

UNIVERSITY OF CALIFORNIA, BERKELEY

FINDINGS FROM THE 2012 DOCTORAL ALUMNI SURVEY:

ESTABLISHING A BASELINE FOR UNDERSTANDING CAREER OUTCOMES

The University of California, Berkeley, produces the largest number of doctoral graduates from the largest number of programs ranked highly by the National Research Council. In Spring 2012, Berkeley's Graduate Division administered a ground-breaking survey to a sample of doctoral degree recipients from the previous 40 years (1968-2008). This cross-sectional study, one of a few conducted nationally and in the University of California system, establishes a baseline for understanding doctoral recipients' career paths, alumni satisfaction with graduate education, and the perceived value of various aspects of graduate education offered at Berkeley over four decades.

At a time when national debates about higher education arise, in part, from perceptions that doctoral students are facing diminished prospects of meaningful employment, studies like this are especially important to enable policy to be based on actual outcomes, rather than anecdotal accounts. Our survey results are rich, and several key findings shed light on current concerns.

Key Findings

- Berkeley doctoral alumni reported low rates of unemployment. Average reported retirement age was 64.

Table 1. Employment Status

Cohort	All		Total Employed		Retired		Not Seeking		Unemployed	
	N	PctN	N	PctN	N	PctN	N	PctN	N	PctN
2005-06 to 2007-08	530	100%	513	96.7%	.	0.0%	8	1.5%	9	1.6%
1999-00 to 2001-02	410	100%	397	96.8%	2	0.4%	6	1.4%	5	1.2%
1989-90 to 1991-92	468	100%	441	94.2%	19	4.0%	4	0.8%	4	0.8%
1979-80 to 1981-82	394	100%	337	85.5%	50	12.6%	2	0.5%	5	1.2%
1968-69 to 1971-72	620	100%	312	50.3%	285	45.9%	6	0.9%	17	2.7%
<i>All</i>	<i>2,422</i>	<i>100%</i>	<i>2,000</i>	<i>82.5%</i>	<i>356</i>	<i>14.6%</i>	<i>26</i>	<i>1.0%</i>	<i>40</i>	<i>1.6%</i>

- Of the respondents in science, technology, engineering and mathematics (STEM) fields, 77% are currently employed in four-year educational institutions, compared to 41% reported in the national NSF Survey of Doctoral Recipients (SDR). An almost identical proportion of respondents in Arts and Humanities disciplines, 78%, are employed in four-year educational institutions (the NSF SDR does not include students in Arts and Humanities disciplines).
- 3.5% of respondents reported current employment in state and local government, compared to 2.9% in the NSF SDR comparison group. This percentage was even higher for Berkeley Arts and Humanities doctoral degree recipients (4.1%).

Table 2. Employment Sector Comparison

Sector	NSF SDR STEM (2008)		Berkeley STEM (2012)		Berkeley Arts & Humanities (2012)	
	N	PctN	N	PctN	N	PctN
Higher education*	269,400	41.4%	996	55.2%	152	78.3%
Private for-profit	212,200	32.6%	438	24.2%	16	8.2%
Private non-profit	42,900	6.6%	87	4.8%	6	3.0%
National government	43,700	6.7%	81	4.4%	0	0.0%
State and local government	18,900	2.9%	64	3.5%	8	4.1%
Self-employed	41,000	6.3%	78	4.3%	9	4.6%
Other	23,100	3.5%	59	3.2%	3	1.5%
<i>All employed</i>	<i>651,200</i>	<i>100%</i>	<i>1,803</i>	<i>100%</i>	<i>194</i>	<i>100%</i>

*Includes 4-year colleges, 2-year colleges, medical schools and university-affiliated research institutes

- Berkeley doctoral alumni employment can be categorized in three broad career paths (Table 3): tenure-track employment (44%), other employment in higher education, including administrative employment and non-tenure-track teaching positions (14%), and non-academic employment (42%).
- There was no statistically significant change in the overall proportions of these three career paths over time except the lower reported rate of tenure-track faculty appointments in the newest cohort (accompanied by a larger proportion in postdoc positions). It is anticipated that in time more postdocs will move into tenure track positions, matching the earlier cohorts. See Table X for estimation of postdoc durations.

