

Bernard M. Gordon–MIT Engineering Leadership Program/ Undergraduate Practice Opportunities Program

Launched in July 2007 through a \$20 million pledge (with a matching component) from the Bernard M. Gordon Foundation, the Bernard M. Gordon–MIT Engineering Leadership Program (Gordon ELP) was established to educate and develop the character of outstanding MIT students. The foundation’s pledge was the largest gift made to MIT’s School of Engineering for curriculum development. The Gordon ELP is designed to prepare potential future leaders in the world of engineering practice and to endeavor to transform engineering leadership in the nation, thereby significantly increasing product development capability.

The program provides to a select group of MIT engineering undergraduates a challenging and supportive environment in which they develop leadership skills that help them to become highly effective leaders of engineering teams. This year, more than 200 rising juniors and seniors applied to the program, primarily motivated by the excellent recommendations they received from former participants. Admission into the program is based primarily on a student’s commitment to participate and engage fully. Students can participate in one or two years of the Gordon Engineering Leadership (GEL) Program. The first year of the program (GEL1) introduces students to engineering leadership experiences and development, and sees approximately 130 students participate. For an exclusive group of 30 to 35 students, the second year of GEL (GEL2) is an intensely personalized leadership development program that includes opportunities to practice leadership and to have significant interactions with industry leaders, staff, and peers.

The Undergraduate Practice Opportunities Program (UPOP) predates the Gordon ELP. It was launched in 2001 as an initiative of the dean of the School of Engineering at that time, Thomas Magnanti. UPOP is a yearlong program that prepares MIT sophomores to enter and thrive in the professional world, through experiential learning, individual coaching, access to internships, and mentoring relationships with MIT alumni and industry partners. It includes an intense weeklong workshop during January. UPOP helps students get a summer internship that acts as a practicum in their field. In 2008, when the GEL Program was formed, UPOP became a part of the GEL Program, forming a natural progression from UPOP in the sophomore year to GEL1 and GEL2 in the junior and senior years. (Although UPOP is a welcome foundation for GEL, it is not a prerequisite.) A UPOP organizational restructuring late in AY2013 streamlined the alignment of UPOP and the GEL Program, generating improved synergy and use of resources.

In June 2016, the Bioengineering Communication Laboratory moved under the GEL program and became the School of Engineering Communication Laboratory. It uses a very effective franchise model to provide structured and need-driven peer coaching for papers, presentations, faculty applications, laboratory reports, and so on, primarily to graduate students. Participating departments and organizations at present are Bioengineering, Nuclear Science and Engineering, the Broad Institute, Electrical Engineering and Computer Science, and Chemical Engineering. The GEL program staff is excited to have the Communication Laboratory within the GEL program, and looks forward to developing synergies where appropriate.

Gordon–MIT Engineering Leadership Program

Educating tomorrow’s engineering leaders requires a new approach that incorporates students’ professional and personal progress, and growth in leadership, in an environment that fosters the development of core values and that builds on the strong technical fundamentals of the MIT education.

The GEL Program enhances students’ technical education by developing their leadership and teamwork skills in an engineering context, helping to prepare them to be effective and successful in an industry setting. In addition, the GEL Program provides augmented opportunities in leadership and innovation, character development, invention, and implementation. The program is delivered through a dedicated instructional staff supplemented by other relevant subjects, collaborations with industry, volunteer mentors, and “engineers in the room.” The program also offers professional education opportunities for early- and mid-career engineering professionals and for developing innovative design skills.

As result of this year’s efforts to sustain program growth—both with regard to student engagement and philanthropic support—the program achieved a high level of recognition both within the Institute and beyond. The GEL Program has demonstrated significant progress toward the program’s goals: to educate and prepare potential future leaders of engineering innovation, invention, and implementation; and to increase the focus of national engineering education on the development of leaders of engineering innovation, invention, and implementation.

Goal: Educate and Prepare Potential Future Leaders

Rising juniors and seniors from engineering and other select departments are encouraged to apply to the first year of the program. UPOP serves as a viable entryway into the GEL Program (in academic year 2017, 69% of incoming GEL Program students came from UPOP), but students can also enter by having demonstrated equivalent experience in an engineering project in an academic or industrial setting. First-year students participate in a set of augmenting elective subjects and immersive learning experiences that, taken together, approximate the level of an MIT concentration.

