



BEYOND REPRESENTATION

An Evaluation of the Sloan University Centers of Exemplary Mentoring Program



ALFRED P. SLOAN
FOUNDATION

By Tashera Gale, PhD, and Donté McGuire, MEd

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ALFRED P. SLOAN
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FOREWORD

by Lorelle L. Espinosa, PhD
Program Director for the Alfred P. Sloan Foundation

A deep commitment to racial and gender equity has long roots at the Alfred P. Sloan Foundation. As a funder in the natural and social sciences, we believe that the best research is done by individuals and teams who reflect our entire society and embrace equity as an important ideal.

Our founder set this aspect of the Foundation's work in motion as early as the 1950s. The theories of change and the goals that have driven our support for diversity, equity, and inclusion (DEI) have evolved over the last many decades. These priorities have been informed by societal changes, certainly, but also by our evolving understanding of the problem of underrepresentation in STEM and its most promising solutions.

The University Centers of Exemplary Mentoring (UCEM) program (the subject of this evaluation report) is itself an outgrowth of work that began several decades ago, in the mid-1990s, when Sloan launched the Minority PhD (MPhD) program. The goal of the MPhD program was to increase the number of STEM doctoral degrees granted to Black, Indigenous, and Latina/o/e (BIL) students through targeted fellowships housed in institutions with a strong track record of serving these populations. Individual faculty members at over 30 universities sponsored "Sloan Scholars"; the faculty members served as mentors and champions of scholar success. We refer to the work of this era as the "legacy program"—an effort that to-date has supported 1,209 minority STEM doctoral students to graduation. In 2003, the Foundation extended the work to include another set of institutions specifically focused on enrolling and graduating Indigenous master's and doctoral students in STEM, known then and today as the Sloan Indigenous Graduate Partnership.

In 2010, the Foundation conducted a comprehensive review of the MPhD legacy program. In addition to investing in institutions with a strong track record of success, offering financial support to individual students, and emphasizing the role of mentoring, the review revealed the need to focus on programs with strong and supportive communities. Such communities reside in institutions with robust infrastructures of support that foreground a student sense of belonging and cultivate a positive racial climate. What had been a focus on individual faculty-student relationships on over 30 campuses became a more comprehensive effort across multiple STEM departments at just eight institutions. Moreover, a broad focus on STEM was narrowed to investments in schools of physical sciences and engineering, given the profound dearth of underrepresented students of color in these fields.

These new areas of focus resulted in UCEM, announced in 2012, with the most recent grants having been awarded in 2022. From the perspective of numerical outcomes, the UCEM has been an enormous success, boasting a 93 percent retention rate when including students who have graduated or are still enrolled. Moreover, this number largely persists when looking across the program's target populations of BIL students. Seventy-two percent of UCEM BIL Sloan Scholars graduate with a doctorate within 7 years, compared to 42 percent of students from these groups nationally.

Beyond these impressive numbers, findings reveal the broader power of the UCEM model. As the following pages will show, many students credit the program as instrumental to their success. For example, scholars cite the unparalleled support of UCEM program teams, as well as the paramount role of peer mentors and an overarching UCEM community that provides validation, affirmation, and encouragement. Clearly, the financial support provided by Sloan is also essential, allowing students the flexibility to pursue academic opportunities that would not otherwise be available to them.

The evaluation's design foregrounds student voice to inform a larger discussion of what it means to support minoritized doctoral students in STEM. It shouldn't come as a surprise that even with a comprehensive program like UCEM in place—and despite its many contributions—Sloan Scholars are still often experiencing a discouraging educational environment. As you'll read in this report, too many scholars are navigating campuses and departments where they don't feel heard, seen, or understood, and where faculty who look like them or share their backgrounds are absent.

Sloan Scholars seek an academic community that understands the experiences of marginalized students and has a pedagogical approach that centers equity, high standards, and student success. They yearn for academic leaders, and the campus systems they design, to recognize and serve students' multiple identities and prioritize their well-being. They want their department's DEI paradigm to move beyond representation to one of retention. A particularly concerning finding is that the quality of mentoring that the program was meant to put into place is inconsistent across the many departments within each UCEM. Overall, Sloan Scholars applaud the UCEM's aims but acknowledge that it doesn't yet get sufficiently to the root of the problem of underrepresentation in STEM. UCEM program teams feel these pressures, too, as advocates for scholars and as individuals seeking to advance change in the face of entrenched campus, departmental, and disciplinary cultures.

These learnings reveal the need to rethink the UCEM model once more, with an emphasis on systemic change that reveals and addresses biases and barriers embedded within the multiple levels of the university system. Across all levels of the institution, including in classrooms and laboratories, barriers can be found in individual actions, organizational practices, incentive structures, and standards for performance. We believe that over time, by revisiting, revising, and strengthening the connection between these and other levers for change, the system can function differently, ultimately benefiting not only underrepresented students, but the entire community. Or as Sloan Scholars posit: we can and must get to the root of the problem.

Enter the Sloan Centers for Systemic Change (SCSC), a newly envisioned program announced in February of this year. SCSC takes the most effective components of the UCEM model and adds robust, tailored supports for faculty, staff, and administrators who are shepherding systemic change approaches. The Foundation is clear about the types of institutions we're eager to support—those with strong, shared leadership at all levels, commitment of a critical mass of faculty members, and a shared eagerness for change with clear avenues for pursuing it. We're taking to heart the recommendations you'll find in this report in the areas of program design, guidance we provide to SCSC campuses, and grant administration.

We know from our decades of grantmaking in DEI that racial and other forms of justice are never fully achieved, nor should we think of them as a final destination. Investments in SCSC, and indeed in our larger portfolio of systemic change grantmaking, comprises the next phase of our DEI journey. This work will continue to evolve and change, including in response to environmental forces that bring new challenges and opportunities. Beyond informing the SCSC itself, the aim of the Foundation is to take what this evaluation has uncovered, share it with the field, and continue to listen and learn from the campuses and students we support. ■

ACKNOWLEDGEMENTS

The Alfred P. Sloan Foundation would like to thank Higher Ed Insight for their partnership on this important evaluation of the Foundation's University Centers of Exemplary Mentoring (UCEM) program. Namely, we thank Dr. Tashera Gale, Donté McGuire, and Elexus Robinson.

We are deeply grateful to the UCEM community—including program teams, faculty, and administrators across the eight campuses—for sharing their insights and reflections. Indeed, their hard work to advance diversity, equity, and inclusion over the past decade has resulted in the significant achievements documented in this study. We are especially thankful for the vital input of the many Sloan Scholars who participated in interviews and focus groups. Our scholars continue to be our greatest source of inspiration.

Sloan greatly appreciates the longstanding support and instructive insights by our dedicated UCEM administrative partners: Denise Ellis and Dr. Carmen Sidbury of the National Action Council for Minorities in Engineering; Dr. Veronica Zepeda, Selena Rodriguez, and Keliakamalulani Napuelua of the Social Science Research Council; and Dr. Ansley Abraham of the Southern Regional Education Board.

The visionary leadership of former Sloan program director Dr. Elizabeth Boylan made the UCEM and its success possible. Past Sloan president Paul Joskow provided instrumental support in the program's early years. The UCEM program was further guided by an illustrious advisory committee whose members have included Drs. Sharon Fries Britt, Lisa García Bedolla, Rigoberto Hernandez, Jerome J. Kukor, Percy Pierre, Stephen M. Ruffin, Janet C. Rutledge, and James H. Stith. The Foundation is grateful for their shared expertise, insights, and commitment to the UCEM's success. We are further grateful for the pioneering work of Dr. Ted Greenwood, who conceived the MPhD Program from which the UCEM was developed.

This evaluation was commissioned by Sloan program director Dr. Lorelle L. Espinosa. She and Sloan president Adam Falk are grateful to their Sloan colleagues for past and continued support of the UCEM program, namely, program associate Dr. Tyler Hallmark, program assistant Latoya Gardner, former program assistant Dorothy Salomon, and the many Sloan colleagues over the years who have provided input, guidance, and reflections on the UCEM program and its evolution. We at Sloan are fortunate to work for an institution whose leadership, vision, and unwavering support for diversity, equity, and inclusion in STEM graduate education remain at the heart of its mission.

EXECUTIVE SUMMARY

INTRODUCTION

Higher Ed Insight (HEI) partnered with the Alfred P. Sloan Foundation to conduct a comprehensive evaluation of the Foundation's University Centers of Exemplary Mentoring (UCEM) program, housed at nine¹ universities nationwide between 2013-2022. UCEM programs are campus-based initiatives that provide student financial support, mentoring, professional development (PD), and other resources to promote recruitment, retention, and completion of Science, Technology, Engineering, and Mathematics (STEM) doctoral study among Black, Indigenous, and Latina/o/e (BIL) student populations.

HEI's evaluation encompassed four primary foci:

- To understand Sloan Scholars² experiences along STEM academic and career pathways.
- To explore UCEM's impact on graduate education across the eight campuses.
- To identify core components of successful UCEM models.
- To examine Sloan's role in supporting the success of each UCEM now and in the future.

KEY LEARNINGS

UCEM programs operate as individual initiatives that align with, leverage, and inform each university's broader STEM and diversity, equity, and inclusion (DEI) infrastructure. Using a case study approach, the evaluation revealed a collection of key learnings across UCEM campuses, focusing on promising practices and important insights related to the following:

01 Sloan Scholar academic and career outcomes.

02 Program design and implementation.

03 Scholar experiences and perceptions.

04 Supporting BIL students in and beyond UCEM.

05 UCEM program teams, affiliated faculty, and institutional leaders' perceptions of program impact, institutionalization, and sustainability.

Scholar Academic and Career Outcomes

Beginning in the 2013-2014 academic year through 2021-2022, the UCEM program has enrolled 668 funded Sloan Scholars, either directly through Sloan Foundation funding (n = 388) or via institutional match³ (n = 280). As of December 31, 2021 (the date that academic outcomes data were collected for this evaluation), 477 Sloan Scholars were still enrolled, with an additional 142 having graduated.



KEY TAKEAWAY: UCEM is realizing scholar success. A full 93.4 percent of Sloan Scholars have been retained in the program when accounting for those who are still enrolled or have graduated. Seventy-two percent of UCEM BIL Sloan Scholars graduate with a doctorate within 7 years, compared to 42 percent of students from these groups nationally. Of those scholars who have graduated, the most common career paths are academia and industry.

Program Design and Implementation

Program Team

Talented UCEM program teams led by senior leadership in graduate education oversee, coordinate, and deliver program activities. These teams ranged in size from a few individuals to 15 people.



KEY TAKEAWAY: The evaluation revealed that UCEM program teams benefit from the following:

- Adequate staff capacity to absorb programmatic responsibilities.
- Significant engagement from high-level administrators.
- Clarity regarding roles and expectations of all internal and external stakeholders.
- Timely and accurate insight into the scholar experience.
- Early sustainability and institutionalization planning.

Scholar Recruitment

UCEM programs primarily rely on institutional recruitment infrastructures to attract prospective BIL students, such as their university's graduate admissions office and specific graduate field recruitment efforts.



KEY TAKEAWAY: Effective recruitment efforts include the following:

- Pipeline programs intended to prepare and encourage racially minoritized undergraduate students to pursue graduate education.
- Participation in conferences that attract BIL undergraduates.
- Hosting of undergraduate research programs.
- Direct outreach to faculty colleagues who work with undergraduates BIL students.
- Engaging current scholars in recruitment efforts.

¹ UCEM institutions include Cornell University, Georgia Institute of Technology, The Pennsylvania State University, University of South Florida, University of Iowa, Massachusetts Institute of Technology, University of California San Diego, University of Illinois Urbana-Champaign, and Duke University. This report includes UCEMs current at the time of the evaluation, which did not include the University of Iowa.

² Sloan Scholars comprise all students that are funded by and engaged with the UCEM program.

³ All UCEMs are responsible for committing institutional resources to engage students beyond those funded by the Foundation; this commitment is called an institutional match. Each institution provides financial support for a subset of Sloan Scholars at its university.

Scholar Support

While scholar support activities varied across the eight UCEM campuses, the most salient forms of support were mentorship, financial support, professional development, and community engagement.



KEY TAKEAWAYS: Whether through UCEM-exclusive activities or existing institutional infrastructure, the best scholar support accomplishes the following:

- Makes it easy for scholars to get the help they need.
- Is based on a holistic view of student success.
- Accounts for the impacts of systemic racism on scholar experience.

Scholar Experiences and Perceptions

In total, 179 Sloan Scholars (133 current and 46 alumni) participated in interviews and focus groups, illuminating the lived experiences of BIL STEM doctoral students in the UCEM program and on their respective campuses.

Mentorship Structures

Mentorship is an important component of the UCEM program; however, the evaluation revealed that differences exist between how the program is designed, how it is implemented, and what scholars expect.



KEY TAKEAWAYS: Due to a lack of formalized mentorship structures across UCEM institutions, scholars identified gaps in and expressed desire for the following:

- Networked, holistic, and culturally responsive approaches to mentorship.
- Personalized, one-on-one mentorship, with interactions occurring regularly to build trust and connection.
- Mentors with similar lived experiences and backgrounds.
- Mentors outside their departments to counter the power dynamic that naturally exists in relationships with their academic advisers.

Financial Support

Scholarship support and other resources provided by UCEM were described as one of the greatest benefits of the program, offering scholars flexibility and increased access to opportunities. For some students, funding was attributed to making the PhD attainable.



KEY TAKEAWAY: While an intersectional lens is important to adopt within the UCEM model in general, it is notably important with regard to financial support, as many BIL scholars reported also being from low socio-economic backgrounds. Some scholars desired greater guidance early in the program on topics such as how funds could be used for academic and professional enrichment, financial literacy, and money management.

Professional Development

Scholars appreciated the holistic manner with which program structures helped to facilitate their personal and professional development. In particular, the Southern Regional Education Board Institute on Teaching and Mentoring was a high point for many scholars who came away inspired by the critical mass of other BIL students pursuing STEM doctorates.



KEY TAKEAWAY: Scholars perceived the UCEM program as having a strong bias toward academia, despite the fact that scholars take many other professional paths. Scholars wanted more career focus early in the program so that they had time to build the skills needed for their desired careers.

UCEM Community

Perceptions of community differed across scholars, with variations observed both within and across institutions. Factors that contributed to students' sense of community included cohort year, racial/ethnic identity, and effects of the COVID-19 pandemic. While many scholars praised UCEM's strong community-building qualities and their subsequent sense of belonging, other scholars have not experienced this feeling of closeness.



KEY TAKEAWAY: Some scholars felt that their academic departments did not explicitly value diversity, racial equity, and inclusivity and therefore did not serve as an inclusive environment, making UCEM the only space where students feel welcomed and valued.

Supporting BIL Students

When reflecting on what BIL doctoral students in STEM need to be successful, scholars described an ecosystem of support that comprised three domains of influence: (1) individual, (2) programs and networks, and (3) systems and cultures.



KEY TAKEAWAYS:

- The individual level centers scholars' personal needs. They desired to be valued as full persons with multiple, diverse identities and yearned for programs that prioritized their wellbeing. In alignment with these needs, scholars named two approaches to support: appreciation of scholars' lived experiences and mental and emotional support.
- At the level of programs and networks, scholars report having multilayered needs for academic mentorship, career development, and financial independence. In alignment with these needs, they named three categories of support: a robust mentorship network; personal, academic, and professional development; and financial support to facilitate agency.
- At the level of systems and cultures, scholars report needs with regard to the postsecondary ecosystem and its impact on their experiences. They named two categories of support: institutional alignment with DEI priorities and access to a supportive and diverse community.

Perceptions of Impact, Institutionalization, and Sustainability

In addition to having an impact on the academic and professional trajectory of individual scholars, Sloan aspires to facilitate systemic change in graduate education through UCEM and similar programs. Among other attributes, a systemic change approach seeks to identify and remove entrenched biases and barriers at the institutional, college, and departmental levels. While this kind of change was not uniformly evident, or even common, across UCEM campuses, the evaluation uncovered a variety of perceived impacts of each UCEM by its stakeholders. These perceptions are informative as they signal possibilities for systemic change as well as the sustainability of UCEM efforts.



KEY TAKEAWAYS: UCEM program teams, faculty mentors, and institutional leaders across all eight UCEMs shared that their relationships with Sloan have led to the following:

- Leveraging of their relationship with Sloan for securing additional investments.
- Creating a community of learning and support among institutions.
- Serving as models for student recruitment and retention beyond the UCEM.
- Shifting toward holistic graduate admissions processes.
- Raising visibility about departmental climate and culture challenges.

RECOMMENDATIONS

The evaluation revealed numerous insights into what UCEM leadership, scholars, and institutional stakeholders believe contribute to a successful program. The evaluation team also had the benefit of considering these insights across all programs and used them to inform 17 recommendations to encourage continued program success and improvements. The following recommendations summarize these collective insights. These recommendations are organized into two categories: program design and grant administration.