Table 3. Broad career paths of respondents indicating that they are currently employed

Cohort	Total Employed		Tenure Track Faculty		Non-Tenure Education*		Non-Academic	
	N	PctN	N	PctN	N	PctN	N	PctN
2005-06 to 2007-08	513	100%	194	37.9%	120	23.3%	199	38.7%
1999-00 to 2001-02	396	100%	191	48.2%	55	13.8%	150	37.8%
1989-90 to 1991-92	441	100%	206	46.7%	47	10.6%	188	42.6%
1979-80 to 1981-82	337	100%	144	42.7%	39	11.5%	154	45.6%
1968-69 to 1971-72	310	100%	143	46.1%	39	12.5%	128	41.2%
<i>All</i>	<i>1,997</i>	<i>100%</i>	<i>878</i>	<i>44.0%</i>	<i>300</i>	<i>15.0%</i>	<i>819</i>	<i>41.0%</i>

* Non-tenure-track jobs include administrative staff, lecturers, postdocs, adjunct professors, and other contingent faculty members

- Currently employed doctoral alumni who reported working in educational institutions were primarily employed by four-year colleges or universities. The percentage was slightly lower for non-tenure education alumni who reported working at medical schools and research institutes more frequently.

Table 4. Types of educational institutions reported by currently employed alumni

Education Institution Type	Tenure Track Faculty		Non-Tenure Education	
	N	PctN	N	PctN
Four-year college or university, other than a medical school	690	78.5%	168	56.0%
Two-year college, community college, or technical institute	20	2.2%	18	6.0%
Medical school (including university hospital or medical center)	37	4.2%	43	14.3%
University-affiliated research institute	102	11.6%	70	23.3%
Other education	29	3.3%	1	0.3%
<i>Total</i>	<i>878</i>	<i>100.0%</i>	<i>330</i>	<i>100.0%</i>

- Overall, time-to-degree is significantly associated with kind of employment in higher education, with shorter time-to-degree preceding tenure-track employment, and longer time-to-degree preceding other higher education employment (Table 5). In certain disciplinary areas (Arts and Humanities, Education, Public Health, and Social Sciences), alumni who pursued non-tenure track careers in higher education required more than two years longer to complete than their tenure track classmates.
- In the most disciplinary sectors, employment outside academia is not associated with longer time-to-degree. In disciplines where a professionally-focused master's degree is sometimes earned before starting a doctoral program (Engineering, Public Health, and Other Professional) the doctoral time-to-degree for alumni with non-academic careers was longer than tenure-track classmates.

Table 5: Mean time to degree by career choice

	All Careers		Tenure Track Faculty		Non-Academic		Non-Tenure Education	
	N	Years	N	Years	N	Years	N	Years
Arts and Humanities	194	8.1	116	7.8	40	8.4	38	8.8
Biological Sciences	189	5.7	74	5.5	71	5.8	44	6.0
Chemistry	226	5.2	63	5.1	138	5.2	25	5.5
Education	89	7.2	26	6.2	39	6.4	24	9.5*
Engineering	423	5.6	150	5.2	244	5.8*	29	5.9
Natural Resources	114	6.4	45	6.3	48	6.6	21	6.4
Other Professional	111	7.5	67	7.0	27	8.7*	17	7.6
Physical Sciences	226	5.9	104	5.8	82	6.0	40	6.2
Public Health	69	7.0	22	5.7	35	7.2*	12	8.5*
Social Sciences	356	7.8	211	7.5	95	7.7	50	9.6*
<i>All</i>	<i>1997</i>	<i>6.5</i>	<i>878</i>	<i>6.4</i>	<i>819</i>	<i>6.3</i>	<i>300</i>	<i>7.4*</i>

*Indicates significantly longer time to degree than tenure-track ($p < 0.05$)

- When time in postdoctoral employment is included with time-to-degree, the longer time in postdoc positions in Biological Sciences produces a total time in apprenticeship equivalent to that of Arts and Humanities and Social Sciences doctorates (Table 6). Further, a full apprenticeship in other sciences also occurs during the early postdoctoral career, lengthening the total time of apprenticeship.

