Introduction

Hundreds of thousands of undocumented immigrants are currently enrolled in U.S colleges and universities. According to a 2018 U.S Census Bureau Survey, there are approximately 454,000 undocumented college students, of which less than half are eligible for Deferred Action for Childhood Arrivals (DACA), a program which grants temporary permission to stay in the United States to certain undocumented youth who came to the country as children.

Scholars of immigration have written extensively on the undocumented experience, and have illustrated the ways in which undocumented college students encounter barriers navigating higher education.¹ Largely absent from existing research, however, is a focus on undocumented students in STEM.² While there is no data on the number of undocumented STEM students at UC Berkeley or in the University of California system, there is reason to believe those numbers are significant. A 2015 study conducted by UCLA reveals that more than 28% of the 900 undocumented students interviewed nationwide were majoring in a STEM field.³

In the spring of 2019, the Undocumented Research Cohort (URC) set out to study the experiences of undocumented students at UC Berkeley. Too often, researchers on immigration are not undocumented themselves, so while we are often the object and focus of research, rarely are we allowed to write about our own experiences. The URC was designed to allow undocumented students to control the narrative, while also providing a paid research opportunity— research by undocumented students, about undocumented students, and for undocumented students.

We began by surveying the resources available to undocumented students on campus, such as fellowship and research opportunities, scholarships, academic advising, basic needs, and legal aid. Next, we conducted in-depth interviews with 25 undocumented students from different majors and with varying legal statuses: Temporary Protected Status (TPS) holders, DACA holders, non-DACA. These qualitative interviews were recorded and transcribed verbatim. In this report, we focus specifically on the experiences of the ten students who stated that they are pursuing a degree in a STEM field. Of these ten interviewees, six have DACA, four are non-DACA, and three of the ten interviewees are transfer students.
We find that undocumented STEM students at UC Berkeley are simultaneously preparing for two futures: one in which they are able to attain legal status, and the other where they remain undocumented after graduation. Unfortunately, the University is not adequately supporting and preparing undocumented students for either future. While the topics we discuss here may be experiences similar to the undocumented community as a whole, some of them are specific to or more amplified for undocumented STEM students. We have organized the report around the following topics: 1) academic advising and mentoring; 2) professional development and internships; and 3) research opportunities. We analyze the barriers that undocumented students face at UC Berkeley, and conclude with recommendations on how to improve the undocu-STEM experience in higher education.

**Advising and Mentoring**

**ADVISING**

Undocumented students often have to navigate the murky world of higher education on their own; consequently, many of the students we interviewed expressed that they were drawn to UC Berkeley because of the presence of the Undocumented Student Program (USP) and the resources it provides. A third year Molecular and Cell Biology student told us that a support infrastructure for undocumented students was crucial in deciding what college to attend. During her senior year of high school, she asked college representatives about resources for undocumented students at their respective campuses, and Berkeley stood out among them:

> Back in [high school], there would be college fairs, and [college representatives]...came out to talk about their institutions. I remember I asked about resources for undocumented students, especially [for those] out of state, and [representatives] didn’t even know how to answer my questions. I just remember looking at [Berkeley’s Undocumented Student Program] website and noticing how much there was for undocumented students... I realized this really is the best place to be based on my identity.

Ranging from academic advising to legal aid, USP provides resources that students can utilize throughout their undergraduate career. Because of these resources, students felt confident in their decision to attend Berkeley. Once students arrive at Berkeley, USP provides them with reassurance, as they know there is a place on campus that understands their situation, and is dedicated to helping them. A third year Nutritional Science and Toxicology student told us:

> USP really helped in terms of [helping me feel] more seen on campus... I think that was one of the few programs that I really latched myself onto... especially with this staff they had -- they were pretty approachable...I’m grateful [the program] is there.

Throughout our interviews, students identified USP staff by name and showed appreciation for the program. Even if they had never, or rarely, used USP’s services, they felt reassured because they knew there was a place on campus they could go to for help.

However, undocumented STEM students felt that USP can improve its academic advising services. Interviewees were unable to get the help they needed for questions about academic planning and class scheduling and sequencing. They felt that USP’s academic advisors were more equipped to help students in disciplines such as Political Science and Sociology, but are unfamiliar with disciplines such as Computer Science, Mathematics, and Biology. This might be because USP’s academic advisors all have a social science background, and are unfamiliar with STEM disciplines.