Program design recommendations address elements that should be prioritized and included across all UCEM programs, though the degree of inclusion will vary based on each program's unique context. Grant administration recommendations focus on practices that facilitate the articulation of core UCEM design components, support future grant-making strategies, guide institutions in quality program implementation, and adequately assess progress toward or realization of initiative outcomes and impacts.

PROGRAM DESIGN Summary of Recommendations

Devise strategies that adequately cover the nature and capacities of program leadership, implementation, and administrative responsibilities.

Clearly document expectations of all UCEM stakeholders in writing.

Reimagine program and scholar success to go beyond traditional, quantitative metrics and include metrics such as scholar sense of belonging and scholar wellbeing.

Implement a scholar orientation or onboarding process that includes but goes beyond the UCEM.

Embed program learning as a core UCEM practice so that each program can assess its work, share learnings with key stakeholders, and improve program design and implementation.

Catalyze high-level buy-in across all campuses, as the UCEM initiative's success is impacted by the program's perceived value to university stakeholders.

Efficiently and strategically coordinate university resources that align with UCEM goals and therefore leverage shared values and collective resources to facilitate greater impact.

Develop sound, feasible institutionalization and sustainability plans at the program onset.

GRANT ADMINISTRATION Summary of Recommendations

Develop a theory of change that considers Sloan's unique positioning to influence the change it seeks at the individual, programmatic, and system levels.

Define mentorship within the program's context such that campuses have clear expectations when designing and implementing mentoring structures.

Design and employ a program model that balances UCEM standards and institutional autonomy while also ensuring the use of evidence-informed practices.

Provide greater guidance to grantees, including in the areas of institutionalization and data collection and reporting, utilizing the role of NACME as a convener of the UCEM community.

Operationalize transformation in a manner that is institutionally or contextually defined since transformation and indeed systemic change will look differently across institutions, as will the resources required to facilitate sustained change.

Diversify the UCEM grantee portfolio to include eligible institutions with high STEM enrollment among BIL students.

Facilitate equitable allocation of funding and resources across UCEM institutions.

Monitor the shifting legal landscape in partnership with UCEM campuses.

INTRODUCTION

Higher Ed Insight (HEI) partnered with the Alfred P. Sloan Foundation (Sloan or the Foundation) to conduct a comprehensive evaluation of the University Centers of Exemplary Mentoring (UCEM) program, which launched in 2013.

UCEM programs are campus-based initiatives that provide financial support, mentoring, professional development (PD), and other resources to promote recruitment, retention, and completion of Science, Technology, Engineering, and Mathematics (STEM) doctoral study among Black, Indigenous, and Latina/o/e (BIL) student populations; UCEM has a particular emphasis on the physical sciences and engineering. A secondary aim of UCEM is to change the demographics of STEM faculty in U.S. colleges and universities by paying special attention to the preparation of underrepresented minority (URM)⁴ doctoral students planning for a career in academia. A set of criteria were considered by Sloan in conjunction with the assessment of each campus' unique context when selecting UCEM institutions.

HEI's evaluation encompassed four primary foci: understanding Sloan Scholars' experiences along STEM academic and career pathways, exploring perceptions of UCEMs' impact on each campus' graduate education, identifying core components of successful UCEM models, and examining Sloan's role in supporting the success of each UCEM. The evaluation team partnered with Sloan, UCEM administrative partners, and all eight campuses that were active in UCEM when the evaluation began. Data collection included conducting interviews with over 200 core UCEM team members, institutional leaders, and Sloan Scholars and Alumni; collecting over 100 proposal and renewal applications, annual and supplemental reports, and Sloan site



visit reports; and accessing over a decade of extant academic and workforce data. This report presents key learnings from the evaluation, findings articulated in ways useful to funders and practitioners engaged in initiatives with goals similar to the UCEM program.

What became apparent throughout the evaluation was the significant variation across UCEMs in design and implementation. For example, whereas mentorship is at the heart of the UCEM model, each UCEM defined and approached mentorship differently. This finding was not surprising given that each UCEM had autonomy to design and implement a campus-based initiative intended to promote retention and completion of STEM doctoral study among BIL students. These initiatives were presented to Sloan via initial and renewal grant proposals, as well as in annual reports to the Foundation. Sloan used the grant proposals and site visits, which proceed renewal proposals, as a mechanism to review, ask questions about, and provide feedback to each UCEM regarding their approach. This proposal process allowed individual programs to develop a UCEM that best fit their specific context and Sloan to share insights and promising practices from approaches used at other UCEMs. In practice, UCEMs operated as eight distinct initiatives being carried out on individual campuses, connected primarily by Sloan and its administrative partners with a shared goal of promoting access, retention, and completion of STEM doctoral study among BIL students.

⁴ Throughout this report, we use the following related race-based terms as they pertain to Sloan and UCEM: underrepresented minority (URM); Black, Indigenous, and Latina/o/e (BIL); and racially minoritized. When making language choices, we prioritized specificity of people groups, language used by Sloan and UCEM (i.e., in speech and/or documents), and the evaluator's preference for racially minoritized—in that order.

UCEM Institutional Selection Criteria

Achievements of the University

with respect to the recruitment, degree progression, graduation, and career trajectory of Black, Indigenous, and Latina/o/e students/alumni in the UCEM's disciplines

Achievements of the Faculty

and the quality of the research environment in UCEM departments as they relate to graduate students' opportunities and chances of success

Quality of the Plans

to advance Sloan's strategic objectives for UCEM

An Inclusive Campus Environment

and high-quality student support services that enable Black, Indigenous, and Latina/o/e graduate students to persist, graduate, and achieve their full potential

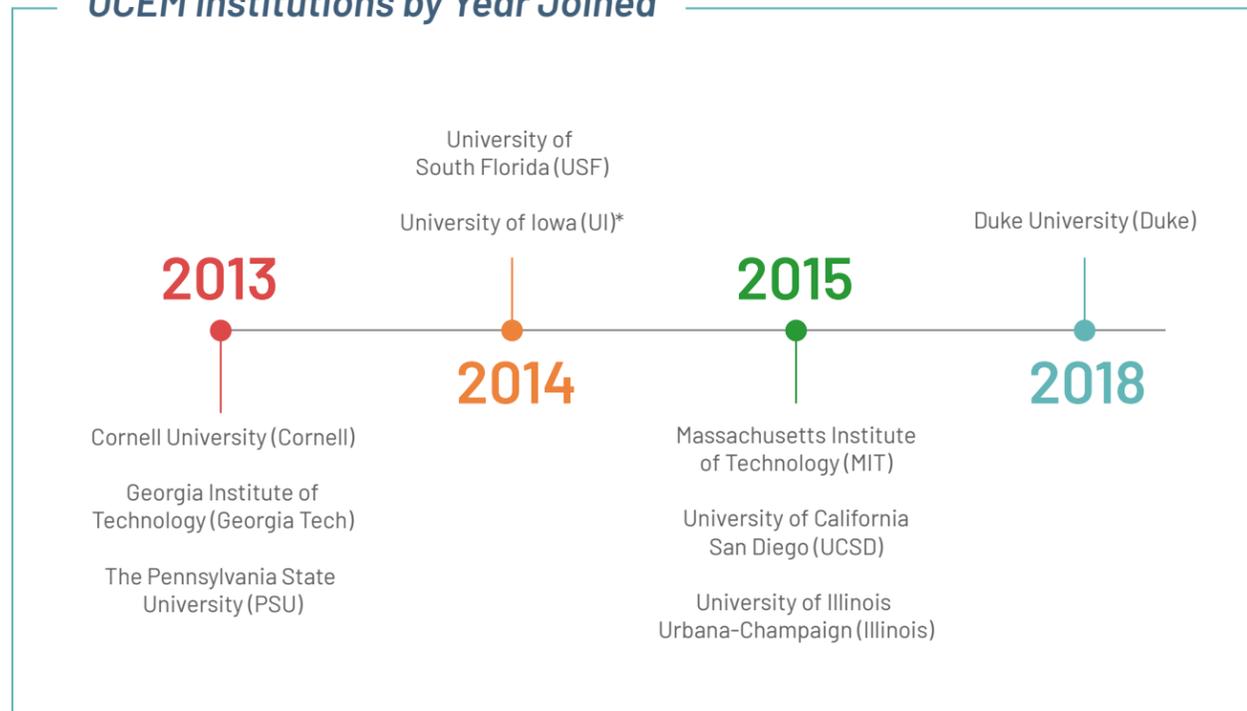
Competitiveness of the Matching Funds

and institutional resources devoted to UCEM aims

Demonstrated Effectiveness

of the institution's commitment to diversity more generally

UCEM Institutions by Year Joined



* This report includes UCEMs current at the time of the evaluation, which did not include UI.

Individual institutional profiles were created for the comprehensive internal evaluation report provided to Sloan. This report, however, presents a collection of key learnings from across all UCEMs, focusing on promising practices and important insights. Specifically, we highlight learnings related to the following dimensions of UCEM:

- Scholar academic and career outcomes.
- Program design and implementation.
- Scholar experiences and perceptions.
- Supporting BIL students.
- Perceptions of impact, institutionalization, and sustainability.

The report closes by offering recommendations for designing, implementing, and supporting successful UCEM programs and other similar initiatives across the higher education landscape.

Sloan Administrative Partners

The National Action Council for Minorities in Engineering (NACME)

Provides administrative and fiscal support for the management of Sloan's funding to all UCEMs, as well as support for community engagement activities amongst UCEM project teams and Sloan Scholars.

The Social Science Research Council (SSRC)

Administers the Sloan Scholars Mentoring Network, an alumni network for Sloan Scholars that offers a variety of professional development, mentoring, networking, and leadership training opportunities.

The Southern Regional Education Board (SREB)

Annually hosts the largest gathering of minority doctoral scholars in the country, the Institute on Teaching and Mentoring, which is attended by Sloan Scholars at least twice during doctoral study and by UCEM program teams.



KEY LEARNING

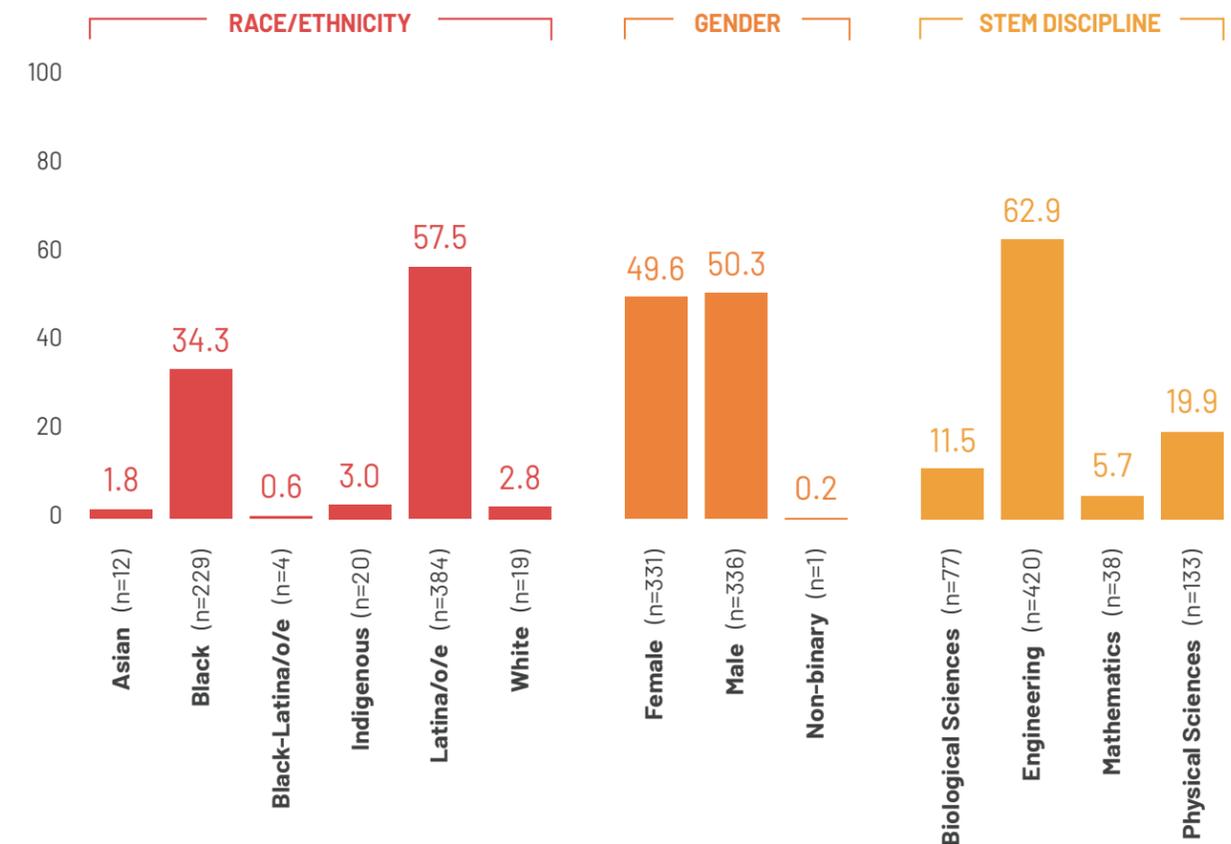
Scholar Academic and Career Outcomes

Central to the UCEM program is attracting, retaining, and graduating BIL doctoral students within STEM. Understanding the composition of UCEM's scholar population offers contextual insights integral to ascertaining the program's achievement of and/or progress toward meeting these initiative-wide goals.

Scholar Profile

Beginning in the 2013-2014 academic year through 2021-2022, the UCEM program has enrolled 668 funded Sloan Scholars, either directly through Sloan Foundation funding (n = 388) or via institutional match⁵ (n = 280). Figure 1 illustrates the demographics of these doctoral scholars.

Figure 1: Sloan Scholar Demographics



⁵ All UCEMs are responsible for committing institutional resources to engage students beyond those funded by the Foundation; this commitment is called an institutional match. Each institution provides financial support for a subset of Sloan Scholars at its university.

Sloan Scholars are nearly equally split among female (n = 331) and male (n = 336); one scholar is non-binary. More than half of scholars identify as Latina/o/e (n = 384), and slightly more than a third as Black (n = 229), with four scholars identifying as Black and Latina/o/e. Twenty scholars are from Indigenous backgrounds. Of those scholars who are not from historically excluded racial/ethnic groups in STEM⁶, 19 identify as White and 12 as Asian American.

In terms of academic discipline, nearly two-thirds of scholars are in engineering (n = 420), nearly one-fifth in the physical sciences (n = 133), one-tenth in the biological sciences (n = 77), and 38 in mathematics.

Retention and Completion

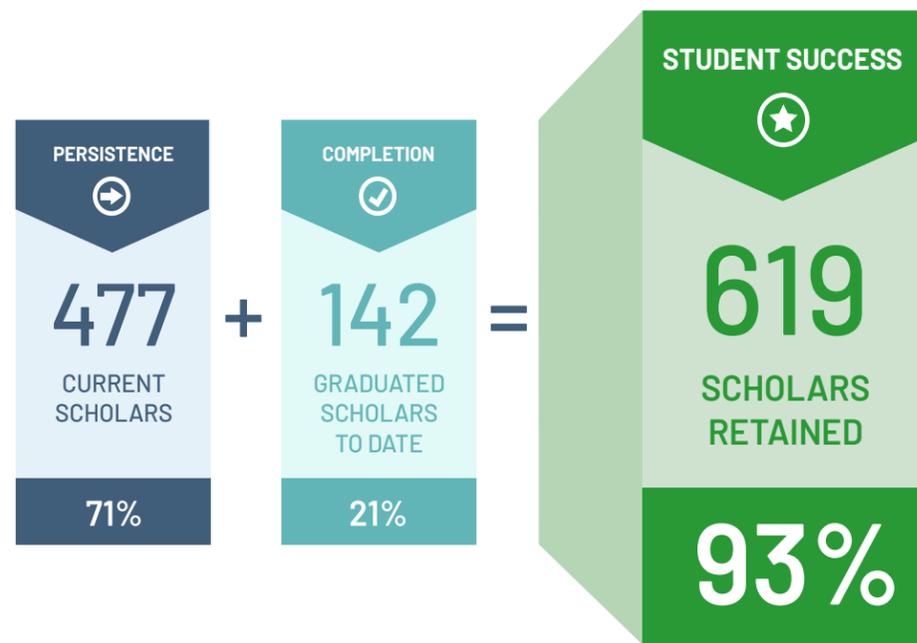
Examination of academic outcomes reveals that overwhelmingly, **UCEM is realizing scholar success.**

As of December 31, 2021, the date that academic outcomes data were collected for this evaluation, 477 of the 668 Sloan Scholars are still enrolled, with an additional 142 having graduated to date.

Of those no longer enrolled, 26 Sloan Scholars withdrew from their programs of study, which includes seven students who transferred to a non-UCEM discipline or different institution. An additional 23 Sloan Scholars also withdrew but earned a master's degree during their doctoral pursuit. Ultimately, UCEM realized an astounding 93 percent success rate with 619 scholars retained to date, as illustrated in Figure 2.