Table 6. Mean total years in apprenticeship

	Mean Time to Degree		Mean Time in Postdoc		Mean Total	
	N	Years	N	Years	N	Years
Social Sciences	351	7.8	355	0.6	350	8.5
Arts and Humanities	193	8.1	193	0.4	192	8.5
Biological Sciences	189	5.7	189	2.7	189	8.5
Physical Sciences	226	5.9	225	1.9	225	7.9
Natural Resources	113	6.4	114	1.3	113	7.7
Other Professional	111	7.5	111	0.2	111	7.7
Education	87	7.2	89	0.5	87	7.6
Public Health	68	7.0	69	0.5	68	7.5
Chemistry	225	5.2	225	1.7	224	6.9
Engineering	419	5.6	420	0.6	416	6.3
<i>All</i>	<i>1982</i>	<i>6.5</i>	<i>1990</i>	<i>1.1</i>	<i>1975</i>	<i>7.6</i>

- From 2005-2006 forward, Physical Sciences and Chemistry saw sharp rises in percentages of doctoral alumni reporting at least one postdoctoral year (Table 7). Similar rises occurred earlier in the Arts and Humanities (1999-2000) and Social Sciences (1978-1979).
- As of the most recent cohort sampled (graduates from 2005-2006 to 2007-2008), 46% of doctoral degree recipients reported at least one year of postdoctoral employment, ranging from 31-33% in the Arts, Humanities, and Social Sciences, to 75-83% in Biological Sciences, Physical Sciences, and Chemistry (Table 6). The lowest proportions of reported postdoctoral employment were in Education, Public Health, and Other Professional degree programs (from 17% to 29%).

Table 7. Doctoral alumni reporting at least one year in postdoctoral placement

	1968-69 to 1971-72	1979-80 to 1981-82	1989-90 to 1991-92	1999-00 to 2001-02	2005-06 to 2007-08	% Change
Arts and Humanities	4%	5%	8%	29%	31%	27%
Physical Sciences	57%	43%	66%	69%	83%	26%
Chemistry	51%	64%	68%	54%	75%	24%
Social Sciences	10%	29%	31%	36%	33%	23%
Natural Resources	31%	67%	46%	47%	49%	18%
Engineering	22%	18%	34%	25%	35%	17%
Other Professional	12%	17%	7%	16%	17%	5%
Public Health	29%	29%	35%	12%	29%	0%
Education	14%	25%	13%	18%	24%	-1%
Biological Sciences	83%	88%	81%	85%	78%	-7%
<i>All</i>	<i>34%</i>	<i>37%</i>	<i>41%</i>	<i>39%</i>	<i>46%</i>	<i>12%</i>

- Overall, 95% of respondents reported both that they would pursue a doctoral degree again and that they would choose graduate study at Berkeley if they could start again (Table 8).

Table 8. Percentage responding they would choose Berkeley again, whether they would or would not pursue the doctoral degree, and whether they would or would not select the same field of study

		Pursue doctoral degree again		
		Would	Would not	<i>All</i>
Select same field of study	Would	97%	70%	96%
	Would not	90%	69%	86%
	<i>All</i>	<i>96%</i>	<i>69%</i>	<i>95%</i>

Employment levels, satisfaction with the preparation provided (even when careers are seen as unrelated to the degree field), and positive assessment of a variety of skills and experiences show that doctoral recipients from Berkeley have enjoyed positive outcomes from their Berkeley degree programs for at least 40 years.

Perhaps the most significant finding of the survey is that, for at least the last 40 years, Berkeley has been training doctoral students who find employment outside the tenure track in high numbers (non-academic positions 41% and other employment in higher education 14%). Data suggest that Berkeley's programs are, and have long been, training doctoral students who gain employment outside the tenure track in high proportions, with a markedly high level of employment in state and local government.

This counters a popular narrative that portrays significant levels of employment in these other sectors *as a recent development*. If these demonstrably long-term patterns are acknowledged, then it is more accurate to speak not of "alternative" careers but of *multiple career paths* for doctoral degree recipients. Rather than an "overproduction" of doctorates,

discussion should recognize utilization of these graduates in a variety of endeavors. Such recognition could promote a cultural change among faculty who may still see only one career goal as valuable, and help promote a broader commitment to helping students explore and prepare for multiple career paths.

