

THE FUTURE OF GRADUATE EDUCATION AT UC BERKELEY

EXECUTIVE SUMMARY

The inaugural cohort of the UC Berkeley Faculty Leadership Academy was asked to propose transformative new approaches to graduate education. Berkeley has long been a standard bearer in graduate education, with our alumni receiving Nobel prizes, taking up leading positions in academia and government, and sparking innovation in technology and business. While we are proud of this legacy, it obliges us to evolve to meet the demands of the present and future. We need **a new vision to meet an array of emergent challenges**: a world in dire need of solutions to hard problems that require interdisciplinary research, reduction of tenure-track positions, rapid shifts in the non-academic job market, and skyrocketing costs for study, work, and living in the Bay Area.

We identified three areas where interventions would reassert our preeminence in graduate education and fulfill our mission to advance scholarship for a more just and better world. Woven into all three is a determination to **reinforce our commitment to diversity** among our graduate students, knowing that diversity is one of the great strengths of the state we serve, and that a diverse graduate student body will increase our intellectual rigor and invigorate academic life.

First, we recommend that the university develop and sustain a coordinated network and clear training pathways to support graduate student research that addresses **pressing public needs and issues**. It should be easier for graduate students who aspire to do research that meaningfully and positively affects society to realize their aspirations, and to do this research *with* rather than *on* the communities they seek to serve. We need to identify leadership for this endeavor and design the network and its supports for faculty, staff, and students. We also propose creating an inventory and public map of existing and new public purpose research efforts and training opportunities, thereby making more visible the contributions of our research to the public.

Second, to solve hard problems and adapt to a rapidly shifting job market, we need to broaden and deepen **graduate education across disciplinary boundaries**. Although myriad interdisciplinary programs exist across campus, they are uneven, disjointed, and interstitial. To do better, we need to make it easier to create new programs, to sustain many existing ones, and to sunset or consolidate old ones. We propose a systematic assessment of interdisciplinary graduate offerings at Berkeley, led by Graduate Council and the Graduate Division, covering concurrent and interdisciplinary degree programs and Designated Emphases. In the Signature Initiatives and the Data Science Commons we see exciting opportunities for unlocking the interdisciplinary potential of new graduate groups and joint MA/MA or MA/PhD programs.

Third, to support the health and well-being of our graduate students, we need to make a **holistic approach to mentorship** a faculty priority. The uncertainty of the job market fuels student anxiety and self-doubt, which is amplified for first-generation students, those who are underrepresented, and those struggling with a disability, sexual harassment or other abuses of power, or economic precarity. Numerous campus services address these needs, but the onus is on students to seek them out. We propose developing a **mentorship center and mentorship program** for faculty as well graduate students. Taking such a proactive approach to student health and well-being is core to maintaining Berkeley's leadership role in graduate education.

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AREA 1: PUBLIC PURPOSE-ORIENTED GRADUATE EDUCATION

Many graduate students across a wide range of disciplines come to Berkeley with a desire to produce knowledge that promotes real, sustained, and positive change in the world—often in the communities from which they come. Our geographic location, public mission, and comprehensive research excellence give Berkeley extraordinary potential for such research across multiple domains and constituencies. Currently, however, graduate training in public purpose-oriented scholarship is decentralized and uncoordinated, and as a campus, we often struggle to persuade policy-makers and the broader public that what we are doing matters to them. Strengthening our explicit public purpose mission in graduate education—rather than allowing it to remain an ancillary feature—will help the public see Berkeley’s value beyond undergraduate education, while encouraging graduate students to engage the public not only as subjects of study but also as partners in knowledge creation.

Our vision for public purpose graduate education is relevant beyond our professional schools. We seek to promote stronger leadership and coordination in graduate education across campus, recognizing that students and faculty in different disciplines and units will take up this critical challenge in diverse ways. Many graduate students come to Berkeley to advance their careers *and* to improve the world, and the problems facing the world today demand redoubled effort from the academy. We must do a better job articulating the connections between graduate education and public impact, and supporting the students who make those connections real.

Background and Rationale

Our vision is to nurture transformational cohorts of Berkeley graduate students committed to addressing pressing problems in every sector. Innovations in community building, mentorship, and curriculum to provide specific training and academic credit for work that has positive societal impact would help attract the most promising students to pursue graduate work in the first place, to pursue it at Berkeley, and to see it to completion. Berkeley’s Graduate Student Handbook observes that “beyond academic rigor... [we create] a socially conscious environment that motivates and values contributions for the greater good.” But for too many students, pursuing a graduate degree feels like a distraction from, rather than a furtherance of, their efforts to contribute to the world and their local communities. Proactive work to coordinate and amplify public impact research and teaching through our graduate programs will position Berkeley as a model of how public universities can make a difference in the world through engaged, rigorous research and training of our students.

This proposal bears directly on Berkeley’s efforts to enhance diversity and improve the overall well-being of graduate students, especially those who come to Berkeley with first-hand experience of the societal challenges (e.g., racism, poverty, housing instability, unequal burden of disease) they seek to address as scholars. Recognizing these experiences as strengths for critical inquiry and outstanding scholarship will foster a sense of belonging and reduce the isolation of graduate students who feel marginalized in our community. Anecdotally, we understand that disengagement from public purpose is a strong factor that discourages diverse students from graduate (especially doctoral) study, both at the application stage and after matriculation. This work must not be relegated to co-curricular status, as this designation places a higher bar on students who are impelled by their public purpose commitments to take on additional work (and likely, additional time to degree, with the economic and personal precarity this often entails) on the path to degree completion.

