834	**0.0155**	-16469	**0.0099**
Freshman	3173	**0.0029**	5268	0.1047	2251	0.7592
Engineering & Computer Science	25419	**<.0001**	82529	**<.0001**	174420	**<.0001**
Life Science/Physical Science	4572	**0.0004**	14761	**0.0002**	29142	**0.0011**
Business	10460	**<.0001**	37040	**<.0001**	80995	**<.0001**
Employment before Graduation	4437	**0.0112**	8100	0.1284	-9819	0.4153
Match between Discipline and Industry	4961	**<.0001**	11670	**<.0001**	23355	**0.0002**
	N=3,806		*N=3,806*		*N=3,806*	
	Adj. R Square=0.18		*Adj. R Square=0.21*		*Adj. R Square=0.19*	

Results

4.9. Engagement and Earnings (regression model)

	Model on Year 1 Earnings		Model on Year 1-3 Earnings		Model on Year 1-6 Earnings	
	Estimate	*p* value	Estimate	*p* value	Estimate	*p* value
Intercept	-281	0.9736	9738	0.7235	-20129	0.7665
Classroom participation and interactions with faculty	-702	0.1409	-1558	0.3137	-3663	0.3361
Research involvement or paid employment	-726	0.2248	-3705	0.0565	-7765	0.1044
Efforts toward academic work	1352	**0.0023**	6265	**<.0001**	15660	**<.0001**
Coursework preparedness	-224	0.6089	373	0.793	3483	0.3198
Study Abroad	-956	0.191	-367	0.8772	3174	0.5867
Internship Programs	2085	**0.0001**	6778	**0.0001**	20041	**<.0001**
Graduation GPA	9323	**<.0001**	32453	**<.0001**	74954	**<.0001**
Female	-3372	**0.0473**	-19081	**0.0006**	-45856	**0.0007**
First Generation	-3440	**0.0348**	-11879	**0.0247**	-17629	0.1755
Freshman	1244	0.4986	-6902	0.247	-29234	**0.0466**
Engineering & Computer Science	23551	**<.0001**	82863	**<.0001**	179172	**<.0001**
Life Science/Physical Science	3168	0.1729	11715	0.1202	13654	0.4619
Business	10965	**<.0001**	48018	**<.0001**	89122	**<.0001**
Employment before Graduation	2854	0.3479	-13835	0.1608	-64515	**0.008**
Match between Discipline and Industry	6220	**0.0001**	15365	**0.0034**	33596	**0.0093**
	N=1,271		*N=1,271*		*N=1,271*	
	Adj. R Square=0.19		*Adj. R Square=0.22*		*Adj. R Square=0.19*	

Results 4.10. Engagement and Earnings (regression model)

	Model on Year 1 Earnings		Model on Year 1-3 Earnings		Model on Year 1-6 Earnings	
	Estimate	*p* value	Estimate	*p* value	Estimate	*p* value
Intercept	-5342	0.6696	-42763	0.2122	-62527	0.3838
Classroom participation and interactions with faculty	-681	0.3383	-4007	**0.0399**	-4018	0.3248
Research involvement or paid employment	531	0.5017	3245	0.1337	8641	0.0568
Efforts toward academic work	846	0.2142	4059	**0.0297**	6824	0.0809
Coursework preparedness	615	0.3574	4153	**0.0235**	9979	**0.0094**
Civic Engagement	1749	**0.0449**	3712	0.1197	6670	0.1819
Graduation GPA	6899	**0.0153**	31822	**<.0001**	63192	**0.0001**
Female	-5785	**0.0164**	-21185	**0.0013**	-41514	**0.0027**
First Generation	-2625	0.2511	-3533	0.5724	-17517	0.1818
Freshman	1282	0.6425	3857	0.6098	1272	0.936
Engineering & Computer Science	21169	**<.0001**	64221	**<.0001**	157751	**<.0001**
Life Science/Physical Science	7116	**0.0394**	18169	**0.0546**	28616	0.1482
Business	9617	**0.0084**	20733	**0.0377**	72170	**0.0006**
Employment before Graduation	6835	0.1131	24867	**0.0354**	25279	0.3067
Match between Discipline and Industry	6261	**0.0063**	12455	**0.047**	18590	0.1568
	N=695		*N=695*		*N=695*	
	Adj. R Square=0.14		*Adj. R Square=0.18*		*Adj. R Square=0.20*	