Students who demonstrate exceptional leadership potential in engineering industry and remain on track to complete the first-year program requirements successfully can elect to apply for advancement to the highly selective GEL Year Two Program (GEL2). GEL2 provides a number of personalized leadership development activities for 30 to 35 second-year students, featuring significant interaction with industry leaders, faculty, and peers. The aggregate two-year program requirements approximate the level of an MIT minor.

The program projects that 160 students will enter GEL1 in fall 2017, a number that is up significantly from the initial cohort of 17 GEL1 students in the fall of 2008. Incoming GEL1s will represent 11 departments across the Institute, including all of the engineering departments. A new record of 34 students is expected to advance to GEL2.

Incoming GEL1 students will largely represent MIT’s School of Engineering (in proportion to department size), but will also include students from Courses 7, 8, and

18 who have expressed an interest in engineering. Because GEL Program graduates are expected to work in industry with professionals from other disciplines, it is a priority to immerse GEL students in such collaborative scenarios as early as possible.

In addition to the GEL Program's ongoing efforts to support MIT's undergraduate and graduate students, the program's faculty and staff collaborate with MIT Professional Education to create and deliver courses on engineering leadership and innovation for early- and mid-career engineering professionals. In the summer of 2017, there were 39 participants in the Engineering Leadership for Emerging Leaders course and 60 in the Mastering Innovation and Design-Thinking course. These courses received positive feedback and contributed significant funds to the GEL operating budget. The program plans to explore expanding future offerings and continuing to work with participants from local companies who are able to participate in the GEL Program as mentors and "engineers in the room."

Program Expansion and Development

The GEL Program has become widely acknowledged by Institute and industry stakeholders as a valuable asset in students' educational experience and for developing potential future leaders in engineering practice.

Program staff members hope to enhance the impact the GEL Program has at the Institute through collaboration with related programs. Related programs include the School of Engineering's New Engineering Education Transformation Program; the new Humanities, Arts, and Social Sciences negotiation and leadership concentration proposed by the School of Architecture; and the program's participation in the Innovation and Entrepreneurship minor.

GEL also continues to work closely and actively with the graduate population to meet this increasing demand to create and deliver an engineering leadership development experience for graduate students. David Niño has been given the task of overseeing this initiative; for a second time, he piloted GEL's first graduate course, 6.928 Leading Creative Teams in fall 2016. In addition, Niño hosted a series of eight workshops over Independent Activities Period (IAP) and the spring semester that were designed specifically for graduate engineering and technology students who want to "make an impact" in their career. Both the graduate course and workshop series received overwhelmingly positive feedback from the graduate students who completed them.

Moving forward in AY2018, the GEL Program will create new graduate leadership offerings and work closely and actively with the graduate community to determine what the appropriate vehicle is for expansion (e.g., more residential or online course offerings, workshops and talks, mentorship and coaching, and so on). As part of the GEL Program's collaborative efforts, a discussion has begun and will continue with select engineering departments about making the graduate course a qualifying elective as a part of their PhD degree programs. The GEL Program believes that gaining support from MIT's departments will increase students' awareness of the GEL Program and increase demand for the program's graduate courses. The GEL Program also believes that collaboration with the School of Engineering Communication Laboratory, the newest member of the GEL family, will help to interest graduate students in the leadership offerings.

Further, the GEL Program is also interested in working with Resource Development to develop and implement a fundraising initiative for the graduate program; it was initially benchmarked for \$10 million in MIT's 2016 Capital Campaign.

Beyond the Institute, the GEL Program formally launched its corporate engagement and sponsorship program, targeted at engineering companies, in efforts to increase industry's participation in the program's educational pursuits and to further support students' internship and job search activities. In AY2017, the GEL Program raised \$20,000 from industry sponsorships. This year's list of corporate sponsors includes Apple, Lockheed Martin, the Naval Nuclear Laboratory, Northrop Grumman, Pioneer Natural Resources, Shell, and SpaceX. When planning for AY2018, the GEL Program will work on increasing its overall corporate sponsorship activities as well as broadening its target list of companies to create more engagement opportunities for the program's diverse group of engineering majors.