There is growing recognition across a wide range of fields that public engagement does not detract from quality scholarship but in fact enhances it. Recent innovations in the sciences find valuable expertise outside of the academy: *citizen science* engages community members to gather data that traditional academic research methods often miss; *participatory science* ensures that those with unique experiences and hard-to-access data are at the center of discovery and included in ethical debates; and *public scholarship* incorporates deliberative practices, such as forums and town meetings, into research design and implementation to address public problems. The Association for Public and Land Grant Universities has initiatives promoting public research and community engagement, noting that public universities conduct 66 percent of all university-based research and produce technological and cultural innovations affecting nearly every facet of public life.¹ The American Academy of Arts and Sciences likewise argues for the “profound” public good that research universities represent, having a disproportionate intellectual, cultural, and economic impact upon society despite comprising only 3 percent of all US institutions of higher learning.² The National Science Foundation recently launched the NSF 2026 Idea Machine, a competition designed to identify and reward ambitious research that “would have significant societal and scientific impact that would benefit many stakeholders, both inside and outside the research community.”³

For all of these reasons, we do a disservice to our students if we fail to provide coordinated training paths to excel in public purpose oriented careers within and outside of the academy. One-third of recent Berkeley doctoral students have pursued non-academic careers, and another third have not found tenure-track appointments. Many students are drawn to public purpose research as a stepping stone to careers in government, health, education, social services, business, or law. But there is a widespread belief that such paths are stigmatized at Berkeley, and that expressing non-academic ambitions will result in less support and guidance from faculty.

Current State of Affairs

We have the resident expertise to lead in this field. There are multiple Berkeley units and many faculty across campus who train graduate students in scholarship that directly engages societal and community challenges. An orientation from “research on” to “research with” is perhaps most explicit in professional schools (e.g., Public Health, Social Welfare, Education, Public Policy, Law), but it is salient across the social sciences, humanities, and STEM fields as well. For example, there are graduate students now being trained in the genetics of infectious diseases such as Zika and malaria *and* in collaborative methods for community-partnered research, because affected communities have expertise needed to advance basic scientific discovery. Established ethical, theoretical, and methodological approaches exist to guide academically rigorous scholarship that is also informed by and useful to extra-academic stakeholders. One key requirement of such work is the establishment of trusting research relationships with community or policy actors, who may otherwise doubt that research will be of value to them or seek to avoid “drive-by” research in which scholars gather data and are not heard from again.

¹ Association of Public and Land Grant Universities, <http://www.aplu.org/projects-and-initiatives/college-costs-tuition-and-financial-aid/publicvalues/research-engagement.html>

² American Academy of Arts and Sciences, https://www.amacad.org/sites/default/files/academy/multimedia/pdfs/publications/researchpapersmonographs/PublicResearchUniv_PublicGood.pdf

³ National Science Foundation, https://www.nsf.gov/news/special_reports/nsf2026ideamachine/index.jsp

Some Berkeley graduate students already benefit from scaffolded mentorship and training to navigate community-engaged scholarship pathways in their research at Berkeley and in preparation for launching their careers. For example, some conduct their research embedded within faculty mentors' long-term research relationships with governmental and non-governmental entities, community-based organizations, and/or public constituencies affected by the topics under study. Others are trained within formalized institutional partnerships, such as [Research Practice Partnerships \(RPPs\)](#), now growing in the developmental, educational, and health fields. Graduate students who work within a relational network or partnership have the benefit of two-way communication in framing their research to engage pressing problems of concern to stakeholders. Thus, their research is more likely to be used and have impact, rather than solely addressing gaps in scholarship. More concretely, students within such partnerships can benefit from collaborative tools (such as memoranda of understanding to provide guidelines for research activities and data management that go beyond traditional IRB stipulations), training, and opportunities for sharing findings with external stakeholders.

Currently, however, there is no clear campus-level intellectual leadership or support structure for public purpose graduate training. Graduate training in public purpose-oriented scholarship at Berkeley is decentralized and uncoordinated; while some units and faculty have history and leadership in these areas, *there is no sustained connection of public purpose supports or opportunities for graduate students*. Other than the Chancellor's Awards for Research in the Public Interest, there is little visibility to help graduate students—or potential community and policy partners—find opportunities for public purpose research. We have observed that graduate students often perceive a false dichotomy between working on public issues they care about and pursuing a successful career in academia. Nationally, there have been efforts to push back against this perception, such as the Mellon Foundation's Public Scholars program for humanists, but pragmatic barriers to public engagement remain. For example, because policy- and community-engaged scholarship often requires intensive collaborative effort not directly reflected in the quantity of peer-reviewed publications, graduate students may worry that a public purpose-oriented research path will undermine their academic career success. Additionally, there is sometimes confusion regarding the distinction between community “service” and outreach (also a critical part of our university mission) versus collaborative, community- and policy-engaged *scholarship* designed to tackle major societal challenges.

Proposal

We recommend that campus leadership leverage the momentum of existing community-engaged scholarship initiatives and centers on campus (see initial [appendix](#)), as well as the Signature Initiatives, to grow *a network of central and/or regional “hubs” to connect, support, and sustain the “spokes” of public purpose graduate training* across campus. The network should help to make visible and scale outstanding public purpose training opportunities to a wider range of interested students via training grants, symposia, course development, and other supports, while also promoting a sense of community and intellectual connection among faculty, staff, and students across campus.