Another place where undocumented STEM students can receive academic advising and support is the College of Letters and Science Advising (L&S Advising). L&S Advising offers one-on-one appointments with academic counselors who serve to familiarize students with institutional policies and ensure they satisfy graduation requirements. One of the main issues undocumented STEM students had with L&S Advising is the limited appointment availability. There is a high demand for advising appointments and it is difficult to navigate because students are not assigned a single advisor throughout their four years at Berkeley. In our conversation about L&S, a fourth year Integrative Biology student expressed that “L&S is a sh*t show to navigate.”

L&S advisors were not always sensitive to the particular needs of undocumented students. For example, they
often discussed studying abroad and including it in students’ educational plans without recognizing that this is not possible for undocumented students. Students don’t always feel comfortable disclosing their status, and it becomes even harder when they must disclose it to a different advisor every time they need academic counseling.

With little help from USP or L&S, students had to overcome challenges on their own or with the help of friends. One consequence of this lack of advising is that students did not learn about academic policies until later on in their time at Cal. A Molecular and Cell Biology student in his fourth year said he found a particular physics course very challenging and wished someone had informed him that he had the option of taking it at a community college during the summer, at a time when he could focus more on the class. It wasn’t until his third year that he learned he had the option of taking transferable classes:

I was just following things in the way everybody else was doing it. Nobody told me, ‘Oh, you have a unique situation... you’re going to have to do this and that’... And I wish someone would have told me that I could have taken Physics 8A at a community college, and I would have done it, but at that point I had already taken [it]. If someone told me that, I would have.

In the absence of proper advising, students take on a heavier workload or enroll in rigorous STEM classes they feel they are not prepared for. When asked if they feel their GPA represents their academic abilities, many students did not think so. An Environmental Sciences third year described how she feels she has to play “catch up” with her peers:

In my personal experience, the classes that I’ve done well in are social sciences and humanities, but... my STEM [classes] have been very challenging for me because I didn’t have that background they expect you to have here. Even, like, my second year...I was [in] classes with freshmen straight out of high school and they knew everything... I don’t know how they were able to find all of that out just from high school... It’s just [that] I need to catch up. That’s why my GPA shows I’ve been struggling to catch up, but eventually I can learn the material and I’ll be fine.

Many interviewees mentioned that they are first-generation college students who come from low-income communities where the high schools they attended did not prepare them for the rigor of college classes. They feel unprepared and don’t have anyone in their families who has been through college to answer their questions. Already first-generation students, being undocumented adds another layer of difficulty navigating college. As a result, it’s all the more important that students receive the advising and support they need to succeed.

**ROLE MODELS AND MENTORS**

Undocumented STEM students also expressed a need for role models and mentors who support their academic and career success. As one unDACAmented student said, “I don’t know anyone in medical school who does not have DACA.”

This demonstrates a stark difference between STEM and non-STEM undocumented students: undocumented STEM students have fewer role models to look to because of the unique barriers in place that prevent undocumented STEM students from pursuing their desired career (a topic that is further discussed in later sections of this report). Without role models, undocumented STEM students are less likely to envision themselves working in their dream careers. Role models in the form of undocumented people who are successfully working in a STEM field can serve as students’ mentors while simultaneously helping them navigate college.

Students also want to access support from their STEM professors, but many reported being intimidated and afraid of reaching out to them. When asked if there was anything they wish their professors knew, one student stated:

I don’t know what I would tell my professors, because even telling [them] about my status or anything related to my status makes me a little anxious. The math department— it’s just, ‘Follow the rules.’ A large lecture hall, the professors [are] these brilliant mathematicians.

Even those who felt comfortable approaching STEM faculty and disclosing their status have been met with hostility, such as one student whose professor did not accommodate an exam because it conflicted with a
Professional Development and Work/Internship Experience

Many employers in STEM fields expect students to have significant work experience in preparation for post-graduation work. Aside from taking classes related to their interests, students can gain deeper knowledge and experience about their respective fields by participating in different forms of professional skills development. Opportunities such as attending professional workshops, participating in networking events, and interning for different companies and organizations are important for students to develop necessary professional skills and to build their resumes, making them more attractive to potential employers. Undocumented students in STEM face significant barriers when seeking these opportunities.

In interviewing STEM students about professional development, many expressed fear about their future in their respective fields. The ability of STEM students to be hired largely depends on the professional experiences they developed while in college, but more often than not, undocumented students do not have access to these opportunities. Federally funded programs typically require participants to have a legal resident status or to be a US citizen. And other opportunities sometimes require a green card or a Social Security number. As a result, many internship opportunities, such as the Stanford Chen Internship, Jesuit Volunteer Corps, Naval Research Enterprise Intern Program (NREIP), and the Bay Area SMACNA Scholarship Trust Fund among others, automatically disqualify undocumented students from applying to their programs.