Gordon–MIT Engineering Leadership Program Years One and Two: Continued Growth

During the AY2017 admissions cycle, word of mouth from motivated GEL students, increased synergy with UPOP, and a highly effective marketing campaign generated the highest number of applications in the program's history. There was a total of 221 applications, an increase of 26% over AY2016. This overall growth demonstrates that the program's engineering students recognize the importance of strengthening their professional development skills as they prepare to leave MIT and make an impact in industry and the world.

With regard to preparing potential future leaders of engineering innovation, invention, and implementation efforts, 98 GELs earned Certificates of Completion in May 2017: 33 from the two-year program and 65 from the one-year program.

Goal: Increase the Focus of Engineering Education on Leaders Development

In AY2017, the GEL Program continued to advance the Community of Practice for Leadership Education for Twenty-first Century Engineers (COMPLETE) by participating in its annual conference at the University of Florida in February 2017. As a founding member of COMPLETE, the GEL Program remains a driving force behind advancing the agenda for this burgeoning group.

The ongoing COMPLETE meetings—the purpose of which is to share best practices and advance the practice of engineering leadership—gather representatives from more than a dozen institutes in North America with engineering leadership programs. Creative public relations efforts augmented the program's visibility in numerous national and trade publications, reinforcing GEL's position as the “thought leader” in engineering leadership.

In addition, the GEL Program actively and regularly shares best practices with others by hosting multiple visits from other institutes who either have, or are seeking to establish, engineering leadership programs at their respective college or universities. Visitors to this year's Emerging Leaders in Engineering course included visitors from the University of Los Andes (Colombia), the National University of Singapore, Northwestern University, the University of Texas at El Paso, and Western New England University.

GEL students in AY2017 also contributed to the national discussion about the landscape of engineering education. They participated in exclusive ethics and leadership conferences at the United States Military Academy, United States Naval Academy, and United States Air Force Academy.

The national impact the GEL Program has had on engineering leadership continues to be significant through the program's participation in the American Society of Engineering Educators (ASEE). In the past two years, GEL has played a significant role in creating and supporting the Engineering Leadership Development Division of the ASEE. It is the newest and the ninth largest division in ASEE, with more than 700 members who are educators of engineering leadership. David Niño is currently representing GEL. He serves as treasurer of the division and collaborates with Northeastern University and other allies to lead strategic planning.

In support of the GEL Program's mission to disseminate best practices in engineering leadership education, program staff members planned and led a discussion on how industry develops engineering leaders with other engineering leadership education programs at the annual ASEE Conference in Columbus, Ohio, in June 2017.

Staffing Update

During AY2017, the GEL Program initiated a comprehensive search for a new industry co-director to manage the three programs that fall under Gordon (i.e., GEL, UPOP, and the Communication Laboratory). Because the search attracted a smaller applicant pool than had been expected, the GEL Program is currently in the process of working with the School of Engineering's Human Resource Division to restrategize marketing and outreach efforts in hopes of filling the position before the end of the coming academic year.

Undergraduate Practice Opportunities Program

UPOP is a self-selecting, yearlong, professional development program whose mission is to prepare sophomores to successfully integrate into and thrive in the professional world, and to be strong contributors to their organizations.

Each year, UPOP supports several hundred MIT sophomores. Applicants come from all Institute majors and represent almost half the sophomore class, providing, each year, a rich cross section of the student body.

In AY2017, of the 528 who applied, 485 applicants were admitted, and 342 students completed the Team Training Workshop requirement. A cohort of 315 students completed all the requirements of the yearlong program, including participating in, and reflecting on, the summer internship or practicum—meaning that almost one-third of MIT's Class of 2019 will have completed UPOP's full yearlong program, gaining the skills and experience essential to integrate into and thrive in the professional world. Almost 70% of Gordon–MIT Engineering Leadership Program applicants were originally UPOP students. The programs work together closely in GEL recruitment campaigns.