We emphasize that this network and organizational supports (e.g., staffing, faculty incentives, graduate fellowships) must be designed with the input of relevant stakeholders both on and off campus, especially as it relates to “value added,” flexibility, feasibility, and sustainability. Berkeley researchers have much to learn from practitioners, policy-makers, and community groups, whose systematic input can help to improve the rigor and impact of their scholarship. Public

purpose graduate training should be nested within *a network of sustained partnerships with experts outside of the academy*.

Finally, departments, schools, colleges and graduate groups, working alongside Graduate Council and Graduate Division, should consider *educational program amendments or new programs to strengthen public purpose scholarship*. Rather than disjointed, “one-off” graduate projects—which if poorly designed and executed may not only fail but also do damage to broader communities’ trust in Berkeley—there should be coordinated pathways that instill and amplify best practices for public purpose graduate training. For example, graduate students’ collaborative scholarship efforts can be scaffolded by faculty mentors within existing partnerships, such as in the RPP model noted above.

Action Plan

Identify Leadership and Coordination

An initial step is to identify where and how leadership, coordination, and staffing for this effort will be taken up among the campus entities whose missions are most relevant. We envision Graduate Council, Graduate Division, and the Vice Chancellor for Research Office (VCRO) as core leaders, with active involvement of units, ORUs, and other important groups with relevant roles (e.g., Social Science Matrix, D-Lab).

Strengthen Support for Existing Public Purpose Graduate Education

Units, centers, and faculty who already train graduate students for public purpose scholarship and research often lack staffing and resources to sustain connections, enable cross-mentoring and training, and promote a shared sense of intellectual community among graduate students. *Centralized support for public purpose graduate training* at Berkeley is needed to increase and scale up opportunities for such research and translational efforts, as well as to increase their impact and relevance. One example would be to leverage and expand existing work done via GradPro (Graduate Division’s professional development wing) to develop a specific public-purpose module of professional development programming that promotes key intellectual and professional training for students who envision public purpose-oriented research careers in academia or in the public or private sectors.

Inventory and Map Resources and Opportunities

An *interactive map* and list of community- and policy-engaged centers and projects should be developed and promoted to make public purpose training “pathways” more visible, incorporating workshops and courses by units and groups as part of the Public Purpose network on campus (e.g. D-Lab, Social Science Matrix, key ORUs). One option would be a user-friendly interactive map on the Graduate Division and VCRO websites (e.g., see a rough [prototype](#) for the VCRO-funded Youth and Inequalities Initiative). The inventory and map should build on our in-progress [appendix](#) of groups on campus to identify best practices and potential participants, including recipients of our Chancellor’s Awards for Research in the Public Interest as well as the long-standing community partners and advisory boards of existing units and centers.

Create Public Purpose Graduate Cohorts

Beyond the opportunities above, we propose piloting, evaluating, and scaling models to create cohorts of Public Purpose Graduate Scholars across disciplines with training opportunities, research working groups, and a stronger sense of communal intellectual identity. This might involve, for example, a “cascading mentorship” ([EOYDC](#), 2019) model of Public Purpose Graduate Scholar GSR-ships, with faculty research mentors and public purpose undergraduate research discovery

experience apprenticeships, building on scaled programs such as the Undergraduate Research Apprentice Program (URAP) and pilots such as the [Youth Equity Scholars](#).

Development

UDAR and campus development professionals should identify philanthropic opportunities for large-scale Public Purpose GSR-ships and fellowships, independently and in connection with the Signature Initiatives or other public purpose efforts. Capital campaign funding designated for cluster faculty and staff hiring could support hiring that advances public purpose scholarship and the training of graduate students in public purpose-oriented research.

AREA 2: INTERDISCIPLINARY GRADUATE EDUCATION

Berkeley is known for interdisciplinary scholarship and connections across the faculty. However, for reasons of historical practice, resource allocation, and value systems, we are structured to prioritize disciplinary graduate training. Especially for our doctoral students, interdisciplinary education is layered on top of a largely discipline-based structure, or fitted into its cracks. This has been the case ever since Berkeley became a top-ranked research university, situated in a university ecosystem that has traditionally prized deep expertise in recognized fields over interdisciplinary experimentation and breadth.

Yet there are evolutionary opportunities we can seize to expand and improve Berkeley's portfolio of interdisciplinary graduate offerings. Our measures acknowledge facts on the ground—the manifest strengths of Berkeley's traditional modes of graduate education, which the campus views as core to its reputation—while seeking to pave new pathways among them. We offer a set of proposals centered on assessing current practices and programs for interdisciplinary PhDs and Designated Emphases, tuning and upgrading them for greater impact, experimenting with new options such as joint degree programs between traditional academic departments and professional schools, and actively investing resources in successful models.

Background and Rationale

Graduate education in the research university has traditionally been defined by academic disciplines, with doctoral training in particular signifying deep immersion in a single scholarly field. Berkeley is renowned for its excellence in such training across an unsurpassed spectrum of departments and schools. Against the backdrop of this campus landscape, and acknowledging the *de facto* priority often given to doctoral education, it is perhaps unsurprising that interdisciplinary graduate education has sometimes struggled to gain visibility or find a foothold at Berkeley.