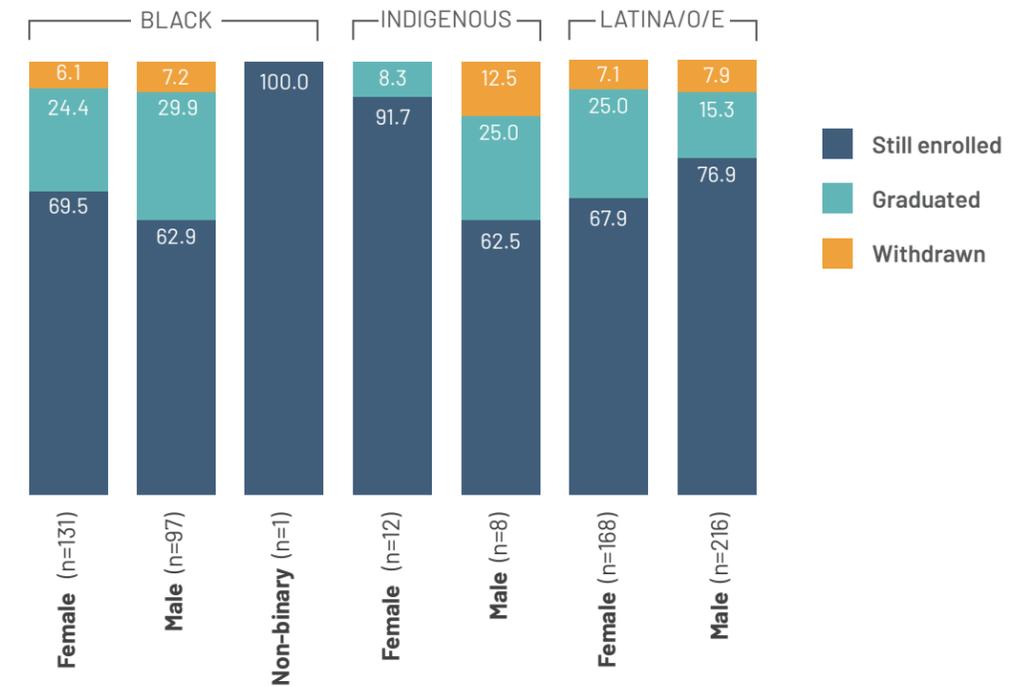
Retention and completion rates among UCEM's BIL scholars indicate that of the 229 Black Sloan Scholars, 93.4 percent have been retained (n = 214), with 66.8 percent currently enrolled (n = 153) and 26.6 percent graduated (n = 61). Ninety-five percent of Indigenous scholars (n = 20) have been retained, with 80 percent still enrolled (n = 16) and 15 percent graduated (n = 3). For UCEM's 384 Latina/o/e scholars, 72.9 percent are still enrolled (n = 280) with 19.5 percent graduated (n = 75), for a total of 92.4 percent retained (n = 355).

Figure 2: Sloan Scholar Academic Success



⁶ We address the inclusion of non-BIL students as Sloan Scholars within the Scholar Selection section.

Figure 3: Retention and Completion by Race and Gender



Intersectional Examination of Retention and Completion

Analysis of retention and completion outcomes with disaggregation by students' racial/ethnic identities is foundational to an initiative of this type, one designed explicitly to provide the structural support required to recruit, retain, and graduate Black, Indigenous, and Latina/o/e doctoral students within STEM. Even within each racial/ethnic group, however, racialized experiences are not monolithic. For example, it is widely recognized that gender has the potential to significantly influence STEM academic trajectories. Therefore, it was equally critical for student performance to be understood from an intersectional lens that considered race and gender simultaneously among BIL scholars.

Intersectional analyses reveal that there are 35 percent more female Black scholars (n = 131) enrolled in UCEM than there are males (n = 97), an astounding figure considering the underrepresentation of Black women in STEM. Similarly, there are 50 percent more female Indigenous scholars (n = 12) than male (n = 8). In contrast, Latino scholars outnumber Latina scholars by nearly four to three; see Figure 3.

At face value, the group with the highest rate of attrition seems to be male Indigenous scholars (12.5 percent). However, that figure is a greater indication of the small population of Indigenous students enrolled than it is a signal of scholar success, as it represents just one scholar. A more reflective trend observed is that female students have marginally lower rates of withdrawal than their male counterparts across racial/ethnic groups.

To date, Latina scholars have graduated at a rate nearly 10 percentage points greater than their male counterparts. Black male scholars have the highest completion rate, with 29.9 percent having graduated thus far, followed by Latina scholars, male Indigenous scholars, and female Black scholars. From the perspective of raw numbers, however, Latina scholars comprise the group with the most UCEM graduates (n = 42), followed by Latino scholars (n = 33), female Black scholars (n = 32), and male Black scholars (n = 29).

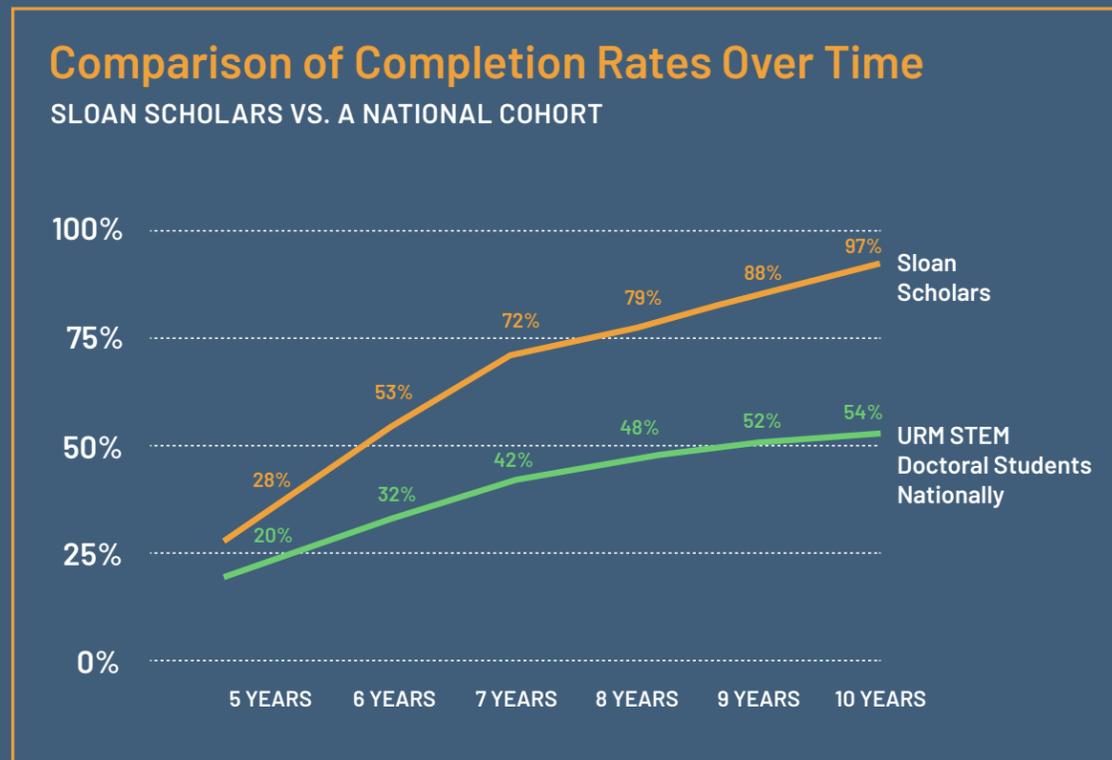
All in all, scholars across all racial/ethnic-gendered groups are performing nearly identically, with rates of retention (as demonstrated by having a status of still enrolled or completed) near that of the Sloan Scholars overall.

A Comparison to National Averages

As the UCEM program continues to evolve since its founding about a decade ago, it is pertinent to understand completion rates over time in relation to national trends. Learnings gleaned from examining outcomes reported in a 2015 national study of URM students in STEM PhD programs conducted by the Council of Graduate Schools (CGS)⁷ help to make clear an important finding: The UCEM initiative has accomplished scholar success deserving of recognition, with UCEM's STEM doctoral rates of completion higher than that of the national average for BIL scholars. Figure 4 illustrates completion rates of Sloan Scholars compared to a national cohort of URM STEM doctoral students.

The CGS study provided 10-year cumulative completion rates, calculated as the percentages of URM STEM doctoral students who started their doctoral study between May 1992 and April 2002, and who completed within 10 years of starting the program (i.e., between 2002–2012). While time has not yet allowed for the calculation of a 10-year completion rate for most Sloan Scholars, completion trends to date can be ascertained by analyzing 5–10-year outcomes⁸.

Figure 4: Comparison of Completion Rates Over Time: Sloan Scholars vs. a National Cohort



⁷ Sowell, R., Allum, J., & Okahana, H. (2015). Doctoral initiative on minority attrition and completion. Washington, DC: Council of Graduate Schools.

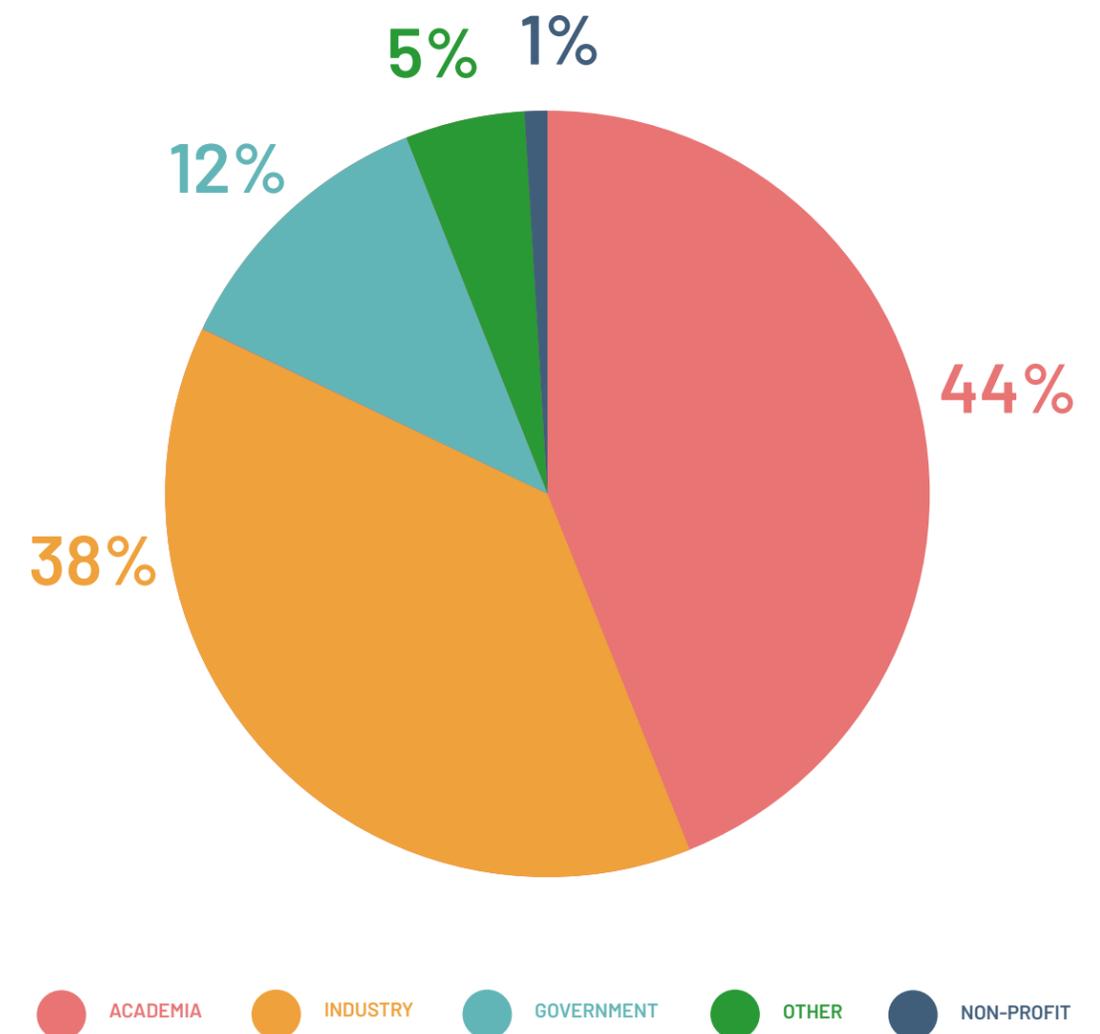
⁸ For each of the six years represented, Sloan Scholar completion rates were calculated by computing figures among all scholars who could have been matriculated in their PhD program for at least that number of years.

Students from the earliest cohorts of the program are most comparable to the CGS cohort in terms of the potential of being enrolled for 10 years. Although a small number of scholars were in the program for at least 10 years (n = 28), those students had a completion rate of 97 percent by that time, nearly double that of the URM STEM doctoral students in the national cohort. In fact, Sloan Scholars increasingly outperform the national cohort at each progressive anchor of time, attaining a rate of completion that is eight percentage points higher at Year 5, 30 percentage points greater at Year 7, and an astounding 43 percentage points higher at Year 10.

Sloan Scholar Career Paths

While the majority of Sloan Scholars are still enrolled, there are early indications of scholars' career paths. As shown in Figure 5, of the scholars for whom career outcomes are known (n = 112), the most common paths are academia and industry. For those in academia, roughly half are in post-doctoral positions.

Figure 5: Sloan Scholar Career Outcomes to Date



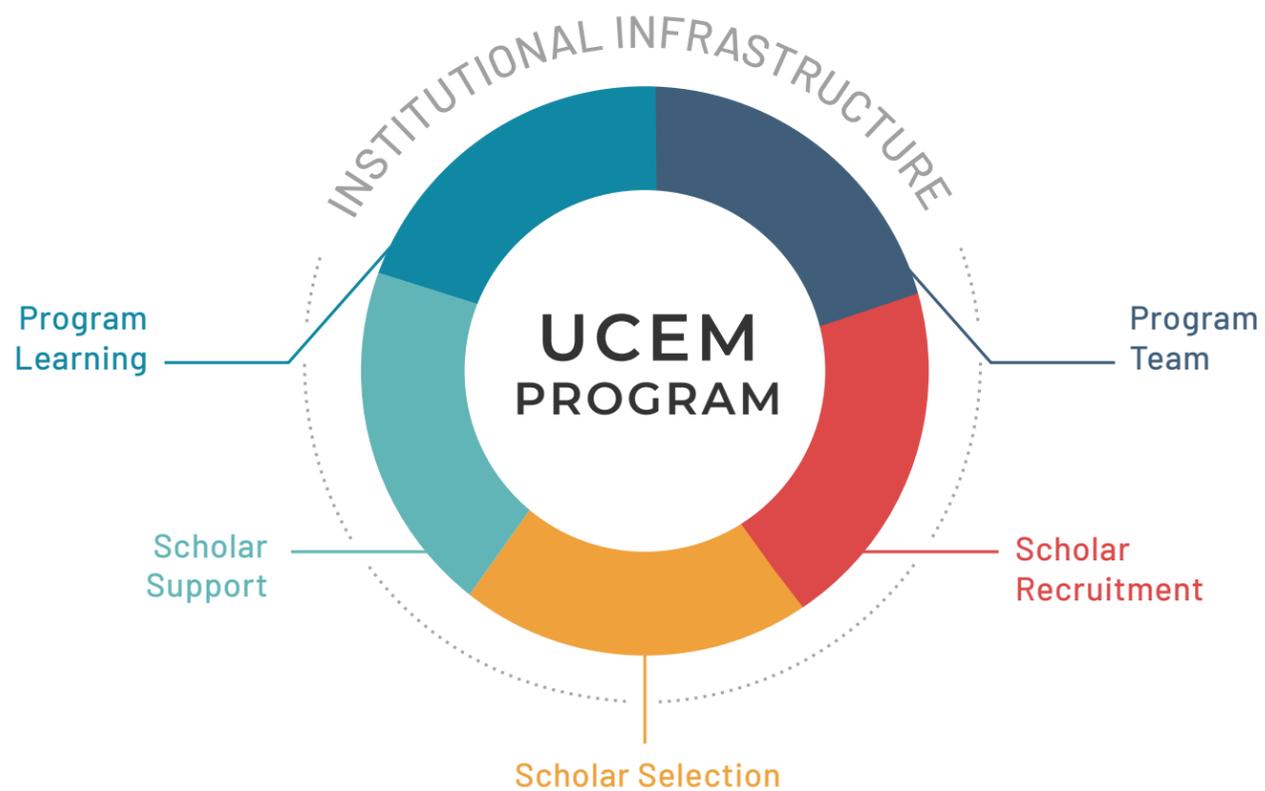
KEY LEARNING

Program Design and Implementation

UCEM programs operate as individual initiatives that align with, leverage, and inform related institutional infrastructure (i.e., policies, practices, resources, and activities external to the UCEM program, but are key to helping UCEM achieve its stated goals). Within this institutional infrastructure, the evaluation identified five primary components to exist within each UCEM: program team, scholar recruitment, scholar selection, scholar support, and program learning (see Figure 6). Whereas UCEMs contain each model component, the degree to which these components show up in a particular program varies significantly. This section combines promising practices and insights related to design and implementation from across all UCEMs.