Survey findings suggest three areas with need for redoubled, improved, or new efforts on the part of the Berkeley campus. These are: providing support for early exploration of a variety of careers (since large proportions of Berkeley doctorates land careers outside tenure-track college/university positions); addressing the relationship between extended time-to-degree and a narrowing of probable career paths; and acknowledging and planning for the extended apprenticeship period evident in all fields, which combines time to doctoral degree and time in limited term postdoctoral employment in research and teaching positions.

Placement of doctoral graduates in tenure-track employment in four-year colleges and universities is more common among those doctoral students who complete the degree in comparatively timely fashion, as is employment outside academia. For those doctoral recipients with longer time to degree, a career path leading either to non-tenure track teaching or to academic administration is more common. While it is possible that some of these individuals always intended to seek positions in academic administration, an alternative hypothesis is that hiring for tenure-track teaching positions favors those who completed the doctorate in a more timely fashion, and that some of those who are pursuing other career paths in academia are doing so as an alternative to tenure-track employment. Whether they find that alternative less desirable is an open question. If this career path is in any degree a result of hiring bias against graduates with longer time to degree, then the university could help encourage more options for every doctoral recipient by encouraging practices that better facilitate student completion of degrees in a more timely fashion, and by addressing student behaviors that lead to remaining enrolled as students longer.

Limiting time to degree is urgent for another reason. Even for those students who find tenure-track employment in four-year colleges and universities, the results of the survey show that there is an expected period of post-PhD continuing professional apprenticeship. When added to time to degree, doctoral students can expect to spend seven to eight years in a combination of doctoral program and postdoctoral training before finding a more permanent position. In the sciences, this has been recognized and institutionalized in the form of multi-year postdoctoral positions. In the social sciences and especially in the humanities, more of this training time is spent while remaining a late-stage doctoral student, which delays the accrual of professional credit that comes with independent research publication and independent teaching. The university should strive to create attractive postdoctoral positions, including teaching postdocs, into which doctoral candidates can transition, to help encourage students to complete the dissertation so that they can enter the job market.

Design and Administration of the 2012 Survey

Five cohorts of Berkeley doctoral graduates were defined (Table 9), roughly corresponding to the NSF Survey of Degree Recipients (NSF SDR) cohorts (5, 10, 20, 30, and 40 years after degree conferral). The employment categories used mirror those of the NSF SDR. Respondent characteristics were obtained in earlier Graduate Division surveys.

Of the overall population of 12,505 possible respondents, approximately 7.7% were excluded for a variety of reasons (they were deceased, had requested no contact, or there was no available contact information). Contact was made with the remaining sample through the postal service only (51.9%), electronic mail only (8.1%), or both means (32.1%).

Table 9: Survey population by cohort

Cohort	Excluded		Mail Only		Email Only		Both Modes		All	
	N	PctN	N	PctN	N	PctN	N	PctN	N	PctN
2005-06 to 2007-08	92	3.6%	1,113	44.3%	259	10.3%	1,047	41.6%	2,511	100%
1999-00 to 2001-02	74	3.2%	1,266	55.3%	177	7.7%	770	33.6%	2,287	100%
1989-90 to 1991-92	141	6.0%	1,290	55.1%	202	8.6%	708	30.2%	2,341	100%
1979-80 to 1981-82	140	6.9%	1,116	55.0%	129	6.3%	641	31.6%	2,026	100%
1968-69 to 1971-72	518	15.5%	1,713	51.2%	252	7.5%	857	25.6%	3,340	100%
<i>All</i>	965	7.7%	6,498	51.9%	1,019	8.1%	4,023	32.1%	12,505	100%

The overall response rate was 21%. Response rates by cohort varied from 19% to 23%. The characteristics of respondents were checked for representativeness within each cohort. Males responded less frequently than females. Overall, there were no statistically significant biases in the characteristics of respondents compared to those of the graduate population in each cohort. There were no statistically significant differences in survey response rates between those contacted by different means (email, US mail, both).

