

Dean for Undergraduate Education

The [Office of the Dean for Undergraduate Education \(DUE\)](#) is focused on assuring the quality of the educational experience of MIT students, with particular responsibility for enhancing undergraduate education as well as delivering mission-critical functions for both undergraduate and graduate students. DUE's scope includes:

- Delivering the essential capabilities of admissions, financial services, and registration.
- Fostering student diversity at all educational levels.
- Promoting student success through advising and mentoring, effective learning strategies, and other forms of support.
- Partnering with faculty to enrich learning through educational innovation and online learning.
- Encouraging hands-on, project-based learning both inside and outside the classroom.
- Providing and expanding global educational opportunities for students.
- Supporting students as they explore career options and opportunities.

DUE is comprised of nine offices: Admissions, Experiential Learning, Global Education and Career Development, Minority Education, Registrar, Reserve Officers' Training Corps, Student Financial Services, Teaching and Learning Laboratory, and Undergraduate Advising and Academic Programming.

This report begins with an introduction by the dean and is followed by individual office reports.

The Dean's Priorities

Dennis Freeman has completed his third year as dean for undergraduate education. Throughout his tenure as dean, he has been a strong advocate and proponent of gathering, analyzing, and synthesizing meaningful and timely data to discern trends, challenges, and opportunities of consequence for MIT undergraduate students. Over the course of the year, he worked with the senior administration, the chancellor's team, DUE leadership team, faculty committees, and faculty colleagues on several key issues and opportunities. Examples of those include the following.

- **Reducing barriers between students and the services and opportunities that help them succeed academically and personally.** The issue of reducing barriers for students is of critical importance to the dean. The dean continued to work collaboratively with senior leadership, faculty, and students to gain a better understanding of the causes of student stress through data collection and analysis, and to develop solutions. In particular, the dean and the Committee on Academic Performance (CAP) chair led a review committee to analyze and make recommendations for changes in the Institute's undergraduate withdrawal and readmission policies and procedures. The purpose and findings of the review,

released in April, are described in more detail in the summary of highlights section below.

- **Developing hands-on educational experiences to complement the first-year learning experience.** This year, a new freshman advising seminar called *Mens et Manus: Building on the GIRs* was offered with the goal of creating maker activities to support learning of the General Institute Requirements (GIR) science core. The seminar was developed by Dean Dennis Freeman, Professor Martin Culpepper (MIT’s maker czar), and Senior Lecturer Dawn Wendell. Students applied elementary principles of physics to model sound, used those models to design a loudspeaker, and then built their loudspeakers using modern rapid prototyping techniques, including laser cutting and 3-D printing. The seminar was well received by the first class of 31 students, and will be expanded and offered again next year.
- **Increasing interaction and engagement between students and faculty.** The dean continues to support efforts to foster stronger connections between students and faculty. As part of an ongoing effort to increase the number of freshmen advised by faculty, the Office of Undergraduate Advising and Academic Programming (UAAP) recruited 157 faculty to participate—consequently, 88% of the Class of 2019 were advised by faculty, a 7% increase over last year. UAAP also hosted over 32 events at which faculty discussed with freshmen such topics as academic challenges, choosing a major, and pursuing graduate school, and shared personal stories about their own career paths. Over the course of the year, the dean hosted seven faculty-freshmen receptions to increase engagement among students and faculty. First generation students—those students who are the first in their family to attend college—were invited to several events with first generation faculty to share their unique experiences and make personal connections. With funding from DUE, the [Experimental Study Group](#) offered a faculty mentoring program in which faculty and freshmen engage in informal discussions and participate in extracurricular activities, such as hiking trips, concerts, and Friday lunches.

Summary of Highlights

Enhancing Student Support and Well-being

DUE has played a significant role this year in the chancellor’s four-year [MindHandHeart](#) initiative, announced in September 2015. A number of DUE staff serve on the initiative’s nine ongoing working groups, some in leadership positions.

To augment access to counseling and support for students, two new staff were hired in UAAP’s Student Support Services office, and the number of walk-in hours has been doubled, resulting in a substantive increase in visits; of all contacts, 39% were during walk-in hours.

DUE collaborated with the Office of the Dean for Graduate Education, the Division of Student Life, MIT Medical, and the Chancellor’s Office to launch the “Don’t struggle alone—it’s okay to ask for help” public awareness campaign, aimed at increasing help-seeking among students and reducing stigma around mental health issues. The

campaign includes distribution of Ask for Help postcards to the entire community, now displayed prominently around the Institute, and the creation of a series of videos of faculty, staff, and students. Some videos focus on the many support resources at MIT, putting a human face to various offices and services and demystifying them; others recount personal struggles with mental health or other issues.

DUE also sponsored a new event in the fall, called Recharge. The event was intended to familiarize students with DUE offices and staff, while also building community and reducing stress. Eight DUE offices opened their doors to students and provided fun, relaxing activities and games, such as balloon popping at the Edgerton Center, coloring, therapy dogs, puzzles, darts, LEGOs®, and plenty of snacks. To encourage students to visit each office, they could win a prize by getting a passport stamped at any four offices. Nearly 450 students participated in the event.

Review of MIT's Withdrawal and Readmission Policies and Procedures

At the request of the chancellor, the dean, and the chair of the [Committee on Academic Performance](#), Professor Charles Stewart, led an extensive review of the Institute's undergraduate withdrawal and readmission policies. The purpose of the review was to understand and address students' concerns about the clarity, transparency, and fairness of existing policies, and the need for increased support for students who take time away from MIT. The committee gathered feedback from hundreds of community members and stakeholders, and reviewed practices at peer institutions. Upon the release of the report, the dean, CAP chair, and chancellor held a town hall meeting to allow the community to share their thoughts and questions about the recommendations. Some of the recommendations include the following:

- Creating a new, flexible leave of absence category for students who wish to leave for educational, professional, or wellness reasons.
- Changing the terms that describe our policies to leave and return.
- Developing a new mentorship program for students considering leave, on leave, or preparing to return.
- Developing personalized action plans to clearly define the expectations of students when they leave and return.
- Reducing coursework requirements for students on academic leave.
- Designating the CAP as the sole decision maker for requests to return.

Many of the review committee's recommendations are expected to be implemented in AY2017.

Fostering Changes in Curriculum

The Registrar's Office facilitated the review of a number of proposals to establish new undergraduate majors and minors. All of these proposals have been endorsed by the faculty. New undergraduate degrees include management (15-1), business analytics (15-2), finance (15-3), and mathematical economics (14-2).

New minors include civil environmental engineering systems; a design minor in architecture; and a computer science minor in electrical engineering. In addition, interdisciplinary minors were approved in entrepreneurship and innovation (Schools of Engineering and Management), and statistics and data (offered by the Institute for Data, Systems, and Society).

To advance the recommendations of the [Task Force on the Future of Education](#), DUE issued a call for proposals for a new \$1 million program called Reimagining Undergraduate Education at MIT. Funded this first year by the d'Arbeloff Fund for Excellence in Education, the program aims to reimagine elements of undergraduate education and the student experience at MIT, such as enhancing the freshman experience, providing flexibility to pursue interdisciplinary intellectual interests, and enriching faculty-student interactions. A wide range of initiatives were proposed, and the first elements will be deployed starting in fall 2016.

Admissions and Financial Aid

MIT continues to attract and recruit an outstanding and diverse cadre of students. The Admissions Office received 19,020 applications for the freshmen Class of 2020. This represents a 3.9% increase over last year—in part because, for the first time, international students were eligible to apply for early action admission. In all, 1,511 students were admitted, including 26 waitlisted students (7.9% of the applicant pool, compared to 8.3% in AY2015), and the overall yield on admitted students increased to 74%.

The composition of the Class of 2020 is indicative of MIT's ongoing commitment to fostering diversity and excellence in the student body. Women represent 46% of the class, 16% are the first generation in their families to attend college, and 10% are international students. Students hail from 49 of the United States as well as from 62 foreign countries.

MIT's partnership with the QuestBridge program, a nonprofit that recruits high-achieving students from low-income backgrounds, continues to be a fruitful one; this fall, 62 QuestBridge finalists will enroll at MIT.

In an ongoing effort to provide broad access to MIT, in AY2016 the Institute allocated \$103.4 million to increase affordability for students—the first time its annual financial aid budget exceeded \$100 million. Through this enhancement, the self-help portion of the financial aid award was reduced from \$6,000 to \$5,500.

Student Financial Services implemented a new Student Account System, which streamlines processes, increases efficiency, and improves the user experience for students and families. The system allows for easier future upgrades and simplified integration of third-party applications for billing, payment, and refunds, among other functions.

Modernizing Student Information Systems

Significant progress was made in AY2016 to implement the 2015–2018 Education Systems Roadmap. The Roadmap—developed by a partnership that includes the Office

of the Dean for Undergraduate Education, Office of the Dean for Graduate Education, Office of the Dean for Student Life, and Information Systems & Technology—focuses on advancing the faculty-student experience by modernizing student information systems, in alignment with the strategic goals set forth by the senior administration. Key milestones include the following:

- Developing Application Programming Interfaces for data associated with student directory information, subject descriptions and schedules, and courses of study.
- Expanding digitization of several functions, including the proposal process to create, change, or retire academic programs (such as degrees and minors); the Humanities, Arts, and Social Sciences Concentration form; and the cross-registration process for Harvard students who register for MIT courses.
- Implementing intelligent messaging and email notifications to alert students, advisors, coaches, and athletic compliance officers if and when student athletes were at risk of falling below athletic eligibility thresholds.

Hosting the Visiting Committee

In March, DUE hosted the DUE Visiting Committee (VC) for its two-day, biennial meeting. The committee acknowledged DUE's progress in:

- Ensuring access to and affordability of an MIT undergraduate education by playing a pivotal role in the substantially increasing financial aid—since the VC met two years ago, aid has increased by 20%.
- Enhancing the educational experience through programs such as freshman First Year Fridays, increasing faculty participation in advising, and establishing a new freshman advising seminar.
- Taking steps to reduce barriers to success for students, such as the new leave and return policies, expanding student support resources, and ongoing efforts to conduct a data-driven analysis to tacking the issues of student stress and workload.
- Fostering collaborations by exploring new models of supportive, residence-based learning communities; blended learning activities; and curricular and classroom innovations.

The committee formulated a number of recommendations, based upon the premise that the world is changing, and that our students—firmly rooted in the millennial generation—are changing as well. As a result, MIT must adapt to meet the evolving needs of its students and their environment. These recommendations center on three areas: the freshman experience, mentoring and advising, and bridging to career.

The Freshman Experience

The committee believes that DUE should take a leadership role in addressing MIT's culture of suffering by developing words, policies, and programs to counteract this pervasive problem. Getting at the issue in students' freshman year is key, as this is when they are just beginning to absorb MIT's culture. The committee recommends that DUE

put this culture of suffering on the Institute's agenda, making sure that the appropriate parties, including faculty, engage in this effort.

Mentoring and Advising

Although DUE has under its purview only freshman advising, the committee recommends expanding DUE's influence in mentoring and advising within academic departments. The committee thinks that this is an opportune time to take a fresh look at the breadth and depth of advising and mentoring in general, including with regard to residential education, such as the potential development of new dormitories and an on-campus fraternities, sororities, and independent living groups village.

Bridging to Career

The evolving needs and expectations of students has resulted in a stronger link between their education and their career. The committee recommended taking a closer look at current career programs and developing stronger metrics to inform future directions in career planning. The committee noted their concern that the annual career fair, planned by students, seemed overly focused on careers in computer science.

Space

With joint funding from the Committee for Renovation and Space Planning, the registrar, and the dean for undergraduate education, DUE was able to complete the renovation of the registrar's offices, now occupying Rooms 5-115 and 5-117. This renovation has greatly improved the flow and function of the space for both staff and visitors, and now supports the Registrar's Office in their important work. To accommodate two new employees in Student Support Services, approved in the FY2016 budget cycle, DUE also completed a minor renovation to the Undergraduate Advising and Academic Programming offices.

The [Kendall Square](#) revitalization project will have major impacts on DUE in the coming year. Both the Teaching and Learning Laboratory and the Global Education and Career Development program will need to vacate Building E39 this fall; planning for their relocation to Buildings E17 and E18 has been ongoing since spring 2015. Also underway are plans to relocate the admissions office to Buildings E38 and E39 in Kendall Square, where they will have a major presence at the new gateway to MIT. This location, across from the MIT Museum's new site, will provide much improved office and reception spaces and, most important, a dedicated space to host admissions information sessions.

Budget

DUE had a successful FY2016 budget cycle, in which we received new funding and increased our employee headcount to advance a number of priorities (as well as nonrecurring funds to continue an important pilot):

- Funding for two additional members in UAAP/Student Support Services to support our students in times of stress.
- Funding for UAAP to support faculty freshmen advisors in response to the faculty motion that all freshmen should have a faculty advisor/mentor.

- Funding for the Office of Minority Education to continue to pilot enhancements to [Interphase EDGE](#), their flagship program for incoming freshmen.
- Funding for the Admissions Office to supplement their baseline recruitment and yield programs.
- Funding for the Registrar's Office to offset the continued decline in transcript fees, which supports their operating budget.

Affirmative Action Goals and Successes

DUE continues to be one of the most diverse organizational units at MIT, with an ongoing commitment to developing a workforce that reflects the rich diversity of the MIT community. The DUE office heads are expected to show leadership in the area of diversity, and this effort is shared across the department. Every DUE employee shares responsibility for fostering an inclusive work environment in which all employees may do their best work.

As a result of the efforts of the leadership team and hiring managers throughout the organization, DUE succeeded in attracting and hiring underrepresented women and minority candidates to fill open positions across the division. In the past year, DUE met all of its placement goals for women and minority candidates.

For the period between June 2015 and May 2016, women represent 84.62% of all new DUE hires and minority candidates represent 36.54%. During the same period, DUE promoted 20 staff members: 90% of whom are women and 35% of whom are minority staff members.

Dennis M. Freeman
Dean for Undergraduate Education
Professor of Electrical Engineering

Global Education and Career Development

The mission of [Global Education and Career Development \(GECD\)](#) is to empower MIT students and alumni to achieve lifelong success through seamless access to transformative global experiences, comprehensive and holistic career services, and mutually beneficial connections with employers and with graduate and professional schools. Our goal is to engage students and alumni in self-discovery and to craft lives that are intellectually challenging, personally enriching, and of service to the world.

GECD continues work on GECD 2020, including elevating the department to become MIT's leading voice for careers and global education, developing confident and world-ready graduates, creating a work culture that maximizes staff growth and engagement, and leveraging and expanding external partnerships.

Changes and New Initiatives

Improving GECD Work Culture

In response to significant staff turnover and retention issues, GECD has embarked on a yearlong process to improve work culture and staff well-being through ongoing dialogue and implementing recommendations of ways to improve organizational trust, communications, and work prioritization.

New Approaches to Freshman and Sophomore Programming

GECD focused on early student engagement with freshman and sophomore students by establishing a new role of assistant director for first year engagement to enhance career development among this population and provide expertise in this area across GECD. The incumbent, Meredith Pepin, helped GECD establish new freshmen-focused programming, including an alumni networking reception and a panel presentation prior to the fall career fair, as well as targeted communications efforts, with 164 freshmen and sophomore participants in the initiative's first year, and a 49% increase in individual appointments with freshmen.

Satellite Office Increases Student Engagement

GECD operated a satellite office, GECD Express, throughout the academic year for the first time since our move from Building 12 in 2014, helping contribute to an increase in individual student contacts across locations, particularly among freshman students. Approximately 1,098 career service drop-ins were held in GECD Express, in addition to a small number of prehealth and global education contacts.

Funding to Solidify and Expand Undergraduate Global Participation

Global Education received new funding to solidify programs that had been piloted over the past five years and helped contribute to a substantial rise in the number of MIT undergraduates participating in global experiences, with an increase from 33% of the graduating class participating in global experiences in 2010 to 45% in 2015. The new funding will support ongoing study abroad programs in Madrid during Independent Activities Period (IAP) and the launch of an additional IAP program there, 21G.S05 Spanish Conversation and Composition.

Additionally, the Victor and William Fung Foundation renewed its five-year, \$1 million gift to GECD to support the continuing expansion of the number of MIT undergraduates participating in global education opportunities. This generous gift will allow program innovation and new initiatives in collaboration with faculty, academic departments, and other partners at MIT.

New Study Abroad Exchange with the University of Tokyo

Global Education, in collaboration with faculty and academic departments, launched a new undergraduate student exchange with the University of Tokyo, including three academic departments: Courses 2, 3, and 22. Up to five students from each institution may participate in the program each year. University of Tokyo students will arrive at MIT in the fall, while MIT students will study at the University of Tokyo in spring 2017.

New Schwarzman Scholarship Competition

Global Education successfully guided student applicants through the new Schwarzman Scholarship application process, supporting six applicants, with three invited to interview and ultimately winning the award. The program is designed to prepare the next generation of global leaders. Winners will be awarded a year of study and leadership training at Tsinghua University in Beijing, China. Two MIT undergraduates and one MIT alumna were named Schwarzman Scholars. Over 3,000 candidates from 135 countries competed for 100 spots in the AY2016 inaugural class. Recipients were selected based on rigorous criteria that included not only outstanding academic qualifications but also leadership potential, character, and the desire to understand other cultures.

New Career Programs for International Students

In August 2015, Career Services collaborated with a consortium of top-tier schools, including Imperial College of London, London School of Economics, University of Cambridge, Columbia University, and Harvard University on three career fairs in Beijing, Shanghai, and Hong Kong. Thirty MIT students and alumni participated.

In March 2016, an International Student Career Symposium was held in collaboration with Harvard and Boston University with workshops covering employability skills and legal information, as well as a networking reception with employers. Sixty-two MIT students participated.

Innovative Programming in Career Services

Jake Livengood created workshops using improvisation techniques to help students and postdocs with interviewing, public speaking, and communication skills. The effort has garnered national attention with articles and [interviews](#) in professional journals and presentations at national conferences.

Career Services launched a new online job and internship search platform, [CBLink](#), to increase student access to recruiting opportunities and to provide greater branding opportunities for employers, aggregating real-time job and internship listings through

an RSS feed and providing interactive employer information. In its first year, there were over 6,000 users, with more than half returning visitors, and 49,000 page views.

Prehealth Advising Improvements

Beginning in May 2016, Senior Assistant Director Aleshia Carlsen-Bryan became the new team leader for Prehealth Advising. The team implemented new programming models in AY2016, including a new cohort series of 14 workshops and panels for student and alumni applicants and mock interview practice sessions prior to the committee interview, with 30 students and alumni participating. As a result, faculty reported that students and alumni were better prepared for the interviews. Prehealth Advising developed new resources for students interested in pursuing a gap year prior to applying to medical or other health-related programs, including new gap-year data to improve advising, and a panel presentation.