Example 1: Conclusions

- Relationship between engagement and earnings
  - There is a relationship between engagement and employment outcomes. In general, the more engaged in academic activities students are, the more they earn after graduation.
  - Among all engagement factors, efforts toward academic work, internship participation, and coursework preparation are the strongest predictors of post-college earnings, both in the short and long term.

Example 2

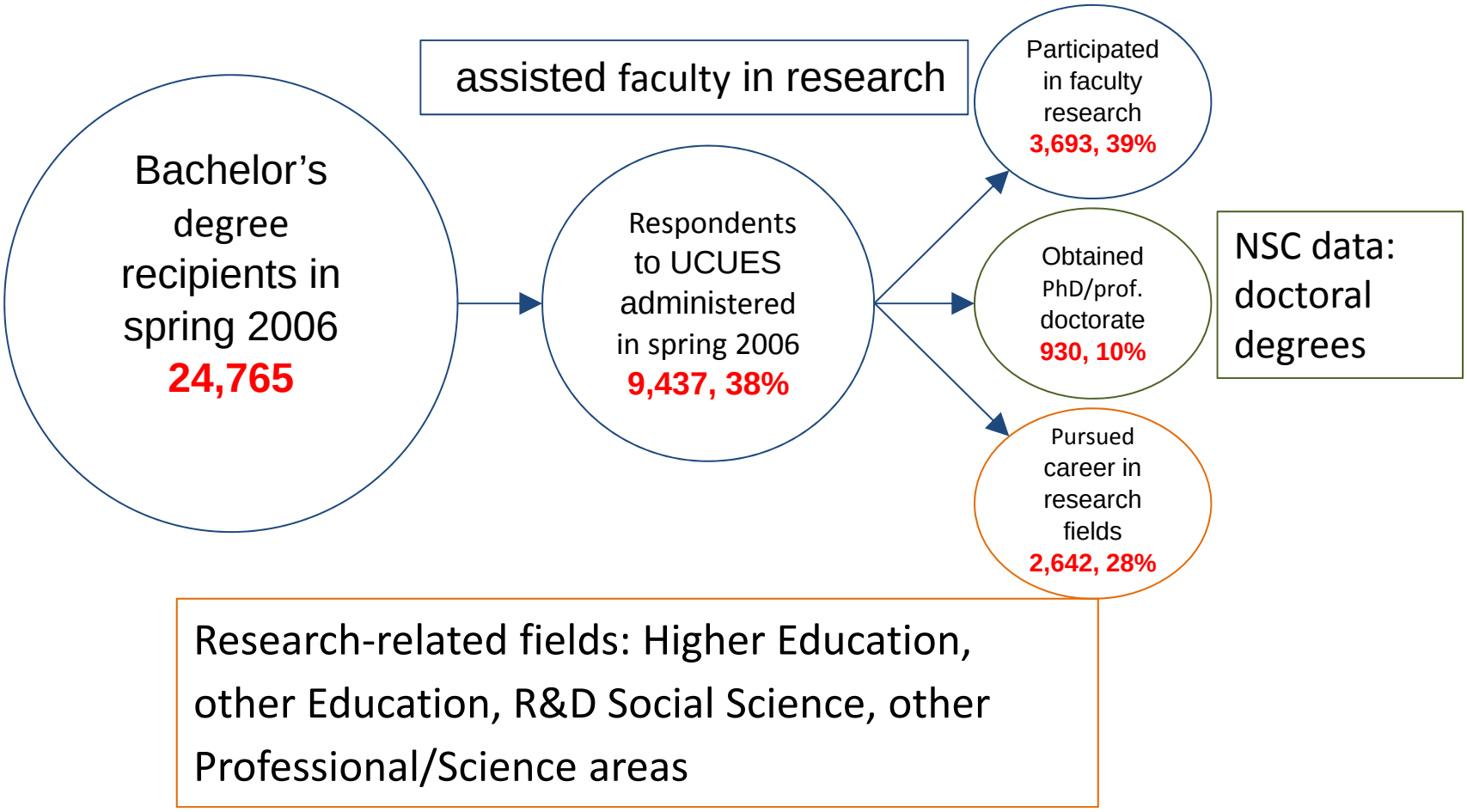
Undergraduate research participation and employment outcomes