Internships are especially important for tech-heavy fields such as computer science, data science, and engineering. Many students in these programs spend their summers interning for different tech companies, ranging from startups to international corporations, and usually eventually get a full-time job with those companies after they graduate. Since undocumented students cannot intern for these companies due to their lack of Social Security number or work permit, they are not only left with less professional experience than their peers, but they are also left without job prospects post-graduation. A computer science student, who was a senior at the time of this interview shares:

I feel behind... because I don't have any work experience or internship experience and... the people that I go to class with... they already have that experience, so me not having it... I feel like I have a lot of catching up to do.

Indeed, the official UC Berkeley Scholarship Database does not have any listed internship opportunities specific for undocumented students in STEM. The only internship opportunity available for undocumented students is the Matsui Local Government Fellowship, which allows interns to have paid experience working for local government offices. While this internship is open to everyone regardless of status, it does not provide STEM students direct experience in laboratories or tech-related industries.

Experiences like these discourage undocumented students from reaching out to STEM professors for assistance. Also, this example allows us to see another difference between non-STEM and STEM students: many of the non-STEM students we interviewed felt comfortable approaching their professors and had ongoing relationships with them. Some faculty study issues around immigration, inequality, and education, so non-STEM students feel more comfortable approaching these professors and disclosing their status as they feel they will be more understanding.

Biometrics appointment scheduled by US Citizenship and Immigration Services (USCIS):

I had my biometrics [appointment] and I couldn’t miss it because then your DACA renewal gets canceled. And I had a midterm [that same day] so I asked my professor if I could take it earlier. He said ‘no, you have to show up to your midterm.’ So honestly, [the USCIS Office] was nicer than the professors here because [they] actually allowed me to show up to my appointment earlier than I should have so I could [take] my midterm.
In addition, undocumented students also have a hard time distinguishing which resources are available to them. Our survey of campus resources found that many opportunities on campus do not explicitly state citizenship/residency requirements, which makes eligibility unclear. In order for undocumented students to find out whether they are eligible or not, they would need to personally reach out to these departments, exposing their identities and disclosing their status. While compiling opportunities on campus that are available for undocumented students, our team personally had to reach out to these resources. There are also cases when even after reaching out, we had to follow up with coordinators due to their lack of response. This may induce an additional layer of fear and discourage or dissuade students from applying.

As a result of being barred from many STEM-related research and internship opportunities, undocumented STEM students often resort to non-STEM-related professional development experiences. A DACA STEM student explained that they initially applied for library jobs despite studying molecular cell biology because it seemed like the only paid opportunity accessible for them, though even that proved difficult:

I remember my freshman year I tried applying for library jobs, and they had a lot of issues with me being undocumented, so I did have trouble with that.

While this DACA student may seem to have more advantage in accessing job opportunities because they have a work permit, their status is nevertheless precarious. Furthermore, they remain burdened with looking for opportunities and experiences that cater to their unique legal status rather than pursuing opportunities that best fit their academic interests and career goals. Not only does this affect students’ internship prospects, but it also reveals the unpreparedness of on-campus staff and employers when it comes to hiring and providing career support services to undocumented students, regardless of whether they have DACA or not.

As a result, many undocumented STEM students feel that they are behind their peers within their fields due to their lack of professional experiences. They are disadvantaged by their inability to access professional development opportunities—an essential aspect of their STEM careers. An environmental science student describes the difficult process of acquiring an internship:

I wanted to go into energy...but I can’t apply for [a lot of government internships] even though I do have DACA... I still don’t qualify.

For this student, who was a junior at the time of interview, gaining internship experience continues to be far from their reach while for STEM students with legal status internships are typically something that they can do every summer. Despite having DACA, they are still unable to secure internships directly related to their major.

Internships are generally difficult to access for undocumented individuals whether they have DACA or not. Because organizations off- and on-campus are usually unaware, unwilling, or unable to accommodate undocumented students’ unique situations, undocumented students continue to struggle in growing and learning more about their fields of study.

Research and Volunteering

SHORTAGE OF CAMPUS OPPORTUNITIES

In laboratory-based STEM fields such as biology, chemistry, and some types of engineering, research experience is necessary in order to land post-graduation work or gain admission to graduate programs. Research experience can give students an overview of what to expect as a researcher or whether or not they would like to pursue graduate school. Universities such as UC Berkeley pride themselves for being research institutions in which every student is able to obtain research experience. For STEM students, attending a university of the caliber of UC Berkeley can potentially mean better opportunities in the workforce post-graduation or a more successful entry into graduate school. In research and even in volunteerships, undocumented STEM students struggle to secure these positions.