Key Accomplishments and Activities

Global Education

There were 897 undergraduate participants in global opportunities in 61 countries between June 2015 and May 2016, compared to 930 in the prior year, representing a decline of 3.5%. The breakdown of experiences included 541 internships, 125 in study abroad, 93 public service and service learning opportunities, 75 internship/International Research Opportunities Program collaborative opportunities, and 63 in research. The declines in internships, internship/research, and study abroad were primarily due to funding decreases and global security issues.

The AY2015 [Graduating Student Survey](#) indicated that 45% of graduating seniors reported completing an international educational experience during their studies, an increase of two percentage points over the prior year. Among survey respondents, 92% reported gains in understanding cultural differences, 91% reported increased adaptability, 88% reported an enhanced ability to communicate cross-culturally, and 83% reported increased self-confidence. Preliminary results from the AY2016 [Graduating Student Survey](#) indicate that 50% of graduating seniors reported completion of an international educational experience during their studies, an 11% increase over AY2015 graduates—potentially reaching the 2006 [MIT Task Force on the Undergraduate Educational Commons](#) stated goal that “any MIT student who wishes to undertake meaningful study, work, or internships abroad may be able to do so without financial or academic penalty.”

In AY2016, 125 MIT undergraduates participated in study abroad opportunities, a 2% decrease from AY2015, an impressive result in light of global security issues and the end of the initial Fung Foundation funding. There was a significant increase in participation in IAP programs as well as participation during the fall and spring terms.

During AY2016, 797 students attended 38 global education–sponsored group sessions and events, a 42% increase over AY2015. There were 2,154 individual appointments, drop-in visits, and email, videoconferencing, or telephone advising sessions, a decrease of 13% over the prior year. Staff transitions are primarily responsible for the decrease. Of

the individual participants, 410 were unique contacts, a decrease of 13% from AY2015, with an average of 4.3 contacts per student.

Distinguished Fellowships

The Distinguished Fellowships program had competitive results this year, with 14 prestigious fellowship and scholarship awards, including three Schwarzman, one Marshall, one Churchill, one Gates-Cambridge, and nine Fulbright award winners. There were 24 Rhodes applicants and 21% received interviews; 25 Marshall applicants, of whom 16% became finalists; and 27 Fulbright applicants, with 25% achieving awards.

Prehealth Advising

There were 105 MIT student and alumni applicants (43 undergraduates, 5 graduate students, and 57 alumni) in the 2015 medical school application cycle, up 9% from 96 in 2014. Ninety-four percent of all applicants used one or more prehealth advising services. The acceptance rate for undergraduate service users was 91%, a 4% decrease from the prior year. The acceptance rate for all applicants who used prehealth services was 71% and the national acceptance rate was 41%.

There were 2,362 individual contacts, including appointments, drop-in visits, videoconferences, and emails—an increase of 16% in contacts over last year. Of these visits, 346 unique students and alumni used the service, with an average of 6.8 “touches” per student or alumnus. There were 462 students and alumni who attended 31 workshops and events, a 29% decrease over the prior year, which is likely due to changes in the model to inviting more targeted audiences to programs rather than open invitations for all sessions.

Prehealth Advising supports and staffs the Committee on Prehealth Advising. Throughout the year, prehealth staff set up meetings, helped frame discussions, provided background material and data, coordinated committee communications, and facilitated the full committee process to calibrate and approve the final candidate ratings. In 2016, there were 85 evaluation interviews conducted with one of 14 faculty committee members and the assistant director for prehealth evaluation.

The AY2016 Physician Shadow Program offered 87 shadow opportunities to undergraduates, compared to 65 in AY2015, with 89 physicians. Among survey respondents, 75% reported an increased understanding of a physician’s typical day, and 94% reported an increased understanding of medical specialty areas.

The Discover Prehealth Freshman Pre-Orientation Program enrolled 18 students. The curriculum was enhanced by incorporating a service learning component at the American Red Cross food pantry.

Career Development Programs

There were 3,805 contacts for individual career counseling services via appointments, drop-in visits, videoconferences, and emails, an increase of 3% from AY2015. Of these visits, 2,000 were unique users, with an average of two contacts per student. While

overall individual student contacts have increased during the past year, they are still well below the 4,225 contacts for AY2014, before the move away from main campus.

Participation in individual advising services among undergraduates increased by 30% this year, primarily among freshmen and seniors. The increase in freshmen is likely a result of GECD's new freshmen programming efforts. There were declines in graduate student and postdoctoral scholar participants, which will be reviewed further for the upcoming year. Among types of individual services, drop-in advising increased by 18%, likely due to using the satellite office for a full year. However, there was a decline in individual appointments for the third year in a row. Demand for advising via videoconferencing increased by 19%. Eighty-nine percent of respondents to a survey of counseling services rated overall counseling "extremely" or "very helpful" and 95% of respondents would refer others to an appointment.

Career Services offered 114 workshops, panels, seminars, and events this past year, with more than 4,432 students, postdocs, and alumni attending. Of the overall participation numbers, more than 3,212 graduate and postdoctoral fellows attended. Targeted graduate student programming included nationally recognized speakers with the *PhD Movie 2* screening and talk by Jorge Cham, an Impostor Syndrome event with Valerie Young in collaboration with the Alumni Association, panel discussions about the academic and industry search, employer events, industry panels, and a career planning small group.

GECD continues to see increased usage of online career resources for students and alumni, with 129 new registered users of InterviewStream, a mock interview platform; 6,328 hits to the international career resource, Going Global; 13,117 hits to the career videos provided by CareerSpots; 150 users who accessed MyPlan, an online career assessment tool; and 220 users who accessed Versatile PhD, an online resource and community for exploring nonacademic careers. Unfortunately our online career workshops could not be hosted on our recently revised website this year, but this will be remedied by the fall term.

In its sixth year, the MIT Global Fellows Program, held in collaboration with the Imperial College of London to train doctoral students in professional transferrable skills, was held in the United Kingdom, with 20 MIT and 20 Imperial College PhD participants. Based on responses to a post-course survey, 94% of MIT attendees would definitely recommend this course to another student, 100% reported improved teamwork abilities, and 75% reported more effective communication skills. Because of the departure of the dean for graduate education, we are uncertain about the future of this program.

Enrollment in SP.800 Freshman/Alumni Summer Internship Program (F/ASIP) increased slightly to 95, with a 59% increase in student retention over 2015. Christopher Capozzola, associate professor of history, served as the program's faculty advisor for AY2016.

There were 24 disclosed MIT students and alumni who applied to law school during AY2016 with 96% of MIT applicants admitted, representing a 4% decline in applicants,

but a 41% increase in acceptances over AY2015. The average grade point average for accepted MIT applicants was 3.35/4.0 (converted from the MIT 5.0 scale) and the average LSAT score was 164.4.

Employer and Recruiting Programs

The undergraduate employment rate among those seeking employment from the Class of 2015 within three months of graduation was 89% and 78% for master's degree recipients. The mean salary for graduating seniors increased by 13% from the prior year to \$84,455. The mean salaries for graduate students have also increased, with slight increases reported for master of science and master of business administration graduates at \$85,842 and \$129,586, respectively, and a 12% increase for master of engineering graduates at \$101,424. The mean salary for doctoral graduates entering postdoctoral positions showed a small decrease at \$62,750, while the mean salary for doctoral graduates entering other positions showed a 7% increase at \$117,922. This year's preliminary placement data for the Class of 2016 is favorable, indicating that 82% of undergraduates and graduate students seeking employment have already accepted job offers. The survey period concludes in September 2016.

In AY2016, Career Services hosted 261 employers on campus conducting 3,708 interviews, representing an 18% decrease in the latter figure from last year. Reasons for the decrease may include the growing trend to convert past interns to full-time hires, thus bypassing on-campus interviewing; the increasing usage of videoconferencing interviews; and earlier recruiting in the fall rather than year-round, thereby outstripping GECD's room availability, due to increasing recruiting competition. The top five industries participating in on-campus recruiting were computers/high tech/internet, finance, consulting, engineering, and energy.

There were 3,059 jobs posted through CareerBridge, a small decrease from last year. Through iNET, an online internship consortium with peer schools, 260 registered MIT student users had access to 2,492 internship postings. There were 2,289 new employer contacts registered, up 18% from AY2015, who attended the MIT Spring Career Fair, conducted interviews on campus, or posted 3,059 jobs, down 3% from AY2015. A total of 74 companies from diverse industries, including academic research, biotechnology, and national labs registered for the 2016 Spring Career Fair, which attracted 800 student participants.

Personnel and Professional Activities

Staff Transitions

During AY2015, three staff members departed GECD: Tami Bolk, Jennifer Earls, and Chiuling Campo. The following staff members were hired: Tyrene Jones and Libby Reed, both as career development specialists; Julie Maddox, assistant dean for global education; Meaghan Shea, prehealth advisor; Dwynette Smith, program assistant; and Sara Stratton, global education advisor. Alessandra Rober Christensen and Aleshia Carlsen-Bryan were promoted to senior assistant director positions. Meredith Pepin and Lily Zhang were promoted to assistant director positions. Nyasha Toyloy moved into the

events assistant position and Todd Jamieson's position as desktop support assistant was reclassified to an IT consultant position.

Leadership

Aleshia Carlsen-Bryan served as a member of the executive committee of the Northeast Association of Advisors for the Health Professions and the annual conference planning committee. She planned the 2016 Boston local area networking conference of the same association. Alessandra Rober Christensen attended the National Association of Colleges and Employers (NACE) Management Leadership Institute. Jake Livengood served as secretary on the board of directors for the Graduate Career Consortium. Kimberly Benard continues to serve as secretary to Phi Beta Kappa. Julie Maddox serves as an advisory board member for CISabroad, an organization that offers affordable study abroad programs and international internships.

Awards

Aleshia Carlsen-Bryan and Meredith Pepin received Infinite Mile Awards from the Office of the Dean for Undergraduate Education. Robert Dolan was a recipient of the Infinite Mile Award for the Offices of the Provost, Chancellor, Vice President for Research, and the Dean for Graduate Education.

MIT Committees and Service

Kimberly Benard served as staff to the Committee on Academic Performance on the Withdrawal and Readmission Process Review last year and is currently serving as a staff member on the Psychiatric Hospitalization and Involuntary Leave Committee. Malgorzata Hedderick is a member of the International Coordinating Committee (ICC) Policy and Procedures Coordinating Committee. Deborah Liverman continues to serve on the Dr. Martin Luther King Jr. Celebration Committee. Julie Maddox is serving on the MIT Travel Registry Committee and the International Emergency Team. Tamara Menghi continues to serve as a member of MIT's Sophomore Year Council. Melanie Parker chairs the Global Theme Team, and Malgorzata Hedderick co-chairs the Global Emergency Team. Jennifer Earls, Deborah Liverman, Melanie Parker, and Meredith Pepin served on MIT [MindHandHeart](#) initiative working groups.

Conference Presentations and Publications

Robert Dolan presented "Converting Your Academic CV to a 2-page Resume for Industry" at the National Postdoctoral Association Meeting and "Job Interviewing and Offer Negotiation" at the American Society of Microbiology Conference. Aleshia Carlsen-Bryan presented "Improv Mock Interview Preparation Used as an Art Form to Help Students Clearly Articulate their Experiences to Health Professions Admission Boards" and "New Advisors Workshop" at the National Association of Advisors for the Health Professions.

Future Plans and Issues

We will continue to work under our five-year strategic plan, prioritizing GECD visibility and developing confident and world-ready graduates through staff growth and engagement and expanding external partnerships.

Increasing Undergraduate Career Confidence and Diversifying Career Opportunities

The 2016 DUE Visiting Committee requested a thorough review of current resources supporting MIT undergraduates in their career exploration and planning. Additionally, the committee is requesting recommendations on how to strengthen support to students in connecting their academic studies to future careers and diversifying the range of job and career opportunities offered to students. GECD will take the lead in this initiative over the next two years.

New Global Programs for Undergraduates

Global Education continues to work on fully realizing MIT's goal to ensure that all MIT undergraduates who seek a global experience are able to participate in one. Based upon the newly received internal and external funding, Global Education will offer an additional IAP program in Madrid in January 2017, 21G.S05 Spanish Conversation and Composition, as well as refine plans to launch other innovative programs. These plans include pilot funding for offices offering global education programs for undergraduates and for faculty who would like to embed modules abroad into academic subjects while increasing opportunities for freshmen and sophomores, as well as underrepresented minority populations and athletes who may experience barriers to participation.

Relocation to Building E17 at Kendall Square

In November 2016, GECD will be relocated from Building E39 to Building E17, which was originally scheduled for June 2016. A major renovation of Building E17's second floor is currently under way. The new space will be closer to central campus, which should be beneficial to students. However, two moves in three years have been challenging to both staff and students.

Enhancing Work Culture

GECD will continue to work on implementing recommendations to enhance staff retention and the GECD work culture throughout the remainder of 2016.

Melanie Parker
Executive Director

Office of Admissions

The MIT Office of Admissions enrolls a diverse and talented undergraduate student body composed of some of the world's most intelligent and creative individuals interested in an education centered on science and technology. The Institute upholds a commitment to meritocracy and fair access to the admissions process for students from all backgrounds.

The Admissions Office works closely with the offices of Student Financial Services, Undergraduate Advising and Academic Programming, Minority Education, and the Registrar, as well as the Office of the President, the Alumni Association, Information Systems and Technology, and the Committee on Undergraduate Admissions and Financial Aid. During Campus Preview Weekend, the Admissions Office coordinates with other offices in the Division of Student Life, the Department of Facilities, and academic departments. It also supports the admissions process for the Minority Introduction to Engineering and Science program, run by the Office of Engineering Outreach Programs in the School of Engineering.

Review and Accomplishments

The Office of Admissions received 19,020 applications for the freshman class entering in the fall of 2016, a 3.9% increase over the past year. This is due in part to allowing international students (based on citizenship) to apply early action for the first time this year. There were 1,012 international citizens who applied early action. Overall, applications from international students increased from 3,971 in AY2015 to 4,299 in AY2016, an 8.3% increase. Admitted students totaled 1,511, including 26 students admitted from the wait list, together representing 7.9% of the applicant pool.

The overall yield on admitted students increased to 74%. Women will make up 46% of the freshman class; the yield on women was 68% versus 79% for men.

There were 569 applications for transfer admissions; 27 were admitted and 23 are expected to enroll. Three enrolled in February 2016, 19 will enroll in the fall of 2016, and one student is deferring enrollment until 2017 following a gap-year between institutions.

In AY2016, Admissions Office staff visited 34 states through 66 Central Meeting programs, of which 34 were MIT-only and 32 were group meetings in collaboration with other schools, including Pomona College, the California Institute of Technology, and Brown and Yale universities. Additional international recruitment travel included trips to Africa, the Caribbean, Western Europe, Uzbekistan, and Romania. On campus, the office welcomed approximately 30,000 admissions visitors. The Admissions Office partnered with other MIT offices to host several programs during the 2016 "Under the Dome" open house, including an admissions session that attracted more than 600 visitors. The Campus Preview Weekend event continued to grow, with 1,120 admitted students and over 1,100 parents in attendance.

The composition of the Class of 2020 reflects MIT's ongoing commitment to student body diversity and excellence. Of the freshmen entering in 2016, 46% are women, 16% will be the first generation in their families to graduate from college, and 10%

are international citizens. Students will be coming from 49 US states and 62 countries. Ninety percent of the incoming class members have been leaders (e.g. president, captain) of an organization, and more than a third (35%) have founded an organization or business. Forty percent were valedictorians and 94% graduated in the top 5% of their high school class. MIT continues to partner with the QuestBridge program, a nonprofit organization that recruits high-achieving students from low-income backgrounds, and 62 QuestBridge finalists will be enrolling in the fall. The freshmen enrolling in 2016 arrive with mean SAT scores of 733 verbal and 772 math, the highest mean scores in both sections to date.

Enrolling students that are US citizens or permanent residents are asked to self-identify their race/ethnicity within categories established by the US Department of Education. International students do not report a race or ethnicity, but when reporting race/ethnicity percentages of the enrolling class we do include international students as part of the entire class, therefore the percentages listed here are the percent of the entire class. Students in the enrolling class have self-identified in the following racial/ethnic groups: American Indian/Alaskan Native, 3%; Asian American, 35%; Black/African American, 9%; Hispanic/Latino, 14%; Native Hawaiian/Pacific Islander, 0%; White, 48%. Twenty-three percent of the enrolling class self-reported as an underrepresented minority student. (Note: students may identify with more than one racial or ethnic group.)

The MIT Educational Council increased the number of alumni interviewers to 5,250. Educational Counselors conducted 17,162 interviews. The pool of interviewers is 17% international and 39% female. This year's group of Educational Counselors includes members from the classes of 1941 to 2015, with 35% of the volunteers hailing from the most recent 10 graduating classes.

In 2016, the Harvard Graduate School of Education released a report titled, "Turning the Tide: Inspiring Concern for Others and the Common Good through College Admissions." The report discussed ways the college admissions process might, "promote greater ethical engagement among aspiring students, reduce excessive achievement pressure, and level the playing field for economically disadvantaged students." MIT's dean of admissions and student financial services endorsed the report and its recommendations.

During AY2016 Dean of Admissions Stuart Schmill also served as the interim executive director of Student Financial Services following the retirement of the former director, Elizabeth ("Betsy") Hicks. In April 2016, Stuart Schmill was named dean of admissions and student financial services on a permanent basis.

Staffing

In AY2016, the staff was composed of 20 administrative and 10 support staff members, consisting of 23 women and seven men. Thirty-three percent of the staff were considered underrepresented minorities (Hispanic, Asian, and African American).

Stuart Schmill
Dean of Admissions and Student Financial Services

Office of Experiential Learning

The [Office of Experiential Learning \(OEL\)](#) brings together the Edgerton Center, D-Lab, Concourse, the Experimental Study Group (ESG), and Terrascope. Its director is J. Kim Vandiver, dean for undergraduate research and director of the Edgerton Center, which includes the D-Lab program. The faculty directors for Concourse, ESG, and Terrascope are, respectively, Professors Anne McCants, Leigh Royden, and David McGee. Each director has provided separate annual reports, which follow this brief introduction.