Research questions:

1. What are the predictors of undergraduate student research participation?
2. Is undergraduate research participation associated with obtaining an advanced (graduate) degree?
3. Is undergraduate research participation associated with pursuing a career in a research-related field?

The original presentation: https://www.ucop.edu/institutional-research-academic-planning/_files/undergraduate-research-participation.pdf

Population and definitions



Predictors of ug research participation

Predictor	Odds ratio and significance
	R-square: 14-18%
First year GPA at UC	OR=1.44, p < .001
Plan to Pursue PhD/Professional Doctorate (0 = no, 1 = yes)	OR=2.88, p < .001
Plan to Enroll in Graduate School (0 = no, 1 = yes)	OR=1.48, p < .001
Declared/Intended Field: Science (ref) vs. Humanities	OR=.27, p < .001
Declared/Intended Field: Science (ref) vs. Social Science	OR=.67, p < .001
Declared/Intended Field: Science (ref) vs. Other Discipline	OR=.62, p < .001
Applicant level: Transfer (0) vs. Frosh (1)	OR=1.18, p < 0.01
Race/ethnicity: White (ref) vs. International	OR = 1.77, p < .001
Race/ethnicity: White (ref) vs. Unknown	OR = .83, p < .04
First generation students (1) vs. others	OR = .87, p < .02

Notes: n=9,104; **non-significant predictors**: reading/writing skills; Engineering discipline; research skills; Pell Grant eligibility status; American Indian race/ethnicity; Asian race/ethnicity

Assisting faculty in research is associated with obtaining a doctorate

Predictor	Odds ratio and significance
R-squared	19-41%
Assisted Faculty in Research (0 = no, 1 = yes)	OR = 1.82, p < .001
Plan to Pursue PhD/Professional Doctorate (0 = no, 1 = yes)	OR = 12.42, p < .001
Plan to Enroll in Graduate School (0 = no, 1 = yes)	OR = 2.27, p < .001
Baccalaureate Degree: Science (ref) vs. Engineering/Computer Science	OR = .48, p < .001
Baccalaureate Degree: Science (ref) vs. Humanities	OR = .23, p < .001
Baccalaureate Degree: Science (ref) vs. Social Sciences	OR = .39, p < .001
Baccalaureate Degree: Science (ref) vs. Other	OR = .34, p < .001
Undergraduate GPA at Graduation	OR = 1.68, p < .001
Applicant level: Transfer (0) vs. Frosh (1)	OR = 1.38, p < .01
First Generation Status: Not First Generation (0) vs. First Generation(1)	OR = 1.23, p = .03
Race/ethnicity: White (ref) vs. International	OR = .39, p < .01
Race/ethnicity: White (ref) vs. Hispanic	OR = 62, p < .01
Race/ethnicity: White (ref) vs. African American	OR = .45, p = .02

Notes: n=8,602; **Non-significant predictors**: reading/analytic skills; research skills; Pell Grant eligibility status; American Indian, Asian, Unknown race/ethnicity

Assisting faculty in research is associated with employment in a research related field

Predictor	Odds ratio and significance
R-squared	2-3%
Assisted Faculty in Research (0 = no, 1 = yes)	OR = 1.20, p = .01
Plan to Pursue PhD/Professional Doctorate (0 = no, 1 = yes)	OR = 1.61, p < .001
Reading/Analytic Skills at Graduation from UC	OR = 1.13, p < .04
Baccalaureate Degree: Science (ref) vs. Engineering/Computer Science	OR = .69, p < .01
First Generation Status: Not First Generation (0) vs. First Generation(1)	OR = 1.18, p = .03

Notes: n=4,690; **Non-significant predictors**: research skills at Graduation from UC; applicant level; Pell Grant eligibility status; race/ethnicity; humanities, social science, other degree discipline; plans to enroll in graduate school; undergraduate GPA at graduation

Example 2: Conclusions

1. What are the predictors of undergraduate student research participation?
   - Intent to pursue further education
   - Science major
   - High-achieving student
   - Generation status
2. Is undergraduate research participation associated with obtaining an advanced (graduate) degree?