UPOP requirements include the intense weeklong Team Training Workshop, delivered twice over IAP, or the three-day alternative workshop over Presidents' Day Weekend. These workshops feature experiential modules taught by MIT faculty and other industry

professionals, focusing on themes of communication, problem solving, and teamwork, and topical seminars led by staff, industry professionals, and MIT alumni. UPOP students must also secure a career-relevant summer practical experience, submit written reflective reports during their summer experience, and complete follow-up meetings with staff.

Over the past few years, the UPOP curriculum has expanded to offer additional collaborative workshops in the fall and spring semesters, with greater opportunities to engage with MIT resources and departments, such as MindHandHeart, MIT Libraries, the MIT International Science and Technology Initiatives Program, and the Society of Women Engineers. Continuing customized employer events this year allow students to learn more about the career opportunities available to them and to practice engaging with employers. These events also act as a source of revenue (see employer engagement and sponsorship). This year's regular review of the Team Training Workshop curriculum resulted in delivery of a new module, Active Listening.

Student Program Retention

UPOP began its first year of operation in AY2002 with approximately 73 students. Annual applications to UPOP now average from 46% to 49% of the sophomore student body. This high percentage reflects the demand from MIT undergraduates for the unique programming provided by UPOP, which offers students abundant opportunities to practice and integrate the skills they will need for career success. UPOP has maintained a steady retention rate of more than 60% since implementing some significant changes in AY2013. The program now maintains a two-pronged approach to retention efforts: personalization and flexibility. Keeping in mind the research on the importance of fostering community, the UPOP staff prides itself on its ability to provide one-on-one advising, workshops, and “meet-and-greets” with various resources on campus. The program also maintains an open-door policy throughout the year for advising and coaching needs. UPOP's employer relations manager holds office hours for students' personalized internship search coaching. As such, the program is a resource for UPOP alumni during their time at MIT, and then beyond MIT. A substantial number of juniors and seniors continue to use UPOP's career advising services frequently.

As mentioned, a core requirement of UPOP's yearlong program is attendance at one of UPOP's two weeklong Team Training Workshops during IAP. This presents a scheduling conflict for many of MIT's sophomores, who are, for example, involved with the Alumni Association's Externship Program, MIT International Science and Technology Initiatives Program Global Teaching Labs, and the increasing number of other campus programs offered over IAP. Most of the students who drop out of UPOP do so because of this scheduling conflict, which is also an impediment to applications.

To convert this from a problem into an opportunity, UPOP offers immense flexibility in integrating the conflicts into part of the yearlong curriculum requirements. For students who participate in a qualifying alternative, the program offers a three-day alternative version of UPOP's weeklong IAP Team Training Workshop, which is held over Presidents' Day Weekend. As an added layer of support, this year (AY2017) UPOP introduced IAP Conflict Clinics, in which more than 250 admitted students met individually with UPOP staff to exhaust all retention options for them. An extensive menu of workshops and events allows students to tailor the program to best fit their individual needs, interests, and schedules.

Summer 2017 Internships

As a practicum, UPOP students are required to participate in a summer experience within an organization to help develop and expand their professional experience. The majority of UPOP students participated in industry internships, both domestic and international, from large corporations to small start-ups, from corporate to research and government. Students also participated in the Undergraduate Research Opportunities Program (UROP), research opportunities at other institutions, teaching and tutoring experiences, and volunteer activities. Some 71% of UPOP students participated in a traditional industry internship; more than half of those internships were arranged through a UPOP-established employer connection. Here are summary figures from AY2017:

- Total UPOP students: 315
- Total industry internships (domestic and international): 224, of which 100 were arranged through a direct UPOP connection with the employer
- Almost all the other UPOP students found UROP-related or other career-relevant summer positions

Top Summer 2017 Intern Employers

The top employers of summer interns in 2017 were:

- Northrop Grumman (13 UPOP student interns)
- MIT Lincoln Laboratory (eight)
- NASA, Jet Propulsion Laboratory (seven)
- Covaris, Facebook, and Lockheed Martin (five each)
- Microsoft (four) and Schneider Electric, Proctor & Gamble, Pfizer Inc., Optum/United Health Group, Goldman Sachs, GE, and Bose (three each)

Employer Engagement and Sponsorship

In AY2017, UPOP again attracted a large pool of actively engaged volunteers, sponsors, and intern employers. More than 100 companies posted UPOP-specific job opportunities for sophomores and more than 125 companies registered for each of the two Team Training Workshops' capstone events: the January networking luncheons.