Edgerton Center

The mission of the [Edgerton Center](#) is to uphold the legacy of Harold “Doc” Edgerton— inventor, entrepreneur, explorer, and longtime MIT professor—by promoting hands-on and project-based learning, offering subjects in engineering and imaging, supporting student clubs and teams, maintaining student machine shops, upholding MIT’s expertise in high-speed and scientific imaging, offering the D-Lab international development program, and offering a year-round K–12 science and engineering program.

K–12 Engagement

Twenty years ago, Edgerton Center director J. Kim Vandiver noted that MIT had received no college applications from students at Cambridge Rindge and Latin High School. Vandiver chose to build a bridge from the Institute to the Cambridge Public Schools by initiating a program of daily three-hour, project-based lessons in science and engineering for fourth- through eighth-grade students. Edgerton Center instructor Amy Fitzgerald leads the lessons (which are aligned with Massachusetts state standards) with assistance from MIT students. Today, this in-demand program hosts over 2,500 student visits annually from public, private, and home schools in the greater Boston area and nearby New England states.

This early initiative seeded the growth for future K–12 programs. The center now serves more than 3,000 young students who participate, at minimal or no cost, in a selection of hands-on engineering programs offered on-site.

In 2004, the center began working with the John D. O’Bryant School of Mathematics and Science (JDOB) in Roxbury, MA. O’Bryant educators and students have since worked collaboratively with staff members, primarily Edward Moriarty and O’Bryant alumnus Alban Cobi. Fruits of the collaboration include the Engineering Pathways Program curriculum, developed by Moriarty, and support for the proposed Community Innovation Arena, a building to be constructed at JDOB for multidisciplinary project-based learning.

The ties established between the center and JDOB remain firm, with preference given to JDOB students for the Engineering Design Workshop, a one-month summer engineering program for high school students that is led by Moriarty and is now in its 10th year. Furthermore, six O’Bryant graduates have matriculated at MIT, with two students now in their freshman year.

Fitzgerald is in her sixth year of collaboration with General Electric (GE) and its plant in Lynn, MA, on the GE Girls summer program. GE Girls was piloted at MIT in 2011 with 25 rising seventh-grade girls from the Lynn Public Schools. The model has been disseminated to other GE sites and partner educational institutions across the nation. Similarly, Fitzgerald's You GO Girl! summer program (in its 17th year) exposes rising ninth-grade girls to hands-on, project-based lessons in science and engineering. Robert Veith, the Edgerton Center's K-12 project coordinator, is in his third year of the SeaGlide workshop, a one-week summer program for high school teachers and students co-taught by staff from the Naval Surface Warfare Center Carderock Division.

Classroom science teachers seek out our "Atoms and Molecules" sets made from basic LEGO® bricks, which enable educators to teach concepts in biology, chemistry, and earth science. Over the past year, we have fulfilled 38 requests from schools across the nation.

The first sets of Edgerton Center-patented, injection-molded DNA/RNA models have been produced for use in teaching hands-on middle school and high school biology. Thirty-one sets with instructional materials have been distributed to teachers across the nation. A grant of \$385,000 from the Barker Foundation has made it possible for us to set the price well below the true cost of production.

We are nearing completion of new prototypes for a similar kit related to instruction on proteins, with distribution scheduled for fall 2016. Instructional teacher training videos are in production.

Our partnership with i2 Camps—a network of middle school science, technology, engineering, and mathematics (STEM) camps—is now in the fourth year of a five-year grant to develop a curriculum for the camps. With other MIT groups, we have developed and implemented additional science and engineering curricula that are in place at 18 locations nationwide and two international locations.

The Saturday Thing program, now in its 11th year, is characterized by unstructured play in a constructive environment. Developed by Ed Moriarty and staffed by Moriarty and MIT alumni volunteers, the program has been replicated in states from Alaska to Florida.

As K-12 educators and administrators seek ways to enhance the learning environment for the younger generation, the Edgerton Center is increasingly approached as a thought partner and collaborator for hands-on, project-based education and professional teacher development. For example, the center entered into a multi-year collaboration with the Meadowbrook School of Weston in 2015 to develop integrated, interdisciplinary design thinking curricula and advise on the school's "maker space." Meadowbrook is now an Edgerton Center testing site for developing K-8 curricula and serves as a potential model program for future independent school collaborations.

In addition, the Edgerton Center and the Winsor School, a private girls' school in Boston, have established a one-year agreement to provide professional teacher development and guidance on an innovation lab for creative approaches to teaching and problem solving.

Hands-on Learning for MIT Students

Student Clubs and Teams

For over 20 years, the Edgerton Center has supported student clubs and teams with seed funds, safety and administrative oversight, and the provision of work space, equipment, and mentorship. The center is now home to more than a dozen student teams (over 200 students) such as the Solar Electric Vehicle Team, MIT Hyperloop, the Electric Vehicle Team, and the Formula SAE team.

We are pleased to report that the past year boasts some impressive accomplishments. The newly formed MIT Hyperloop team won a best overall design award in a competition that included entries from 115 university teams representing 20 countries. The team is now building and testing its Hyperloop pod for a demonstration to take place on a one-mile test track in fall 2016. MIT's Formula SAE team (which differs from most Formula SAE teams in having about as many female as male team members) competed in the Collegiate Design Series in Lincoln, NE, earning sixth place. Members of MIT's Electric Vehicle Team entered their electric motorcycle in the Pikes Peak International Hill Climb in Colorado and placed second in the Electric Bike division.

The Solar Electric Vehicle Team traveled to Australia to compete in the 2015 Bridgestone World Solar Challenge. The team endured some technical challenges but saw the experience as immensely valuable. "It really brings you out of your design bubble to see the ways other people have attacked the problem," said Rose Abramson '15. Team captain Priya Kikani added that "I learned a lot in my classes but if someone asked me where I learned the most about engineering, it was as a part of this team."

Hands-on Academic Offerings

The Edgerton Center offers 20 to 25 subjects for credit each year, including 17 subjects associated with D-Lab, as well as 6.163 Strobe Project Lab and 6.070 Electronics Project Lab (the latter two taught by James Bales, our associate director). This past fall and during Independent Activities Period (IAP), the Edgerton Center welcomed Keith Ellenbogen, visiting artist at the Center for Art, Science & Technology, to collaborate with Bales and Associate Professor of Physics Allan Adams. During IAP, Ellenbogen, Adams, Bales, and 16 MIT students took part in 8.S10 Underwater Conservation Photography, an IAP class sponsored by the Edgerton Center and the Department of Physics. The class traveled to the Wildlife Conservation Society Glover's Reef Research Station in Belize to carry out conservation photography projects. In May, the Museum of Science hosted a live event in the Charles Hayden Planetarium at which Adams and Ellenbogen presented and narrated still and video images collected in Belize. This event was made possible, in large part, by support from the Roy Little Fund.

Student Machine Shops

Well-equipped workshop space for students is a vital component of the center. Essentially, it is the stage upon which students can put their education into practice.

We completed the transformation of the N51 space into a state-of-the-art fabrication lab. Acquired in 2007, the renovated 6,000-square-foot space gives individual students, clubs and teams, staff, and faculty access to CNC Shop tools and equipment—bed mills, lathes, and a machining center, a water-jet cutter, a thermal-forming machine, a mini

mill, 3D printers, and an injection molding machine. Students and staff now look to technical instructor and master machinist Pat McAtamney for expertise and guidance, and, as a result, much of the fabrication can go from start to finish because of the advanced tools and expertise now available in the shop.

Now in its 19th year, the Edgerton Center Student Shop in 44-022 continues to draw students, and our free machine training (12 hours in duration) is booked months in advance. Students spend nearly 6,000 cumulative hours annually in the Student Shop, expertly led by shop manager Mark Belanger with internship support from Oxsana Lasowsky.

D-Lab

Founded in 2002 by Amy Smith, senior lecturer in the Department of Mechanical Engineering, **D-Lab** is working to meaningfully improve the lives of people living in poverty. The program's mission is pursued through interdisciplinary courses, field and lab research, technology and enterprise development, and community initiatives. Whether at MIT or in the field, D-Lab emphasizes experiential learning, real-world projects, community-led development, scalability, and impact assessment.

D-Lab has active partners around the world in countries including Brazil, Cambodia, El Salvador, Ethiopia, Ghana, Guatemala, Haiti, Honduras, India, Lesotho, Nepal, Nicaragua, Nigeria, Pakistan, Peru, the Philippines, Tanzania, Uganda, and Zambia. International partners—such as local nongovernmental organizations and social enterprises—define student projects, participate in research, collaborate on the design of technologies, host design summits and training sessions, and much more.

To date, D-Lab has enrolled more than 2,100 students in its MIT classes, trained more than 5,000 people worldwide in design or business skills, and provided financial support or mentorship to more than 70 designers and entrepreneurs.

D-Lab has developed 22 MIT courses and a range of technologies and processes, including community water testing and treatment systems, human-powered agricultural processing machines, medical and assistive devices for global health, and cleaner-burning cooking fuels made from agricultural waste.

Student Engagement

D-Lab courses continue to be popular among MIT students. This past year, 322 students enrolled in 17 D-Lab subjects and two independent studies (a marked increase over the 189 students enrolled in 10 courses during the prior year). Three new courses were offered: EC.788 D-Lab: Field Research, EC.719 D-Lab: Water and Climate Change, and E.750 Humanitarian Innovation: Design for Relief, Rebuilding, and Recovery. In addition, two courses—EC.721 D-Lab: Mobility and EC.S07 D-Lab: Education and Learning—underwent a significant redesign.

Also, D-Lab staff and researchers oversaw more than 25 undergraduate research projects and six undergraduate theses during 2015–2016, along with supervising numerous interns from a variety of institutions.

Over the course of the year, through IAP trips as well as spring break and summer fieldwork, 56 D-Lab students traveled to El Salvador, Ethiopia, Ghana, India, Indonesia, Jordan, Kenya, Peru, Tanzania, Thailand, Uganda, and Zambia to work intensively with D-Lab community partners. D-Lab makes international fieldwork possible for all students enrolled in EC.701 D-Lab: Development and EC.711 D-Lab: Energy as well as a selection of students from each of the other D-Lab classes. Student travel funds were augmented by funds from the Underclassmen Giving Campaign, which this year chose D-Lab as its new partner. As a result, D-Lab was able to award six Underclassmen Giving Campaign D-Lab fieldwork grants totaling \$17,250.

As was the case in previous years, D-Lab students were well represented in the IDEAS Global Challenge winner's circle this year. Four of the year's 12 winning projects were initiated in D-Lab courses.

D-Lab Scale-Ups

The D-Lab Scale-Ups social entrepreneurship fellowship program was created in mid-2011 to identify and support technology ventures with potential for wide-scale poverty alleviation. To date, the program has sponsored 27 social entrepreneurs working on four continents in sectors including health care, agriculture, clean water, waste, energy, hands-on education, prosthetics, and mobile financial services. As of November 2015, Scale-Ups fellows had been awarded \$510,000, and these entrepreneurs have gone on to raise more than \$2.3 million in equity and debt. The cumulative impact of the Scale-Ups ventures continues to grow, with 201 direct and 1,240 indirect jobs created, 421,000 users reached, and \$1.36 million in revenue generated.

Research

D-Lab research—including needs assessments, market research, product evaluations, and sector-specific applied research—cuts across all programs.

Biomass Fuel and Cook Stoves

Nearly three billion people worldwide rely on biomass and traditional methods for cooking and heating. These time-honored means of cooking pose acute and chronic health risks, introduce time burdens on women and children, contribute to unsustainable harvesting of forests, and, in many cases, represent a significant cost burden for base-of-pyramid households.

Led by research scientist Daniel Sweeney, the D-Lab Biomass Fuel and Cook Stoves team has developed innovative methods for testing and evaluating fuels and cooking technology in the lab and in the field, as well as a range of approaches for measuring performance and impact. They employ advanced scientific methods that are typically not used in developing countries, including lower cost sensors that measure stove usage and household air pollution. The sensor data can be transmitted over mobile phone networks, uploaded to an online server for real-time monitoring, and shared with the product designers and implementers to address technology or intervention design deficiencies.

An example of the group's work over the last year was a month-long interview-based study ("Adoption of Improved Cooking Products through a Local, Market-Based Approach in Uganda") they undertook in late summer 2015 in Uganda. Working with D-Lab/MIT startup Sensen, the team installed sensors allowing for remote monitoring of stove use and levels of household pollution.

Mobile Technology Lab

The Mobile Technology Lab, established in 2014 by Richard Fletcher and based at D-Lab, develops new mobile technologies for a wide range of applications that have social impacts; examples include mobile health (mHealth), global health, mobile psychiatry, and intelligent agriculture. The lab's research spans the areas of electronics and sensor design, advanced signal-processing algorithms, machine learning, and user interface design.

All over the world, mobile phones have become our personal wearable computers, transforming our work as well as our personal lives. Smartphones can be used as powerful instruments, as a guide for navigating through life, or for connecting with other people and places. As with any tool, they can be abused. In general, however, these ubiquitous personal computers have enormous potential for empowering people in a wide variety of areas, ranging from mental health and drug addiction to global health, diagnostic tools, and even farming and education. Current projects include a mobile heart Doppler device, pulmonary disease diagnostics, and a neonatal assessment device.

Off-Grid Energy Services

According to the World Bank, roughly 1.2 billion people lack access to modern energy services such as affordable and reliable heating, cooking, mechanical power, transportation, lighting, and telecommunications services.

D-Lab believes that local organizations in off-grid communities can be powerful agents of change for driving increased energy access, regardless of their existing expertise in the energy sector. However, most models for scaling energy access in the developing world focus on the producer or vendor as the agent of change. In addition, many procurement organizations often have limited information about local market needs and opportunities as well as the quality and availability of products.

Over the course of the past year, in support of local organizations seeking to increase energy access in their own communities, the D-Lab Off-Grid Energy group has developed resources including the D-Lab Off-Grid Energy Toolkit. This open-source tool provides structured guidance for organizations to develop programs for increasing off-grid energy access with minimal external support, as well as a solar lighting database that includes 50 products and 100 distributors operating in 47 countries across Africa, Latin America, Asia, and Oceania. The toolkit allows consumers to determine which products are available and where they can purchase them.

Local Innovation Group

Led by International Development Innovation Network (IDIN) staff member Elizabeth Hoffecker, this group explores the role of local innovation and grassroots problem

solving in improving community well-being and addressing development challenges associated with poverty.

Current research is organized into three areas: local innovation processes and ecosystems (increasing our understanding of how local innovation works and how innovation processes and ecosystems can be described, mapped, and analyzed), development impacts of local innovation (investigating the development effects of local innovation, helping us understand why and how local innovation matters), and enabling and scaling local innovation (exploring the role that global networks play in enabling local innovation and spreading the development impact of local solutions and approaches).

Practical Impact Alliance

In the fall of 2014, Scale-Ups lunched the Practical Impact Alliance (PIA), an initiative designed to foster shared learning and collaborative action among corporations, nongovernmental organizations, and social enterprises committed to scaling solutions to global poverty. Current members include Ajinomoto, Community Empowerment Solutions, Danone, Greenlight Planet, Johnson & Johnson, Living Goods, Medtronic, the Melton Foundation, Mercy Corps, Philips Healthcare, S.C. Johnson, Siemens Stiftung, Snow International, the US Agency for International Development's (USAID) Global Development Lab, and World Vision International.

Through working groups, D-Lab collaborates with members to produce practical working tools—best practices, decision-making frameworks, and other resources—to be broadly disseminated at year's end. During 2015–2016 PIA released three publications: “The Base-of-the-Pyramid Distribution Compass,” “Fostering Co-Design in Base-of-the-Pyramid Markets,” and “Best Practices for BoP Door-to-Door Distribution.”

In fall 2015, the first annual PIA Co-Design Summit took place in Ghana. The weeklong summit, at which participants collaborated in co-design and participatory research, was co-organized and hosted by the Technology Consultancy Centre at the Kwame Nkrumah University of Science and Technology. The event brought together more than 25 individuals, including PIA members from industry and international nongovernmental organizations, Ghanaian innovators and social entrepreneurs, and members of the local community.

International Development Innovation Network

Initiated in 2013, the International Development Innovation Network is a five-year program funded by the Global Development Lab. IDIN empowers a diverse, global network of innovators to design, develop, and disseminate low-cost, practical solutions to alleviate poverty.

In its fourth year, IDIN fostered and supported its growing network of more than 600 inventors, technologists, and social entrepreneurs from 61 countries who have produced and advanced more than 100 innovation technologies and services. IDIN Innovation Centers have now been established in Uganda, Brazil, and Tanzania, and new centers are under development in India, Kenya, Nepal, Sierra Leone, and Zambia. Over the course of the year, IDIN awarded 14 micro-grants of \$500 to \$2,000 for promising prototypes

and ventures, and helped connect its network members to other funding opportunities. IDIN also awarded small grants to five local chapters in Colombia, Costa Rica, Ghana, India, and Peru (there are a total of 10 chapters worldwide). There are currently 101 prototypes and ventures in the IDIN pipeline. In addition, IDIN trained 136 innovators at several International Development Design Summits this year, including month-long summits in Chennai, India, and D'Kar, Botswana, and two-week-long summits in Lahore, Pakistan, and Bogota, Colombia.

IDIN's work is led by MIT's D-Lab and a consortium of universities and institutional partners in the United States and abroad, including Colorado State University, Olin College of Engineering, the University of California at Davis, the Kwame Nkrumah University of Science and Technology in Ghana, the National Technology Business Centre in Zambia, Singapore Polytechnic International Learning Express, and the ECHO East Africa Impact Center in Tanzania.

Comprehensive Initiative on Technology Evaluation

D-Lab continues to be an active partner in the Comprehensive Initiative on Technology Evaluation (CITE), a five-year program led by MIT and funded by the USAID'S Global Development Lab. CITE, established in 2013, is headquartered at the MIT Department of Urban Studies and Planning with D-Lab as a partner. The initiative has developed a methodology for evaluating technology solutions intended for use in global development work to help donors and implementing organizations identify the best solution for their work. The main product of each of CITE's evaluation is a comparative rating chart that graphically displays how each technology solution stacks up to its competition along one or more of the three axes of evaluation.

D-Lab staff members Kendra Leith (evaluation manager) and Lauren McKown (IDIN communications) spend half of their time on CITE-related work. Over the past year, D-Lab instructor Susan Murcott completed work on the CITE evaluation of household water filters in Ahmedabad, India, and instructor Matt McCambridge began work designing an evaluation of developing-world wheelchairs that will be completed in 2016–2017.