   Yes
3. Is undergraduate research participation associated with pursuing a career in a research-related field?

   Yes

Example 3

Undergraduate soft skills and employment outcomes

Research questions:

1. How do UC students rate their soft skills?
2. Do UC students report changes in their soft skills by senior year?
3. Are student extracurricular activities associated with soft skills development for UC students?
4. Do self-reported student soft skills relate to future earnings?

The original presentation: https://www.ucop.edu/institutional-research-academic-planning/_files/getting-hired-how-uc-prepares-students.pdf

Soft skills

Attributes employers seek on a candidate's resume in addition to looking at GPA *(National Association of Colleges and Employers, 2016)*

Attributes employers seek on a candidate's resume (Fig.38)	% of Respondents
Ability to work in a team	78.0%
Problem-solving skills	77.3%
Communication skills (written)	75.0%
Strong work ethic	72.0%
Communication skills (verbal)	70.5%
Leadership	68.9%
Initiative	65.9%
Analytical/quantitative skills	64.4%
Flexibility/adaptability	63.6%
Detail-oriented	62.1%
Interpersonal skills (relates well to others)	58.3%
Technical skills	56.8%
Computer skills	49.2%
Organizational ability	47.7%
Strategic planning skills	37.9%
Friendly/outgoing personality	25.8%
Tactfulness	25.8%
Creativity	21.2%
Entrepreneurial skills/risk-taker	19.7%
Fluency in a foreign language	4.5%

Leadership skills are significantly associated with earnings

	2012 Model on Year 1-3 Earnings			2014 Model on Year 1-3 Earnings		
	Estimate	Std. Estimate	*p* value	Estimate	Std. Estimate	*p* value
Intercept	16101		.0009	-763.567		.9099
Current proficiency: Leadership skills	1401	0.0545	**.0009**	1609	0.0466	**.0055**
Current proficiency: Interpersonal (social) skills	327	0.0122	.4528	842	0.0234	.1615
Engineering & Computer Science	13050	0.1051	**.0001**	10976	0.0662	**.0001**
Life Science/Physical Science	22986	0.2327	**.0001**	16462	0.1241	**.0001**
Undergraduate GPA	2255	0.0254	.0637	12155	0.1023	**.0001**
Male	4670	0.0634	**.0001**	8212	0.0831	**.0001**
Industry: Business Services	15304	0.1791	**.0001**	14041	0.1193	**.0001**
Industry: Education & Social	-395	-0.0049	.8077	-6413	-0.06021	**.0061**
Industry: Engr/Arch/Hi Tech	19729	0.2384	**.0001**	22553	0.2083	**.0001**
	N=4,767			*N=4,767*		
	Adj. R Square=0.24			*Adj. R Square=0.19*		

Note: Model also controlled for race/ethnicity and campus.

Next steps: concerns and further work

- Survey administration
  - Response rate
  - Survey fatigue
  - Length of the instrument
  - Data quality—validity and reliability
- Data reporting and analysis
  - Raw responses vs. in-depth analysis
  - Interpretation
  - Linkages between results and policy making and learning improvement
- Research
  - Further explore and mine data to find evidence for instrument improvement
  - Identify issues of student learning, course teaching, programs, etc.
  - Enhance campus climate change and adaptive learning
  - Better understand relationships between student experience and completion and employment outcomes
  - What other outcomes student engagement and soft skills may be related to

Thanks! Questions?

Explore the UC story through data at UC Information Center!
http://www.universityofcalifornia.edu/infocenter