It is important to note that COVID-19 had a significant impact on UCEM programs. To that end, the learnings shared here are rooted in the near decade of program history that include but extend beyond operations disrupted by the global pandemic.

Figure 6: UCEM Program Model



Program Team

UCEM program teams oversee, coordinate, and deliver program activities. They ensure that the program meets reporting and other grantee-related responsibilities. These teams range in size from a few individuals to 15 people. Similarly, the institutional roles (e.g., vice provosts, deans, graduate school staff, faculty, and Sloan Scholars) represented within each team varied to a significant degree. The Foundation required the graduate dean be involved in the program, some of whom serve as lead PIs.

The evaluation revealed that UCEM program teams benefit from the following:

- adequate staff capacity to absorb programmatic responsibilities,
- significant engagement from high-level administrators,
- clarity regarding roles and expectations of all internal and external stakeholders,
- timely and accurate insight into the scholar experience, and
- early sustainability and institutionalization planning.

Adequate staff capacity to absorb programmatic responsibilities

UCEM's approach to scholar support often goes beyond standard student support services. The UCEM program team is responsible for assuming and/or coordinating these responsibilities, typically in addition to the responsibilities of their existing institutional role(s). Inadequate capacity often meant UCEMs were unable to implement their programs as designed (i.e., described in their proposals); some of the unfulfilled aspects were directly related to scholar support activities. One team found that a large UCEM team helped with continuity of services. As one of the team members shared, "We never know in the span of a person's career at a particular place where he or she will land. We are very confident that anybody can step in and look at our structure and say, 'Okay, here we go.' I think that the actual structure of our program has really made for a successful initiative."

UCEM PI/Co-PI Expectations

1. Appointment of at least two co-principal investigators (Co-PIs)

by the university president or chancellor to provide administrative oversight and co-chair the UCEM coordinating/steering committee. At least one PI must hold a tenured appointment in one of the UCEM departments, and one is expected to hold a decanal or provostial title.

2. Nominate Additional Core Members

of the coordinating/steering committee including (but not limited to) senior faculty with a track record of strong mentoring and with influence in departmental recruitment and retention; at least one senior administrator or dean responsible for graduate student success and well-being; and at least one program staff person responsible for communication, record-keeping, and reporting. Of note, these committees varied from a few individuals to 15 members.

3. Provide mechanisms for including other members

of the faculty in UCEM departments/schools who can contribute meaningfully to the program's aims; including through formal mentoring plans;

4. Commit program staff

to maintain student and financial records, develop reports, and serve as a liaison(s) to students; and

5. Commit sufficient staff time in graduate student support

offices by individuals with the expertise to advise students on personal and professional matters.



DUKE UCEM: Faculty Champions Orientation

Duke UCEM's oversight team led an orientation for their faculty champions to introduce them to the main components of the UCEM program, review the faculty champion handbook that includes expectations and roles, introduce the graduate school's mentoring toolkit and other key resources, and provide a space to discuss mentorship best practices.



MIT UCEM: Scholar Circle

MIT UCEM's Scholar Circle is a monthly meeting that mostly provides a space for open discussion, support, and resource sharing among scholars. At times, the Scholar Circle also serves as a space for formal programming (e.g., presentation skills workshop). Ultimately, the aim of the Scholar Circle is to cultivate a space where UCEM Scholars can develop stronger networks among each other and freely express their needs. In addition, guests are invited from across MIT to add additional mentors to the scholars' mentoring board.

Such guests include DEI staff, UCEM department administrators, staff from the Office of Graduate Education, director of MIT Medical and MIT Mental Health, as examples.

Clarity regarding roles and expectations of all internal and external stakeholders

Early on, the Sloan Foundation established expectations for UCEM program teams. For roles and expectations that go beyond those detailed by Sloan, clarity helps teams ensure that the additional responsibilities and scholar support associated with implementing a UCEM program are efficiently integrated into team members' institutional responsibilities and campus student support services and resources.

For example, most UCEMs' approach to mentorship incorporates faculty members within a scholar's department (e.g., a scholar's academic advisor). Ensuring that these faculty, who are external stakeholders, approach scholar support in ways that align with the type of support UCEMs advertise to their scholars is important. Some programs use a combination of program handbooks and faculty training to provide clarity regarding roles and expectations to internal and external stakeholders. Duke UCEM's orientation for their faculty champions⁹ is an example of faculty training practice.

Timely and accurate insight into scholars' experiences

Whereas academic and workforce outcomes provide important insight into the success of a program, the experience of scholars persisting towards and achieving said outcomes are equally important measures of success. Sloan Scholars, as the primary beneficiaries of program efforts, can provide valuable insight to the effectiveness of various program activities and can help program teams understand what is working well and what can be improved. For example, the MIT UCEM initiated its UCEM Scholar Circle based on scholar survey responses that suggested the MIT UCEM facilitate formal peer-to-peer mentorship among scholars.

⁹ Faculty champions are individual faculty members from participating UCEM departments who serve as scholars' primary point of contact, support scholar recruitment, mentoring, and wellbeing efforts; and help to integrate scholars into their department's academic and research communities.

Significant engagement from high-level administrators



UCEMs operate within a broader institutional infrastructure. Significant engagement from high-level administrators (e.g., deans, provosts, and chancellors/presidents) can ensure that the program is best situated to align with, leverage, and navigate relevant policies, practices, and resources. These individuals may or may not be formal members of the program team, yet their insight and support are particularly important in the roles of strategic thought partners and program champions. High-level administrators can help program teams in their institutionalization and sustainability efforts as strategic thought partners while also helping program teams navigate roadblocks or gain access to additional resources as program champions. In fact, Sloan requires that each UCEM name a formal senior administrative program champion, though the most successful campuses had multiple, visible champions.



Early sustainability and institutionalization planning

Sloan requires each UCEM to make plans to catalyze the institutionalization and sustainability of their program beyond the foundation's financial support, which can last up to nine years. Admittedly, meeting this requirement has been a significant challenge for UCEMs because of the limited guidance from Sloan and the difficulty of replacing the amount of funding provided by Sloan. Additional challenges include competing funding priorities at the institution, limited influence over department culture and policies (e.g., regarding valuing diversity in admissions), and limitations to planning capacity among the program team.

Even so, UCEMs that can begin planning for institutionalization and sustainability early in the funding cycles are better positioned to sustain efforts beyond Sloan funding. These early efforts have included establishing relationships with development officers to identify potential funding; aligning the UCEM design with established institutional priorities; and offering training and other resources to campus community members (e.g., mentoring best practices).



Illinois UCEM: Graduate College Fellowships for URM Recruitment

Illinois Graduate College (GC) Fellowships designated for URM recruitment increased from \$1.2M in 2018 to \$3.5M in 2020-21. This funding ensures that GC will be able to support a minimum of 15 STEM doctoral students per year from the 19 UCEM departments on \$25,000 per annum Graduate College Fellowship.

Under the central campus fellowship policy, GC provides three years of funding, and the academic department provides additional years of funding through assistantships or departmental fellowships.



Scholar Recruitment

UCEM programs rely primarily on institutional recruitment infrastructures to attract prospective BIL students, such as their university's graduate admissions office and/or specific graduate field recruitment efforts. Recruitment efforts include pipeline programs intended to prepare and encourage racially minoritized undergraduate students to pursue graduate education; attendance at conferences with high attendance of these groups; undergraduate research programs; and direct outreach to faculty colleagues who work with BIL students (see Table 1 for an illustration of Sloan Scholar recruitment strategies). Though UCEMs often leverage institutional recruitment infrastructures, they serve as thought partners to their university's graduate admissions offices and/or graduate fields, particularly pertaining to recruiting BIL STEM graduate students (e.g., expanding places from which students are recruited).

Scholar Selection

At most UCEM sites, the scholar selection processes have the goal of identifying students who would not only benefit from the award but also be engaged in the broader scholar community. While the process for institutional nomination of Sloan Scholars has changed over the years, Sloan currently requires that scholars be nominated upon their entry to doctoral programs in eligible UCEM disciplines. Sloan's priority populations for scholars are BIL, although public institutions work within the legal parameters of their states when it comes to graduate admissions, financial aid, and similar benefits.

A practice that is particularly promising is the manner with which UCEMs support the implementation of holistic admissions processes. Most programs have adopted and refined a holistic admissions review rubric appropriately tailored to their institutional context. UCEMs share these rubrics with departments, and in some cases, offer training around the application of this tool as a way to encourage adoption of more holistic admissions processes.

Most UCEMs use a similar process to nominate admitted doctoral students as Sloan Scholars (including the institutional match scholars). This process involves programs/departments submitting a list of nominated scholars to the UCEM program teams for consideration, the involvement of UCEM selection committees, and the ultimate review of selected scholars by NACME to ensure eligibility.

Table 1:

Illustration of Sloan Scholar Recruitment Strategies

RECRUITMENT EFFORT	EXAMPLE
URM pipeline programs intended to prepare and encourage URM undergraduate students to pursue graduate education	The USF UCEM has successfully partnered with feeder programs including LSAMP, McNair, MARC U STAR, and RISE for about a decade. These programs help undergraduate students get research experiences early in their academic careers and support graduate school placement. By connecting with these programs, the USF UCEM can create pipelines for potential PhD students earlier. These feeder programs are located within a variety of institutions—including internally at USF—so they provide a rich, diverse pool of strong applicants.
Attendance at conferences with high undergraduate URM attendance	The PSU UCEM participates in national STEM conferences that serve minority students such as the Annual Biomedical Research Conference for Minority Students, Society for Advancement of Chicanos/Hispanics and Native Americans in Science, Emerging Researchers National Conference, and the National GEM Consortium.
Undergraduate research programs	MIT's Summer Research Program (MSRP) MSRP brings first generation or low socioeconomic African American, Latinx, Native American, Native Hawaiian and Pacific Islander undergraduate sophomores, juniors, and seniors to MIT to gain research exposure and experience. The Illinois UCEM's Summer Research Opportunity Programs (SROP) is a nine-week summer program for undergraduate students who are from populations underrepresented in graduate study at Illinois. The program is an opportunity to explore careers in research and learn more about graduate education at Illinois.
Direct outreach to faculty colleagues who work with URM undergraduate students	The Duke UCEM solicits student referrals from individual faculty members, such as faculty who previously wrote recommendation letters for current Sloan Scholars. These faculty are also invited to join their students and current Sloan Scholars during the pre-matriculation Early Start Research Immersion program (Early Start). Additionally, faculty members who have relationships at institutions that produce high URM STEM graduates are encouraged to reach out to their peers to discuss graduate education opportunities at Duke for their undergraduate URM students.
Current scholars supporting recruitment efforts	Current scholars in the GA Tech UCEM serve as recruitment ambassadors, participating in recruitment efforts, assisting in recruitment activities, and speaking with undergraduate students who are considering graduate school.
Relationships with colleagues at minority serving and other priority institutions.	The USF UCEM recruits students via their relationships with colleagues at minority serving and other priority institutions. This has included visiting institutions to meet with students, hosting faculty at USF to participate in programming aimed at fostering reciprocal partnerships that would create new PhD pipelines for URM students, soliciting recommendations from colleagues at minority serving and other priority institutions.

Scholar Support

Whether through UCEM-exclusive activities¹⁰ or leveraging institutional infrastructure, the best scholar support (1) makes it easy for scholars to get the help they need, (2) is based on a holistic view of student success, and (3) accounts for the impacts of systemic racism on scholar experience. This extensive scholar support makes UCEM stand out from other programs with similar aims. As a UCEM program team member and faculty shared, “We’ve been making use of Fellowships for many years prior to the UCEM. The emphasis then was just attracting underrepresented minority [URM] students and not providing them with this additional mentorship that’s been so important with [the UCEM].” This team member attributed their college of engineering’s increase from a 60 percent to 90 percent retention rate of URMs to UCEM’s focus on “making sure [scholars] can transition appropriately into our grad curricula [and] monitoring them and making sure they’re making progress.” Forms of scholar support offered through UCEMs were as diverse and varied as the scholars themselves; however, for this report we focus on four salient forms of support that exist across UCEMs: **mentorship, financial support, PD, and community.**

Mentorship

Mentorship is central to the UCEM program in terms of design, implementation, and the scholar experience. Each UCEM had the freedom to approach mentorship in a way that worked best for their institutional context, a practice that often evolved over the years as the programs gained more experience and insight about what works.

Sloan Scholars, program team members, and institution faculty agreed that the mentorship needs of a scholar cannot, and should not, be met by one individual. One UCEM program team member described the goal as “allow[ing] students to access a broader array of mentors outside of just the thesis advisor.” Some UCEMs not only ensured scholars had access to multiple mentors but also helped scholars and mentors cultivate healthy, productive mentor-mentee relationships.

In the words of one UCEM program team member, “[we helped them] learn as both faculty mentors and mentees, how to cultivate our mentor-mentee relationship and get the most out of it, and to have that relationship be productive and enjoyable.” See Figure 7 for promising mentorship practices.

Figure 7: Mentorship: Three Promising Practices



¹⁰ UCEM-exclusive activities are activities that are only available to Sloan Scholars.

¹¹ With the exception of two UCEMs, NACME administers funding directly to Sloan Scholars.

Financial Support

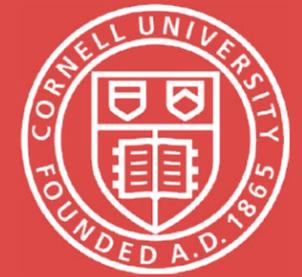
All Sloan-funded Scholars receive an additional \$40K above their standard institutional funding package, a design parameter set by the Foundation. UCEMs have flexibility in how much additional funding to provide Institutional Match Scholars, with supplemental awards ranging from \$10K to \$40K.¹¹ The evaluation emphasized the importance of decreasing or removing barriers for easy dispersal of funds to scholars and keeping the funding as flexible as possible in terms of how students use their awards. Whereas several scholars shared the positive impact of this financial support, they also found it challenging to manage these large sums. Scholars valued the opportunity some UCEMs provided for financial literacy support (e.g., budgeting and connecting them with resources to help them understand the potential tax implications of the award).

All UCEMs have a process that requires scholars to submit a spending plan to NACME and/or a UCEM program team member before funds can be dispersed. Within these plans, both program team members and scholars highly valued the ability for scholars to use funds for living expenses. One UCEM program team member noted that this ability is particularly helpful for students who do not have a lot of disposable income. Specifically, they shared that “it’s helping to defray the costs of living that our students might have” such as sending money home, with the “hope that [scholars] would use [funds] to offset” financial responsibilities.

DUKE
THE GRADUATE SCHOOL

**DUKE UCEM:
Financial Literacy**

The Duke UCEM set out to support scholars’ financial literacy. Specifically, the oversight team members from the graduate school’s financial aid team meet scholars, first during Early Start and again at the start of the fall semester, to discuss the scholar’s program spending plan, review their financial aid packages, and answer their questions.



Cornell UCEM: Departmental Scholar Support Plans

The Cornell UCEM requires graduate fields to submit a mentoring plan along with names of nominated students. These plans describe in detail how the department will ensure scholars receive adequate mentorship within their graduate field and department.

These plans do not follow a specific format but they often speak to a department’s capacity and intentions for ensuring a scholar has access to funding, field faculty with shared research interests, opportunities to develop technical skills sets, or opportunities to integrate into field or department-specific peer communities. If a candidate is strong but their mentoring plan is not, the department is contacted to address concerns regarding their mentoring plan.

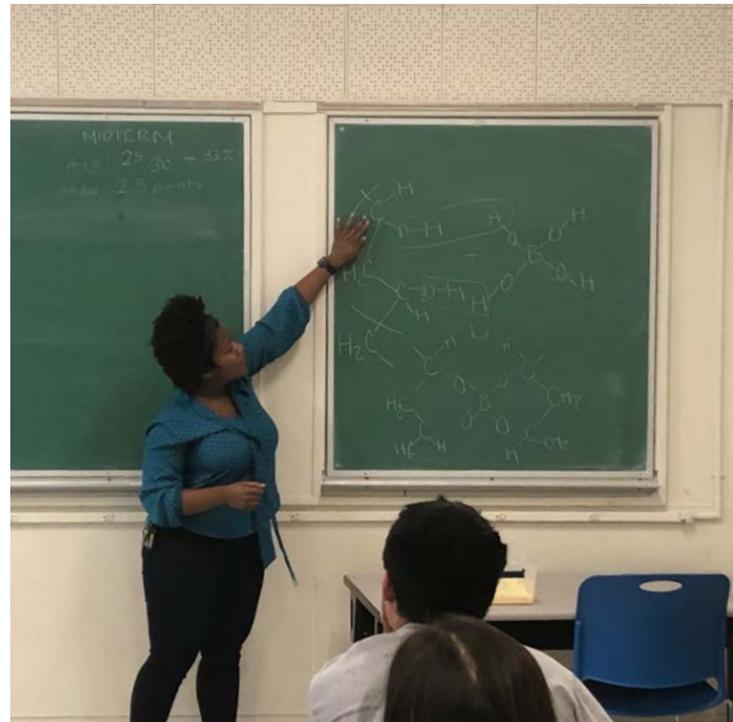


The Sloan Scholars Mentoring Network (SSMN)

SSMN serves as an alumni network for the over 1300 graduates of the Sloan Minority PhD Program and Sloan Indigenous Graduate Partnership initiatives, including over 150 UCEM graduates.