MIT Scaling Development Ventures Conference

The fourth annual MIT Scaling Development Ventures conference featured more than 30 speakers and panelists. This year's conference was made possible by the Legatum Center for Development and Entrepreneurship and was organized by D-Lab, the Priscilla King Gray Public Service Center, the Media Lab, PIA, IDIN, CITE, the Martin Trust Center for MIT Entrepreneurship, and the MIT International Science and Technology Initiatives program.

Personnel Changes

One staff member departed: instructor Alban Cobi '13. A second, Jessica Artiles '12, SM '15, joined us for the year to work on the Meadowbrook School project.

Long-time D-Lab special projects coordinator Dennis Nagle retired last winter. Research associate Becca Smith left after five years to pursue other interests. Partnerships

coordinator Elisha Clark left after more than four years, and Dana Gorodetsky, formerly of MIT Foundation Relations, was hired in January to take that position. Daniel Frey, professor of mechanical engineering and engineering systems and co-director of the Singapore-MIT International Design Center, joined D-Lab in June as the faculty director to oversee research and be part of the D-Lab leadership team. Long-time co-director Victor Grau Serrat will be stepping down in July 2016. We are now in the final stages of a search process for a new executive director; an announcement of a hire will be made in July.

Concourse Program

Concourse is a freshman learning community of students and instructors dedicated to exploring foundational questions at the heart of humanistic inquiry and the relationship of these questions to science and engineering. We supplement the MIT experience with the environment of a liberal arts college in which students and faculty together think about the questions that span disciplines, how to formulate those questions, and how to begin to answer them. Our curriculum covers the standard science core curriculum (mathematics, physics, and chemistry), offers its own core humanities classes, and integrates both the sciences and humanities into a larger context in the program's weekly freshman advising seminar. Concourse math and science classes follow the standard curriculum, with scheduled lectures, recitations, problem sets, and quizzes. The humanities classes are Communication Intensive in the Humanities, Arts, and Social Sciences (CI-H) subjects. Their small size (maximum of 55 students) permits the class to focus on careful reading, cogent analysis, thoughtful discussion, and good writing. It also allows for an intimate atmosphere in which a passion for learning and thinking beyond the traditionally strict disciplinary boundaries is fostered and flourishes.

Personnel

Members of the Concourse faculty and staff during AY2016 were Paula Cogliano, program administrator; Linda Rabieh, lecturer; Robert Winters, lecturer; Jolyon Bloomfield, lecturer; Elizabeth Vogel, lecturer; and Professor Anne E.C. McCants, program director. In addition, 13 undergraduates were employed as tutors and graders.

Enrollment

Concourse had 51 students registered for the fall term. Spring enrollment was 43.

Teaching and Curriculum

Two sections of CC.110 Becoming Human: Ancient Greek Perspectives on the Best Life were offered as CI-H subjects in the fall term. In math and science, we offered CC.801/CC.8012 Physics I, CC.1802 Calculus II, 18.01A/18.02A Calculus, and CC.5111 Principles of Chemical Science. In the spring, there were two humanities offerings: CC.116 How to Rule the World, which was also a CI-H course, and our new CC.120J Making Books in the Renaissance and Today course, which was cross-listed with History. In math and science, we offered CC.802/CC.8022 Physics II, CC.1803 Differential Equations, and CC.512 Organic Chemistry. CC.A10/CC.010 The Concourse of Core Questions and Ideas was our freshman advising seminar in the fall, and it continued with CC.011 Thinking Across the Disciplines in the spring. We also offered two seminars specifically for our

upperclassmen during the year: CC.S11 Concourse Special Topic in the fall and CC.012 Continuing Conversations in the spring.

Accomplishments

Concourse continues to flourish under the direction of Professor McCants. Our enrollments remain robust, and we continue to develop and strengthen the unique interdisciplinary aspect of our program that permits students to learn deeply in each course as well as to reflect upon and discuss the connections among their courses and between science and the broader world.

To advance our goals, we continue to expand the options available for our first-year and alumni students to engage in conversations between the sciences and humanities. This year we received a \$25,000 extension of our award from the T.W. Smith Foundation for an additional year. This has allowed us to continue enhancing our upperclassman seminar offerings, such as CC.012 Continuing Conversations, by providing funding for curriculum work by Rabieh. The award also helped to fund our annual curriculum planning retreat.

We continued to use our spring seminar, CC.011 Thinking Across the Disciplines, to expose our freshmen to other faculty at MIT. Most importantly, our guest speakers offered students insights into how their own research and discipline touch on the core questions that are at the heart of Concourse's focus. Concourse also served as a home for piloting creative, new classes such as Making Books in the Renaissance and Today. In an effort to address our students' physical as well as their intellectual well-being, we continued to offer Concourse-specific physical education classes through a collaboration with the Department of Athletics, Physical Education, and Recreation.

We also have a strong commitment to robust and supportive advising. All staff members serve as advisors, with upperclassmen serving as associate advisors. Because the staff meets weekly, we soon learn about any student who is struggling academically, emotionally, or socially, and we are able to offer support in a timely way. Developing supportive relationships with students and among the students themselves is a crucial part of our mission. To promote community and stimulate conversation, we organized regular outings to plays, concerts, and films.

Experimental Study Group

Student Statistics

Fifty-two first-year students were enrolled in the [Experimental Study Group](#) this year. Of these students, 52% were female, 25% were underrepresented minorities, and 12% were international students from countries including China, Turkey, Germany, Kenya, and Morocco. Approximately 40 non-ESG students enrolled in the five humanities classes (all CI-H or CI-H-Writing Focused classes) offered at ESG. An additional 80 students (most of whom were non-ESG students) enrolled in eight pass/fail undergraduate seminars sponsored by ESG in the fall and spring terms.

Staff and Faculty

ESG's administration includes Director Leigh Royden, Associate Director Graham Ramsay, and Academic Administrator Paola Rebusco. Bettina McGimsey completed her first full year as associate in charge of community and resource development.

Analia Barrantes continued to head the ESG physics staff, joined by Paola Rebusco. Postdoctoral Associate Bhaskar Roy Bardhan provided additional help with the 8.012 Physics I and 8.022 Physics II offerings during spring 2016. Leigh Royden also taught a section of 8.01 Physics I. The mathematics staff was headed by Jeremy Orloff and included Gabrielle Stoy. The chemistry and biology offerings at ESG were taught by Patricia Christie. Former postdoctoral fellow Kyle Peet provided additional help by teaching a third section of 7.103 Biology in spring 2016. In the fall term, Dave Custer taught ES.033J Science Writing and the New Media. For the third time, Custer and Ramsay co-taught (in spring 2016) the humanities CI-H credit subject ES.333 Production of Educational Videos: Skills for Communicating Academic and Professional Content. Lee Perlman rejoined the ESG teaching staff this year after several years at Concourse. He taught ES.112 Philosophy of Love in the fall and ES.113 Ancient Greek Philosophy and Mathematics in the spring.

The ESG teaching staff were assisted by 48 undergraduate teaching assistants (TAs) in the fall and 39 in the spring; 65% of these TAs were women. The TAs provided excellent support for our freshmen, learned valuable teaching and leadership skills, and achieved an impressive overall median grade point average of 4.8 while doing so.

Educational Initiatives

Faculty Mentoring Program

This year, with funding from the Office of the Dean for Undergraduate Education, ESG continued its fledgling faculty mentoring program, which is designed to engage ESG freshmen and faculty in meaningful discussions on topics ranging from creating Undergraduate Research Opportunities Program (UROP) projects to exploring possible majors. Faculty were invited to participate in activities such as informal talks with small groups of students, hiking trips, and theater and concert outings. Faculty participants included John Belcher (Physics), John Essigman (Chemistry), Taylor Perron (Earth, Atmospheric and Planetary Sciences), Alex Slocum (Mechanical Engineering), David Vogan (Mathematics), and Karen Willcox (Aeronautics and Astronautics). Other MIT faculty who took part in student trips or made presentations included Anna Frebel (Physics) and Heather Paxson (Anthropology).

Undergraduate Seminars

In fall 2015, ESG offered three seminars, ES.200 ESG Teaching Seminar (taught by Christie and Stoy), ES.S10 Introduction to Psychopharmacology (taught by ESG alumnus Zachary Fallows '09), and ES.S40 ESG Book Club (taught by Perlman). In the spring, ESG sponsored eight undergraduate seminars: ES.010 Chemistry of Sports (taught by Christie and Stephen Lyons), two sections of ES.011 Kitchen Chemistry (co-taught by Christie and chemistry graduate student Markrete Krikorian), ES.200 ESG Teaching Seminar (taught by Stoy), ES.S21 Fourier Frontier Math Seminar (developed and taught by ESG

undergraduate Phong Vo '16), ES.S40 Current Events Seminar (taught by Perlman), ES.S41 Law and Technology Seminar (taught by Lyons), ES.S70 Programming Physics: E&M with Python (taught by Barrantes, Rebusco, and ESG undergraduate Joseph Griffin '16), and ES.S50 Twist, Warp, Stitch and Glue: Textile Art(s) and the Making of Culture (taught by Professors Royden and McCants). Three of the spring seminars were new offerings and received high ratings from students. The Python seminar will be offered in fall 2016 as a freshman advising seminar, and 24 students have already pre-enrolled.

New Symposium Series

As a companion to the Kitchen Chemistry seminar, ESG piloted a new spring 2016 symposium series open to the entire MIT community. Renowned food experts Kenji Lopez-Alt (an MIT alumnus and *New York Times* best-selling author of *The Food Lab*), Ayr Muir (an MIT alumnus and head of Clover Food Labs), Gus Rancatore (Toscanini's Ice Cream), and Benjamin Holmes and Ronn Friedlander (Aeronaut Brewing Company founders and MIT PhD candidates) spoke on a variety of food science topics of general interest to overflow audiences of more than 100 people per talk. These symposia enabled the Kitchen Chemistry seminar to extend its reach and serve a broad audience of food enthusiasts.

Research

In spring 2016, ESG staff and former students published the results of a seven-year study on the effects of specific running shoes on running speed outcomes in a *Journal of Athletic Enhancement* article titled "A Case Study Comparing Minimalist Design Running Shoes with Traditional Motion Control Foam Core Running Shoes." The research was made possible through the ESG seminar ES.010 Chemistry of Sports, in which students and other members of the MIT community volunteered as part of the study. Co-authors were three former undergraduate seminar participants (Ryan W. Jackson, Christopher T. Carper, and ESG student Melissa Gymrek) as well as the two co-instructors of the seminar (Christie and Lyons).

Inclusion of Concourse Students

In collaboration with other freshman learning communities, seven Concourse students participated in a variety of ESG General Institute Requirement (GIR) subjects in both the fall and spring terms, including subjects in biology, chemistry, math, and the humanities.

Panel on Prison Education

ESG humanities instructor Lee Perlman organized a "Teaching in Prison" panel discussion. Held in May 2016, the discussion centered on what prisons and prison life are like and on teaching in the prison system. It also explored opportunities for MIT students to enter into dialogue and take classes with incarcerated men and women in the Massachusetts prison system. MIT faculty members Helen Elaine Lee (Women's and Gender Studies) and Justin Steil (Department of Urban Studies and Planning) were joined by Lecturer Jacob Bower-Bir (Department of Political Science) and Senior Policy Associate Justin Loiseau (Department of Economics) as panelists. This panel discussion helped lay the groundwork for a seminar on teaching in the Massachusetts prison system that is now in development and will be offered at ESG in fall 2016.

Singapore University of Technology and Design

ESG continued its ongoing relationship with the Singapore University of Technology and Design. Patti Christie continued her mentoring relationship by making a trip to Singapore in January and again in June 2016 to help with the organization of the next cohort chemistry class.

Awards

Winners of the annual Peter and Sharon Fiekowsky Community Service Award (for outstanding contributions to the ESG community) included Emma P. Bingham '19, Frances R. Hartwell '19, and Rianna M. Jitosh '19. Winners of the annual Peter and Sharon Fiekowsky Excellence in Teaching Award (given to graduating seniors who have demonstrated excellence in teaching at ESG over a sustained period of time) were Richard L. Chang '16, Francisco Holguin '16, Haley M. Hurowitz '16, Rachel C. Reed '16, Leah R. Schmitz '16, Phong T. Vo '16, and Clare M. Zhang '16. In addition, a special Fiekowsky award was given to graduating senior Joseph Griffin for excellence in seminar development and teaching at ESG.

Fundraising

In FY2016, ESG raised over \$100,000 in a combination of gifts and pledges in an ongoing effort to meet a \$1 million endowment goal before ESG turns 50 in AY2020. This endowment will be used to fund ESG educational initiatives such as seminars, educational video projects, and other educational and community activities not covered under ESG's base budget.

Conclusion

This year has seen a particularly sharp growth in ESG's service to the wider MIT community through a combination of teaching GIR subjects and seminars and sponsoring panel discussions and symposia. Collectively, these activities engaged over 500 non-ESG students during AY2016. ESG's dedicated staff continues to offer MIT undergraduates a small group learning experience in a community-based setting that fosters opportunities to teach and learn in a collaborative environment.

Terrascope

The [Terrascope](#) Program is designed to help first-year students develop the skills to analyze and solve complex problems, work effectively as part of a multidisciplinary team, and communicate in a variety of formats, including formal presentations, web pages, interactive displays, and radio broadcast segments. In the fall, freshmen are presented a complex problem focused on issues of sustainability and the environment in the credit-bearing subject 12.000 Solving Complex Problems (known as Mission 20xx, where xx is their graduation year). The problem, which forms the focus for the year's curriculum, typically involves aspects of the Earth system; however, Terrascope is intended to be a valuable experience for students entering all fields. It is unlike any other class they will take at MIT, and many students find that the skills they learn can be applied to the rest of their academic studies and in future employment. In Terrascope, first-year students are considered scientists and engineers from the first day of class

and are empowered to think about—and propose solutions to—major issues facing the planet. They may opt to continue work begun in the fall by enrolling in one or both of a pair of Terrascope subjects offered in the spring. In addition, each year students can participate in a weeklong field project to gain firsthand experience with issues they have studied from a distance during the year. Core science and mathematics subjects are taken outside the program. Program faculty and staff advise all students who initially join the program each fall. Terrascope provides facilities for the students, including workshop and classroom space, a lounge, and a kitchen.

Personnel

David McGee, Kerr-McGee Career Development Assistant Professor in the Department of Earth, Atmospheric and Planetary Sciences, became the director of Terrascope this year. He taught 12.000 Solving Complex Problems in fall 2015 with the help of TA Michael Eddy and a dedicated group of undergraduate teaching fellows (all graduates of Terrascope) and MIT alumni (who act as mentors within the subject). In the spring Charles Harvey, professor of civil and environmental engineering, was lead faculty member for 1.016 Communicating Complex Environmental Issues, assisted by Lecturer Ari Epstein. Epstein also taught SP.360 Terrascope Radio in the spring. Emily Martin joined the program to take on the coordination duties carried out by the former program administrator Debra Aczel.

Enrollment

In the fall term, 32 students enrolled in 12.000 Solving Complex Problems. In the spring term, four students enrolled in 1.016 Communicating Complex Environmental Issues and nine students enrolled in SP.360 Terrascope Radio.

Highlights

This has been an eventful and successful year for Terrascope, with highlights including changes in leadership and staffing, national recognition for the program's path-breaking accomplishments, wide distribution of students' work, and a very successful Spring Break Field Experience.

Terrascope's major challenges and opportunities this year involved leadership and staffing, with long-time Terrascope director Professor Samuel Bowring stepping down due to illness and founding program administrator Debra Aczel retiring. As noted, David McGee has stepped in as director of the program and lead instructor for its signature class and Emily Martin has taken over many of Aczel's duties. Long-time Terrascope lecturer Ari Epstein has also taken on an expanded role, and Paula Cogliano (program administrator in Concourse) has assisted with financial management. The transition has been smooth and productive.

At the beginning of the academic year, Terrascope hosted a number of forums that gathered alumni and current students to reflect on the program's role in their MIT careers and beyond and identify key factors contributing to the program's success. These forums made clear to new and continuing staff alike both Terrascope's history and accomplishments and areas for future growth and adaptation.

This academic year also saw Terrascope receive national recognition, as the program was named by the National Academy of Engineering (NAE) as one of 25 “Exemplars in Engineering Ethics Education” nationwide. Designees’ achievements are outlined in a book published by NAE, and the awards were highlighted in a session of the annual conference of the American Society for Engineering Education (ASEE) in June 2016.

Several groups of Terrascope students and alumni were recognized nationally as well. Both this year’s and last year’s Terrascope Radio final projects were distributed nationally by the Pacifica Radio Network, and they have been heard on roughly 50 college and community radio stations nationwide. In addition, Shante Stowell ’15 won a national contest sponsored by ASEE for her audio story on diversity titled “Feeling Raced,” and a podcast series created by Stowell and two other Terrascope alumni—Linda Seymour ’14 and Elise Chambers ’12—was named to the Public Radio Exchange’s list of “Best Youth-Produced Audio of 2015.” Lisa Song ’08, already a Pulitzer Prize winner, was a finalist for another Pulitzer Prize this year.

This year’s Terrascope theme problem centered on food security and sustainable agriculture in an era characterized by rapid climate change. Freshmen in the program developed a comprehensive approach to solving the problem, and they then presented and defended it in front of a panel of global experts. The Spring Break Field Experience explored agriculture in New Mexico and the Navajo Nation, giving students the chance to learn firsthand about agricultural methods from the ancient to the modern, from smallholder farming communities to one of the largest industrial farms in the nation. In the spring, some of the Terrascope students continued their work on agriculture in SP.360 Terrascope Radio and 1.016 Communicating Complex Environmental Issues. In 1.016, students developed hands-on, maker-style projects such as an educational home hydroponic-farming kit and a device to increase the efficiency and productivity of human-powered weeding on smallholder and organic farms (the latter was created in service of a local organic farmer who provided the student team with advice and guidance).

Looking forward, program staff and leadership plan to continue Terrascope’s outreach to other units within MIT, including the new Environmental Solutions Initiative, a natural synergistic partner for Terrascope. Next year’s core Terrascope problem concerns the design (or redesign) of cities as urban populations continue to grow rapidly. In addition, some program spaces will undergo renewal and refurbishment, and the program as a whole plans to strengthen its ties with its rapidly growing alumni population.

J. Kim Vandiver

Director, Office of Experiential Learning, and Forbes Director, Edgerton Center

Dean for Undergraduate Research

Professor of Mechanical and Ocean Engineering

Anne McCants

Director, Concourse

Professor of History

MacVicar Faculty Fellow

Leigh Royden
Director, Experimental Study Group
Professor of Geology and Geophysics

David McGee
Director, Terrascope
Kerr-McGee Career Development Assistant Professor

Office of Minority Education

The mission of the [Office of Minority Education \(OME\)](#) is to promote academic excellence, build strong communities, and develop professional mind-sets among students from underrepresented minority groups, with the ultimate goal of developing leaders in the academy, industry, and society. OME supports MIT's academic mission to provide the best possible education for all students while serving the nation's need to have underrepresented and underserved students in science and engineering disciplines pursue higher education and achieve success in these fields.