Yet many of today's most pressing challenges—including climate change, inequality, migration, and threats to democracy—lie at the interface or boundary of two or more traditional fields. It is practically a truism that real-world problem-solving requires integration of multiple sets of disciplinary skills. Vibrant new fields of scholarship—such as bioengineering, cognitive science, behavioral economics, media studies, and critical theory—have arisen where scholars from different disciplines have come together around specific topics, tools, or problems. Collaborations span the social sciences, humanities, professional schools, and STEM. The rise of digital technologies, remote sensing, machine learning, and big data portend more such “interdisciplines” in the coming years.

Moreover, these intellectual developments are matched by trends among our students. At the undergraduate level, we have seen surprisingly rapid growth in interdisciplinary programs such as political economy, cognitive science, global studies, and data science, suggesting that many young people now approach their education with greater desire for integration and less investment in the focused disciplinary training that many of today's faculty received. At the post-baccalaureate level, Berkeley has historically placed priority on doctoral training for academic careers. Yet one-third of Berkeley PhD recipients now go on to non-academic careers, and another third hold non-tenure track academic positions. Many of these students, we believe, would embrace and benefit from enhanced institutional support for interdisciplinary graduate training. In particular, many graduate students now seek training that will prepare them to address major public problems using tools from multiple scholarly fields (see Public Purpose-Oriented Graduate Education section). For the careers

that these students seek, a doctorate is both more (in terms of time commitment and credential) and less (too narrowly focused) than they need. Greater support and coordination for interdisciplinary graduate education that emphasizes socially relevant learning would enable Berkeley students to cross more confidently into different fields, career paths, and civic participation.

Over recent decades, Berkeley has been evolving new ways to provide interdisciplinary graduate education, though often without full attention to the choices that are being made. We believe now is a good moment to assess that experience, learn from it, expand its scope, and develop new forms of training that will help us meet the demands of the day. We want to undertake this change thoughtfully and empirically, drawing lessons from our experience so far.

Current State of Affairs

Practices and structures

In practice, interdisciplinarity is latent across Berkeley graduate education. Faculty and students can capitalize on our comprehensive excellence across departments and schools to combine insights and expertise from multiple fields. The institutional expressions of this excellence are myriad: from ORUs, centers, and institutes to workshops, conferences, speaker series, and research incubators such as the Social Science Matrix. All Berkeley doctoral students are exposed to multiple disciplines through the requirement to have at least one “outside” member on their qualifying and dissertation committees, which may help to select interdisciplinarily-minded candidates in the graduate admissions process.

In terms of formal structures and offerings, interdisciplinary graduate education at Berkeley currently takes three major forms.⁴ Each has significant educational potential, but each also suffers from unique difficulties and, in some cases, lack of support.

Graduate Groups. First are *alternatives* to strictly disciplinary degrees, in the shape of PhD and Masters programs offered by interdisciplinary groupings of faculty called graduate groups. There are 34 degree-granting graduate groups at Berkeley, of which 32 offer PhD programs. Examples range from Health Policy to Ancient History & Mediterranean Archaeology, from Neuroscience to Folklore, and from Endocrinology to Urban Design.⁵

The oldest interdisciplinary PhD program now extant at Berkeley is Romance Languages & Literatures, formed in 1926. Between the mid-1940s and the late 1970s, about five new interdisciplinary PhD programs were formed every decade. The rate of formation then slowed. The newest PhDs to be offered by graduate groups are in Metabolic Biology and in Molecular Toxicology, both formed in 2002, and Computational Biology, which started as a DE and added a PhD in 2010.

The largest graduate groups in terms of PhDs awarded (averaging more than 5 PhDs per year over the period 2008-2018) are nearly all in the sciences and engineering: Bioengineering

⁴ There is also an option for students to create their own Interdisciplinary Doctoral Program. It is relatively little exercised, possibly in part because, as [Graduate Division's website](#) advises, “Completing a doctorate in an existing departmental, school, or group program is to your advantage because access to space, financial support, and continuing supervision are much more difficult for interdisciplinary students.”

⁵ Data are drawn from Graduate Division records and Cal Answers, with thanks to Linda Song and David Culler. The data and approaches used here are also informing the design of the Data Science Commons.

(averaging about 16 PhDs per year), Epidemiology (just over 10 PhDs per year), Biophysics, Neuroscience, Energy & Resources, Microbiology, Applied Science & Technology, Vision Science, Jurisprudence & Social Policy, and Biostatistics (all between 5 and 10 PhDs per year).

Designated Emphases. Second are *supplements* to disciplinary degrees, in the form of Designated Emphases (DEs, or graduate minors), which are hosted by graduate groups as well. Sixteen DEs are currently offered at Berkeley. Examples include Film Studies, Energy Science & Technology, Critical Theory, Development Engineering, and Science & Technology Studies.

The oldest extant DEs at Berkeley are the Designated Emphases in Women, Gender & Sexuality and in Film Studies, formed in 1995 and 1997. A wave of DEs followed in the mid-2000s, in part prompted by the formation of the New Initiative Centers (NICs), including DEs in Nanoscale Science & Engineering [since discontinued], New Media, and Global Metropolitan Studies. Since 2005, a new DE has been added on average roughly every year, most recently Indigenous Language Revitalization in 2018. Since their origin in the 1990s, DEs have been the major instrument available for interdisciplinary graduate education for the humanities and social sciences since the late-1970s slowdown in forming new interdisciplinary PhDs.

In fall 2018 more than 340 graduate students were enrolled in DEs across the campus. The largest DEs are currently Critical Theory (91 students), Women, Gender & Sexuality (37 students), and Computational & Data Science & Engineering (31 students).