Table 10: Response rates

Cohort	Sample	Overall		Mail Only		Email Only		Both Modes	
	N	N	PctN	N	PctN	N	PctN	N	PctN
2005-06 to 2007-08	2,419	535	22%	130	12%	74	29%	331	32%
1999-00 to 2001-02	2,213	417	19%	137	11%	61	34%	219	28%
1989-90 to 1991-92	2,200	472	21%	165	13%	86	43%	221	31%
1979-80 to 1981-82	1,886	403	21%	143	13%	47	36%	213	33%
1968-69 to 1971-72	2,822	638	23%	239	14%	106	42%	293	34%
<i>All</i>	11,540	2,465	21%	814	13%	374	37%	1,277	32%

Assessment of Academic Preparation

Retrospective assessment of the degree to which Berkeley doctoral programs prepared graduates for their careers is a measure of perceived effectiveness of these programs. The alumni survey showed very high levels of satisfaction with overall preparation across all disciplines: 90% of all those responding said they were well-prepared or prepared by their degrees (Table 11). The level of satisfaction with preparation for careers was highest among those in tenure-track employment (95%) but was also very high among doctoral recipients in other academic employment (89%) and outside academia (85%). The lowest reported level of satisfaction with preparation was by doctoral recipients in the Physical Sciences employed outside academia, but even this was a relatively high 75%.

Table 11: Proportion of respondents who felt "well prepared" or "prepared" after completing their degree (red values are higher than average; blue values lower than average)

	Tenure Track	Non-Tenure Education	Non-Academic	All
Public Health	100%	100%	94%	97%
Engineering	98%	100%	91%	94%
Natural Resources	90%	100%	97%	94%
Chemistry	98%	87%	90%	92%
Other Professional	94%	91%	83%	90%
Arts and Humanities	93%	89%	79%	89%
Education	100%	87%	83%	89%
Biological Sciences	94%	89%	80%	88%
Social Sciences	96%	88%	76%	88%
Physical Sciences	95%	79%	75%	85%
All	95%	89%	85%	90%

The survey asked respondents to rate a variety of specific skills that formed part of their doctoral program (Table 12). The most valued skill was practice of academic or professional writing, rated as important or very important by 91% of respondents overall, followed by practice of a formal analytic technique specific to the field (84% overall), presentation of work at a professional conference (82%), and experience working collaboratively (79%).

Least valued was exposure to ethical dilemmas in the field, with only 44% of doctoral recipients overall ranking this as important or very important. Whether this reflects a lack of exposure to ethics training or an undervaluation of ethics training, this is an unexpected result. Doctoral recipients in practice-based fields gave consideration of ethical dilemmas in the discipline the highest endorsement as important or very important (68% of respondents).

Table 12. Percent responding “Very Important” or “Important” to the question, "In your opinion, how important are the following elements of doctoral education for students entering jobs in your field?"

	Natural Resources	Public Health	Biological Sciences	Other Professional	Chemistry	Engineering	Education	Social Sciences	Arts and Humanities	Physical Sciences	All
•Practice of academic or professional writing skills	94%	97%	93%	96%	92%	90%	91%	94%	95%	79%	91%
•Practice of formal analytic technique in your field	89%	92%	87%	88%	81%	84%	76%	82%	79%	88%	84%
•Presentation of work at a professional conference	88%	92%	88%	84%	86%	84%	69%	82%	77%	75%	82%
•Experience working collaboratively with colleagues	91%	87%	86%	82%	86%	82%	87%	67%	59%	78%	79%
•Opportunity to interact across disciplines	92%	79%	76%	71%	77%	70%	67%	65%	77%	63%	71%
•Experience as a GSR (research assistant)	79%	44%	67%	69%	77%	69%	42%	62%	41%	65%	65%
•Experience gained through an internship or practicum	79%	86%	69%	61%	57%	67%	84%	52%	58%	55%	63%
•Experience as a GSI (teaching assistant)	55%	38%	62%	71%	45%	40%	43%	68%	82%	52%	56%
•Consideration of ethical dilemmas in your field	57%	56%	47%	59%	43%	43%	68%	45%	40%	19%	44%

Another surprising result was a general lukewarm attitude toward the value of various forms of engaged practice (experience as a Graduate Student Researcher, experience from an internship or practicum, and experience gained as a Graduate Student Instructor). These experiences were ranked as important or very important overall by between 56% and 65% of respondents. It is difficult to interpret this result. It may reflect a mixture of reactions to these experiences as career preparation (which presumably would be valued more highly) or as simply sources of financial support (e.g. repeated service as a GSR or GSI may not add perceived value as career preparation). It may also reflect the fact that the experiences gained from being a GSR or GSI, or engaging in a practicum or internship, are not uniform across disciplines. There is some support in the detailed data for these possible explanations, as some of these activities were of more importance to doctoral recipients in specific sectors.