The SSMN provides in-person and virtual programming to support the professional development of scholars after graduation. Programming includes a strategic mix of workshops, grants, and networking and mentoring opportunities for scholars. Since 2018, the SSMN has provided more than \$625,000 in research seed funding, mentoring grants, and travel awards to scholars, the majority of which are at early stages in their career and are able to use the funding to secure additional long-term support for their research.

Through the SSMN website, newsletter, and social media, the network also highlights scholar achievements and stays connected to graduates in order to track career progression and outcomes.



Professional Development

Sloan has had a primary goal of diversifying the STEM professoriate over the majority of UCEM's history. Subsequently, all UCEMs provide some form of PD support related to preparing scholars for careers as faculty. Additionally, the Foundation requires, and provides funding for, all Scholars to attend the Southern Regional Education Board's (SREB) Institute on Teaching and Mentoring at least twice while in their program. Funding is also provided for program team members to attend. SREB describes the Institute on Teaching and Mentoring, a four-day conference focused on faculty diversity, as the "largest gathering of minority doctoral scholars in the country that provides minority scholars with the strategies necessary to survive the rigors of graduate school, earn the doctoral degree and succeed as members of the professoriate."

Most UCEMs also provide PD support to prepare scholars for careers outside of the academy, recognizing that scholar choice and/or available jobs might lead scholars to pursue careers other than as faculty members. Institutional infrastructure also serves as great PD resources to UCEMs, allowing program teams to partner with other campus units to ensure scholars gain broader access to the resources within their department and on campus as a whole. Three approaches to PD that stood out as promising practices included engaging program alumni, facilitating development along multiple career pathways, and using a variety of PD delivery methods; see Figure 8). UCEM also provides professional development support to all alumni scholars through the Sloan Scholars Mentoring Network (SSMN), administered by SSRC.

Figure 8: Professional Development Promising Practices



Community

For many scholars, UCEMs not only provide individual level support but also a sense of community. The UCEM community is particularly valuable to scholars who may be one of few, if not the only, BIL students in their classrooms and/or departments. UCEM program teams are intentional about developing a community for scholars. One vice chancellor shared that UCEM was the only program at their institution at the graduate level "specifically focused on building a stronger sense of community, networking, and mentoring;" see Figure 9 for an illustration of promising practices employed within UCEM to cultivate community.

Because UCEMs operate within an institutional context, some UCEMs also exist within an already established community. One example of this is Cornell's Diversity Programs in Engineering (DPE), which manages the Cornell UCEM. DPE vertically integrates diversity programming, such as the Cornell UCEM, aimed at recruiting and retaining engineering undergraduates, graduates, and faculty at Cornell. Sloan Scholars are therefore encouraged to engage the community being cultivated by DPE through all of its programming and related efforts.

Program Learning

Program learning refer to the processes, formal or informal, that UCEMs use to ensure that insights related to program design and implementation, scholar experience, challenges, and successes are clearly understood and used to improve program efforts. In the words of one vice chancellor, "We want to know from [the students'] perspective what has made them

UC San Diego

UCSD UCEM: Pre-doctoral Institute

The UCSD UCEM offers a Pre-doctoral Institute to all first-year Sloan scholars. This program aims to build community and provide an introduction to campus before the semester begins. The institute is nearly one month long and includes team-building activities as well as workshops on budgeting in graduate school, writing in graduate school, and recognizing and responding to microaggressions. During the institute, new scholars have the opportunity to meet with their department advisors, advanced Sloan Scholars, and participating graduate deans and the UCSD UCEM team.

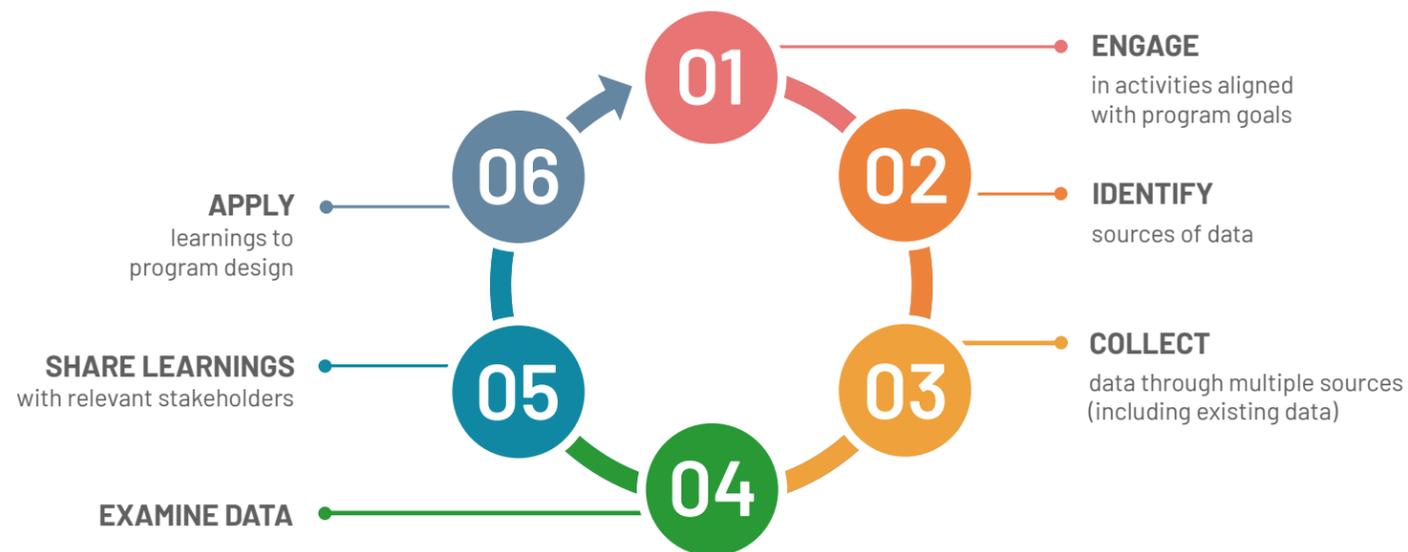
Figure 9: Cultivating Community: Three Promising Practices



so successful, as well as what they think the university needs to work on, to make it actually better so that we can do what we're doing at a graduate [school-wide] scale."

The approaches to program learning among UCEMs range significantly and were used to address both internal and external learning and reporting responsibilities. Some UCEMs partnered with the graduate school to access and compare quantitative outcomes data (e.g., retention, years to completion, completion rates, career trajectories) for scholars and non-scholars. Others surveyed scholars directly either at the end of a workshop/event or at the end of an academic semester or year. Focus groups with scholars and/or faculty mentors also served as ways for programs to learn what was working and what could be improved in the program. While these formal means of program learning existed, many UCEM program teams also used individual and group scholar check-ins as ways to better understand their scholars' experiences in the program and at the institution more broadly. See Figure 10 for an example of a simple, formal approach to continuous program learning the HEI evaluation team provided to UCEMs.

Figure 10: Approach to Continuous Program Learning



KEY LEARNING

Scholar Experiences and Perceptions

This section centers the lived experience of Black, Indigenous, and Latina/o/e STEM doctoral students, illustrating their perceptions of and experiences as scholars in the UCEM program and on their respective campuses. In total, 179 scholars—133 current and 46 alumni—participated in interviews and focus groups.¹² Overall, 29.3 percent of Sloan Scholars engaged in interview processes; see Figure 11 for a breakdown of BIL scholar interview participants by racial/ethnic group.¹³

The following themes illustrate key scholar insights regarding mentorship structures, financial support, PD, and the UCEM community.

Figure 11: BIL Scholar Interview Participants



Mentorship Structures

Mentorship is an important component of the UCEM program; however, the evaluation revealed that differences exist when comparing mentorship as designed (model), mentorship as experienced by scholars (implementation), and mentorship as envisioned (scholar desires). This section highlights key themes reflected by scholars related to valued mentorship experiences, opportunities for strengthening mentorship support, and visions for exemplary mentorship.

¹² Georgia Tech's Institutional Match Scholars were not included in data collection as they do not participate in UCEM programming.

¹³ Asian (n = 4) and White (n = 5) students participated in interviews. However, BIL students largely comprised the sample of scholars engaged in interview processes (95 percent) and is the population of students the program is most explicitly designed to support. As such, insights reflected in this section represent the experiences of these scholars.

Valuable Mentorship Experiences

Scholars shared that one of the benefits of UCEM is the peer mentorship and support available within the community, though this mechanism was often organically formed and scholar driven. UCEM program teams were also named as integral sources of mentorship and knowledge for scholars. Students saw their program teams as additional support systems when they experienced issues that needed to be addressed (e.g., departmental advisory issues, career questions, personal/life support). In fact, some scholars reported having a strong sense of trust in their program teams, a value that they found to be one of the greatest qualities of the UCEM program and significant to their doctoral experience. This experience was also related to the approachability of program team members and even other scholars within the program, a characteristic that scholars associated with exemplary mentorship.

Additionally, scholars recognized that they, too, serve a critical role in cultivating positive mentored experiences—reaching out to mentors, putting in effort within relationships, being proactive, and being open to and in an adequate mental state for mentorship. Interestingly, while students emphasized their need for and desire of mentorship, many scholars also saw themselves as mentors (see Table 2 for additional information about scholars’ valued mentoring experiences).

Table 2:

Six Valuable Mentorship Experiences

01	Peer Mentorship	One of the most valuable systems of support accessible to scholars was peer mentorship, though this mechanism was often organically formed and scholar driven.
02	Scholars as Mentors	Scholars often identified as mentors, or deeply aspired to serve in that capacity, being intentional in their efforts to "pull as they climbed."
03	Appreciation for UCEM Program Teams	Scholars expressed fondness for the UCEM program team—for their pride in the program, enthusiasm, resourcefulness, and honesty. Team members were described as supportive, encouraging, knowledgeable, and integral to fostering community.
04	UCEM Program Team Thought Partnership	Scholars were grateful when the program team served as thought partners and sounding boards, even though the staff’s influence on academic or professional issues was limited.
05	Mentor-Scholar Shared Identity	Scholars noted the importance of being able to discuss matters with faculty and staff with whom they can identify, particularly since there were very few BIL faculty and staff, if any at all, within their departments.
06	Offices Centering DEI	Institutional offices that centered DEI, like Cornell’s Diversity Programs in Engineering or Penn State’s Office of Graduate Educational Equity Programs, were places where scholars could receive mentorship from affiliated staff and leverage as extensions of the UCEM community.

Strengthening Mentorship Supports

Scholars appreciated elements of the mentorship they received; however, many also reported negative and inconsistent mentored experiences. Students highlighted that despite gaps in their receipt of mentorship, they value mentorship and believe it’s extremely important for BIL students to at least have one official mentor who is “decent” and supports them with care and attention. In essence, scholar feedback provided evidence of mentoring gaps and a vision for exemplary mentoring.

Gaps in Mentorship

- **There is a lack of formalized mentorship structures across UCEM institutions**, despite UCEMs having a mentorship structure on paper. Instead, many scholars received informal mentorship via UCEM events, through UCEM leadership, or from affiliated staff. Numerous scholars equated seminars and workshops with mentorship since that is the extent to which many experienced it.
- By and large, **there was a perceived gap in the assignment of UCEM-affiliated faculty mentors**. Scholars reported being unaware of faculty assigned or available to them outside of their doctoral advisor. Instead, they were often encouraged to seek out mentorship through UCEM-related activities, without much guidance to support navigating that process.
- A majority of scholars expressed **frustration about or desperation for mentorship and guidance**, resulting in many lowering expectations for mentoring in light of minimal levels of support.

Visions for Exemplary Mentorship

- **Networked, holistic, and culturally responsive approaches to mentorship** are highly desired by scholars to adequately address their varied needs.
- Scholars also hope for **personalized, one-on-one mentorship, with interactions occurring regularly** to allow for the development of strong, trusting bonds.
- **Scholars amplified the importance of having mentors with similar lived experiences**—persons of color, women, mentors coming from a low socio-economic background, mentors who were first-generation college students, or non-native English speakers, to name a few.
- **Mentors outside of scholars’ departments** were recognized as integral to counter the power dynamic that naturally exists in relationships with their academic advisers

“

I saw their name on a sheet one time and that was the extent of my mentorship with the department.

SLOAN SCHOLAR

“

All I really want at this point is someone who treats me like a human with respect.

SLOAN SCHOLAR

Community

Perceptions of community differed across scholars, with variations observed both within and across institutions. Factors that contributed to or detracted from students' sense of community included cohort year, racial/ethnic identity, and effects of the COVID-19 pandemic.

Positive Attributes of the UCEM Community

When reflecting on the UCEM community, many scholars described feeling welcomed, supported, and enfolded in a community (see Table 3). Terms often used to characterize the UCEM community were close-knit, wholesome, and family. Many scholars expressed feelings of joy regarding the diversity of the UCEM community, appreciating the differences in culture, ethnicity, language, and lived experiences represented within their specific cohorts as well as the UCEM community at large. UCEM—and particularly its peer network—served as a safe space for scholars to share experiences and be in community with others of similar backgrounds. Scholars reported a strong inter-relationship between peer-to-peer mentorship and a positive sense of community. Cultivated scholar relationships live beyond their graduate education studies, with scholars describing the development of life-long connections.

Table 3:

Six Positive Attributes of the UCEM Community

01	Common Backgrounds and Experiences	A highlighted benefit of UCEM was the pre-existing community of people from similar backgrounds, since forming such communities in graduate school can be challenging.
02	Easing of Culture Shock and Isolation	The UCEM community eased culture shock at the differences in diversity, degrees of wealth, and historic experiences, and also countered feelings of isolation and aided in defeating feelings of imposter syndrome.
03	Shared Scholarly Pursuits	Scholars valued being in community with like-minded people of color, who were similarly interested in scholarly pursuits.
04	System of Support	Scholars appreciated a robust system of support, which was paramount during times of racial tension.
05	Multidimensional Support	Community served as a vehicle for multi-dimensional scholar support across academic, professional, mental, emotional, and social domains.
06	Access to Institutional and UCEM-wide Networks	This community enabled networking with professors, deans, external guests, alumni, and scholars within and across UCEM institutions, that may not have otherwise been feasible.

Opportunities for Community Development

While many scholars praised UCEM's strong community-building qualities and their subsequent sense of belonging, other scholars have not experienced this closeness. The COVID-19 pandemic greatly impeded the cultivation of community. Moreover, even though the UCEM program values diversity, racial equity, and inclusivity, it's not clear to scholars that their academic departments hold those same beliefs. Scholars felt that when academic departments don't value diversity and inclusion, they do not serve as an inclusive environment to recruit BIL students. The implication of these at times hostile departmental cultures is that UCEM becomes the only space where students feel welcomed and valued.

Impacts of COVID-19

- **There were tremendous differences in perceptions of community pre- and post-pandemic:** COVID-19 deterred UCEMs' maintenance and/or cultivation of a strong sense of community.
- Overwhelmingly, **newer cohorts yearned for the level of connection and integration they observed or heard about from previous cohorts.** Some described feeling "cheated" out of having access to a system of support rich in value.
- **Opportunity for genuine interaction was lacking** as meetings and interactions were limited to virtual environments.
- **Engagements and events were held less frequently** than scholars would have liked, hindering opportunities for community building.

“

Sloan provided a community of scholars that looked like me.

SLOAN SCHOLAR

Community in Silos

- **Some scholars didn't feel connected to the UCEM community at large,** with familiarity only with those in their departments or cohorts.
- **Scholars desired greater connection with alumni** as a means of strengthening and extending community.
- **Sense of community or belonging didn't always extend to the institution.** Some scholars reported a lack of support as BIL students at their institution, describing campus cultures as toxic, feeling invisible and unheard, and having a sense that they were not authentically welcomed.



“

A stronger sense of community outside of the program is necessary for the whole program to actually be successful.

SLOAN SCHOLAR

Financial Supports

Funding was described as one of the greatest benefits of the UCEM program as it often provided scholars with key flexibility that supported their doctoral success.

Benefits of Financial Supports

The advantages afforded to scholars given their access to additional financial resources transformed their academic experience (see Table 4). Scholars recounted how UCEM funding facilitated their freedom to make choices, like selection of a research advisor or project based on their passions, as opposed to being limited by funding availability. Carrying funding also made them more attractive to prospective advisors. Scholars described having increased opportunities to pursue research interests and take intellectual risks, possessing the flexibility to switch labs if situations weren't working out as intended, and being able to focus on progressing academically and advancing their research instead of being burdened by external obligations (e.g., additional teaching responsibilities of assistantships). Financial autonomy was also deemed a great developmental steppingstone for those considering faculty positions. Also of importance, many scholars expressed feelings of relief that they had much less worry about how they would get their next meal or afford housing. With this financial independence, scholars understood the goal of the funding: use the money in ways that help you earn your PhD.