Concurrent Degree Programs. Finally, there are 29 *concurrent degree* programs, which combine a Masters with another advanced degree, most typically a second Masters. Such programs are for the most part within or between professional schools, with some connections into Masters programs in Engineering and Letters & Science. Concurrent degree programs require some coordination, allowing a limited number of units to be used in common to reduce the time to earn both degrees, and involving a single, integrated capstone. They must address a variety of administrative matching issues (e.g., aligning admissions processes, curricular requirements, and tuition schedules, allocating revenue streams).

Processes and challenges

Proposing and launching a graduate degree program, whether disciplinary or interdisciplinary, is an extended process that is described in the [Berkeley Compendium](#) (last revision: summer 2018). We note that only one new interdisciplinary PhD program has successfully been created in more than 15 years (Computational Biology, which began as a DE in 2003).⁶ Almost all interdisciplinary faculty energy in the past two decades has been directed into the lighter DEs (as well as, one assumes, into proposals for new revenue-generating Masters programs, though these serve different needs and require significant effort to prepare and support). The instruments available in recent decades to support interdisciplinary graduate education also seem to be significantly lighter in the social sciences and the humanities than in the STEM fields. There have been relatively few attempts to create campus-crossing interdisciplinary graduate offerings,

⁶ The relative stability of Berkeley's departmental structure reinforces this direction. Our most recently formed interdisciplinary departments (Film & Media, 2010, and Bioengineering, 1998) were also decades in incubation and originated in interdepartmental teaching programs.

combining STEM with non-STEM disciplines, and no active encouragement of students or faculty who want to experiment in this critical part of the graduate landscape.

Moreover, the infrastructure for sustaining interdisciplinary graduate education is haphazard. As the *Compendium* notes (p. 27):

Typically, a graduate group does not have an established budget or budgeted faculty FTE, although three graduate groups are exceptions (Energy and Resources Group, the Neuroscience Group, and Computational Biology), which are considered “augmented” graduate groups.

As a result, many DEs, in particular, are administrative orphans—with limited and precarious funding, often no dedicated staffing, and insecure teaching commitments—even when graduate student interest is robust and sustained. Unless they can find a *de facto* home in a strongly committed department (as, for example, the DE in Women, Gender & Sexuality has in the Department of GWS), they must ride on top of existing academic department structures that control the allocation of space, resources, FTE, and teaching.

Many graduate groups therefore operate in a procedurally challenging part of the academic landscape. Unless they have an MOU in place, they lack any defined authority to assign teaching to faculty, whose FTE reside in the various departments. Under business-as-usual conditions—in which faculty teaching is considered a fixed quantity, disciplinary programs maintain their existing curricular requirements, and these continue to have first claim on faculty teaching—collective interdisciplinary graduate offerings are hard to sustain. Exceptions can be found where there are historical commitments to an interdisciplinary program, in larger departments where the “loss” of a faculty member’s teaching may be more easily borne, when a predictable rotation can be established across multiple faculty in different departments, or when graduate classes can serve multiple departments or programs.

Graduate Division and Graduate Council (the responsible Academic Senate committee) share the task of overseeing graduate groups. Graduate groups are intended to be reviewed regularly, but DEs in particular are a low priority compared to degree-granting programs. Reviews have been too few and far between to judge what effect they might have in catalyzing critical reflection, inducing change, or reinvigorating programs, again for DEs in particular. Along with size of faculty cohort and strong organizational support, a key resource for success and satisfaction seems to be whether a program has a physical space where its students can convene, study, and hang out.

Finally, each interdisciplinary graduate program or offering is effectively treated as a one-off, isolated from others. There are few pathways for sharing experiences, and the set of interdisciplinary opportunities is not viewed or managed as a portfolio of options that Berkeley offers to the world. We see this as a great opportunity—and in no small sense an obligation—for Berkeley to capitalize on our disciplinary strengths and lead the world in overcoming structural and intellectual barriers that have continued to confine graduate training within a 19th-century set of disciplines and organizational structures.

Proposal

The above challenges notwithstanding, many of our existing instruments seem well-suited in principle to the needs of interdisciplinary graduate education. We hope to see strong programs better supported and encouraged to keep evolving, and to make it easier for successful

interdisciplinary programs to be formed. This is very much in the university's interest in meeting the demand of our students and the call of the larger world for greater interdisciplinary training at the graduate level.

Thus we propose:

1) The review process for interdisciplinary graduate programs should be prioritized and strengthened, so that campus has better mechanisms for understanding and improving the quality and reach of the programs we have, both individually and across programs. The review process can help guide allocation of resources.

2) Processes, policies, and incentives should be explored that can make it easier to nucleate, grow, and sustain interdisciplinary programs, including by providing support for preparing the extensive proposal materials, and by loosening up constraints on faculty teaching and administrative bandwidth (for instance, providing TAS to compensate departments for faculty teaching effort dedicated to core DE classes). Incentives might also be used to create or revise DEs to contribute to campus priorities such as diversity, equity, and inclusion.

Here the Data Science Commons may be a valuable experimental space, with its capacity to carry partial faculty FTE for some time and form the equivalent of new augmented graduate groups. It may also be useful to think about coordinating graduate and undergraduate teaching.

3) Programmatic resourcing of interdisciplinary programs should be taken seriously as part of a new emphasis in Berkeley graduate education. Along with administrative support, the needs include enhanced support for programming such as workshops, conferences, or collaborative research projects. Mechanisms could involve shifting resources to support these programs, growing new resources, or finding ways for streamlined processes of resourcing to support multiple programs (such as the Commons noted above).