The vision of OME is to “imagine an MIT experience where all students are connected, happy, excelling, expanding their boundaries, and inspired to follow and achieve their passions.” The Office of Minority Education plays an integral role in shaping the college experience of students from underrepresented groups through a robust portfolio of programs and services. In so doing, OME impacts the experience and overall success of all MIT students and moves the Institute closer to fulfilling this vision.

OME Signature Programs

Interphase EDGE

Interphase EDGE (Empowering Discovery | Gateway to Excellence) is a two-year scholar enrichment program that includes a seven-week summer session as well as programming during the academic year (through the end of sophomore year). The focus of the summer program is to give scholars an introduction to the MIT experience by exposing them to the rigors of a full subject load and to life on campus. In addition, the Interphase EDGE (IP) curriculum is uniquely designed to impart pivotal concepts that increase long-term academic success. The program design not only gives students an “edge” on their MIT experience but also catalyzes their success beyond MIT. During the summer and academic year, scholars participated in a range of personal and educational seminars and activities designed to ensure their smooth transition into college life. Throughout the academic year, scholars continued to build upon the relationships created during the summer by attending biweekly and/or monthly meetings with EDGE advisors and monthly professional and academic enhancement events, including programs that expose them to various career pathways.

Our academic-year programming is a critical component of the Interphase EDGE model. Throughout the year, the 2015 Interphase EDGE (IP15) cohort of scholars attended faculty mixers, confidence workshops, and workshops designed to help them choose a major prior to their sophomore year. In August 2015, second-year Interphasers (IP14 scholars) participated in a two-day retreat at the Connors Conference Center. The primary objectives of the retreat were to reconnect cohort members, help them reflect on lessons learned during their first year at MIT, reestablish their connection to the MIT community, and help them begin the process of thinking about their lives or pathways after MIT. In addition to the retreat, Interphase EDGE advisors held monthly individual check-ins with the sophomores, connected the scholars to various MIT programs and resources for upperclassmen, and facilitated informal focus groups with the scholars to discuss program outputs.

The inaugural 2012 Interphase EDGE cohort consisted of 78 scholars. These students were advised by Interphase staff members during their first year. The 2015 cohort consisted of 71 students. After the 2013 passage of an MIT faculty resolution requiring that all first-year students be advised or mentored by a faculty member, we were asked to make major changes to the original advising model. In 2013, IP staff advised about 50% of the cohort; however, in 2014, all of the Interphase EDGE scholars were advised by non-Interphase staff and/or faculty. In 2015, with support from Dean for Undergraduate Education Dennis Freeman, a modified version of the original Interphase EDGE advising model was implemented. IP staff advised about 30% of the 71 students in the cohort.

The Interphase EDGE advising component is a critical aspect of the program design. The advising philosophy is one of increased access, personalized attention or high touch, and proactive engagement. When the model was implemented in its proposed state, we had notable results. For example, among the 2012 and 2013 scholars who had Interphase EDGE staff members as their first-year advisors, fall fifth-week flag rates declined to 18.2% and 13.5%, respectively. For the IP14 cohort (with all students advised externally), the fall fifth-week flag rate rose to 24.3%, which at that time was higher than any fall-semester rate since the implementation of Interphase EDGE. It was also higher than the rate in the fall semester prior to the program's implementation.

The fall 2015 flag rate for Interphasers (25.4%) was higher than that of previous semesters. However, the recovery rate for that semester (83.3%) was also higher than the rates for all cohorts tracked by the Office of Undergraduate Advising and Academic Programming (UAAP). Although the upward trend in flag rates concerned us, the high recovery rate was encouraging. In the spring, the flag rate for Interphase EDGE students was basically flat (approximately 25.0%). However, the recovery rate of 62.5% was the lowest of any UAAP tracked cohort during that semester. This suggests to us that we need to reconsider fully implementing the original advising model as proposed in 2012 in order to improve academic outcomes.

Seminar XL and Seminar XL/Limited Edition

Seminar XL and Seminar XL/Limited Edition (LE) are academic enrichment seminars designed primarily for freshmen that involve an innovative and effective small-group learning concept. In Seminar XL, groups of four to six students meet for 90 minutes, twice per week during the semester, to share their understanding of course concepts and problem-solving methods. A facilitator, typically an upperclassman or graduate student, guides each group. First-year students can receive course credit provided they attend at least 80% of the group sessions.

In AY2016, 120 students participated in the program, with 55 of those students registering for more than one Seminar XL subject (a total of 175 Seminar XL enrollments). Twenty-one students participated in Seminar XL/LE sessions. LE sessions are the same as the regular sessions; however, they begin after "Add Date" and students can earn partial credit for LE participation in a course in which they received a fifth-week flag. The staff of 39 facilitators delivered content in 15 subjects from across many different disciplines. Seminar XL/LE provides an invaluable service to the

entire Institute. It is used frequently by all undergraduates, with 25.1% of the AY2016 participants being non-minority students.

The Seminar XL training and evaluation plan, developed in collaboration with the MIT Teaching and Learning Laboratory over the past three academic cycles, involves offering training to new and returning facilitators and administering quantitative assessments with different data points throughout the academic year. After analyzing these quantitative data from participants, we found that:

- Participants rated the quality of teaching in Seminar XL as 4.6 on a 5-point scale (with 5 being the highest rating).
- Ninety-six percent of the participants who responded in fall 2015 stated that they would recommend their facilitator.
- Participants stated that they understood concepts better, with an average rating of 4.5.
- Participants stated that they became better problem solvers, with an average rating of 4.2 (up from 3.8 last year).

In AY2016, we continued delivering weekly worksheets and problem sets as part of the course curriculum. Lead facilitators, in close collaboration with departmental faculty and teaching assistants, were hired to develop weekly worksheets/problem sets that were closely aligned with the course content and student needs. This method has proven to be successful; participants stated that the worksheets had helped reinforce concepts, with an average rating of 4.6.

Talented Scholars Resource Room

The Talented Scholars Resource Room (TSR²), housed in Building 16-159, continues to be a vital resource for students as well as for faculty and staff who provide advice, guidance, and referrals.

The new name (the room was formerly called the Tutorial Services Room, or TSR) is one way we hope to dispel several myths while simultaneously sending positive messages about asking for and taking advantage of academic resources and support. One such myth is that OME runs the TSR², therefore only minority students need tutoring or academic support at MIT. The reality is that many students need such services. Another myth is that non-minority students are not welcomed or encouraged to take advantage of TSR²'s services. On the contrary, not only are they welcome, they take us up on our invitation to use the TSR². Last fall, 30% of the students who used TSR² services were non-minority students. In addition, we often find that some students are hesitant to use academic support services because of what they believe other people will say or think about their intelligence and academic ability. Of course, this new name will not fully address or mitigate these concerns, but it is an important step in the right direction.

TSR² features include one-on-one and group support, homework/problem-set nights, exam reviews, and a study lounge for undergraduate students. In AY2016, there were a total of 994 visits (made by 554 students) to the TSR² (Table 1).

Table 1. Number of Visits to Talented Scholars Resource Room, by Term, AY2016

Visit description	Fall	Spring
Homework/problem sets	154	106
One-time one-on-one tutoring	41	35
Weekly/standing one-on-one tutoring	14	44
Lounge	64	51
Exam review	90	37
Personal study time	254	104
Total	617	377

This year, 49 teaching assistants (upperclassmen and graduate students) provided coverage for homework/problem-set nights, one-on-one support, exam reviews, and so forth. Many of the TAs also worked as Seminar XL facilitators and were assigned to assist Seminar XL/LE participants who received more than one fifth-week flag. Additionally, we continued to enhance our evaluation and assessment tool so that students receiving tutoring services could give us feedback. We received a total of 58 responses, and some key highlights are as follows.

- With respect to knowledge of the subject material, participants rated their tutor as 4.7 (out of 5) in both fall 2015 and spring 2016.
- Participants rated the overall quality of their tutor as 4.5 in the fall and 4.4 in the spring.
- In fall and spring, 100% and 93% of participants, respectively, reported that they would request/recommend their tutor again.
- Participants rated the efficiency of the scheduling process as 4.2 in the fall and 3.2 in the spring.

We will need to continuously track and monitor student participation and feedback in order to see if the name change has long-term implications. However, even if we do not see dramatic increases in numbers, we believe that the potential for positively influencing how students see themselves and/or how they feel about using “helping” resources is just as important.

Laureates and Leaders

Laureates and Leaders, OME’s signature graduate school initiative, continues to offer relevant and high-quality programming to students, including faculty research talks and panels, guest speakers, roundtable dinners, and workshops. In June, 19 senior laureates graduated from MIT; seven will go on to PhD programs (at schools including MIT, Princeton, Stanford, and Harvard), one will pursue an MD/PhD, four will enter master’s programs with the goal of applying to a PhD program upon completion, one will pursue a master’s degree in architecture, and six will work in industry. There are currently 45 students enrolled in the program, including rising juniors and seniors.

As a means of increasing cohort cohesion, the Laureates and Leaders class of 2017 was inducted into the program along with the class of 2018 during the induction ceremony in February. AY2016 programming included faculty research talks, team-building activities,

workshops, study breaks, panel discussions, and GRE reviews. This last resource was extremely well received by the students who attended and will likely be offered again in the coming academic year.

Mentor Advocate Partnership Program

The Mentor Advocate Partnership (MAP) is a volunteer mentoring program that pairs MIT freshmen with faculty, postdocs, and staff for a yearlong mentoring relationship. After a year's hiatus to rebuild the program's staffing infrastructure, MAP entered its eighth year with 26 mentors and 27 protégés as participants. Mentoring relationships kicked off in September 2015 and were maintained and strengthened through one-on-one interactions and a series of group activities during the fall and spring. Key group events included Meet Your Match, the Ice Cream Social, the Mentor Appreciation Luncheon, and the End-of-Year Celebration, which recognized mentors and protégés for their participation in the program.

Both protégés and mentors reported in an end-of-year survey that, overall, they were satisfied with their match in terms of compatibility and closeness; 82% of mentors who responded to the survey reported that their protégés sought their input or advice very often, often, or sometimes, and 87% of protégés agreed that a statement indicating their mentors cared about them was very true or pretty true.

E-Mentor Advocate Partnership

The MAP E-Mentoring Initiative (EMAP), an extension of the traditional MAP program, pairs MIT sophomores, juniors, and seniors with industry and alumni professionals. The goal is to help participants transition from MIT to the workplace. Protégés communicate with their mentors via email, Skype, text, and/or phone. EMAP kicked off its third year very strongly with a total of 36 mentors and 38 protégés. EMAP mentors are from the 23 corporate, government, and nonprofit organizations that make up OME's Industrial Advisory Council for Minority Education (IACME), including BP, Draper Laboratory, Google, Intel, Lincoln Laboratory, NASA Goddard, and Raytheon. In addition, several mentors were members of MIT affinity groups (e.g., Black Alumni/ae of MIT). Of the 38 protégés, there were 18 sophomores, 13 juniors, and seven seniors.

Of the 13 protégés who responded to the end-of-year survey, 69% reported that working with their mentor had better prepared them to transition from MIT into the workplace, 60% reported being more confident in their readiness to develop as a professional, and 53% reported having made valuable connections with people in industry. Similarly, the 16 mentors who responded reported having a positive experience. All of the mentors who completed the survey rated the quality of their experience as an EMAP participant as good, very good, or excellent; 62% reported that they had gained personally from their mentoring relationship; and 68% stated that they would volunteer again next year or in the future. One goal in the upcoming year for both MAP and EMAP is to increase the number of participants completing the end-of-year surveys so that we have a more representative sample of the groups' experiences.

Master Your Future

Master Your Future (MYF) is funded and delivered in collaboration with IACME. The program's events and workshops are designed to help sophomores, juniors, and seniors successfully navigate the work environment. There are four MYF professional development modules: Career Paths, Job-Finding Skills, Business Etiquette, and Employability. During the spring, the program hosted the PhD in Industry panel, in which three PhD professionals (all MIT alumni) working in industry shared their experiences about obtaining a PhD and why they decided to pursue a career in industry. The session was attended by 17 students.

Momentum

Twenty-seven freshmen and sophomores participated in the January 2016 session of Momentum, an interdisciplinary project-based class held during the Independent Activities Period. Momentum is funded by IACME, with additional funding and support provided by Lockheed Martin. Representatives from IACME companies also serve as judges for the Momentum poster sessions and competition.

This year, we continued our partnership with the National Science Foundation's Center for Sensorimotor Neural Engineering (CSNE). Participants explored the brain-computer interface to improve lives by connecting the brain with technology. Professor Joel Voldman from the Department of Electrical Engineering and Computer Science (EECS) served as the lead instructor. Professor Voldman is also a member of the OME Faculty Advisory Committee and serves as the MIT principal investigator for the CSNE grant that fosters this exciting partnership. Additionally, Joe Steinmeyer, a lecturer from EECS, taught several lectures/workshops and provided general technical support throughout the class. Participants were connected to various Institute resources such as D-Lab, the EECS lab, and the Communications Lab as they built their prototypes and prepared for their final poster presentations and the competition.

Students worked in small teams to construct a system that controls a robotic arm in order to perform a task. Throughout the course, students received assistance with resume building, oral presentations, and interviewing skills. Momentum 2016 culminated with a poster presentation and networking event with industry representatives on January 28. Each team presented its final project; all projects were judged by IACME representatives.

Finally, four IACME labs and companies (Draper Laboratory, Lincoln Laboratory, Lockheed Martin, and the NASA Jet Propulsion Laboratory) interviewed 16 Momentum participants for potential internship positions; five students received offers, and four accepted their offers.

Recharge Day

On November 4, several units of the Office of the Dean for Undergraduate Education (DUE) came together to host a day of stress-relieving activities for students. DUE Recharge Day was a collaborative effort to provide students with an opportunity to engage with DUE offices and take a few minutes out of their day to relax and recharge. Students were also encouraged to participate in the "passport challenge": students could take a passport

card to each location they visited and receive a sticker for participating. If students visited at least four offices, they were entered into a TechCash raffle, and the first 100 students to complete the challenge received a DUE Recharge portable cell phone charger.

Over 400 students participated in the challenge, and 125 completed it. Each office hosted its own unique activities. In one event, OME staff welcomed students with “Hugs and Hot Chocolate,” offering a little stress relief by providing some well-needed hugs, high-fives, and words of encouragement while students enjoyed delicious hot chocolate. More than 260 students visited OME for the event. It was a huge success and will likely continue to be one of the services we provide for students each year.

Fund Development

Each year, we receive financial support from IACME, which (as noted) now includes 23 corporate, government, and nonprofit partners (including Black Alumni/ae of MIT and Latino/a Alumni/ae of MIT). The council, co-chaired by Dr. Robert Kurtz '63, provides approximately \$80,000 annually to underwrite costs associated with current OME programs and initiatives such as Momentum, Master Your Future, MAP E-Mentoring, and several networking and informational events. We have yet to convert the Kristala L. Jones Prather (1994) Interphase Fund into an endowed account; however, we are still striving to do so and have made progress. We have received nominal but impactful contributions from key alumni, and we hope to cultivate these relationships so that donations increase over time.

As mentioned above, we continued our partnership with the Center for Sensorimotor and Neural Engineering. OME and CSNE collaborate to further the center’s diversity, education, and outreach goals. OME and the MIT Office of Engineering Outreach Programs receive approximately \$40,000 each year to offer workshops, seminars, and courses that expose students to careers in neural engineering, as well as opportunities to do undergraduate research in center-related fields. Through Interphase EDGE, Laureates and Leaders, and Momentum, OME hosted three major events that exposed over 100 students to CSNE research. In addition, one MIT student will participate in an undergraduate research experience with the center this summer at the lead institution, the University of Washington.

Staffing Infrastructure

The OME staffing structure includes the associate dean/director, three assistant deans, two program coordinators, two program assistants, and two administrative assistants. This year, two of our long-term employees took new opportunities outside of OME. We are currently in the midst of two searches, and we hope to fill both roles by early fall. We are proud of the excellent team we have in place. Our goal is to fill the openings in a timely manner to reduce the burden on those who are working diligently to support OME and the students we serve. Overall, OME had an exceptional year, and we plan to keep up the great work.

DiOnetta Jones Crayton

Director

Associate Dean for Undergraduate Education

Registrar's Office

The [Registrar's Office](#) ensures the integrity of academic information, fosters curricular innovation and educational community building, and develops and maintains a robust infrastructure that is responsive to the evolving needs of students, faculty, staff, and alumni.

Technological Highlights

The Registrar's Office provided leadership and critical input into the development of the 2015–2018 Education Services Roadmap in partnership with Information Services and Technology (IS&T), the Dean for Undergraduate Education, the Office of the Dean for Graduate Education, and the Dean for Student Life. The office supported IS&T as it experienced significant reorganization and transformation. Major progress was made in exploring foundational system structures, introducing new technology tools, and clarifying policy. These efforts included:

- Partnering with IS&T to develop application programming interfaces for data associated with student directory information, subject descriptions and schedules, and courses of study;
- Deploying a vendor solution to digitize the proposal process to create, change, or retire academic programs such as degrees and minors;
- Developing and launching QuickRoom, an app that helps members of the community find an unreserved classroom in real time;
- Implementing intelligent messaging and email notifications in the registration applications (online registration and add/drop/change) to alert students, advisors, coaches, and athletic compliance officers if or when student athletes were in danger of falling below athletic eligibility thresholds;
- Examining and proposing foundational data structure changes to support current and future subject structures (subject numbering conventions, modularity, digital learning formats, joint and meets-with relationships, etc.);
- Digitizing the cross-registration process for Harvard students who register for MIT subjects;
- Expanding the digitization of the Humanities, Arts, and Social Sciences Concentration form to include both the proposal and completion processes; and
- Devising and testing the changes needed to the degree audit to accommodate a new path to fulfill the Restricted Electives in Science and Technology Requirement.

Educational Policy and Governance

The Registrar's Office played a major role in advising senior administrators and faculty committees on several complex student issues involving registration, the academic calendar, and degree programs. Among other efforts, the office:

- Supported the Committee on the Undergraduate Program and its standing Subcommittee on the Communication Requirement and Subcommittee on the

Humanities, Arts, and Social Sciences Requirement. The Subcommittee on the Communication Requirement reviewed 74 student petitions; the Subcommittee on the HASS Requirement reviewed 58 petitions.