Experience as a Graduate Student Researcher was ranked as important or very important by 79% of Natural Resources PhDs and by 77% of Chemistry PhDs. The GSR title typically provides support paid for from faculty research funds or grants. The research topic may not always align with the recipients’ own doctoral goal nor advance students’ career goals. (This is probably more

often the case in non-STEM fields.) This means that being a GSR in, for example, Chemistry could be experienced very differently from being a GSR in some other fields.

Experience as a GSI was ranked highly by 82% of Arts and Humanities doctoral recipients and by 68% of Social Sciences doctoral degree recipients. In these fields, GSIs routinely conduct small group sections. Student instructors may be responsible for framing pedagogy, goals, and even assessment approaches in the section. Thus, in these disciplines, being a GSI may be a beginning of faculty practice. In the Physical Sciences, whose respondents tended to rank this activity lower, many if not most GSIs conduct lab and/or review sessions designed by the instructor of record, providing less scope to experience the autonomy of teaching.

Not all of the variability in assessment of the value of teaching appointments can be accounted for so simply. Being a GSI was also highly ranked by 71% of those receiving Professional degrees, other than in practice-based fields. It is possible that in some professional schools, college-level teaching is seen as significant in career preparation -- or, there may be variability in the kinds of teaching experiences offered to GSIs in different professional schools.

Experience gained through an internship or practicum was of importance to very high proportions of alumni in practice-based fields. The lower ranking of these activities by graduates in other disciplines may well reflect an absence of such opportunities in the normal training pathways for other doctoral degrees. The positive assessment of internships/practice and the positive assessment of service as a Graduate Student Researcher (ranked as important or very important by 79% of Natural Resources PhDs) gives the College of Natural Resources a pattern similar to some professional schools.

In the Biological Sciences, experience gained as a GSR (67%), GSI (62%), or through an internship (69%) were not viewed as unimportant, but were not seen as important or very important by as many alumni in these fields as valued more individual skill development. A similar pattern was seen in the Physical Sciences, where levels of alumni who reported that these activities were important or very important were similar or even lower (GSR 65%, GSI 52%, and internship/practicum 55%). Alumni with engineering degrees reported some of the lowest levels of appreciation of teaching experience (only 40% ranking this as important or very important) and reported moderate assessments of the importance of being a GSR (69%) or participating in an internship or practicum (67%). Given the significant amount of time students in STEM fields spend as researchers, including in internships, these results are surprising: either these alumni did not see value in a core activity, or this core activity was somewhat taken for granted.

Relationship of Career to Degree

Overall, a high proportion (78%) of survey respondents stayed in the same degree field (Table 13). The majority (69%) reported that their work was closely related to their degree (Table 14).

Table 13. Percentage of respondents reporting they “Stayed in same field” or “Moved around within the same general field” (red values are higher than average; blue values lower than average)

	All	Tenure Track	Non-Tenure Education	Non-Academic
Education	85%	79%	96%	83%
Public Health	84%	86%	83%	83%
Engineering	81%	88%	73%	77%
Biological Sciences	80%	90%	89%	63%
Natural Resources	80%	89%	86%	71%
Social Sciences	78%	89%	64%	65%
Other Professional	77%	92%	45%	63%
Physical Sciences	75%	92%	67%	60%
Chemistry	75%	87%	50%	74%
Arts and Humanities	72%	91%	67%	27%
<i>All</i>	78%	89%	72%	69%

Table 14. Proportion of respondents replying that their work was "closely related" to their degree (red values are higher than average; blue values lower than average)

	All	Tenure Track	Non-Tenure Education	Non-Academic
Education	70%	89%	75%	54%
Public Health	85%	88%	100%	78%
Engineering	65%	85%	79%	53%
Biological Sciences	65%	78%	71%	47%
Natural Resources	73%	84%	83%	59%
Social Sciences	74%	91%	56%	48%
Other Professional	85%	94%	80%	67%
Physical Sciences	69%	91%	71%	41%
Chemistry	54%	74%	48%	46%
Arts and Humanities	68%	87%	59%	20%
<i>All</i>	69%	87%	68%	50%

Alumni in tenure-track careers were least likely to report having changed field (89% report that they did not change field) and most likely to report that their work was closely related to their degree (87%). Alumni employed outside academia were most likely to report changing field

(31%) and most likely to report that their work was not closely related to their degree, although half (50%) identified their work as closely related to their degree.