In addition to UPOP's traditional offerings of company field trips and educational events, UPOP hosted nine corporate-sponsored events. UPOP had initiated an industry sponsorship campaign in AY2014. The campaign raised \$48,000 that year; the program now averages more than \$100,000 per year in sponsorships.

MIT Alumni and Mentor Support and Involvement

UPOP continued and expanded the mentorship program within the Team Training Workshop weeks during IAP and Presidents' Day Weekend, where MIT alumni and other industry professionals volunteer to participate in the workshops as mentors for

teams of seven to eight students. Mentors are essential for facilitating curriculum content and guiding student discussions at their tables. Of the 58 mentors who participated in AY2017, 46 were repeat participants from past years and 12 were new. Additionally, as part of the series UPOP Presents, several alumni delivered topical seminars for the MIT community during IAP and the fall and spring semesters on subjects including patent law, the New Horizons space probe, ethics for engineers, agile engineering, and identifying customer needs.

Sixty-three MIT alumni participated as industry guests at events during the yearlong curriculum. UPOP also engages with more than 430 community members, many of whom are MIT and UPOP alumni, through a monthly newsletter that provides updates on and highlights of the yearlong program.

To continue advancing the goals of UPOP through mentor and alumni involvement, in 2014 the program established a UPOP Advisory Board that meets each July. The board is composed of 20 or more MIT alumni who work actively on committees and curriculum revision.

UPOP Alumni

UPOP continued its series of so-called Industry Rotations in the spring semester, inviting graduated UPOP alumni and early-career MIT alumni to engage current UPOP students in discussions about their career paths. UPOP alumni continue to be involved as industry volunteers, employers of interns, and sponsors on behalf of their organizations. In AY2017, 26 graduated UPOP alumni participated in the program as industry volunteers.

Program Expansion and Collaboration

UPOP continues to collaborate with Professor Warren Seering of Mechanical Engineering on a study of the career paths of MIT alumni and industry professionals. UPOP students contribute to the study by reporting, during their summer work experiences, on their informational interviews with MIT alumni and industry professionals.

Staff

UPOP has five full-time staff members reporting to Professor Joel Schindall, director of UPOP, Gordon ELP, and the Communication Lab. During the summer and early fall of 2016, both of UPOP's student program coordinators left the program. These staffing gaps afforded the opportunity for a minor reorganization of the roles. UPOP's full-time staff is now composed of one student program coordinator, an employer relations program manager, a mentor liaison and outreach coordinator, a communications and operations coordinator, and a program assistant whose primary task is student support, but who also supports UPOP's work with employers and donors.

Accomplishments and Awards

Combined, the Gordon ELP and UPOP programs affected more than 1,000 students throughout the year. The combined programs earned corporate funding in the form of grants and company sponsorships, as well as from a pool of committed individual donors, including program alumni.