“

Sloan is freedom in grad school.

SLOAN SCHOLAR

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Table 4:

Five Benefits of Financial Supports

01	Empowerment	UCEM funding is empowering. Language like freedom, flexibility, and independence was commonly used by scholars when describing the impacts of UCEM funding support of their PhD experience and overall livelihood and wellbeing.
02	Flexibility and Latitude	The flexibility in being able to use the award to enrich their livelihood, in addition to supporting their professional development, was transformative for scholars.
03	Breadth of Application	Financial support was used to fund a wide range of scholar needs, including professional development, books and supplies, technology and equipment, research engagements, travel, housing, meals, and livelihood expenses (e.g., mental health care, winter coat, mattress).
04	Opportunity	Funding was attributed to making the PhD attainable; it was perceived as helping to level the playing field.
05	Agency	Financial autonomy was identified as a source of professional development by scholars afforded that liberty, with scholars making parallels to faculty/scientists managing a research project, including budget.

Strengthening Financial Supports

Whereas there was tremendous benefit associated with program funding, there were logistical considerations identified that, if strengthened, could further extend the financial impact of UCEM.

Financial Literacy, Acuity, and Planning

- **An intersectional lens is important to adopt** within the UCEM model, and notable as it applies to financial literacy. As an illustration, many Black, Indigenous, and Latina/o/e scholars reported also being from low socio-economic backgrounds. Students identified how this factor was associated with the gaps they recognized in their financial literacy during the management of their funds.
- **Some scholars wished there was greater guidance early in the program about wise expenditures**—advice on how funds could be used for academic and professional enrichment. Bolstered supports relating to financial literacy and money management would have been appreciated (e.g., tax implications of funding, financial planning strategies, effective budgeting practices).

Clarity in Funding Expense Approval

- **Scholars were not always clear about what expenses were allowable.** They questioned whether funding could be used only to support PD, traditional academic expenses, or particular research costs. They were uncertain if other costs associated with schooling—direct or otherwise—were also permitted (e.g., livelihood expenses like food, shelter, mattresses, winter coats, or mental healthcare; professional clothing or passport fees for conference attendance; technological resources, specialized tools, or office equipment).
- **There was sometimes confusion among faculty in scholars' departments or labs** regarding the purpose of UCEM funding. Faculty weren't always clear that Sloan funding should not be spent on expenditures that department or labs should be funding, and that money should directly benefit scholars.

Funding Disbursement Systems

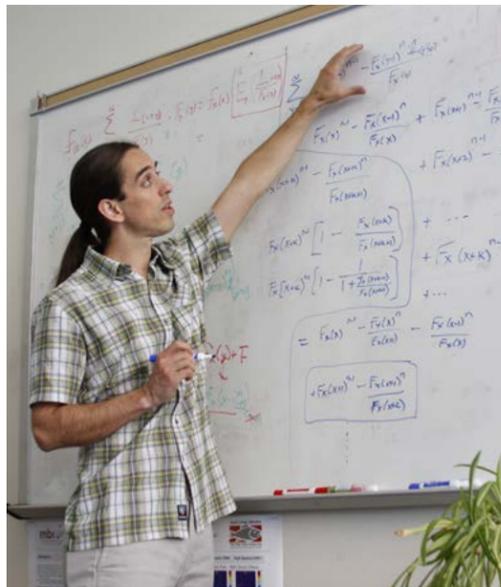
- **Access to financial resources varied by institution**, with some institutions requiring detailed financial plans outlining intended stipend utilizations and formal approvals, while others allowed greater discretionary independence. Finding balance between these two modalities could simultaneously facilitate scholars' financial autonomy and productive resource utilization.
- **Scholars expressed frustration at the delays sometimes experienced with disbursement of funds**; when needing to front the money, prolonged reimbursement periods meant interest accrual on credit cards. Sometimes processes weren't nimble enough to quickly respond to last-minute needs, like a last-minute PD opportunity.

“

I've always been money conscious just because when growing up I didn't have much of it. . . . Though I appreciate the money, when I first got the money, I was like, 'Okay, so y'all are giving me \$40,000. What do I do with this money? How do I use the money?'

SLOAN SCHOLAR

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Professional Development

Scholars described how UCEM funding provided the advantage of helping them learn to navigate professional environments (see Table 5). Financial resources were often used to support student attendance at conferences and other professional events, where they were able to present their research and gain the experience of operating within scholarly spaces. Scholars also appreciated programmatic offerings provided locally on UCEM campuses. There were recounts of events that included representatives from academia and industry, which exposed students to varied career sectors and pathways. These experiences helped to “broaden connections” and “intellectual growth,” opportunities important to scholars. At some institutions, workshops also extended beyond traditional academic and professional domains, exploring emotional and social health as well as personal wellbeing.

Table 5:

Six Important Characteristics of Professional Development Offerings

01	Holistic Nature	Scholars recognized the holistic manner with which program structures helped to facilitate their personal and professional development; this holistic approach was an advantage that benefited their academic success and career prospects.
02	Access to a Broader Resource Network	Scholars conceptualized the many individual and collective UCEM program offerings as expanding their access to quality professional development within an esteemed network.
03	Intra-community Bonding	Professional development fostered community development, as workshops and events facilitated greater touch points among scholars.
04	In-Person Connection	Many scholars noted being much more receptive to in-person offerings compared to remote programming given the benefits inherent to physical engagements, particularly considering the limitations they’ve experienced with virtual activities.
05	Breadth and Comprehensiveness	Professional development entailed academic, research, career, and leadership development, as well as mental health support, and frequently took the form of luncheons, workshops, and seminars.
06	Scholarly Community Centering BIL People	The Institute on Teaching and Mentoring was highly regarded by many scholars, who conveyed that the Institute was valuable and inspiring, and tailored to Black and Brown people.



[The SREB Institute]
was just a space where . . . you saw so much
greatness for Black and Brown people.

SLOAN SCHOLAR

Scholars were particularly complimentary of the Institute on Teaching and Mentoring, describing it as a major asset. Whereas scholars are typically one of a couple persons of color in their departments or colleges, at the Institute, they witnessed hundreds of BIL individuals pursuing or having completed PhDs: “Just going there for the first time, I was blown away. [I was] like, ‘Wow, there’s so many of us that are Black and Hispanic and Indigenous’ . . . hopefully, we all succeed and get those numbers up in all of these high-level academic and intellectual spaces.”

Professional Development Enhancements

Many components of PD were greatly beneficial to scholars, serving as a source of enrichment across personal, academic, and professional domains. However, scholars also saw opportunity to further enhance the nature of PD offerings made available, identifying the following qualities that could be strengthened:

- **Scholars perceived the UCEM program as having a strong bias toward academia**, a focus that surfaces in the nature of PD opportunities made available, despite the fact that scholars take many other professional paths.
- **Scholars would like increased exposure to and networking** with diverse students, alumni, and faculty thriving in STEM.
- **While highly valued, PD offerings could sometimes feel redundant**. Some scholars expressed that there is opportunity to refresh seminars and workshops to introduce new topics.
- **PD could be improved by tailoring workshops and events to stages of scholars’ PhD trajectory** to increase relevance, subsequently heightening utility and scholar engagement.
- **Scholars wanted more career focus early in the program** so that they had time to build the skills needed for their desired careers.

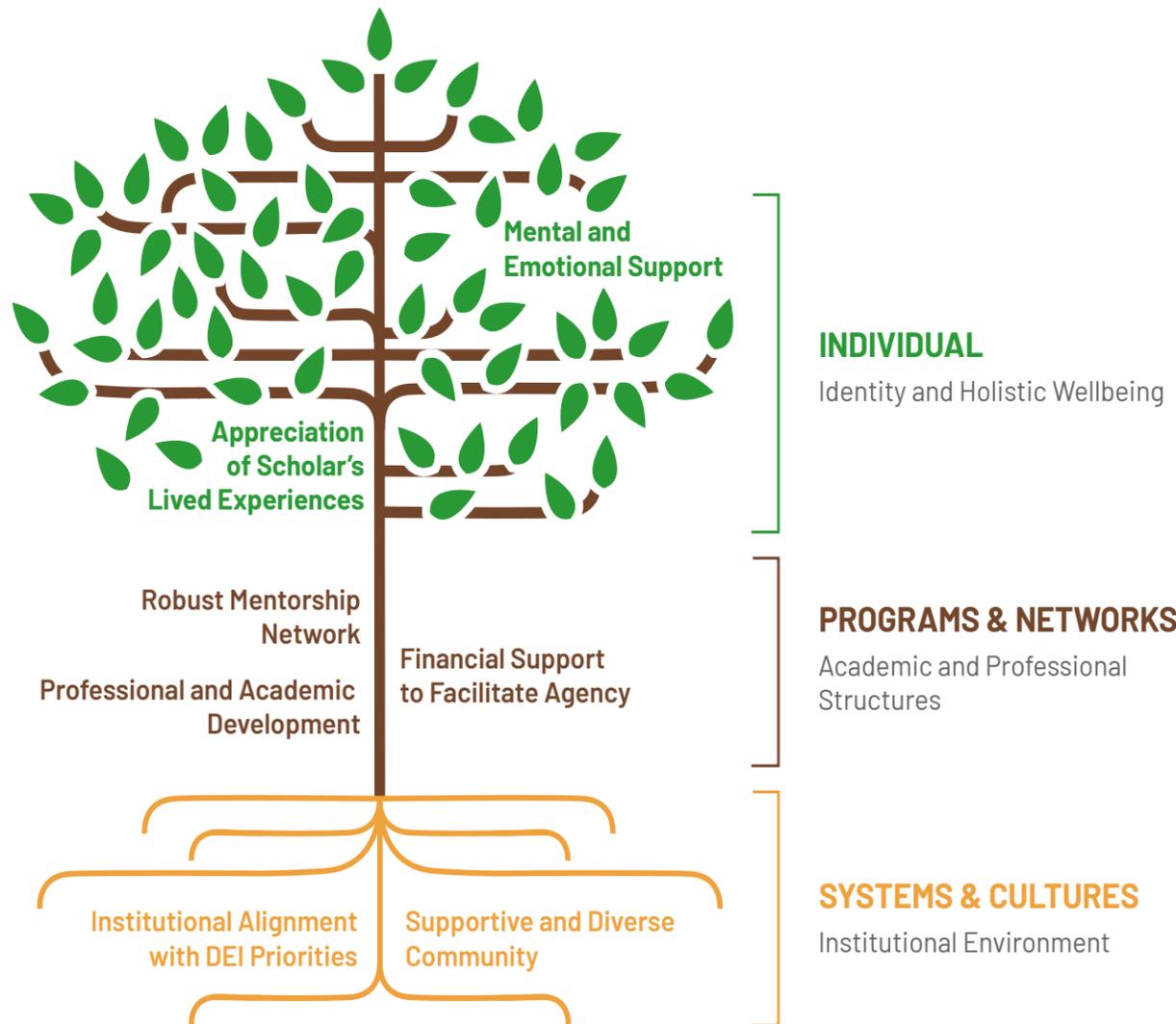


KEY LEARNING

Supporting BIL Students

Approaching this work from a paradigm of equity meant recognizing students as experts in their lived experiences and therefore uniquely positioned to both articulate their needs and identify mechanisms best suited for addressing them. Scholars recounted how it is commonplace for students from minoritized identities within STEM (and postsecondary education systems more broadly) to encounter differential experiences, requiring tailored support structures to aid in facilitating their success. When reflecting on what BIL doctoral students in STEM need to be successful, scholars described an ecosystem of support that comprised three domains of influence: (1) Individual, (2) Programs and Networks, and (3) Systems and Cultures, each of which are described below. See Figure 12 for an illustration of this ecosystem of support.

Figure 12: Ecosystem of Support for BIL Doctoral Students



Individual Domain: Identity and Holistic Wellbeing

The individual level centers scholars' personal needs. They desired to be valued as full persons with multiple, diverse identities and yearned for the prioritization of their holistic wellbeing. In alignment with these needs, scholars named two approaches to support: Appreciation of Scholars' Lived Experiences and Mental and Emotional Support.

Appreciation of Scholars' Lived Experiences

When considering catalysts that could provide scholars with the stimulation hoped for in their strides toward success, scholars often described wanting people within academic and professional spaces to have a greater appreciation for their lived experience.

Appreciation of scholars as whole persons

Scholars shared an appreciation for having a community in UCEM that recognized them as complex persons as well as the struggles they are likely to encounter as persons of color in an environment not designed with them in mind. Scholars also noted the importance of having institutional stakeholders (especially faculty and administrators) who understand their unique challenges and needs. Students shared that there are many spaces where they don't feel heard, seen, or understood on campus or in their departments, and held that unless students are heard, faculty, program, and university staff will be unable to support their individual needs.

Acknowledgement of scholars' lived experiences

Scholars mentioned the need for safe spaces to discuss issues of race, STEM resiliency, campus climate, and the complex interaction that exists among these phenomena and graduate STEM education. Scholars also emphasized the value of having mentors who are persons of color, as they have likely gone through the academic process and understand the added racialized burdens, like that of implicit bias. They noted how it was particularly difficult being a student of color in 2020 when the country was divided on race. One scholar talked about the comfort they felt having someone on campus they could turn to when needing to discuss sensitive race-related issues: "He understands."

Scholars identified the crucial need for faculty and other institutional stakeholders to be prepared to work with diverse students. This equipping calls for increased cultural competence, including awareness of what is going on in the world that might affect BIL students: "I can't focus on the presentation. I can't retain [information]. I can't have the same scientific conversation that the other people in the room are having. Then the professors are looking at me as a student like, 'Well, why can't she keep up?' They're not thinking about the fact that some Black person just got shot." Scholars want professors to understand that there might be differences in how they are each experiencing a moment, and that influences on BIL students' academic state of being might not be confined to the boundaries of the immediate classroom space.



The concept that research is the only thing that I should be focused on and it's the only thing that should have my focus, I think, is a very foreign thing for a Black person.

SLOAN SCHOLAR

Reflecting on academic and professional experiences from the lens of their diverse, intersecting identities, scholars yearned for someone with whom they had similar shared experiences and after whom they could model a career.

Intersectional understanding of identity

Scholars also noted the importance of having their multiple identities and their intersections recognized as evident by having a community that sees “the accumulation of all your identities.” In practice, this recognition could mean being provided differentiated supports based on a student’s subcategories of minoritization as well as their amalgam. One scholar shared, “It affects me as queer being lumped in with cisgender White Latinos and other students that don’t go through the same issues or aggressions as I do and as other people do.” Another explained, “I’m Hispanic, which is a minority . . . but I’m also legally blind. That has been a huge hindrance in regards to my academic roadmap because I just don’t know of any academics that are blind at all.” Reflecting on academic and professional experiences from the lens of their diverse, intersecting identities, scholars yearned for someone with whom they had similar shared experiences and after whom they could model a career. At the very least, scholars desired someone able to appreciate their diverse, intersecting identities, acknowledge their identities’ influence on their doctoral trajectory, and offer holistic support.

Mental and Emotional Support

At the individual level, scholars underscored the importance of having in place mechanisms and a culture of mental and emotional support, including encouragement of their belonging, the prioritization of their wellness and wellbeing, and protection from toxic and hostile cultures and climates.

Encouragement of belonging

Some scholars reported receiving comments from others implying that the only reason they were granted a scholarship was because of their race or gender. Such comments, they stated, can trigger feelings of imposter syndrome, of being accepted just to meet a quota: “You need . . . reassurance that you are here because you deserve it, because you have worked hard, and because you’re more than good enough to be here.” Even more often, scholars emphasized burdens such as being the only person of color in a class or lab, exacerbating internalization of these dispositions: “Not seeing other people of color makes you feel like maybe you shouldn’t be here. You have imposter syndrome—maybe this isn’t for you.”



You need . . . reassurance that you are here because you deserve it, because you have worked hard, and because you’re more than good enough to be here.

SLOAN SCHOLAR



Prioritization of scholars’ well-being

Scholars cited the imperativeness of a culture that prioritizes wellness and wellbeing as integral for their mental and emotional health. Scholars noted that a “really critical” skill to learn is balancing workload without burning out, though admittedly, this mentality is “at odds with the pressures that students generally face in graduate school.” Along similar lines, scholars generally recognize that the PhD journey is a “marathon . . . not a sprint,” as one student put it. They talked about how getting through the PhD program is “very stressful” and “very much a mental thing.” To best handle this pressure, scholars feel the need for greater attention to the necessity of, and coaching around, establishing boundaries. They discussed how PhD students often aren’t aware that setting these parameters is needed, let alone acceptable, especially since it is common in academia to have advisors “who push students too far.” Scholars conveyed how students are groomed within STEM to “prioritize theoretical understanding and their skills and traditional STEM topics,” whereas other competencies integral to becoming a well-rounded scholar and maintaining a healthy well-being are much less promoted.