4) New combinations of programs should be explored. We see particular opportunity in campus-crossing combinations of degrees and joint professional/academic programs (PhD/Masters, Masters/Masters), which meet student interest, build on established pathways, provide additional opportunities (for instance, joining a Masters in climate science or data science with a broad range of PhD programs) and can help address skepticism or reticence from classical disciplines. We strongly hope that one or more decanal units will feel encouraged to invest effort in a trial.

We offer these proposals recognizing that the situation in interdisciplinary graduate education is multifaceted and complex, particularly in a campus context of historically strong disciplinary departments. We hope to contribute by clearly framing the problem and spurring and encouraging existing processes and partners along.

Action Plan

Graduate Council (GC) is the appropriate faculty group to review and shepherd the academic side of these processes. GC could consider forming an interdisciplinary subcommittee that would seek to develop guidelines, policies, and new opportunities. GC could also lay out expectations (and request assistance) for reviewing all interdisciplinary graduate programs, especially

DEs, on a regular timeline, focusing on international excellence, plans to keep each group's programs evolving to meet student needs, and broader lessons for success.

Graduate Division may find its efforts strengthened by introducing a designated portfolio for academic/staff leadership for interdisciplinary programs. Additional staff support would be an appropriate request, given the significance of this area. Graduate Division would also be the venue for managing central programs or resource pools to support interdisciplinary programs, and it could create new campus-level programs, such as an alumni network drawing on graduate alumni who have built non-academic careers in interdisciplinary ways.

Shared efforts of mutual information would provide mechanisms for tuning up processes and programs across the campus. We see real value in a forum of the heads of graduate groups (like the Chairs' Forum and council of ORU directors), as well as in conversation with department chairs as a group, collaboration with Graduate Assembly in convening discussions, and an annual workshop for faculty who are curious about forming new interdisciplinary graduate offerings.

Champions at the dean level can lead experimentation. The new Data Science Commons may be a valuable pilot space, as may the Signature Initiatives, which represent intrinsically interdisciplinary topics of high strategic importance to the campus that demand collaborative research and training efforts.

AREA 3: MENTORING

Completing a PhD at U.C. Berkeley remains one of the surest paths to a successful academic career. However, tenure-track hiring in many disciplines has plummeted; the non-academic job market is intimidating and mysterious to many doctoral students; and the day-to-day stress of living in the Bay Area on slender means has produced an alarmingly high incidence of depression in our graduate student population.

Although faculty mentorship is key to graduate students' success, Berkeley's current culture of mentoring is inadequate. While resources are in place to train graduate students themselves in mentoring, both the resources and the formal incentives for faculty to become more effective mentors of graduate students are sparse. The many programs, offices, and initiatives aimed at graduate students should be coordinated and augmented with a new commitment to training faculty in a more comprehensive approach to mentorship. Such an approach would help graduate students better negotiate the intellectual and personal challenges of graduate school and make them stronger candidates for both academic and non-academic jobs.

We recommend the creation of a new Mentoring Center that would develop a pilot Mentorship Certificate Program (MCP). The program would provide faculty with the skills and knowledge necessary to foster general professional development and offer advice about preparation for non-academic careers and the full breadth of academic positions; provide inclusive support for students from diverse backgrounds; promote SVSH prevention; attend to the physical and economic needs of students; and model the holistic approach to mentoring that we describe herein.

After the program has been piloted and the resources necessary to make it available across campus have been secured, we recommend that (1) departments with doctoral programs designate a Mentoring Officer; (2) new hires be required to complete the Mentorship Certificate Program by their tenure review; (3) charge letters sent to External Review Committees include a request that the Committee Report address the faculty mentoring of graduate students as a discrete category of evaluation; and (4) the discussion of mentoring in the APM's "Criteria for Appointment, Promotion, and Appraisal" be strengthened.

Background and Rationale

Employment trends for Berkeley's graduate students show significantly better-than-average placement in four-year academic institutions, business, government, and non-profit organizations. Clearly there are many things that Berkeley does right in training graduate students. But at the same time there is evidence that graduate study generally has become more challenging: academic, financial, social, and emotional pressures have mounted.

According to a broad 2018 study in *Nature Biotechnology*, "graduate students are six times as likely to experience depression and anxiety as compared to the general population."⁷ The study pointed to a failure in mentorship as one of the probable causal factors in graduate student distress. The Berkeley Graduate Assembly's [2014 Report on Happiness and Well-Being](#) found that 47% of all Ph.D. students (and 64% of Arts and Humanities PhD students) scored as depressed. The approach

⁷"Evidence for a mental health crisis in graduate education." *Nature Biotechnology* 36 (2018): 282. (2018).

to mentoring that we recommend would address four of the ten chief areas of graduate student concern: career prospects, social support, feeling valued and included, and advisor relationships.

Traditionally, mentorship within the context of graduate study has been conceived narrowly as training in academic research and methods. But with a shrinking academic job market, rising financial pressures, and a broader national culture of anti-intellectualism, PhD candidates find themselves facing challenges on a growing number of other fronts.

Mentorship that aims solely toward replication of the adviser's scholarly path to an R1 institution no longer suffices. The uncertainty surrounding job prospects creates a specter of personal failure, particularly when a student encounters the message that only a tenure-track career at a top-ranked research institution spells success. Struggles for recognition as a non-traditional student or a student with disabilities are a further source of frustration. Sexual harassment and violence, or other abuses of power, can destroy a student's ambitions entirely.