Gordon Engineering Leadership Program

- Some 221 MIT undergraduates applied to Gordon ELP to join GEL1 in spring 2017; 160 students representing 11 MIT departments (including all departments in the School of Engineering) will enter GEL1 in fall 2017.
- Ninety-eight students earned GEL Program Completion Certificates in May 2017.
- Thirteen students completed GEL’s graduate course, which was piloted for a second time in fall 2016.
- The GEL Program’s two MIT professional education courses, which are being offered in summer 2017, had 98 registered participants.
- Gordon ELP’s new industry engagement and sponsorship program, launched in July 2016, raised \$20,000 from corporate sponsorship and matching gifts.
- In fall 2016, GEL subjects became multidepartmental (Courses 6 and 16).
- GEL subjects became credited electives that can be taken to fulfill the leadership requirement for the entrepreneurship and innovation minor, beginning in fall 2016.
- During IAP and spring 2017, Gordon ELP hosted a series of eight inaugural workshops designed specifically for graduate engineering and technology students who want to “make an impact” in their careers.
- In April 2017, Gordon ELP hosted a special Tech Talk with founder and benefactor Bernard M. Gordon, who shared lessons he has learned as a lifetime engineering leader. The talk attracted more than 400 members of the MIT community; it almost filled Room 10-250.
- Gordon ELP held two Industry Advisory Board meetings to receive input from engineering leaders.
- Gordon ELP participated in the planning for the School of Engineering’s New Engineering Education Transformation Program, which plans to launch a new engineering minor in AY2019.
- Gordon ELP continued to be a significant thought leader and driving force in developing the new Engineering Leadership Development Division of the ASEE; this is the fastest-growing division in the nation, with more than 700 members
- Gordon ELP led a discussion at the annual ASEE Conference in Columbus, Ohio, in June 2017.
- Gordon ELP started the process of leading a comprehensive search for a new industry codirector to manage programs under Gordon ELP (i.e., GEL, UPOP, and the School of Engineering’s Communication Lab).

Undergraduate Practice Opportunities Program

- Some 528 Class of 2019 MIT sophomores applied to UPOP in fall 2016; 292 Class of 2018 students graduated from UPOP in September 2016.
- UPOP's corporate sponsorship program raised more than \$100,000 in AY2017.
- A total of 58 individual donors contributed more than \$600,000 to the program in AY2017.
- UPOP's original endowment fund goal of \$5 million, raised through the efforts of UPOP mentors, has been met.
- UPOP's efforts to increase diversity among its mentor pool to reflect the UPOP student population more accurately resulted in two new mentors of color and four new female mentors.

Future Plans

- Expand outreach and increase awareness of UPOP and Gordon ELP among prospective MIT students.
- Continue to perform educational assessments related to the overall efficacy of UPOP and GEL.
- Continue to explore and discover new synergies that exist and will benefit growth and development of the programs under the Gordon ELP's organizational structure (i.e., GEL, UPOP, and the Communication Lab).

Gordon Engineering Leadership Program

- Expand outreach and increase awareness of the GEL Program among MIT alumni in an effort to increase MIT alumni engagement with the program.
- Continue to work closely with Resource Development to solicit potential program supporters to provide funds to expand the program and fund the development of a graduate program.
- Continue to work closely with the graduate community on a strategic plan for the development of a GEL graduate program, and determine what the appropriate vehicle is for expansion (e.g., more residential or online course offerings, or both; more workshops and talks; more mentorship and coaching, and so on).
- Expand GEL's corporate engagement and sponsorship program to attract a wider and more diverse set of engineering companies.
- Diversify GEL's mentor roster to be more representative of the current engineering majors in the program (Electrical Engineering and Computer Science is currently underrepresented).

- Increase outreach and awareness of MIT professional education courses to engineering and technology companies interested in supporting younger employees' professional and leadership development.
- Explore new opportunities for collaboration with the MIT departments where GEL can lend its expertise in engineering leadership to help channel new innovations.
- Continue to help lead strategic planning (with Northeastern University and other allies) for newly established Engineering Leadership Development Division of the ASEE.
- Hire a new administrative assistant before fall 2017.
- Lead search for new industry co-director who will manage the programs under Gordon ELP (i.e., GEL, UPOP, and the Communication Lab) and plan to hire him or her before end of AY2018.

Undergraduate Practice Opportunities Program

- Expand outreach and increase awareness of UPOP (a program for sophomores) among incoming freshmen, their parents, and the MIT Admissions and orientation staff, and educational counselors
- Expand outreach and increase awareness of UPOP through engagement with the Alumni Leadership Conference and the Corporation Development Committee.
- Diversify UPOP's mentor roster to be more representative of the diversity of students in the UPOP program.
- Explore the expansion of UPOP to a graduate student population.
- Expand opportunities for mentor and alumni engagement through vehicles such as the UPOP Presents seminars.
- Explore the expansion of UPOP through delivering aspects of the program to other programs within the MIT community and to outside organizations.
- Continue fundraising efforts with corporate sponsorships and MIT alumni donors.
- Collaborate with the MIT annual fund to launch a targeted fundraising outreach campaign to the UPOP alumni base (almost 3,000 members).
- Continue to recruit and retain a significant percentage of MIT sophomores.
- Continue to review and refine the yearlong and team training workshop curricula to prepare MIT sophomores for the transition from the world of academia to the world of work.
- Continue to expand the roster of employers for UPOP students.