Unsurprisingly, the COVID-19 pandemic added to mental health challenges, but many scholars said their UCEM program made efforts to promote good mental health and access to resources, the kind of support that can happen when dedicated individuals are in place to serve students. “Everyone needs mental health resources,” one scholar mentioned, noting it is important for scholars to know they have support not only for their academic progress but also for their needs on an emotional level. In addition to traditional academic and professional resources, scholars identified mentoring circles and communal reflection as beneficial to their personal and professional wellbeing.

Protection from hostile and toxic cultures and climates

Scholars emphasized the importance of having protections against toxic campus cultures and climates. Several students had extremely negative experiences on what they describe as a “hostile” campus. Many students reported exploitative and toxic working and learning environments within a “system . . . designed to break you.” One scholar conveyed, “I think graduate students do not get paid enough, period. I think there needs to be more mental health support. Being a graduate student doesn’t mean breaking your back . . . I’m very against the mindset that graduate students need to get paid nothing and work so much.” In this vein, scholars wanted more structured support for BIL doctoral students to combat systems of exploitation and exclusion. And while some scholars felt that UCEM efforts to this end were constructive, they held that the program doesn’t go far enough to address the root of the problem, which includes issues like hostile campus climates, publish-or-perish promotion models, and low retention rates for underrepresented students in STEM.



Being a graduate student doesn’t mean breaking your back . . . I’m very against the mindset that graduate students need to get paid nothing and work so much.

SLOAN SCHOLAR

Programs and Networks Domain: Academic and Professional Structures

At the level of programs and networks, scholars report having multilayered needs for academic mentorship, career development, and financial independence. In alignment with these needs, they named three categories of support: a robust mentorship network; personal, academic, and professional development; and financial support to facilitate agency.



No one other than the students are going to know what they need to succeed in a program.

SLOAN SCHOLAR

Robust Mentorship Network

Scholars reported the importance of mentors from various spheres of their experience, including faculty and peers.

Multiple forms of mentorship aligned with varied scholar needs

Faculty guidance and encouragement were deemed “very critical” and “a big thing.” Faculty mentors were especially valued for their perspective as a person who was not a scholar’s research advisor, worked outside the scholar’s department, and provided “a broader view of the workings of academia and . . . a PhD program.” With a faculty mentor, scholars appreciated having someone to “bounce ideas off,” offer guidance if they were having issues with their advisor, and direct them to valuable resources. They also wanted a faculty member who wasn’t a direct advisor to ensure that their feedback wouldn’t be counted against them professionally or academically. Further, scholars noted that support of more senior peers was also valuable because they “have done it before” and can inform scholars where and how to access additional support and resources.

In response to the challenges of intersectionality, some scholars also called for more tailored support. While they appreciate UCEM’s broader PD and emerging mentoring structures, they want to be afforded greater input regarding what support looks like. As one scholar put it, “No one other than the students are going to know what they need to succeed in a program.” Without listening to what each scholar needs, they fear that some of them will fall through the cracks. On the flipside, tailoring support could lead to more success for more students.

Diverse network of mentors, inclusive of successful People of Color

Scholars conveyed a desire for support from mentors from shared ethnic and cultural identities who were experiencing success in their fields. One scholar recounted the benefits that resulted from this type of mentorship pairing: an invited speaker for one of the UCEM monthly sessions became their long-term mentor, even after they graduated. For this scholar, the relationship was strong and long-lasting because this speaker-turned-mentor was from the same ethnic background. Reflecting on their engagements, the scholar held how “nice it was to have someone who understood what it was like being Hispanic in grad school.” This scholar also noted their similar views on success: “To us, it does not mean you-win-and-everybody-else-has-to-lose kind of thing.”

Scholars also expressed that they’d like more exposure to, and networking with, diverse students, alumni, and faculty thriving in STEM. “Seeing people from similar backgrounds succeeding in these positions,” said one scholar, “we are definitely lacking in that. My own advisor, he is Puerto Rican, and he has a high-standing position in our institution. Seeing that has demonstrated to me that I can indeed achieve success in this setting, and that’s huge.” Scholars also noted that while not everyone has this type of role model, if more did, they would have a strong, additional source of support to continue persisting toward success.

Strong, trusting, and authentic relationships

Students remarked that while having professional and academic networks was very important to them, they valued relationships that were not only professional but also deeply personal. For some scholars, similar cultural or ethnic backgrounds strengthen the bond within mentorship relationships. Scholars expressed how it is the “personal and ethnic bonds” that keep successful relationships going. They also found consistent one-on-one check-ins to discuss progress, challenges, and pathways forward to be integral to their success.

Personal, Academic, and Professional Development

Scholars emphasized the importance of having opportunities and resources for personal, academic, and professional development—and of being made aware that such supports exist.

Access to resources that support success, including navigating barriers

Scholars held that institutions can’t “just throw money” at BIL students, declaring that funding alone is not enough. They emphasized the critical need to have access to other structures such as social support, programmatic offerings, career development opportunities, and extracurricular supports. When reflecting on efforts that could aid with navigating barriers,



My own advisor, he is Puerto Rican, and he has a high-standing position in our institution. Seeing that has demonstrated to me that I can indeed achieve success in this setting, and that’s huge.

SLOAN SCHOLAR





scholars suggested workshops that discussed “how to stand up to an advisor, when to put your foot down, learning to say no, how to ensure you’re not being exploited, goal setting, healthy productivity, and burnout,” speaking to issues related to their less positive experiences as STEM doctoral students. Scholars want to learn how to improve mentoring, have difficult conversations, assess professional fit, and establish boundaries.

As an illustration of extracurricular guidance, appreciation was expressed for a senior-level administrator’s help accessing health insurance for one scholar’s family: “She just grabbed me into her office and helped get all the documents I needed for Medicaid so I [could] give my daughter help, because I just couldn’t figure it out. She’s a high-level person. I did not know this at the time. That was remarkable.”

Scholars also discussed needs related to their belonging to multiple minoritized communities. A salient identity for many scholars was being of first-generation status. They noted that first-generation graduate students need to be made aware not only of opportunities and resources that might be available to them but also “how to network, how to collaborate, how to reach out for new projects, how to be involved in a research community, and how to make themselves known.”

First-generation scholars conveyed the need for mentors to show them the ropes, help them navigate academe, and direct them to opportunities. They recognized their disadvantage as first-generation students: “One thing that surprised me when I got here is that a lot of my peers had parents [who] were professors or had parents with bachelor’s degrees, whereas I came from a family who either had . . . high school diplomas or a little bit of college.” Access to workshops on topics such as thesis writing, publishing logistics, or technical skills development (e.g., drawing graphs, data management, citation managers) were deemed important for their success. As the first in their families to attend college, they feel being equipped with a toolkit of resources, including support to process experiences, can make all the difference.

Exposure to diverse opportunities and pathways

When considering professional trajectories, scholars desired increased exposure to, and awareness of, opportunities available upon completion of their advanced STEM graduate training, though many perceived that there is often a strong culture of academic career bias within academe. Scholars valued being afforded opportunities to explore broad sectors of professional interests and encouraged to act on curiosities and discoveries.

Financial Support To Facilitate Agency

An important dimension in the Programs and Networks Domain is scholars’ desire for financial support that helps to facilitate agency and independence. This aspiration includes having both access to funding and flexibility with how and when to use such funding. Funding alleviates a lot of stress, especially for students who come from low-income families. UCEM takes a welcome approach to funding by recognizing the individualized nature of financing graduate education. As one alum stated: “I think Sloan’s approach to agency and financial supports are really key. Because of my [non-traditional] route, I’m older and so I was way less willing to take certain risks; [for example,] I’m not taking unpaid internships.”

Further, facilitating access to funding goes beyond simply providing grants or scholarship monies. It must include opening doors for greater academic or professional exposure as well as increased relationship building that can lead to additional funding sources. As one scholar noted, “Getting the opportunity to go for free to [a] conference to meet people, to be a part of workshops, and [attend] an exhibit fair to try to get some kind of postdoctoral position or internship or talk to other faculty members—I think that is access to opportunities.”

Systems and Cultures Domain: Postsecondary Ecosystem

At the level of Systems and Cultures, scholars report needs with regard to the postsecondary ecosystem and its impact on their experiences. They named two categories of support: institutional alignment with DEI priorities and having access to a supportive and diverse community.



Sloan has only been
a good thing for me,
but it is not enough
to fix this system that
is very broken.

SLOAN SCHOLAR

Institutional Alignment with DEI Priorities

Scholars noted the importance of institutions having an articulated mission and vision aligned with DEI priorities and working to ensure buy-in across departments and other segments of the institutional community. To operationalize that mission and vision, transformation is needed at the systems level with regard to beliefs, values, and behaviors.

Systems-level transformation in beliefs, values, and behaviors

When asked about the needs of BIL doctoral students in STEM, scholars indicated that UCEM offers helpful financial and community support, but the bigger problem lies with the culture of academia and specifically graduate education:

There are things in the doctoral program that are bigger than Sloan that I don’t think Sloan by itself can completely solve, but these are more fundamental issues in doctoral studies. For example, there’s a lot of pressure to publish and [challenges regarding the] mental health aspect, but those tend to stem from academia itself and your advisor.

Scholars emphasized that whereas a program like UCEM might be able to meet the unique needs of BIL doctoral students in STEM, accountability for supporting diverse students goes beyond one program or even one institution. A scholar shared how their department faced challenges around inappropriate comments being made regarding race in seminar settings. As a result, this scholar talked about how these observed discriminations and disparities “definitely shaped how I look at the entirety of it,” including the scholar’s viewpoint that a program like UCEM “can’t really fix that as an issue,” as isms and other inequities are seemingly deeply rooted within institutional systems and cultures.

Multiple scholars also noted challenges with faculty in relation to DEI. They conveyed that all faculty associated with UCEM should understand the experiences of marginalized students and have a pedagogical posture that centers equity, high standards, and student success. A scholar suggested that an indicator of faculty investment in DEI is whether faculty members who do not represent historically excluded groups are invested in shifting campus climate, rather than placing the burden solely on scholars (and other people) of color. This appears



to be an area for institutional improvement, as many scholars reported they would benefit from more positive interactions with faculty members in their departments. When reflecting on the considerations necessary for supporting BIL students in STEM via faculty mentorship, a scholar shared the following:

If faculty members don't care about diversity, what kind of resources and mentoring are they able to provide a student of color that is in a mentoring program like Sloan? If the faculty member doesn't see the benefit of putting extra effort into recruiting Black students or retaining Black students, then me as a Black student when I get assigned to that faculty, our conversations are literally going to be pointless.

In a similar vein, scholars consistently felt it was important to conceptualize DEI as a symbiotic relationship where students, faculty, and institutions are benefitting equitably in relation to one another. Scholars noted that some faculty don't always see DEI as mutually beneficial. They emphasized the imperative of holding a disposition that it is not only students of color that benefit from work centering DEI: all students (and other institutional stakeholders) are better off because of it.

Broad shared and demonstrated commitment

Scholars felt it to be significant that diversity initiatives are led by all members of the university community. Scholars are keenly aware that a lot of engagement with DEI is spearheaded by stakeholders of color on campus and that those "leading the charge" on DEI initiatives seem often to be persons from minoritized identities, students included. As one scholar put it: "I'm tired of serving on every diversity committee. I know y'all just want me here for a reason . . . this is stuff I like to do but at some point I get tired." Such additional commitments add to students' workload. Scholars want their majority counterparts to realize that DEI initiatives cannot always fall on the backs of BILs—that all people should invest in these efforts. They posit that a shift toward a new norm for furthering these agendas needs to occur, with "a clear desire from the administration, faculty, and staff in general that aren't underrepresented minorities to also push this." To increase the prospect of success, scholars have strong beliefs that everyone must be adequately prepared to actively contribute to centering DEI—for all—on campus. Scholars also pointed out a discrepancy between articulated visions and goals around diversity and what is observed in practice: "you're promoting this on the one hand but the school doesn't look like that." That gap must also be intentionally bridged.

Supportive and Diverse Community

Also in the Systems and Cultures Domain, scholars underscored the importance of having access to a supportive and diverse community where they were one of many and felt validated in who they were as people.

Access to community

Most spoke about a community that is helpful, affirming, and reassuring, where scholars "know that they are not alone." Others described a community where scholars can discuss shared difficulties and frustrations (both academic and personal). Scholars discussed how they found their UCEM cohort to be a space where they could be open about their struggles,



If faculty members don't care about diversity, what kind of resources and mentoring are they able to provide a student of color that is in a mentoring program like Sloan?

SLOAN SCHOLAR



. . . understanding that we're all struggling, and it's hard, and it's okay, and we're going to get through this.

SLOAN SCHOLAR

"understanding that we're all struggling, and it's hard, and it's okay, and we're going to get through this." They spoke about the value of simply meeting people, hanging out, and having a natural mechanism for making friends. Scholars also described the importance of community in supporting BIL students in STEM, reflecting that access to community improved their sense of belonging.

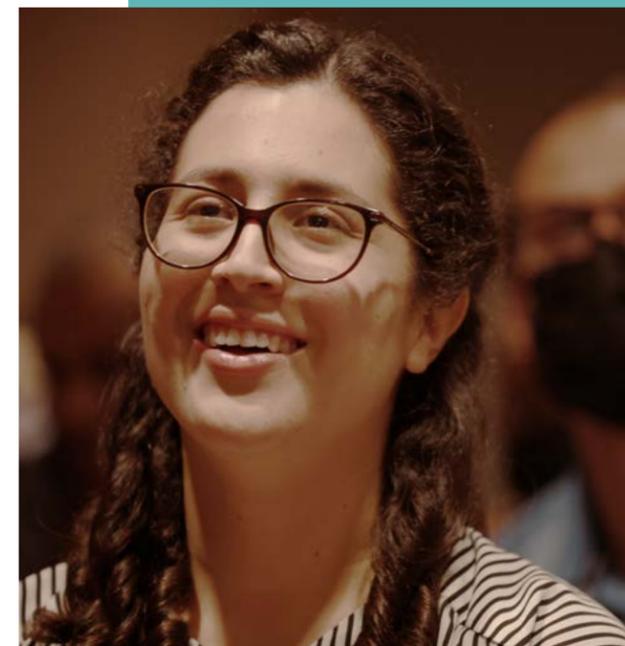
A sense of belonging, or lack thereof, was a theme in several scholars' reflections. At one institution, a scholar described how they felt "really out of place," "uncomfortable," and "like they had made a bad decision" because they felt as if they were "socially, culturally, and economically in the wrong place." However, the UCEM program helped bridge that significant gap. While previously uncomfortable and unable to identify anyone who looked like them within their university, they eventually found "good people that were from similar identifying backgrounds as me." During a time of profound uneasiness, UCEM served as "a strong community" that "felt really good to have."

Being one of many

Scholars mentioned how a general racial homogeneity at an institution can render them simultaneously highly visible and invisible as outsiders. Numerous scholars mentioned they were one of a handful of Black and Latina/o/e people in their departments; however, UCEM was a space with critical masses of both groups. As such, scholars had spaces where they didn't feel alone.

For scholars, being in community with students of color is even more appreciated when they are the only person from a minoritized background in their labs. Scholars were candid about how being the sole woman or Black person could be isolating, leading them to question their feelings and "overthinking" certain interactions. When reflecting on the value in communities such as UCEM, one scholar described how these systems of support help students to not "minimize themselves in spaces or rooms," which ultimately could push them "out of STEM, out of a certain career, out of opportunities that [they] otherwise might be empowered to have."

When reflecting on the value in communities such as UCEM, one scholar described how these systems of support help students to not "minimize themselves in spaces or rooms," which ultimately could push them "out of STEM, out of a certain career, out of opportunities that [they] otherwise might be empowered to have."





So many of us URMs can develop imposter syndrome, not so much because we lack confidence in ourselves, but because we keep being told that we don't belong there or we feel that we don't belong there. Being part of a community like UCEM sort of debunks those myths.

SLOAN SCHOLAR

Scholars also highlighted the importance of diverse representation on campus and within STEM programs to support BIL doctoral students in STEM. One alum referred to increased representation as “tricky” because there always needs to be the first student or the first cohort or the first class to attract more diverse students and “open the floodgates.” Eventually, scholars posited, the program could help institutional systems move from a paradigm of representation to one of retention. They indicate that UCEM offers a beneficial model of not just attracting BIL students but supporting their retention and success.

Not feeling the need to be the representative

In addition to feeling like they don't belong from a racial/ethnic or gender identity perspective, scholars said that it can be exhausting being the only or “representative” member of an identity group. One scholar, who was the only mathematician in their lab, said that while they got along well with their lab colleagues, sometimes they just wanted to let their hair down and be among people who understood where they were coming from as “a country boy from North Carolina.” Scholars also mentioned the pressure to be the “centerpiece” at protests when they didn't necessarily want to participate. The UCEM space was a home, a refuge, where they didn't have to represent.