Alumni in non-tenure-track positions in academia with doctoral degrees in Public Health (100%), Natural Resources (83%, compared to 84% in tenure-track positions), Biological Sciences (71%, compared to 78% in tenure-track positions) and Education (75%, compared to 89% in tenure track positions) reported that their jobs were still related closely to their degrees. This includes graduates reporting employment in hospitals and research centers.

A relatively high proportion of Chemistry alumni working in non-tenure-track positions (50%) reported changing fields. Chemistry doctoral recipients were less likely when employed outside academia to report that their work was closely related to their degree (46%). It would be interesting to know whether the change of fields reported in this case reflects changes to more interdisciplinary fields (such as biochemistry) or a more dramatic reorientation of field in employment (such as might come about by moving into industry and taking on a role in management, product development, or marketing).

Alumni with Professional degrees in fields other than Public Health or Education who are employed in higher education but not in the tenure track more frequently reported changing fields (55%), yet still said their work was related to their degree (80%).

Alumni from fields in Arts and Humanities employed outside academia were most likely to report having changed fields (73%) and less likely to report having work closely related to their degrees (80%).

Conclusion

Across disciplinary sectors (Table 15) and different career paths (Table 16), Berkeley doctoral recipients report they would pursue the doctoral degree again.

While some might choose a different field (Table 17), across all disciplinary sectors, very high proportions of these doctoral recipients would pursue a degree at Berkeley again (Table 18).

Even among those who would not choose to pursue a doctoral degree in the same field again, 69% would still choose Berkeley again (Table 8). This high level of satisfaction accompanies a high diversity in career paths which has persisted for forty years. Preparing current students for that diversity of careers is essential to maintain and increase the positive outcomes for Berkeley doctoral recipients registered in this first retrospective alumni survey.

Table 15. Percentage of alumni who responded that they would pursue the doctoral degree again, by disciplinary sector

	N	%
Natural Resources	136	98%
Physical Sciences	281	98%
Other Professional	137	97%
Public Health	79	97%
Chemistry	282	96%
Education	144	96%
Engineering	484	96%
Arts and Humanities	234	95%
Biological Sciences	240	93%
Social Sciences	446	92%
<i>All</i>	<i>2463</i>	<i>95%</i>

Table 16. Percentage of respondents who would pursue the doctoral degree again, by career track and assessment of degree to which doctoral program prepared them for their career

	Tenure Track	Non-Tenure Education	Non-Academic
“Well-prepared” or “Prepared”	99%	95%	95%
“Somewhat prepared” or “Not prepared”	88%	83%	79%
<i>All</i>	<i>98%</i>	<i>94%</i>	<i>93%</i>

Table 17. Respondents who would select the same field again, by disciplinary sector

	N	%
Public Health	79	96%
Other Professional	137	90%
Physical Sciences	281	90%
Biological Sciences	240	87%
Natural Resources	136	86%
Chemistry	282	85%
Education	144	85%
Engineering	484	85%
Social Sciences	446	85%
Arts and Humanities	234	81%
All	2463	86%

Table 18. Respondents who would choose Berkeley again, by disciplinary sector

	N	%
Education	144	97%
Engineering	484	97%
Other Professional	137	96%
Chemistry	282	96%
Public Health	79	96%
Natural Resources	136	95%
Physical Sciences	281	95%
Social Sciences	446	94%
Biological Sciences	240	93%
Arts and Humanities	234	91%
All	2463	95%

Endnote

The alumni survey reported here was envisaged by Andrew Szeri, Dean of the Graduate Division, in 2011 and carried out by Andrew Smith, Assistant Dean for Research and Planning, in 2012. Analyses of the data were completed by Assistant Dean Smith in fall of 2013. The text accompanying these analyses was finalized in summer of 2015.