MIT School of Engineering Communication Lab

The MIT School of Engineering Communication Lab is an innovative professional development resource that uses discipline-specific peer coaching to improve the technical and professional communication skills of graduate students, postdoctoral associates, and undergraduates (on a limited basis). Since its successful launch within a single department (Biological Engineering) in 2012, the Communication Lab has grown to include branches in five departments and institutions: Biological Engineering, Chemical Engineering, Electrical Engineering and Computer Science, Nuclear Science and Engineering, and the Broad Institute. Each departmental Communication Lab comprises a team of four to 16 trained graduate students and postdoctoral associates—the Communication fellows—and one half-time manager, all under the leadership of one central program manager.

In 2016, the Communication Lab became a member of Gordon ELP, as a complement to the program’s existing undergraduate leadership programs. In the future, the Communication Lab team will seek to build synergy with GEL’s developing graduate leadership program.

The Communication Lab has four distinctive features:

- **Discipline specificity:** Training graduate students and postdoctoral associates within a given department to act as communication coaches for their fellow department members means that these Communication fellows can engage with their clients about both the communication and the science. Their coaching is informed by a deep understanding of field expectations, language, and culture. Each Communication Lab can also customize its practices and resources according to its department’s demographics, rhythm, and culture.
- **One-on-one peer coaching:** Communication Lab fellows ask their clients strategic questions to help them analyze high-level communication principles such as audience, message, and structure. The Communication fellows do not provide line editing or grammar fixes. Their high-level focus encourages clients to create their own solutions and to learn transferable communication skills.
- **Authentic tasks:** Clients can bring any professional or technical communication task to the Communication fellows for input, including papers, presentations, faculty applications, and laboratory reports.
- **“Just in time”:** Working on authentic, deadline-driven needs gives clients immediate and genuine motivation to learn communication principles. The Communication Lab aims to provide clients with resources in a manner tied to real deadlines—for example, offering workshops four weeks prior to the National Science Foundation Graduate Research Fellowship deadline, and encouraging attendees to come to the Communication Lab for one-on-one coaching during the subsequent weeks.

It is not only the clients that benefit—so do many other participants in the Communication Lab, as follows:

- The peer coaches, who are carefully selected and paid a modest stipend, receive extremely valuable training and skill development from the training workshops, from their experiences in coaching their clients, and from the experience of working together as a team.
- Many faculty members have stated that the program produces better publications and presentations and also reduces their workload.
- The franchise model allows the overall program to explore, develop, evaluate, and accumulate a repository of tested material. This has already led to a website that is widely used both within and outside MIT, a research paper that has been published and presented at ASEE, and a weeklong Summer Institute to help disseminate and share this knowledge with other universities.

Altogether, the Communication Lab is a flexible, adaptable, and lean program that uses student leadership and minimal staffing to support diverse communication initiatives. Since its launch, the Communication Lab has served approximately 1,200 unique clients, with more than 2,700 hours of one-on-one coaching, across more than 3,300 appointments. In addition, the Communication Lab has partnered with more than 80 subjects and academic programs, and offered more than 100 workshops. Finally, to date, 80 Communication fellows have been trained, representing a workforce and think tank of exceptionally articulate and creative student leaders.

Accomplishments and Awards: Communication Lab

Overall, in AY2016, the Communication Lab continued to thrive in its core mission of providing one-to-one communication coaching, with average rates of at least one session per day in each member department.