- Worked with the Admissions Office and the Committee on Undergraduate Admissions and Financial Aid regarding the College Board's implementation of a revised SAT this year and how to adjust MIT's policy. The Committee on Undergraduate Admissions and Financial Aid and the Subcommittee on the Communication Requirement agreed that MIT should neither require nor recommend the SAT essay exam, and added additional language to the Admissions Office website regarding the importance of communication to the MIT undergraduate curriculum.
- Managed the review, by the Subcommittee on the Communication Requirement, of 18 new communication-intensive (CI) subjects and of relicensing proposals for 15 CI subjects in the humanities, arts, and social sciences.
- Organized and facilitated the fall workshop for instructors of writing-focused communication-intensive subjects in the humanities, arts, and social sciences (CI-HW). The workshop was well attended by faculty members and lecturers, and its agenda provided ample opportunity for robust discussion and exchange of good pedagogical practices.
- Provided general advising and targeted reminders to students as they progress through the [Communication Requirement](#) and the [HASS Requirement](#). Students submitted 1,332 HASS concentration proposals and 1,109 completion forms. Members of the Class of 2016 completed the highest numbers of concentrations in Economics (221), Music (119), Spanish (65), and Philosophy (55). They completed a total of 239 concentrations in foreign languages (including Spanish). The Comparative Media Studies/Writing Program, the Literature Section, and the Music and Theater Arts Section remain popular, each with around 40 to 50 students.
- Facilitated the review of four proposals to establish new undergraduate degrees in finance (15-1), management (15-2), business analytics (15-3), and mathematical economics (14-2). The faculty ultimately endorsed these proposals.
- Several minors were also approved: a new minor in civil and environmental systems, a design minor in architecture, and a computer science minor in electrical engineering and computer science. New interdisciplinary minors were also approved in entrepreneurship and innovation, offered by the Schools of Engineering and Management, and a statistics and data science minor, offered by the Institute for Data, Systems, and Society.
- Provided advice and guidance on the creation of a new Master of Business Analytics degree and of a new "micro-master's" path in supply chain management for the MEng degree.
- Actively participated in discussions and supported faculty governance consideration of policies regarding subterm subjects.

- Advised on the implications for the undergraduate degree audit and the Institute's Laboratory Requirement and Communication Requirement of renumbering subjects taught in a modular format in the Department of Chemistry.
- Provided ongoing staff support to the Committee on Curricula, which reviewed 211 applications for double majors, 18 petitions regarding the Restricted Elective in Science and Technology requirement, and four Institute Laboratory Requirement petitions. On behalf of the Committee on Curricula, the Curriculum Management Team also worked with the Subcommittee on the Communication Requirement and the Subcommittee on the HASS Requirement to coordinate the complex review of General Institute Requirements for former students who apply for readmission after failing to complete their undergraduate studies within 10 years of original entry. Seven such cases were reviewed during AY2016.
- Added 161 subjects (79 undergraduate and 82 graduate) and revised 592 existing subjects (266 undergraduate and 326 graduate). In addition, 215 subjects were removed from the catalog, and nine were reinstated. MIT begins AY2017 with a regular curriculum that boasts 3,761 subjects (45.9% undergraduate and 54.05% graduate).
- Engaged with the Office of the General Counsel and the Information Technology Policy Committee to develop procedures and terms-of-use documents to ensure data security for consumers of application programming interfaces.
- In association with the Office of the General Counsel, developed a new policy on the privacy of student records that was approved by the Academic Council.

Faculty Support

The Registrar's Office provided service to and maintained a trusted partnership with the faculty and the community in support of the Institute's educational mission. Highlights included work on classroom scheduling, management, and renovation.

Classroom Scheduling

The Schedules Team made 5,366 classroom reservations for lectures, recitations, laboratories, and design sessions in support of MIT subjects. The team processed an additional 10,849 reservations for academic activities, such as exams (including final exams), review sessions, not-for-credit seminars, office hours, tutorials, presentations, and so on.

MIT's classrooms are also in high demand as community spaces for meetings, conferences, student groups, continuing education, and registered events throughout the year. The Schedules Section made 24,078 classroom reservations for 5,606 events on behalf of the MIT community for the fall and spring terms, and more than 8,500 reservations for more than 1,100 events for the summer.

Classroom Management Highlights

A number of changes to the classroom inventory were made. Over the academic year, the office:

- Completed the renovations of lecture hall 6-120 and classrooms 5-232 and 36-372 (lecture hall 6-120 was completed for the start of the fall 2015 term and classrooms 5-232 and 36-372 were completed for the start of the spring 2016 term).
- Completed the renovations of 12 classrooms in Buildings 2 and E52. Construction on those projects began during the fall 2012 term; work on the classrooms was completed for classes in spring 2016.
- Led the effort to develop the design scope for the renovation of classrooms 4-148, 4-152, 4-156, 4-160, and 4-364. These renovations are scheduled to be completed during the summer of 2016.
- Developed the design scope for the seating replacement and room finishes update for lecture hall 26-100. These updates are scheduled to be completed during the summer of 2016.
- Six classrooms used as swing space during the Building 2 renovation were reassigned from the Registrar's inventory: E17-122, E17-128, E17-129, E17-133, E17-136, and E17-139.

Enhancements to classrooms included:

- Installing new acoustic wall panels and maple paneling in seminar classroom 5-216;
- Replacing tablet armchairs and updated finishes in 14E-310;
- Replacing tablet armchairs in 4-364, 24-121, and 36-155;
- Installing new tables and chairs in 26-302, 26-310, 26-314, 26-322, and 26-328;
- Replacing the floor covering in 1-379 and installing a chair rail in 4-145, 4-149, and 4-153;
- Installing new video projectors and updated code to either MediaLink or Crestron control systems for classrooms 1-132, 1-134, 1-190, 1-246, 4-145, 4-149, 4-153, 14-0637, 14E-310, and 26-100;
- Installing new audiovisual systems, including video projector and connection points for laptops, in classrooms 36-153, 36-155, and 38-166; and
- Installing new flat screen monitor and connection points for laptops in seminar classroom E51-390.

The MacVicar Faculty Fellows Program

The [MacVicar Faculty Fellows Program](#), honoring MIT's best undergraduate teachers, named four new MacVicar Faculty Fellows: Associate Professor Patricia Tang, Music and Theater Arts; Professor Srinivas Devadas, Electrical Engineering and Computer Science; Professor Jeffrey Grossman, Materials Science and Engineering; and Professor Michael Sipser, dean of the School of Science and professor of Mathematics.

The new Fellows were introduced publicly by Dean for Undergraduate Education Dennis Freeman on MacVicar Day, March 11, 2016, at a symposium entitled From Hand to Mind: Advances in Evidence-Based Teaching. Symposium. Speakers included Professors Catherine Drennan, Chemistry; Martin Culpepper, Mechanical Engineering;

Michael Cuthbert, Music and Theater Arts; David Darmofal, Aeronautics and Astronautics; and Robert Miller, Electrical Engineering and Computer Science. Janet Rankin, interim director of the Teaching and Learning Laboratory, moderated the panel.

MacVicar Day concluded with a dinner hosted by Provost Martin Schmidt and Chancellor Cynthia Barnhart at the new Samberg Conference Center. A special guest throughout the day was Victoria MacVicar, sister of the late Margaret MacVicar, professor of physical science and dean for undergraduate education, for whom the program is named.

Subject Evaluation

During the end-of-term evaluation period for fall 2015, 1,006 subjects in 37 departments and programs were evaluated online. There were 21,004 evaluations completed by 6,974 students, including ratings and comments for 2,176 instructors. The average response rate of subjects evaluated online was 64%, excluding registered listeners. The average overall rating of subjects was 5.8 and the average overall rating of instructors was 6.0 (where 1 means very poor and 7 means excellent).

During the end-of-term evaluation period for spring 2016, 17,922 evaluations were completed. The average response rate of subjects evaluated online was 55%, excluding registered listeners.

Curriculum Development Funds

Faculty groups developing new curricula received a little more than \$806,000 from the [d'Arbeloff Fund for Excellence in Education](#) (seven awards) and from the [Alumni Class Funds](#) (15 awards), supported by the Classes of 1951, 1955, 1972, and 1999. Both funds aim to enhance undergraduate education and are administered by the Curriculum and Faculty Support Team.

The d'Arbeloff Fund was established through a gift from Brit (SM '61) and Alex ('49) d'Arbeloff. The call for proposals focused on projects aimed at introducing online components to MIT classes that enhance faculty-student interactions as well as development of subjects offered in the first year and as General Institute Requirements.

Faculty Outreach

Throughout the year, Dean Freeman facilitated monthly meetings of the Undergraduate Officers Group with support from the registrar and her staff. Agenda topics included the Committee on Academic Performance, the Subject Structure Project, MIT graduate outcomes, the late add/drop form, the MindHandHeart Initiative, the progress of the Academic Council's Working Group on Inclusion, the MIT Ombuds Office, subterm subjects, and the undergraduate financial aid budget. The officers also met with the community and equity officer, the new director of the International Student Office, the co-chairs of the Future of Libraries Task Force, and the chancellor.

Data Request and Academic Calendar Highlights

The Registrar's Office provided student data for several longitudinal studies regarding issues such as graduation rate, undergraduate units completed, term load, majors and double majors, and dropped subjects. The office also partnered with faculty and students who were looking to develop new online tools for curriculum mapping and to assist students with subject selection. Several departments performed curriculum studies investigating subject prerequisites, enrollment trends, and gender differences in course selection. Faculty committees and subcommittees made several data requests. Among these were studies related to subterm subjects and the timing of grade submissions and final exams. In addition, the office supplied requested statistics to government agencies and national organizations in cooperation with the Office of Institutional Research.

The 2015–2016 academic calendar was affected by the fact that Labor Day was late this year (September 7), and that 2016 was a leap year. The fall semester was abbreviated to 63 teaching days. This also eliminated the September student holiday and shortened Columbus Day to a one-day observance without classes. Commencement was held on June 3, the earliest possible date in the current calendar scheme.

Registration

In AY2016, student enrollment was 11,331, compared with 11,319 in AY2015. There were 4,527 undergraduates (compared with 4,512 the previous year) and 6,804 graduate students (compared with 6,807 the previous year). The international student population, including citizens of 120 countries, was 3,411, representing 10.7% of the undergraduate and 43% of the graduate population. (Students with permanent resident status are counted as US citizens.)

In AY2016, there were 4,347 women students (2,082 undergraduates and 2,265 graduates) at the Institute, compared with 4,226 (2,055 undergraduates and 2,171 graduates) in AY2015. In September 2015, 521 first-year women enrolled at MIT, representing 46.8% of the freshman class of 1,113 students.

In AY2016, there were 3,708 self-reported minority students (2,327 undergraduate and 1,381 graduate students) at the Institute, compared with 3,696 (2,317 undergraduate and 1,379 graduate students) in AY2015. Minority students included 524 African Americans (non-Hispanic), 136 Native Americans, 21 Native Hawaiians or other Pacific Islanders, 942 Hispanic Americans, and 2,085 Asian Americans. The first-year class enrolled in September 2015 included 596 minority students, representing 53.5% of the class.

Degrees Awarded

Degrees awarded by the Institute in AY2016 included 1,111 bachelor's degrees, 1,744 master's degrees, 10 engineer's degrees, and 646 doctoral degrees—a total of 3,511 (compared with 3,439 in AY2015).

Staff

The Office of Faculty Support, a separate office within the office of the Dean for Undergraduate Education, joined the Registrar's Office in October and formed

the Curriculum and Faculty Support Team within the office. This added Kathleen MacArthur, Genevra Filiault, Patricia Fernandes, Lauren Weitkamp, Jason Donath, Rosanne Santucci, Deborah Boldin, Brian Nelson, and Kate Danahy to the total Registrar's Office staff.

Mary Enterline, who was associate dean in the Office of Faculty Support, retired after serving MIT for 38 years. Mary's retirement prompted a rearranging of responsibilities and Piero Chacon came on board as an assistant dean. Jo Flessner-Flizen, associate registrar of curriculum and classroom management, retired in early December after nine years at MIT. Pam Walcott assumed her position in late December. Pam joins the office after spending 10 years at the Sloan School of Management. Mary and Jo's dedication and commitment to MIT, along with their vast knowledge of the Institute, will be greatly missed.

Lauren Weitkamp, staff associate on the Curriculum and Faculty Support Team, left MIT after 5 years. A search for a successor is pending.

Renee Howe, registrarial assistant on the Schedules Team, left MIT after 13 years for a position as assistant registrar at Lesley University. Meghan Burke, a recent graduate of the College of the Holy Cross, joined the schedules team as registrarial assistant in June.

Jessica Zdon-Smith and Patricia Fernandes were part of the Dean for Undergraduate Education Recharge Team and received an Infinite Mile team award for innovation and creativity.

The suites in 5-115 and 5-117 underwent a much-needed full renovation.

Mary Callahan
Registrar
Senior Associate Dean for Undergraduate Education

Office of Undergraduate Advising and Academic Programming

The Office of Undergraduate Advising and Academic Programming (UAAP) sets a standard of excellence in providing quality student-centered services to all undergraduates to enhance their academic success, social adjustment, and assimilation to the Institute. To achieve that vision, the UAAP provides programming, access to Institute resources, and services that recognize the many needs, diversity, and uniqueness of students at MIT. This includes coordinating freshman pre-orientation and orientation programs, facilitating academic advising and mentoring relationships, building community through the First Generation Program initiative, providing access to academic and personal support through Student Support Services (S3) and Student Disabilities Services, and promoting leadership development. UAAP responsibilities also include Undergraduate Research Opportunities Program (UROP) management, operation, and oversight; coordination of Independent Activities Period (IAP); Accessibility and Usability, and the Assistive Technology Information Center (ATIC) Laboratory; and staff support to the Committee on Academic Performance.

New Initiatives

UAAP continued to make progress on the faculty-voted motion of spring 2013 that all freshmen have a faculty advisor or mentor. In AY2016, to that end, 157 faculty were recruited and 88% of the Class of 2019 were advised by faculty. This was more than a 7% gain over last year. Additionally, faculty mentored another 7.3% of the class. A structure of UAAP staff consultants continues to support these faculty advisors, serving as not only a resource but also backup when faculty are unavailable. Over the course of the year, Dean Dennis Freeman hosted seven faculty-freshman receptions to facilitate engagement among these individuals.

The office organized a professional development program for UAAP staff and campus collaborators in the form of a video: *Imported From China*, produced by Michigan State University journalism students, Academic Specialist Troy Hale, and Associate Professor Geri Alunit Zeldes. Complementing the video and leading the follow-up discussion was an MIT panel that included Dr. Xiaolu Hsi of MIT Mental Health and Counseling; Course 10 graduate student Jianfeng He; and freshman Run Chen.

One grant from the Amgen Foundation funded the Amgen UROP Scholar Program and supported 20 undergraduates; this was the ninth year of the program. A second grant established MIT as the Global Program Office with administrative oversight for 17 site programs—10 in the United States, five in Europe, and two in Japan. In addition to the expansion of the program, UAAP hosted Amgen Alumni events in Boston, Los Angeles, San Francisco, and New York City, and produced a book on undergraduate summer research programs as a best practices manual for colleges and universities interested in developing or expanding undergraduate research efforts on their campuses.

In support of international immersion experiences for students, UAAP offered to support all faculty who engage undergraduates in research activities abroad. In addition, UAAP funded 75 MIT International Science and Technology Initiatives UROP placements and supported 48 traditional International Research Opportunities Program (IROP) projects for summer 2015, including exchanges with Imperial College and Hong

Kong University of Science and Technology. These student research experiences took place in 27 countries.

UAAP continued to participate in resource development efforts and stewardship with respect to UROP gifts and endowments, and funds from the Amgen Foundation, the Lord Foundation, the Baker Foundation, and the Class of 1959. This year, we successfully secured two endowments to support student emergencies: the Attanasio Family Endowment and the Class of 1954 Good Samaritan/Mitzvah Endowment. Moreover, two endowments from Dwight A. Kellogg and Susan and Steven Lotwin were established for UROP, and two major expendable gifts were created: the James V. Czajka Memorial and the Johnson & Johnson UROP Scholars Program. Led by Professor Charles Stewart, the Committee on Academic Performance (CAP) completed a comprehensive review of withdrawal and readmission (now called leave and return) processes, including the roles of staff as distinct from CAP, expectations on leave, communications with students, outreach and support to students on leave, and the return process.

In collaboration with the S3 team and Mental Health and Counseling, UAAP created a Support Lunch to provide an opportunity for peers to support one another in a safe space. Challenges discussed included mental health issues, academic stress, the benefits a leave, and managing a family crisis. While the number of participants were small, the impact was positive and the effort will continue.

UAAP coordinated an all-staff event for the Office of the Dean for Undergraduate Education (DUE) called Recharge, which provided students with an opportunity to engage with DUE offices and take a few minutes to relax and recharge. Each office hosted a unique and creative activity. With a “passport” in hand, students were encouraged to visit at least four offices—over 400 students participated.

UAAP collaborated with Global Education and Career Development on programming to involve local young alumni with first year and sophomore students. The objective was to provide opportunities for young students to speak with alumni about their educational path, which undergraduate opportunities and experiences they recommend, their thoughts about early career choices, and so forth.

In February 2016, ATIC, including the Accessibility and Usability team, moved from Information Services and Technology (IS&T) to DUE, specifically within UAAP. The motivation for this reorganization was to move these resources within the academic enterprise to ensure accessibility to electronic course content and usability of new technologies.

Functional Enhancements

With an outside developer, UAAP undertook a complete redesign of the full suite of UAAP websites, including new navigation and content. The unified look and new format will allow nimble updating of information. The first sites will roll out midsummer 2016, followed by a full implementation in the fall.

With the help of IS&T, we have undertaken a redesign of the UROP online application, review, approval, and database. With increased functionality, the new system will allow processes to respond to new models of UROP, such as SuperUROP, IROP, and international exchanges.

UAAP engaged a consultant to develop an online application system for the [Freshman Pre-orientation Program \(FPOP\)](#). The application was completed for the Class of 2020; 667 applications were received via this system for review by the directors of the 26 FPOPs that will be offered in August 2016.

During IAP 2016, departments, administrative offices, Association of Student Activities groups, and non-student groups sponsored 516 not-for-credit activities and 185 for-credit undergraduate subjects. Enrollment in these subjects was 4,661 registrants.