Although research opportunities at the university appear to be abundant, many of these research programs are often very impacted in the sciences and are not always accessible, particularly to undocumented students. The Department of Molecular and Cell Biology website explicitly states, “Since there is so much competition for MCB lab positions, it is wise to approach your search for a lab position with the same degree of professionalism you would approach a real job search.” Despite these challenges, undocumented students are already at a disadvantage when it comes to academic resources such as advising and mentoring, and...
the lack of research opportunities further impedes their career prospects.

**TRANSFER STUDENTS AT A DISADVANTAGE**

Many of our unDACAmented interviewees were transfer students. This can further complicate their ability to gain research experience. Many campus positions require a minimum Berkeley GPA, but transfer students start at Cal with a 0.0 GPA, preventing them from applying in their first semester. Because they have limited time on campus, there is added pressure for them to perform well in their classes and gain professional experience as soon as possible. Transfer students also have no margin for error. Since they are in upper division classes as soon as they arrive, meeting the minimum GPA requirements may be even harder since these classes are often especially rigorous. Some students manage this by extending their time at Berkeley. A mathematics major transfer student who did poorly in their first semester shares with us:

> Had I taken some [more community college classes] I would’ve maybe been able to transfer out faster or manage my... classes faster, and... I probably would have gotten the ball rolling sooner... Even right now at Berkeley, I’m going to stay as a transfer [for] three years. I’m not staying for two years.

In order to be competitive for graduate studies, this student planned to extend their stay in order to not only improve their GPA but also to take advantage of professional or academic opportunities.

**FEDERAL FUNDING REQUIREMENTS LIMIT OPPORTUNITIES**

Many labs on campus are often supported by federal funds, which require participants to have some type of citizenship or legal residency. With this eligibility requirement, undocumented STEM students are automatically excluded from gaining hands-on experience in laboratories. Without research opportunities, getting into a PhD program is difficult or impossible, and a whole pathway is foreclosed.

**LIMITATIONS EXTEND TO VOLUNTEER EXPERIENCES**

Some students are able to get lab experience, but these opportunities are often on a volunteer basis. This is true for STEM students both with and without DACA.

When a DACA recipient in STEM was asked about the lab experience they have had they said:

> In terms of labs, I’m working at labs, but I’m not getting paid. It’s volunteer work, so it’s hard to get internships and get paid for your work if it’s in the STEM field.

While volunteer work does provide students the experience they need within their fields, it is not a viable option for students who are struggling financially. Volunteer positions often require around the same hours as a fellowship or a part-time internship would but without the financial security. Undocumented students, therefore, tend to opt out of volunteer opportunities, and instead, work often low-paying jobs, STEM-related or not, in order to meet their basic needs.

Even when students are willing to work as volunteers, they are not always allowed to do so. One of the authors of this report was told that she could not volunteer in a lab because the graduate student mentor refused to allow her to work without any compensation. Another professor told the author that they only take people who can get paid because otherwise, their commitment to the project would be questionable. The professor worried that they would not be able to ask for the same time or quality of work if students were not compensated.

In addition, students seeking to volunteer in hospital or clinical settings, a valuable experience for those applying to medical schools, are unable to volunteer due to their status. An interviewee said:

> My status has served as a hindrance in a sense that I can’t… be part of those institutions because there are rigorous background checks and... they need a social [security number], and what not... When I tried... applying as a volunteer for Highland Hospital... I went through two interviews and after that I was successful and they told me they want to welcome me to the hospital. I disclosed my status. And they’re like, ‘Oh, that’s really unfortunate. We can’t do anything about it.’

The student explained that this experience has significantly influenced how they pursue and take advantage of opportunities.

In situations wherein volunteers are expected to work with vulnerable populations or required to follow HIPAA regulations, they are required to undergo a background
The main reason why I didn’t go with physics from the start is because pretty much for all those jobs, you need a PhD, you need a lot of federal funding, which, you know, how am I going to get any of that?

As undocumented STEM students are pushed into opportunities outside their fields of study, a career in STEM becomes less of a possibility. Even if a pathway to legalization were to become available in the future, undocumented students might not be able to work in their dream career because they lack the necessary preparation and experience.