Selected data, including responses from surveys of Communication Lab users, showed the following:

- In the Department of Biological Engineering, 62% of department members have used the department's Communication Lab. This figure was 49% for Nuclear Science and Engineering and 8% for Electrical Engineering and Computer Science. The latter is the department that has, by far, the largest number of members; it is also one of the newer Communication Lab users. The 2016 data represent a fivefold increase in percentage of use since last year.
- Between 34% and 59% of clients (depending on department) are repeat users, showing that users find value in working with the Communication fellows.
- Surveyed users reported that they felt that the Communication Lab helped them most with organization and structure, visuals, the writing process, and articulating ideas.
- Between 58% and 90% of users (depending on department) reported that the Communication Lab is helping them acquire the skills that they need to be successful at MIT.
- All the faculty survey respondents from Biological Engineering reported that they felt that their students are becoming more effective and more confident communicators.

The Department of Chemical Engineering joined in January 2017 as the newest Communication Lab department; it launched its coaching efforts in April 2017 with a team of nine Communication fellows. Uniquely, the Chemical Engineering Communication Lab manager's role also includes 50% employment in Career Services Development for the department. This offers an opportunity to build synergy between the Communication fellows' work and field-specific career initiatives, creating a holistic support system for career and professional development in the department.

The Department of Mechanical Engineering has expressed interest and begun working with the Communication Lab program manager to launch a Communication Lab in January 2018. Five of the eight School of Engineering departments would then have a Communication Lab.

Department Communication Lab teams have refined existing communication initiatives and launched new ones. The new efforts include approximately 20 workshops and the following activities:

- **Biological Engineering:** The manager launched a senior thesis opportunity for undergraduates, and a Communication fellow team is leading a taskforce on advanced public speaking skills.
- **Electrical Engineering and Computer Science:** A team led by three Communication fellows published and presented a paper about the Communication Lab model at the June 2017 conference of ASEE: "Technical Communication Instruction for Graduate Students: The Communication Lab vs. a Course" (authors: A. Hanson, P. Lindahl, S. D. Strasser, A. F. Takemura, D. Englund, and J. Goldstein).
- **Nuclear Science and Engineering:** The manager significantly reformed a required graduate communication course; 67% of students reported that they felt more confident in their presentation skills as a result of taking this class.
- **Cross-departmental:** Communication fellows' taskforces are creating and publishing new online resources about public policy, communication, and postdoctoral career needs.

Collaborations with the School of Engineering Communication Lab and the Office of the Dean for Graduate Education also took place, including the following:

- In January 2017, the Communication Lab staff designed and facilitated a weeklong blogging course that was attended by 50 graduate students. The idea was to provide students with blogging skills and to create 100 blog posts to launch a Graduate Admissions blog.
- In April 2017, five Communication fellows created an audio tour of the campus that had been commissioned by School of Engineering Communications.
- In June 2017, the Communication Lab program manager facilitated the formation of a student editorial board to continue running the Graduate Admissions blog. The program manager continues to provide guidance to this group, in collaboration with the Office of the Dean for Graduate Education.

In July 2017, the Communication Lab held a four-day Summer Institute, its first workshop for institutions that would like to create their own communication laboratories.

The workshop was attended by 14 participants from seven institutions: Boston University, Brandeis University, the Broad Institute, Brown University, the California Institute of Technology, and Hofstra University. MIT's Department of Mechanical Engineering also attended. The workshop received overwhelmingly positive feedback, and raised approximately \$10,000 for the program. By creating a community of educators invested in the Communication Lab model, the Summer Institute has inaugurated a new phase of growth and collaboration for the Communication Lab.

Future Plans: Communication Lab

The Communication Lab has set a number of goals for the near future, including:

- Expanding outreach and increasing awareness of the Communication Lab, especially within the less established member programs: the Broad Institute, the Department of Electrical Engineering and Computer Science, and the Department of Chemical Engineering;
- Continuing to find opportunities for Communication fellows to collaborate and network across departments;
- Building programming for alumni Communication fellows, including involving them as professional development resources for current Communication fellows;
- Continuing to research where communication needs are occurring within the Institute, create innovative resources to meet those needs, and measure and refine the effects of these efforts;
- Supporting the institutions outside MIT that attended the Summer Institute to develop a collaborative community of Communication Lab users; developing models for both selling and sharing resources (e.g., curriculum);
- Collaborating with GEL's other member programs, especially the developing graduate leadership program; and
- Exploring and developing sources of additional funds, such as donations, to support expansion of the program.

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