Community as a form of validation and support

Another important mechanism of support was connecting with other BIL scholars in their own and other departments, with these beneficial connections being one of the many reasons students attribute the UCEM community as paramount to their doctoral experience. The UCEM community offers a form of assurance wherein scholars are comforted knowing institutional support exists for BIL scholars. UCEM also provides a visible space for BIL scholars, affording them the opportunity to see and interact with other students who look like them on a regular basis. Finally, scholars shared that UCEM opened opportunities for seeing themselves represented in success. Scholars and alumni reflected on the impact of attending the Institute on Teaching and Mentoring and how this conference affirmed their identities as BIL doctoral students in STEM. They connected with peers from other institutions who were doing impressive research—peers they might not have met if they were not in UCEM. One scholar expressed the impact of attending the conference on overcoming imposter syndrome: “I know a lot of people suffer from imposter syndrome . . . feeling like you're never good enough just because of how people have put you down over time . . . going to those conferences, you're almost like saying to yourself, ‘This is me. I can do this stuff, and these are people like me.’” Another scholar talked about being “just in awe of how many super-intelligent brilliant people of color there were in one space,” present to an extent they had never experienced before.

KEY LEARNING

Perceptions of Impact, Institutionalization, and Sustainability

In addition to having an impact on the academic and professional trajectory of individual scholars, Sloan aspires to facilitate systemic change in graduate education through UCEM and similar programs. Among other attributes, a systemic change approach seeks to identify and remove entrenched biases and barriers at the institutional, college, and departmental levels. Such work includes policy and practice change, as well as a change in the conduct and standards of STEM faculty and other gatekeepers such that they demonstrate not simply a willingness to promote diversity, equity, and inclusion, but rather a deep commitment to embedding DEI in the fabric of the educational experience.

While this kind of change was not uniformly evident, or even common, across UCEM campuses, the evaluation uncovered a variety of perceived impacts of UCEM by its stakeholders. These perceptions are informative as they signal possibilities for systemic change as well as the sustainability of UCEM efforts, the latter of which is a stated expectation of the Foundation. First, we provide a brief overview of relevant challenges before presenting the perceptions of impacts.

Challenges

UCEMs are aware of the significant challenge of not only designing and implementing a UCEM program but also institutionalizing promising practices and sustaining efforts beyond Sloan's funding. As one institutional leader shared, “The challenge has been scale because it's not an inexpensive program, and in order for it to be successful, we need the individual academic units to really be prepared to invest in it. We've had some success there, but to be honest with you, not as much as I would've liked.” Other challenges related to institutionalization and sustainability efforts include the difficulty of changing issues related to culture and climate, limited influence over departmental cultures and policies (e.g., regarding valuing diversity in admissions), limited guidance regarding expectations from Sloan, competing funding priorities, and limitations to planning capacity among the program team.



[T]he most critical [challenge] is culture change because the lived experience of people at the local level is so critical for us. When we do surveys, we still find people who feel that they're not welcome here, that they don't feel that they belong. That is something we need to work on and to stay with because that is critical to retention, to recruitment, and to ensuring that people thrive and succeed here.

INSTITUTIONAL LEADER

Perception of Impact by UCEM Teams

Given that the "Key Learnings: Scholar Experiences and Perceptions" details scholar and alumni perceptions of the impacts of the UCEM program, this section details perceptions of impacts gleaned from interviews with UCEM program teams, faculty mentors, and institutional leaders across all eight UCEMs. We did not seek to measure the extent or magnitude of these impacts and instead present the following as examples of positive practices partner institutions have been able to implement because of UCEM.

Leverage Relationship with Sloan for Securing Additional Investments

Some campus leaders described their institution's relationship with Sloan as a key point of leverage to solicit additional donor funding. As one Dean shared, "There are philanthropists that . . . say, 'Well, Sloan gives it a seal of approval, so I don't have to worry about it working well or not . . . I can put my money in with confidence.'" The UCEM program model and the success of the "ecosystem" provides administrators with opportunities to procure investments from donors to supplement scholar support for scholars and graduate students beyond the program.

Sloan's credibility and influence has also been leveraged by some UCEM program teams to secure additional investments within the institution. As one program team member shared, it's an "important lever to be able to say . . . , 'This is a priority of the foundation'" when seeking additional, internal resources.

The ability to leverage an institution's relationship with Sloan to secure additional internal and external investments is key because of the funding landscape for UCEM's priority populations. Several institutional leaders shared that funding for graduate initiatives is relatively small compared to undergraduate initiatives and even more so for funding graduate initiatives focused on BIL students. When reflecting on constraints regarding advancing equity in STEM graduate education for BIL students, one Dean shared: "[Partnership with Sloan] can really be the critical piece to addressing a problem that we wish we were addressing all along but never really had the resources to do."

Create a Community of Learning and Support Among Institutions

Similar to the ways each cohort of Sloan Scholars provide support to one another, the collective cohort of UCEM program teams from each institution provide support to one another. One UCEM program team saw inter-institutional collaboration and learning as a strength to the Sloan approach: "The idea that you have UCEMs at different institutions and the leadership of the UCEM programs can get together and share experiences that might benefit each other." As another program team member shared, "[There's an] exchange of knowledge and practice, where we can look at who's doing what, and what it is that you're doing that can help inform and accelerate the work that we need to be doing . . . Why do we recreate the wheel?"

NACME plays an important role in this regard through their community meetings. These regularly occurring meetings provide a space for UCEM programs not only to exchange promising practices and share resources but also to discuss challenges without a concern that it might negatively impact future funding from Sloan. This point is not to suggest that Sloan has given the institutions any indication that this negative impact would happen, but rather that the nature of, and power dynamics inherent within, relationships between funders and grantees makes it difficult to be fully transparent about things an institution or program is not doing well.

Serve as Models for Student Recruitment and Retention

The UCEMs' approach to PhD STEM student recruitment and retention (i.e., scholar support) has provided models to institutions of how to approach student recruitment and retention. For example, one UCEM institution is in the process

of institutionalizing a diversity preview weekend as a student-led recruitment mechanism. One of the two co-founders of the first diversity preview weekend was a Sloan Scholar. At another institution, the UCEM program ensured that each first-year scholar was provided a peer mentor. Subsequently, other programs adopted this model to provide peer-mentors to all incoming first-year students. As a UCEM team member at that institution stated, "These ideas that are being tested and shown to be successful for the Sloan group tend to expand beyond that group and envelop the entire department."

Shift toward Holistic Graduate Admissions Processes

We highlighted the promising practice of supporting implementation of holistic admissions processes in the scholar selection section. The perceived impact of UCEMs on various program and department admissions processes was one of the most cited across all eight programs. Specifically, this impact has been spurred by Sloan's provision of a holistic rubric that assesses students beyond standardized scores, a holistic process adapted by individual UCEMs to best fit their contexts. The UCEMs demonstrated success regarding diverse student recruitment, retention, and completion. One UCEM team member shared, "We developed a robust way of doing [holistic admissions] for Sloan, and now [36] departments have adopted that approach to admissions, which we feel has been successful." A lot of this particular team's success was attributed to their institution's graduate admissions office conducting holistic admissions workshops for departments that featured the Sloan-adopted rubric and UCEM implementation process. While a holistic approach to admissions is not adopted across all programs, one signal of progress for some teams is the steadily growing number of programs that no longer require the GRE from applicants.

Raise Visibility about Department Climate and Culture Challenges

As a critical mass of BIL students is approached or achieved in some departments, in part due to Sloan funding, BIL students' concerns and priorities are more likely to be heard. While this perceived impact was only named by one UCEM program, it is illustrative of the possible impact other UCEMs might experience. An institution leader at this particular UCEM shared how scholars' concerns about department climate and culture led to a greater investment in addressing these issues (e.g., via a climate study and an informal evaluation of teaching and mentoring practices). This leader also recounted one department lead's response to what instigated his department's greater focus on climate and culture issues:

He was frank in saying it has been Sloan. It has been the fact that we have a very large cohort of underrepresented students here, that we do have to think about how we do things, how we work with our students, how we work with each other, the kinds of language we use in the classroom. We've never had to have those questions before, faced those questions before, but now we do, and we want to do better.



Because you have the Sloan program, not just recruiting these students, but really empowering them to learn how to work within graduate education, to speak up about what they need or to go get help when they need that to help address a problem.

It's forcing the faculty to confront the legacies and traditions within the department to better serve those students. I think that's a great thing.

INSTITUTIONAL LEADER



RECOMMENDATIONS

The evaluation revealed numerous insights into what UCEM leadership, Sloan Scholars, and institutional stakeholders believe contribute to a successful program. The evaluation team had the benefit of considering these insights across all programs and used them to inform the following recommendations to encourage continued program success and improvement. These recommendations reflect and are organized into two categories: program design and grant administration.

Program design recommendations address elements that should be prioritized and included across all UCEM programs, though the degree of inclusion will vary based on each program's unique context. Grant administration recommendations focus on practices that facilitate the articulation of core UCEM design components, support future grant-making strategies, guide institutions in quality program implementation, and adequately assess progress toward or realization of initiative outcomes and impacts.

By focusing on the role both UCEMs and the Foundation play in the future success of the program, the Foundation can more intentionally journey alongside its partner institutions as they collectively endeavor to improve graduate STEM education for BIL students.

RECOMMENDATIONS

Program Design



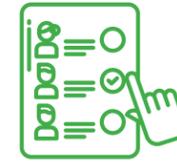
Devise strategies that adequately cover program leadership, implementation, and administrative responsibilities.

UCEM program teams oversee, coordinate, and deliver program activities—responsibilities that are most often in addition to existing institutional obligations. The program team size will vary by institution; however, program design documents should clearly state individual team member responsibilities and account for the capacity required to carry out defined duties fully and successfully. Ensuring that programs have adequate staffing capacity will likely involve applying a greater percentage of budgets to non-student award costs.



Clearly document expectations of UCEM stakeholders, including in writing.

UCEM programs rely significantly on external stakeholders (i.e., stakeholders outside of the program team) such as faculty within the respective UCEM departments and student support services staff elsewhere on campus. Therefore, clearly documenting and conveying expectations to all stakeholders (e.g., roles, responsibilities) is of high value.



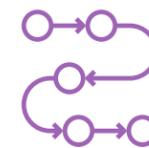
Establish scholar-selection processes with transparent, holistic criteria.

These processes should be consistently applied across UCEM departments and make clear each department's role. Many UCEM programs employ a rubric to assess students who have been nominated by their admitting department. Programs should establish and communicate to nominators these holistic criteria, while also requiring departments to explain—and ultimately commit to—how they intend to support the success and well-being of nominated scholars (e.g., access to and engagement with mentors, support for social integration, and access to PD opportunities).



Re-imagine program and scholar success to go beyond traditional, quantitative metrics.

Scholars, in particular, emphasized the importance of defining success beyond traditional metrics (e.g., increase in diversity, number of publications, and time to degree) to also include metrics such as scholar sense of belonging and scholar wellbeing. Re-imagining success should include all program stakeholders and center scholar voice.



Implement a scholar orientation or onboarding process.

Scholars' transition to a new institution, department, or city would benefit from a formal orientation or onboarding process. These processes might focus on introducing scholars to campus resources, facilitating pre-enrollment meetings with faculty and department staff, discussing financial literacy, and building community within each cohort.



Embed program learning as a core UCEM practice.

Each UCEM program should clearly identify how it assesses progression towards or regression from its goals, how insights will be shared transparently with key stakeholders, and how learnings will improve program design and implementation. This process should also involve honestly assessing STEM learning environments and broader university cultures and their influence on scholar experiences. In addition to data related to students' academic performance and progress, campuses should collect data on students' experiences of support from their advisor, department, and the UCEM program. Additionally, programs would benefit from collecting data from faculty, staff, and administrators affiliated with the program about their experience supporting scholars as well as their perceptions of departmental culture and the program's impact.



Catalyze high-level buy-in across all campuses.

The UCEM initiative's success is impacted by the program's perceived value to university stakeholders, including those representing senior administration, graduate education, schools and colleges, and academic units. Strategies for building buy-in could include demonstrating UCEM alignment to the university's mission, vision, values, and/or strategic priorities; disseminating program learnings and successes relevant to the institutional community; and/or cultivating a critical mass of campus partners with similar interests. Relatedly, UCEM program teams should communicate with interested campus stakeholders what demonstrations of commitment look like.



Efficiently and strategically coordinate university resources that align with UCEM goals.

Numerous programs, initiatives, and institutional efforts have aims consistent with those of UCEM. There is thus an opportunity to leverage shared values and collective resources to facilitate greater impact. Coordination of this type could broaden the representation of diverse communities and foster the diffusion of inclusive cultures beyond designated UCEM spaces, transformations articulated as highly desired by students.



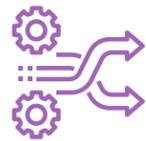
Develop sound, feasible institutionalization and sustainability plans at the program onset.

These plans should be collaboratively designed among Sloan Foundation staff, UCEM program teams, and institutional leaders. Core to this activity is differentiating institutionalization and sustainability as two related but distinct activities. For example, mechanisms might be initially institutionalized but not later sustained given limited resources, shifts in leadership, or changes in organizational priorities. To that end, identify which efforts are practical for institutionalization (e.g., cultures, values, practices, resources, structures), on what timeline (e.g., grant year, program cycle), and at what levels (e.g., program, department, school, university). It is important that progress toward milestones of institutionalization and sustainability be regularly monitored, with plans periodically refined as conditions warrant.



RECOMMENDATIONS

Grant Administration



Develop a theory of change.

This framework should 1) consider Sloan's unique positioning to influence the change it seeks; 2) account for the broader higher education landscape; 3) clarify how the UCEM design and approach aligns with its intended outcomes; and, 4) identify how the framework can be used to inform grantee-selection decisions. Similarly, Sloan should encourage UCEM institutions to develop their own theories of change or blueprints for success, noting that these two frameworks align.



Define mentorship within the program's context.

Currently, individual programs define what mentorship means within their specific context. Whereas flexibility is important, the foundation should provide guidance on what mentorship programs are expected to provide scholars. This definition should be informed by the research literature and by the diverse needs of scholars, needs that include personal (e.g., social, emotional, mental, wellness, and wellbeing), academic, and professional needs, necessitating a multi-dimensional network of support.



Design and employ a program model that balances UCEM standards and institutional autonomy.

The model should be based on insights from promising practices and institution design choices that best reflect unique contexts, with attention to the implications across the initiative. In other words, the foundation should ensure that all programs incorporate what is known to work, regardless of institutional context (e.g., having access to multiple mentors and providing easy access to funds), while also acknowledging that some design choices must be left up to the programs based on their individual contexts (e.g., scholar nomination process).



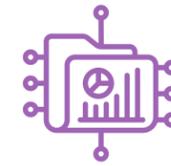
Provide greater guidance to grantees.

Sloan should provide guidance to grantees about items core to the UCEM mission, such as designing and implementing sustainability and institutionalization plans, collecting and tracking key data required for grantee reporting processes, and/or any other expectations set forth as part of the next phase of UCEM investments. NACME's efforts to build a learning community among UCEM institutions can be further leveraged to support grantees in better understanding and applying the guidance provided.



Operationalize institutional transformation in a manner that is institutionally or contextually defined.

UCEM campuses are successful in some domains while facing challenges in others, with no homogeneity among them all. As such, transformation and indeed systemic change will look differently across institutions, as will the resources required to facilitate sustained change. Those resources should be built into program budgets or may come from supplemental Sloan funds, including through funded participation by program teams in PD offerings that can assist in the change they are seeking.



Diversify the UCEM grantee portfolio to include eligible institutions with high STEM enrollment among BIL students that have also demonstrated commitments in line with the goals of the UCEM initiative.

The foundation's work in operationalizing DEI, reimagining doctoral scholar success, and advancing systemic change in STEM graduate education will likely entail integrating these institutions into the UCEM portfolio. In doing so, the Foundation will need to recognize the contextual differences and unique needs of each institution, leveraging the cultural capital they offer while simultaneously supporting opportunities for development.



Facilitate equitable allocation of funding and resources across UCEM institutions.

The evaluation revealed that some institutions put forth budgets in their proposals based on early estimates of need, only to realize that true need was different once the program was being fully implemented. The Foundation should provide opportunities to revisit program budgets at key milestones and adjust expectations in partnership with UCEM program teams. The evaluation also revealed that most programs would benefit from having more funding assigned to programmatic scholar support (i.e., beyond student scholarships) as well as staff time to support the program's many activities. That said, the Foundation can expect campuses to leverage their own resources in-kind, especially those with robust student support services and other similarly funded initiatives.



Monitor the shifting legal landscape and adjust accordingly.

A changed landscape could necessitate adjusting expectations based on the broader contexts within which UCEM is situated. As an illustration, the legality of race-conscious admissions and funding allocations could be influenced by the decisions of cases currently being heard by the U.S. Supreme Court, decisions that could have a tremendous impact on the foundational mission and structure of UCEM. Once again, Sloan will need to act in partnership with UCEM institutions, who will be responsive to legal requirements and will need flexibility and support in that response.



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