Policy Recommendations

Throughout this report, we outlined several issues that undocumented STEM students face at UC Berkeley: 1) STEM students don’t receive adequate academic advising and support, 2) STEM students lack mentors and role models, and 3) undocumented STEM students lack opportunities for professional development both on- and off-campus due to citizenship eligibility requirements or lack of awareness about the undocumented experience by potential employers, professors, and mentors. To address these issues, we make the following recommendations:

FOR UC BERKELEY

- Professors and GSIs often add campus resources to their syllabi such as the Disabled Students Program (DSP), Counseling and Psychological Services (CAPS), and the Basic Needs Center. We encourage faculty and GSIs to add information about the Undocumented Student Program so that students are aware of its existence, as well as the resources they can receive.

- Campus should require all faculty, advisors, GSIs, and campus staff to attend undocumented-sensitive training and workshops in order to better support undocumented students.

To accommodate the increased demand, the
While UC Berkeley and the UC system have the power to improve the experience of undocumented students, there are certain barriers to equitable access to education beyond their control. For that reason, we also offer the following recommendations for the state and federal governments:

**FOR THE STATE OF CALIFORNIA**
- Allocate funding for college campuses to provide paid professional experiences for AB540\(^\text{15}\) students.
- Create a state program similar to federal work-study for undocumented students, which would allow them to gain access to laboratories, internships, and other on-campus jobs that require work-study.

**FOR THE FEDERAL GOVERNMENT**
- Allow undocumented students, both DACA and non-DACA, to participate and be paid for federally-funded research and internship opportunities.
- Pass legislation that would provide undocumented students a pathway to legal residency and/or citizenship so that:
  - They can gain professional experience that is related to their field of study.
  - They can practice their profession to its fullest extent while being compensated for their work.

**FOR THE UNIVERSITY OF CALIFORNIA**
- STEM departments should allow non-DACA students to work in labs in order to gain experience to advance in their professional career. If ineligible for work study, compensate students in creative ways including stipends, gift cards, etc.
- Campus or STEM departments should fund positions in STEM research labs specifically for undocumented students.
- All campus departments and units should provide clear eligibility guidelines on websites that feature research opportunities, scholarships, and internships, so that DACAmented and unDACAmented students know if they are eligible to apply.
- The UC Office of the President (UCOP) should continue advocating for immigrant rights and immigration policy reform at the state and federal level respectively.
- UCOP should also increase funding for Undocumented Student Programs across the UC system so that they can 1) increase staffing, especially of STEM academic advisors and 2) continue providing necessary services to undocumented students.

Undocumented Student Program could host workshops through Zoom, as it allows for a large amount of attendees. The USP could hire undocumented students to lead these workshops and compensate them.

- The Career Center often hosts networking events for undergraduate students on campus. We encourage the Career Center to collaborate with the Undocumented Student Program and host networking events specifically for undocumented students to expand their social and professional networks.
- STEM departments on campus should apply to the Undocumented Student Program’s Transcending Beyond Berkeley\(^\text{14}\) Fellowship, a program that partners with units/departments on campus to provide access to paid professional development opportunities for undocumented students.
About the Authors

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About the Undocumented Research Cohort
The Undocumented Research Cohort (URC) represents a group of seven undocumented undergraduates who set out to document the experiences of undocumented students at Cal. Funded by IRLE, the URC not only provided these students with a paid research opportunity, it also allowed undocumented students to control the narrative -- research by undocumented students, about undocumented students, and for undocumented students.

About IRLE
The Institute for Research on Labor and Employment is an interdisciplinary institute at the University of California, Berkeley that connects world-class research with policy to improve workers’ lives, communities, and society. IRLE promotes better understanding of the conditions, policies, and institutions that affect the well-being of workers and their families and communities by informing public debate with hard evidence about inequality, the economy, and the nature of work.

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References


2. STEM is an acronym that stands for science, technology, engineering, and mathematics. It includes a variety of fields of study, such as computer science, environmental studies, and health and medicine.


4. The Temporary Protected Status (TPS) program offers temporary legal status to immigrants living in the United States who cannot return to their country of origin due to ongoing armed conflict, natural disasters, or other extraordinary circumstances.

5. We focus on the College of L&S because we did not have sufficient interviewees from the Colleges of Engineering, Chemistry, or Natural Resources to write about their experiences in their respective colleges. With the exception of one student who is in the College of Natural Resources, all STEM interviewees were in the College of L&S, which holds the Division of Mathematical & Physical Sciences and the Division of Biological Sciences. Future research studies could explore the advising experiences of undocumented STEM students in other colleges at UC Berkeley.


7. The DACA renewal process includes visits to the US Citizenship and Immigration Services (USCIS) office for biometrics appointments, which can interfere with work or school activities. See: https://www.uscis.gov/forms/filing-guidance/preparing-for-your-biometric-services-appointment.


10. University of California, Berkeley Scholarship Connection, scholarships.berkeley.edu