Current State of Affairs

Resources

Berkeley has developed many resources for graduate students seeking to develop their mentoring skills: the [SMART](#) (Student Mentoring and Research Teams) program “engages doctoral students in creating mentored research opportunities for undergraduate students”; in the [GiGS](#) (Getting into Grad School) program, graduate student mentors help “motivated undergraduates...succeed in the graduate school application process”; graduate mentors are the cornerstone of [Berkeley Connect](#); the [QB3-Berkeley Graduate and Postdoc Career Development office](#) was launched in 2018 to “strengthen professional development support for graduate students and postdoctoral researchers in the biological sciences at Berkeley”; and the [Graduate Student Professional Development Program 301](#), offered every Spring, “guide[s] graduate students as they mentor undergraduates at Berkeley, work in the context of a mentoring relationship with their graduate advisers, and prepare for the mentoring they will do in future academic and nonacademic careers.”

By contrast, the resources for faculty seeking to become more effective mentors of graduate students are surprisingly scarce. The “[Faculty Mentoring](#)” section of the Vice Provost for the Faculty's website, which focuses on the mentoring of junior faculty, includes a link to the Graduate Council's “Best Practices for Faculty Mentoring of Graduate Students” (2006). The “Academic Progress” section of the Graduate Division's website includes a “[Getting Mentoring](#)” subsection with links to three documents: “[Best Practices](#),” “[Mentoring Graduate Students: A Checklist for Faculty](#),” and “[Qualities of a Good Mentor](#).” The impact of these documents, which contain much useful information, might be greatly increased simply by moving them to the website of a new Mentoring Center. However, as the rest of our report makes clear, we do not believe that static documents are sufficient to transform the culture of mentoring.

Recognition and Incentives

The Graduate Division, the Graduate Assembly, the Graduate Council's Advisory Committee for GSI Affairs, and the GSI Teaching and Resource Center administer three annual awards for outstanding faculty mentoring of graduate students: the [Carol D. Soc Distinguished Graduate Student Mentoring Awards](#), the [Faculty Mentor Award](#), and the [Faculty Awards for Outstanding Mentorship of GSIs](#).

Faculty mentorship of graduate students is highlighted in departmental external reviews. The “[Guide for the Review of Existing Instructional Programs](#),” published by the Division of Academic Planning, suggests that a department’s self-study describe its “requirements for oversight, division of work activities, and mentoring of GSIs by the professor of record,” “how graduate students are mentored from entry into the program through dissertation filing,” “[h]ow...preparation for careers outside of academia [is] addressed” (p. 21), “[h]ow...the faculty provide role models, mentoring, and research opportunities that encourage underrepresented students to become more fully represented in their field,” and how “faculty [are] actively encouraged and valued for their contributions to mentoring and advising students from groups that are underrepresented in higher education or in the field” (pp. 21-22).

However, mentoring is not a discrete category in faculty promotions and merit reviews. Instead the APM’s “Criteria for Appointment, Promotion, and Appraisal” stipulates that “[m]entoring and advising of students and faculty members, particularly from underrepresented and underserved populations, should be given due recognition in the teaching or service categories of the academic personnel process” ([210-1.d](#)).

Proposal

Our vision is to provide faculty training in comprehensive and holistic mentoring that prioritizes the well-being of graduate students as students, individuals, and future professionals. The major objectives of this approach are three-fold: first, to create campus and departmental environments in which graduate students can thrive; second, to support students from underrepresented groups and students with disabilities; and third, to provide guidance for students in various academic as well as non-academic careers.

To create campus and departmental environments in which graduate students can thrive, mentoring relationships should be rooted in a culture of sexual violence and sexual harassment prevention and recognition of basic needs. In the Mentoring Center, faculty will gain in-depth learning about new campus resources that seek to ameliorate these issues: we expect Michelle Thomas, Berkeley’s first-ever basic needs manager, and Professor Sharon Inkelas, Special Faculty Adviser to the Chancellor on Sexual Violence and Sexual Harassment (SVSH), would play key roles in the development of the training program.

The mentorship program would complement the work of the Division of Equity & Inclusion, which expands pathways to access and success for all Berkeley students. Mentorship of graduate students must include *support for underrepresented students, students with disabilities, undocumented students, international students, and first-generation students* and could contribute to a reconceptualization of the infrastructures and pedagogies that faculty typically utilize to facilitate the accessibility and success of a diverse graduate student population.

Finally, comprehensive mentoring would *prepare graduate students for various academic settings, including small liberal arts college and community colleges, and for opportunities beyond academia*. According to a recent story in *Science*, “For the first time, private sector employment (42%) is now nearly on par with educational institutions (43%)” for newly-minted PhDs.⁸ While faculty should not abandon the training of graduate students for academic employment, they also must be able to provide

⁸ Katie Langin, “Private sector nears rank of top PhD employer.” *Science* 363 (March 15, 2019): 1135.

information about non-academic career paths and to offer strong encouragement to take advantage of relevant resources.

Action Plan

Part 1: Training and Dissemination

The broader, more inclusive notion of mentoring outlined above cannot be meaningfully accomplished through an abbreviated on-line training or a single seminar. Abundant evidence supports a “flipped classroom” model to enhance student learning; similarly interactive workshop-based approaches are required for transformative mentorship training at the faculty level. Given the demands on faculty time, key challenges lie in convincing faculty of the value of such an endeavor and implementing it broadly.