To support the academic success of first-year students, UAAP sponsored 50 learning strategy, academic programming, and revisited orientation topics sessions. Associate advisors offered 18 programs within their residences; this was a focused priority of the Associate Advisor Steering Committee. UAAP hosted 32 additional events at which faculty discussed academic challenges, selecting majors, graduate school, first generation student experiences, and personal stories of faculty career pathways. Finally, four events for returning students and 13 events for students with disabilities were offered to support those student communities.

Freshmen were advised or mentored by 157 faculty plus 21 teaching staff and 17 administrators, including those who led 54 freshman advising seminars. In all, 520 students participated in an advising seminar, plus 35 in the [Terrascope](#) community. Advisors were matched with 201 associate advisors who served as peer mentors to the first-year students. Beyond the new advisor training and the orientation advisor training for fall registration, four programs were offered: advising first generation students; end of term advising and preparing for finals; stress and resources to support students; and exploring majors.

Training and development of associate advisors was an articulated priority. Ten different programs were strategically offered to associate advisors throughout the academic year.

[The First Generation Program](#) remains very active, with an enthusiastic student advisory board and faculty advisor. UAAP sponsored 16 events, including a welcome dinner, faculty luncheons, an alumni dinner, study breaks, a service day at Community Servings, a Campus Preview Weekend panel, and a senior recognition ceremony. Dean Freeman and Professor Paul Lagace presented seniors with their first generation sash to wear with their commencement regalia. UAAP also sponsored first generation students to attend the Ivy Conference at Harvard University and the First Generation College Student Summit at Williams College.

The three recipients of the UAAP 2016 Institute Convocation awards were Professor Shankar Raman (Arthur Smith Award for contributions to Student Life and Learning); Professor Srinivas Devadas (Baker Foundation Award for Excellence in Undergraduate Teaching); and Assistant Professor Michael P. Short (Earll M. Murman Award for Excellence in Undergraduate Advising).

Student Support Services

This year, the deans had 5,678 contacts, including appointments, walk-in visits, and significant telephone conversations. This represented steady state over the previous year. However, extending walk-in visiting time by two hours dramatically changed the way service was provided to students. Of all contacts, 39% were walk-in meetings. We believe we are more nimbly delivering service to students and meeting their needs in real time. Student Support Services (S3) processed 106 withdrawals (45% medical and 55% voluntary) compared to 105 last year, and 132 of 155 applicants (85%) were readmitted.

For the Class of 2016, 68% of the graduates (756 out of 1,111) visited S3 at least once during their undergraduate experience.

Student Disabilities Services

In the same period, Student Disabilities Services had 872 scheduled appointments with students and actively accommodated 450 undergraduate and graduate students.

- The service witnessed an increase in the complexity of student needs for required accommodations and services, including students with learning disabilities and students with hearing, vision, or mobility impairments.
- Ninety-five students required temporary accommodations.
- Sixty-five students were employed to help support the academic accommodations for these students.
- Thirteen events were held that provided additional support to this student population.

Undergraduate Research Opportunities Program

During summer 2015 and AY2016, 4,686 UROP projects were completed. Of the projects completed during the academic year, 63% were paid experiences, and 54% of the students were women. Of undergraduates graduating in 2016, 90% participated in at least one UROP, and 90% of graduating students from an underrepresented minority group (223 out of 249) participated.

UAAP provided \$4,339,093 in direct funding. The direct funding budget is comprised of endowment income (42%), expendable gifts (20%), general Institute funds (37%), and foundation grants (1%). The UROP book-value endowment is \$17.95 million, represented by 62 named endowed funds and 10 named gifts.

Faculty allocated \$4,414,535 in support of UROP. Half of MIT faculty mentor and supervise UROP students. UROP remains the primary opportunity for students to engage with faculty outside of the classroom.

Accessibility and Usability, and the Assistive Technology Information Center

The Assistive Technology Information Center (ATIC) served 86 clients during FY2016. Of those customers, there were 27 MIT undergraduates, 22 graduate students, 36 employees and one non-MIT customer. We provided 118 contacts (consults) to those customers. ATIC obtained alternative format course materials for 10 students with print disabilities

for 57 courses, for 10 students. Accessibility and Usability reviewed 31 accessibility projects and 45 usability projects.

Future Plans and Initiatives

- Continue to work to accomplish the goal of ensuring that every freshman has either a faculty advisor or mentor.
- Develop a Sophomore Year Experience program to support the successful transition of sophomores to major departments and to continue the effort to ensure students are aware of campus resources to ensure personal growth and academic success.
- Define programming to engage students with faculty mentors and identify a strategy to add value to the UROP experience. Survey UROP faculty supervisors to understand what they view as advantages, challenges, or both, in serving as research mentors to undergraduates; how faculty define mentoring; and how they develop relationships with students whereby they know them well enough to provide references.
- Continue to work with the Office of Leadership Giving with the intention of fully endowing MIT's Undergraduate Research Opportunities Program.
- Partner with the International Students Office to ensure a successful international student orientation and define additional UAAP programming that meets the needs of this cohort.

Staffing Changes

This year, six individuals were hired:

- Ike Brochu, administrative assistant, Student Disabilities Services team (replacement hire);
- Meghan Campbell, staff associate, Student Support Services team (replacement hire);
- Samantha Tideman, staff associate, Student Disabilities Services team (replacement hire);
- Alice Rugoletti, staff associate, Advising and New Student Programming team (new hire, one-year appointment);
- Ray Feller, assistant dean, Student Support Services team (new, full-time equivalent); and
- Justin Kasarsky, assistant dean, Student Support Services team, (new, full-time equivalent).

Julie B. Norman

Senior Associate Dean for Undergraduate Education

Director, Office of Undergraduate Advising and Academic Programming

Reserve Officer Training Corps

Air Force Reserve Officer Training Corps

The mission of the [Air Force Reserve Officer Training Corps \(AFROTC\)](#) is to develop high-quality leaders for the US Air Force.

Accomplishments

The quality of the MIT cadet corps and cadre remained first class in AY2016, and our cadets continued to be recognized by the US Air Force for their performance. During summer 2015, the juniors attended an intense field training leadership course. Cadet Nicholas James earned the top 10% performer award at the four-week course. Each semester, AFROTC recognizes the detachment (out of a pool of 145) with the highest average grade point average (GPA) and the highest average fitness score. This academic year, the cadets achieved both honors (GPA and fitness) for fall and spring semesters.

Several of MIT's cadets received individual recognition for various competitive awards. Cadets Martin York and Daniel Getty were two of 33 cadets nationwide who received the Society of American Military Engineer award. Cadet Dayannara Munoz received a national award from AFROTC for her essay on the impact of technology on today's air operations. Cadet James was recognized by AFROTC as the top junior year cadet in the Northeast region. Cadet Matthew Deyo was selected as one of the top 10% of all AFROTC commissionees this academic year. Also, Cadet York was selected by AFROTC as one of three cadets nationwide to be recognized with the Cadet of the Year award.

Increasing the size of the cadet corps continues to be a priority. There were three AFROTC cadets commissioned in AY2016 and nine rising sophomores are expected to continue with the program (see Table 2). Nineteen freshmen are projected to join in the fall, more than double last year's freshman class. This will nearly double the size of the entire cadet wing. Part of this success is due to participation in MIT programs such as Campus Preview Weekend and support from MIT Admissions to identify interested ROTC candidates.

Table 2. Year-End Enrollment in Air Force ROTC, as of June 2016

	Freshmen	Sophomores	Juniors	Seniors	Total
MIT	4	3	3	5	15
Harvard	2	0	1	0	3
Tufts	1	0	0	0	1
Wellesley	2	0	0	0	2
Salem State	0	0	0	0	0
Total	9	3	4	5	21

Highlights

Highlights of the cadet training program included Air Force simulations in the new Joint ROTC Simulator; Career Day, with 20 active-duty officers; a leadership reaction course at Camp Edwards near Cape Cod; and the annual Dining-In. Finally, the Air Force,

Army, and Naval ROTC programs combined to conduct a sports competition (where the AFROTC cadet wing won the trophy for the first time since 2002), a Veteran's Day ceremony, a commissioning ceremony, and a formal joint-service military ball.

In addition to weekly leadership training, five cadets attended the National Character and Leadership Symposium at the US Air Force Academy in Colorado Springs, CO; three cadets traveled to Holloman Air Force Base in New Mexico for a base visit and orientation flight in an F-4 fighter aircraft; six cadets attended a Yale University leadership conference; and 23 cadets traveled to Hanscom Air Force Base in Massachusetts for a large field leadership exercise with four other AFROTC detachments. The cadet wing hosted more than 30 voluntary morale and training events over the course of the year, including a landing from a Huey helicopter from Andrews Air Force Base, MD, during MIT's Open House in April. The program is thankful for the support it receives from MIT.

Staffing Changes

There will be two military staff changes during summer 2016. The detachment commander, Lieutenant Colonel Karen Dillard, will depart in July and her replacement, Detachment 365/MIT alumna Lieutenant Colonel Sheryl Ott, will arrive in August. Captain Michael Parry will depart in July. His replacement, Major Michael Clifford, arrived in June.

Lieutenant Colonel Karen Dillard, PhD

United States Air Force

Army Reserve Officer Training Corps

The mission of the [Army Reserve Officers Training Corps](#) (AROTC) is to select, retain, train, and commission cadets from MIT, Harvard University, Tufts University, Wellesley College, Endicott College, Gordon College, Salem State University, Gordon-Conwell Theological Seminary, and Lesley University in a two, three, or four-year program in order to prepare them for future leadership roles in the US Army, the nation, and the world. Our vision is to develop agile and adaptive leaders who utilize critical and creative thinking skills to solve complex, ambiguous problems.

Accomplishments

We commissioned 16 officers this year, which met the Cadet Command-assigned commission goal of 15 officers. One of these 16 officers completed her undergraduate degree at MIT and will serve as an Engineer Officer in the Army Reserves while pursuing a PhD at the Georgia Institute of Technology. One cadet was selected for the ultra-competitive Educational Delay program, of which only 88 (out of 5,600 nationwide) were selected. She will attend medical school at the Uniformed Services University of the Health Sciences before serving her army commitment as a doctor. Five cadets, including the one from MIT, earned the honor of Distinguished Military Graduate, which placed them in the top 20% of all cadets nationwide. One of our cadets was ranked number 10 of 5,600 cadets nationwide and was selected as one of the first women to serve as a commissioned officer in a combat arms branch, Armor.

As of May 1, 2016, 62 students were enrolled in the Army ROTC program, a small increase from last year. Over \$1,283,500 was awarded in scholarships for all students in the consortium. The Class of 2017 is expected to commission 11 officers, which means the corps will not meet the Army-directed commission goal. Both the freshman Class of 2019 and incoming Class of 2020 have seen significant growth from previous years, particularly with regards to MIT students. The Class of 2019 currently has four MIT students on full ROTC scholarship and the Class of 2020 is expecting 10 MIT students with full scholarships.

Table 3. Year-End Enrollment for Army ROTC, as of May 1, 2016

	Freshmen	Sophomores	Juniors	Seniors	Total
MIT	4	0	1	1	6
Harvard	5	2	2	3	12
Wellesley	3	0	3	2	8
Tufts	2	2	1	1	6
Other Affiliates	8	9	4	9	30
Total	22	13	11	16	62

Our cadets continue to achieve excellence academically, physically, militarily, and morally and ethically. Several of our cadets were recognized nationally for their achievements, including a senior MIT cadet who earned the Society of American Military Engineers Award of Merit, presented to the top 20 cadets in engineering majors nationally. A freshman MIT cadet won the Military Historical Society of Massachusetts essay contest, which includes an individual prize of \$2,500 and an additional \$1,500 prize awarded to the MIT program.

At the annual Cadet Leader Course conducted at Fort Knox, KY—attended by more than 5,000 rising seniors nationwide—MIT cadets exceeded local, regional, and national averages in nearly all measurable areas, as they do every year. Five cadets were selected to participate in the Cultural Understanding and Language Proficiency and Project Global Officer programs over the summer, spending up to two months abroad in China, Estonia, Madagascar, Slovakia, and Liberia. We had several cadets attend and complete military training schools including air assault and airborne. Many of our cadets took advantage of competitive internships at MIT's Lincoln Laboratory, the National Defense University, the Pentagon, and with Congress. Additionally, one of our cadets will serve with an active-duty unit and shadow an officer as part of the Cadet Troop Leadership Training program.

Our instructors continue to excel at classroom leadership instruction and hands-on training of cadets and of non-ROTC students at MIT. Army ROTC continues to be a preeminent source of high-quality leadership instruction at the Institute. During the Independent Activities Period, our cadre participated in its 15th consecutive year instructing a for-credit special seminar on leadership with the MIT Sloan School of Management.

This past academic year, MIT Army ROTC organized the following major events: New Cadet Orientation in both September and January; National Medal of Honor Convention support at Harvard; field-training exercises, in conjunction with the ROTC programs at Boston University and Northeastern University, at the USAG Fort Devens Army Reserve Forces Training Area in September and at Joint Base Cape Cod in April; a formal Dining-In in November; a military ball in March; a battlefield staff ride at Lexington and Concord in April; and commissioning ceremonies at MIT, Harvard, Tufts, Wellesley, Gordon, and Endicott. We also hosted a Cadet Leadership Conference at Harvard University, which included more than 70 cadets from 20 different schools in Massachusetts and New York. Additionally, we invited Nicholas Murray, professor of strategy and policy from the US Naval War College, to lecture on the use of historical case studies as a tool to develop decision making, capped off with a practicum using the Duffer's Drift tactical decision-making exercise.

Staffing Changes

The Army assigned three new full-time instructors during the past year: Captain Michael Sim, executive officer; Captain Mark Pollak, operations officer; and Master Sergeant Joshua Davis, senior military science instructor. We also welcomed a new MIT senior administrative assistant, Christina Andujar, and a new Department of the Army civilian, Bonnie Paiz (human resources assistant).

Challenges and Plans for the Future

MIT Army ROTC's continued challenge is to remain viable by increasing the number of cadets in the program, especially from MIT. Acceptance rates into MIT for ROTC scholarship applicants have increased in the past two years, which has resulted in much larger incoming and outgoing freshman classes. While the current reduction in the size of the Army has resulted in less available scholarships, we have seen an increase in the number of scholarship recipients who both apply to and get accepted at MIT. This bodes extremely well for the continued viability of the program.

Lieutenant Colonel Peter F. Godfrin Jr.
United States Army

Naval Reserve Officer Training Corps

The Naval Reserve Officer Training Corps (NROTC) program hosted by MIT develops and provides full-scholarship opportunities to midshipmen aspiring to become ensigns in the US Navy or second lieutenants in the Marine Corps. The mission of NROTC is to prepare students morally, mentally, and physically, imbuing them with the highest ideals of duty and loyalty. Graduates possess a basic professional background, are motivated toward careers in the Navy and Marine Corps team, and are devoted to the service of our nation. They embody the potential for future development in mind and character in order to assume the highest responsibilities of command, government, and citizenship.

NROTC midshipmen enroll in eight different naval science courses during their time at MIT, including naval engineering, history, doctrine, operations, and leadership. The

curriculum is nationally recognized, centrally supported, and taught at more than 65 universities nationwide. Guest speakers are invited to enhance course relevancy with evolving trends in technology, national policy, and geopolitics. Coursework is further tailored by the instructors to reflect their individual operational experiences and is monitored by the visiting professor of naval science, Captain James Horten.

NROTC officers and staff are committed to ensuring that every midshipman balances his or her time and energy to realize the tremendous benefits of an MIT, Harvard University, or Tufts University education. Midshipmen complement their rigorous NROTC commitments with extracurricular activities such as varsity athletics, fraternity and sorority leadership positions, and other school events, including leadership conferences. Others take an active role in volunteering, counseling, and mentoring.

While the NROTC staff is responsible for mentoring and instructing students, midshipmen build leadership skills while running the NROTC battalion. Midshipmen are involved in the planning and implementation of numerous military and civic activities and events, including the Joint Service Ball, field-training exercises, sailing regattas, and tri-service competitions.

Table 4. Year-end Enrollment in Naval ROTC, as of June 2016

	Freshmen	Sophomores	Juniors	Seniors	Total
MIT	9	4	9	4	26
Harvard	2	4	3	4	13
Tufts	2	3	1	1	7
Total	13	11	13	9	46

Accomplishments

During summer 2015, midshipmen patrolled undersea aboard submarines, flew in Seahawk helicopters, piloted aircraft carriers and guided missile destroyers, and conducted amphibious landings ashore with the Marines. A total of 35 successful midshipman summer cruises were conducted globally, including a high-visibility foreign exchange with the Royal New Zealand Navy.

AY2016 was the first year that the BU-MIT NROTC unit enjoyed the use of two new simulators in Building 53 at MIT. The Conning Officer Virtual Environment ship simulator, which has been installed at only five universities nationwide, offers midshipmen a highly realistic immersive experience to enhance training during navigation and naval operations courses. Additionally, midshipmen used the Joint Military Simulator Lab to conduct operational decision-making exercises for cadets and midshipmen.

The academic year concluded on June 3 with the commissioning of three NROTC students, one Army ROTC student, and two Air Force ROTC students on board the USS *Constitution*. Captain Chris Cassidy SM '00 was the guest of honor and presented commissioning scrolls to all of the new officers. Dean Dennis Freeman also provided

congratulatory remarks. Captain Cassidy's daughter, Grace Cassidy '16, commissioned as an ensign, and earned the distinction of being the first female from MIT to be selected as a nuclear submarine officer.

Ensign Vincent Kindfuller '16 and Ensign Carolena Ruprecht '16 were also selected to serve in the Naval Nuclear Power community. Vincent will report to a submarine and Carolena will report to a surface ship stationed in Hawaii. Additionally, one NROTC senior, Midshipman First Class Steven Holcomb, who will serve as a naval aviator, delayed commissioning in order to pursue the completion of his master's degree in mechanical engineering from MIT.

NROTC hosted numerous high-profile visits and distinguished guests during AY2016, including:

- The Honorable Mr. Ashton Carter, Secretary of Defense
- The Honorable Mr. Ray Mabus, Secretary of the Navy
- Admiral Michelle Howard, US Navy, Vice Chief of Naval Operations
- Vice Admiral Sean Pybus, US Navy, Deputy Commander, US Special Operations Command
- Captain Heidemarie Stephanyshyn-Piper '85, US Navy, NASA Astronaut
- Colonel Michael Peznola, US Marine Corps, Retired, Executive Director, Institute for Global Leadership at Tufts University
- Colonel Frank Wendling, US Marine Corps, Senior Marine Liaison, Naval Education and Training Command
- Commander Eric Sager, Commanding Officer, USS *California* (SSN-781)

Staffing Changes

BU-MIT NROTC bid fond farewells to Captain Steven Benke, who served as the commanding officer of the Boston Naval ROTC Consortium for four years, and to Lieutenant Stephen Smith, the freshman class advisor. Captain Benke was relieved on June 10, 2016, by Captain James Horten, and will serve on the staff of Commander, Submarine Forces, located in Norfolk, VA. Lieutenant Smith will serve aboard the USS *Nimitz* (CVN-68), an aircraft carrier stationed in Naval Base Kitsap, WA.