We therefore propose a phased approach to implementation, involving **1) an initial piloting phase**, developed and overseen by a new (and lean) Mentoring Center, in several receptive units and existing resource centers, **2) progressively larger scale implementation by building on departmental-level successes**, especially during new faculty onboarding and, finally, **3) expansion of a campus Mentoring Center**, which would offer regular workshops and resources, including issuing a Certificate of Mentorship that could be linked to faculty incentives such as promotion, merit increases, and training grant slots.

A. Piloting Phase

Introduction of bold new initiatives necessarily requires piloting. Excellent frameworks for such a program are available from the Center for the Improvement of Mentored Experiences in Research ([CIMER](#)), a partner of the National Research Mentoring Network (NRMN), and the William T. Grant Foundation Forum for Youth Investment. CIMER provides access to materials for training faculty as facilitators of mentorship training workshops and mentorship-related curricula, and can assist with strategic planning for department- and institution-level integration of strategies to improve mentoring relationships. *Many of these resources are offered free of charge.*

The initial round of training would be provided to faculty from 3-5 units across campus, as well as members of UC Berkeley’s Teaching and Resource Center and the Center for Teaching & Learning. We envision dissemination during the Piloting Phase through a series of trainings associated with monthly faculty meetings, incorporation into departmental retreats, and/or more intensive 1- to 3-day workshops. While any interested faculty could enroll, ideal candidates would be current Graduate Student Advisors or departmental Equity Advisors, as mentorship is core to DEI initiatives.

A second component of the Piloting will focus on the mentees. Here, we propose offering either a workshop or, ideally, a graduate 290 weekly seminar course in which students will be educated on campus resources available to them, how to best engage in productive mentor-mentee relationships, and how to be mentors (an important career skill in itself, and one required of them if they work with undergraduates). Notably, this training could involve assignments in which students work with their current mentor to incorporate an Individual Development Plan (IDP) and a mentor-mentee compact that articulates expectations of graduate training relevant to their particular situation. This would have the added benefit of “educating” their faculty mentors (some of whom may be recalcitrant to participating in formal mentorship training) about these important mentorship resources.

B. Broader Dissemination

Assessment and evaluation of mentor training efforts and outcomes should be evaluated at the completion of the Piloting Phase, and these data used to refine the program for broader dissemination efforts. Here, we propose that new incoming faculty be the key audience. Rather than relying solely on departmental-level training, this phase would be linked to existing onboarding curricula and carried out in connection with the Mentoring Center. A 2- to 3-day workshop would be the ideal framework for this training. Workshop participation could be opened up to additional interested faculty, perhaps with an emphasis on the Assistant Professor level.

C. Expansion of the Mentoring Center

The resources, knowledge, and expertise developed during the piloting phase will be the foundation of an expanded Mentoring Center, which would provide centrally located, regularly curated, and easily accessible mentorship training and resources to the campus community at large. Its flagship would be a track for faculty to earn a Certificate of Mentorship, which could be tied to various campus incentives, as well as serve as tangible demonstration of Berkeley's commitment to student success—a feature to be highlighted during graduate and faculty recruitment, and fundraising.

Part 2: Incentives and Requirements

After the Mentoring Certificate Program has been successfully developed and the Mentoring Center has been expanded, we recommend that:

(A) Departments with doctoral programs designate a member of the ladder faculty to serve as Mentoring Officer. The MO might, but need not, be the DGS/Graduate Advisor. The MO would complete the Mentorship Certificate Program during the first year of her tenure. Departments would be strongly encouraged to recognize the MO position as a significant service assignment;

(B) New hires in departments with doctoral programs be required to complete the MCP by the tenure review;

(C) The charge letter sent to External Review Committees be amended to include a request that the Committee Report address the faculty mentoring of graduate students as a discrete category of evaluation. The “Guide for the Review of Existing Instructional Programs” would be amended accordingly; and

(D) The discussion of mentoring in the APM's “Criteria for Appointment, Promotion, and Appraisal” should be strengthened and should reflect the more expansive conception of mentoring outlined in this report.

Part 3: Development

The recent and laudable attention to the undergraduate experience at Berkeley has included a significant investment by the administration in undergraduate mentorship initiatives. However, the same has not been true in graduate student mentorship, which, by every measure, has been approached in a relatively diffuse manner. A fundraising drive to establish a Mentorship Center that served faculty, graduate students, and undergraduates would, we believe, attract support from a wide range of donors: some concerned primarily with the undergraduate experience, others focused on graduate education, and still others eager to encourage graduate students either to commit

themselves to public service or to bring their knowledge and expertise to the private sector. If there is one large donation, the Mentoring Center could be named for an alumnus.

Once established, the Mentoring Center will integrate several activities that would better connect us to our alumni. For example, alumni from area companies could be recruited to teach mentoring courses that provide experiential, real-life perspectives on alternative careers. Through these shared academic/industry teaching experiences, the Mentoring Center might well lead to an increase in alumni donations and provide networking opportunities for graduate students to gain internship opportunities.

Several private sector foundations with interests in advancing education and the welfare of students may be engaged to play a role in supporting and advancing the mission of mentoring. These foundations and programs might include: the [Ford Foundation](#); [the National Academy and Ford Foundation fellowship program](#); the [Mellon Foundation](#); and the HHMI Professorship Program, which supports scientists dedicated to training the next generation of leaders in science.