This year, NROTC welcomes Lieutenant Ryan Wielgus as the freshman class advisor and Lieutenant Richard Greyson Geer as the sophomore class advisor.

The NROTC program eagerly looks forward to growing its family of superbly qualified individuals at MIT, who continue to maintain the highest standards of excellence.

Captain James E. Horten
United States Navy

Student Financial Services

Student Financial Services (SFS) is committed to making the dream of attending MIT a reality by providing students and their families the resources necessary to meet their financial obligations. By helping today's students finance their education, SFS hopes to inspire them to join the infinite circle of support that allows MIT to ensure access and affordability for future generations.

Student Financial Services Highlights and Updates

After 15 years in Student Financial Services, Elizabeth Hicks retired from the position of executive director in August 2015. Upon her departure, Stuart Schmill, dean of admissions, began serving as interim executive director of SFS. Stuart held the interim position for eight months before being appointed dean of admissions and student financial services in April 2016, taking a permanent leadership role over SFS.

Underscoring its commitment to preserving broad access to MIT, the AY2016 award year is the first time MIT's annual financial aid budget exceeded \$100 million. The Institute allocated \$103.4 million to ensure affordability for its 4,500 undergraduate students. The sharp increase in the Institute's financial aid budget reflects the commitment of an added \$3.2 million to reduce what students are expected to contribute to their education through work and loans. Through this enhancement, the self-help portion of the financial aid award was reduced from \$6,000 to \$5,500.

To streamline processes, create workflow efficiencies, and meet the expectations of students and their families, SFS implemented a modern Student Account System in August 2015. The standalone version of the Ellucian Banner Student Information System replaced the MIT Student Information System—a 20-year-old legacy student account system. Banner allows for easier future enhancements and upgrades, and simplified integration of third-party applications. Upon going live, Banner became the foundational Student Account System for all student account processing (billing, refunds, payment, payment plans, 1098T forms, third-party processing, etc.).

The core responsibilities of SFS are organized around two major functional areas:

- Billing and collecting tuition, fees, and other Institute charges; and
- Administering student financial aid, including student and parent loans, and student employment.

Billing and Collecting Tuition, Fees, and Other Institute Charges

Tuition, fees, and other major Institute charges totaled \$658,264,474 in AY2016, a 0.4% increase over the previous year. This includes:

- Tuition: \$583,709,308
- Student life fee: \$3,315,892
- Housing: \$56,385,724
- Dining/TechCASH: \$10,016,443
- Health plan/insurance: \$21,142,067

- Medical/dental charges: \$192,164
- Late payment fees: \$660,743
- Miscellaneous charges: \$1,992,100

Graduate tuition was \$377 million, 65% of total tuition, and undergraduate tuition was \$206 million, 35% of total tuition.

As of June 30, 2016, the student accounts receivable balance, netting out credit balances and exclusive of advance summer term billing, was \$2,342,466. Students are eligible for refunds when the credits on their student account exceed their charges. In FY2016, 4,648 refunds, totaling \$23 million, were issued to students.

The overall education loan notes receivables as of June 30, 2016, comprised of the federal Perkins loans, MIT Educational Loans, MIT Technology Loans, and MIT Parent Loans, decreased 7.2%, to \$45.2 million.

The MIT Educational Loan Plan is a benefit program that provides loans to eligible employees to help finance undergraduate or graduate education of eligible dependent children. SFS administers this loan program on behalf of Human Resources. In AY2016, \$2.3 million was loaned and \$2.2 million collected. The year-end receivables balance for this program continued to climb, rising 1.2%, to \$8 million.

Administering Undergraduate Student Financial Aid

MIT believes that parents and students have primary responsibility, to the extent that they are able, for paying the costs of an undergraduate education. The Institute recruits and enrolls the most talented and promising students, without regard to their financial circumstances. It awards aid only for financial need and does not award undergraduate scholarships for academic or athletic achievements or any other nonfinancial criteria. MIT guarantees that each student's demonstrated financial need is fully met.

In AY2016, the annual price of an MIT education totaled \$63,750 per student—\$46,704 for tuition and fees; \$13,730 for room and board; an estimated \$2,816 for books, supplies, and personal expenses; and a per student average of \$500 for travel. With 4,474 undergraduates enrolled, the collective price for undergraduates was \$285.2 million. Of this amount, families paid \$151.9 million, or 53%. Financial aid covered \$133.3 million, or 47%.

When defining the percent of undergraduates on financial aid, MIT uses a broad definition by including need- and merit-based scholarships, grants, student loans, and employment from institutional, federal, state, and private sources. For AY2016, 91% of undergraduates (4,067 students) received \$133.3 million in financial aid. If the definition of financial aid is narrowed to only include need-based aid, 59% of MIT undergraduates received need-based aid.

For students with family incomes under \$80,000 a year, the Institute continues to ensure that scholarship funding will allow them to attend MIT tuition free, a policy put in place in 2008. In AY2016, 33% of undergraduates (1,489 students) received scholarships and

grants from all sources equal to or greater than tuition, of which 1,060 students, 24% of undergraduates, had incomes under \$80,000.

In AY2016, 18% of undergraduates (786 students) received a Federal Pell Grant. Based on a policy the Institute put in place in 2006, the Institute matches the Pell Grant dollar for dollar by reducing a recipient's loan, term-time job expectation, or both, and not the MIT scholarship.

Sources of Undergraduate Student Financial Aid

MIT was the largest source of financial aid to its undergraduates in AY2016, providing 80% of the aid undergraduates received. Ninety-one percent of the aid MIT provided was scholarships, 9% student employment, and less than 1% student loans.

Private sources of financial aid—including charitable and civic organizations, corporations, foundations, banks, and other financial institutions—provided 11% of all aid undergraduates received in AY2016, making it the second largest source of financial aid. This included private scholarships and alternative student loans (so called to distinguish them from federal loans). State aid is not a significant factor in financing an MIT education.

The federal government was the third largest source of financial aid to MIT undergraduates in AY2016, providing the remaining 9% of the aid undergraduates received. Undergraduates received Federal Pell Grants, Federal Supplemental Educational Opportunity Grants, Reserve Officer Training Corps scholarships, Federal Direct Subsidized and Unsubsidized Stafford Loans, Federal Perkins Loans, and Federal Work-Study, including Federal Work-Study Community Service.

Undergraduate Scholarships and Grants

Scholarships and grants from all sources totaled \$115.7 million, with 70% of undergraduates (3,118 students) receiving scholarships. MIT awarded \$97.1 million in need-based scholarships to 56% of undergraduates (2,498 students). The average MIT scholarship was \$38,871. Approximately 80% of MIT scholarships were funded from restricted sources, and 20% came from the general Institute budget or unrestricted sources.

Undergraduate Student Loans

During AY2016, 19% of undergraduates (838 students) borrowed \$7.4 million. The average loan per borrower was \$8,855, and the median \$6,432. Approximately 28% of graduating undergraduates in the Class of 2016 (307 students) borrowed at some point during their education. Their debt ranges from \$350 to \$184,551, with the 90th percentile at \$50,803. The average total debt per borrower is \$24,698, and the median \$16,703.

Undergraduate Student Employment

Sixty-nine percent of undergraduates (3,091 students) earned wages from on-campus employment and employment under the Federal Work-Study Program, including both on- and off-campus programs. Their wages totaled \$10.1 million, or an average of \$3,278 per student worker.

Undergraduate Parent Loans

Approximately 3% of undergraduate families (147 parents) borrowed \$3.9 million through an education parent loan program administered by MIT. Federal Direct PLUS loans accounted for 96% of the dollars borrowed. The average loan per borrower was \$26,736.

Administering Graduate and Professional Student Financial Aid

Graduate and professional students receive tuition support and stipends in connection with research assistantships, teaching assistantships, and fellowship appointments. While this support is considered financial aid, it is not included in this report, as it is not administered by SFS.

Graduate and Professional Student Loans and Federal Work-Study

Graduate and professional students are eligible for need-based financial aid, including student loans and student employment under the Federal Work-Study Program, both of which are administered and reported by SFS. In AY2016, loans totaled \$44.9 million, an increase of approximately \$1.5 million from the prior year, with 10.9% of graduate and professional students (739 students) borrowing an average of \$60,719. Graduate student employment earnings under the federal Work-Study Program, including on- and off-campus programs, totaled \$0.891 million, with 1.9% of graduate and professional students (132 students) earning \$6,752 on average.

Graduate and Professional Student Grants

In AY2016 8.5% of graduate and professional students (581 students) received private sources of grants totaling \$23.3 million. Eighty percent of this amount is received through sponsor billing, a process by which a sponsor, such as a foreign government, agrees to cover tuition and other Institute charges for a student and SFS invoices that sponsor.

Staffing

New hires included: Amber Fermo, counselor for customer service; Meghan Frazier, associate director for financial aid; Michelle Gaffney, assistant director for financial aid; Linda Peckham, communications manager; and Michelle Pezzulli, associate director for customer service.

Three staff members left for new professional opportunities: Linda Peckham, communications manager; Diana Ubaldo, counselor for education loan collection; and Peter Wyatt, assistant director for financial aid. Susan Wilson, associate director for financial aid, retired.

As the year ends, there are 34 positions, exclusive of the dean, including two open positions: communications manager, and counselor for education loan collection. Of the 32 positions filled, 70% are filled by women, 30% by men, 30% by a member of a minority group, and 20% by a member of an underrepresented minority group.

Stuart Schmill

Dean of Admissions and Student Financial Services

Teaching and Learning Laboratory

The **Teaching and Learning Laboratory (TLL)** was founded in 1997 as a resource for faculty, administrators, and students who share a desire to improve teaching and learning at MIT. Our mission is to partner with MIT educators to create an environment where students are academically challenged, actively engaged, and personally supported, and to contribute to MIT's standing as a leader in science and engineering education.

This report details TLL achievements in the office's two functional areas: teaching and learning, and assessment and evaluation. In addition, it describes our efforts and achievements in the dissemination of knowledge and our collaborations with the Dean for Undergraduate Education, other MIT offices, faculty, and international initiatives.

Accomplishments in Teaching and Learning

TLL strengthened the Kaufman Teaching Certificate Program (KTCP) by securing long-term funding from the Office of the Vice President for Research for the inclusion of postdoctoral fellows and associates. TLL also obtained funding from the Office of the Dean for Graduate Education to support graduate student participation in the program and received funding from the Singapore University of Technology and Design for the inclusion of visiting faculty from the Teach the Teachers program.

In addition, TLL refined and offered a second certificate program—the EdTech Teaching Certificate Program (ETCP)—developed and offered a suite of programs to support graduate teaching assistants at MIT, and revised TLL's resource *Guidelines for Teaching @MIT and Beyond*. The revised guidelines include examples from MIT educators, including video footage. In addition, TLL worked with MIT OpenCourseWare (OCW) to create a resource site, including an Instructor Insights section that features This Course at MIT pages.

TLL provided pedagogical consultations and support to approximately 24 MIT educators on a wide range of subjects, projects, and initiatives. In particular, Darshita (Dipa) Shah, associate director for teaching and learning, consulted with approximately 16 MIT educators and provided pedagogical and organizational support for Professor Karen Willcox, whose *Scalable Differentiated Instruction* was awarded the 2015 Department of Education First in the World Development Grant to develop her Fly-by-Wire project.

TLL provides the expertise in teaching and learning that complements the MIT faculty's domain expertise. Our signature program is the Kaufman Teaching Certificate Program. As in past few years, the program attracted large numbers of graduate students and postdoctoral fellows and associates from across MIT, with a total of 209 participants completing the program in 2016. Postdoctoral enrollment was particularly high, and 2016 saw the participation of 121 postdoctoral fellows and associates—over half of all participants. Table 5 shows the distribution of enrollment from across the various constituent groups in the program broken down in terms of spring and summer offerings.

Table 5. Kaufman Teaching Certificate Program Enrollment, 2016

Groups	Spring	Summer	Total
Postdocs	47	74	121
Graduate students	41	35	76
Others	10	2	12
Total	98	111	209

As stated above, the past year brought the significant financial commitment of the Office of the Vice President for Research, which committed funds to support the ongoing enrollment of postdoctoral fellows and associates. Demand for the program, coupled with an effective vacancy in the Teaching and Learning staff, made it necessary for us to hire outside instructors for each offering (four non-TLL instructors in the spring, and four non-TLL instructors in the summer). This required significant training and support, which was organized and executed by Shah. In addition, Leann Dobranski, TLL assistant director, continues to provide managerial, organizational, and structural support to the program.

Dipa Shah and Janet Rankin developed a new teaching certificate program, the EdTech Teaching Certificate Program, in collaboration with Sheryl Barnes in the Office of Digital Learning. (Although a prototype version of the program was offered in January 2015, the program was significantly expanded in AY2016 with an increase in participant expectations and requirements.) ETCP was created for MIT graduate students and postdoctoral researchers who have completed the Kaufman Teaching Certificate Program and wish to learn more about the selection and use of educational technology in and outside of class to support student learning.

By the end of the program, participants should be able to explain the theoretical underpinnings of specific implementations of educational technology; describe how educational technology is changing classroom, course, and programmatic structures in higher education; evaluate various educational technology products with regard to their suitability for a given learning scenario; and select appropriate technology tools to enhance or transform the learning environment.

In order to successfully earn a certificate, participants must attend all seven sessions and complete all pre-session reading assignments and all post-session writing assignments. Each participant must also complete a final project that requires them to identify a technological intervention that addresses an educational need, challenge, or goal for a future teaching context. Participants must describe the educational context in which the intervention will be used; the challenge or goal the intervention addresses; an overview of the educational technology to be utilized; their decision-making approach—including a description of the educational research, cognitive science research, or both, that supports and informs the intervention—and the anticipated outcomes and potential pitfalls. Eighteen participants received certificates of completion in 2016.

As noted above, TLL developed several new workshops for MIT teaching assistants (TAs), most notably In the Trenches and Open Office Hours for TAs. In the Trenches

is a series designed specifically for teaching assistants across the Institute who will be leading recitation sections or other small-group learning experiences, who have limited teaching experience, and who would like a regular discussion group that focuses on issues related to their teaching.

TLL provided the Office of Undergraduate Advising and Academic Programming with additional workshops and consultations on teaching, learning, and mentoring to Undergraduate Research Opportunities Program (UROP) graduate supervisors, the MIT Summer Research Program, the Department of Brain and Cognitive Science, the Department of Economics, and MIT's five Schools through orientations for new faculty and new teaching assistants.

This year saw the revision of TLL's flagship resource, [Guidelines for Teaching @MIT and Beyond](#). Shah and Dobranski worked with MIT OpenCourseWare to create the online resource. The inclusion of Guidelines for Teaching on the OCW site will make this resource more widely accessible and useful to the MIT community and beyond.

Rankin and Shah continued ongoing collaborations with individual faculty and instructors from the Departments of Aeronautics and Astronautics, Chemical Engineering, Chemistry, Civil and Environmental Engineering, Economics, Materials Science and Engineering; Mathematics; Mechanical Engineering; Physics, and the Program in the History, Theory, and Criticism of Architecture and Art. Shah's work with Professor Willcox on the latter's Fly-by-Wire project is of particular note as she devoted 50% of her effort to this project during the fall and winter of AY2016.

TLL's level of pedagogy support, and the variety and scope of its work during AY2016 would have been impossible without the extensive contributions of Dipa Shah. TLL has been operating at reduced staffing levels for the entire reporting period. Shah's efforts (despite an 80% appointment as associate director) have ensured that MIT educators received adequate support and resources. In addition, Janet Rankin filled the positions of both senior associate director for teaching and learning and interim director of the Teaching and Learning Laboratory.

Accomplishments in Assessment and Evaluation

- TLL expanded its capacity to support MIT educators in assessment and evaluation through the hiring of a third associate director for assessment and evaluation. During AY2016, TLL provided one-on-one consultations with more than 45 MIT educators on the assessment and evaluation of educational practices in MIT subjects, departments, programs, and offices.
- TLL staff developed and offered a suite of six workshops for faculty and instructors who wish to create and implement their own assessments and evaluations in MIT subjects, programs, or both. In addition, TLL provided assessment and evaluation support for more than 17 projects, grants, and initiatives, securing \$48,756 in funding from faculty grants.

The large increases in TLL consultations and projects are due, in part, to the enhanced collaboration between the Office of Faculty Support and the Teaching and Learning Laboratory with respect to the Alumni Class Funds and the d'Arbeloff Fund for

Excellence in Education. Additionally, there has been a general increase in the number of MIT faculty who seek support for the evaluation and assessment of their teaching practices.

During AY2016, Associate Director Rudolph Mitchell conducted program evaluation studies involving approximately 10 different cohorts within five different project areas. For each of these cohorts, Mitchell designed surveys; conducted interviews; analyzed survey data, interview data, or both; and generated 22 reports for associated faculty and instructors.

Through the hiring of Anne Marshall in May 2016 and Melissa Barnett in spring 2015, we have expanded our assessment and evaluation capacity to three times that of AY2015. In her short time as a member of the Teaching and Learning Laboratory, Marshall has taken on five Alumni Class Funds projects, and offered consultation services to several other MIT educators. Barnett has taken on two extremely large, multi-year, multi-cohort projects: the MIT International Science and Technology Initiatives Program Impact Study and the Office of Minority Education Interphase EDGE four-year assessment study. Both of these projects serve a range of stakeholders, and it is expected that the results and analyses of these studies will have a significant impact on teaching and learning at MIT. Barnett also developed and delivered six new workshops for MIT educators on assessment and evaluation.

TLL'S assessment and evaluation efforts have been augmented and supported by the work of Leann Dobranski, who has made significant contributions to survey design, administration, and analysis for multiple TLL assessment projects. The assessment and evaluation work of TLL staff is summarized below and shows ongoing and completed assessment projects for AY2016.

MIT International Science and Technology Initiatives

Program Impact Study—Associate Professor Chappell Lawson (Melissa Barnett)

- Baseline conversations with staff, program managers, and students
- Pre and postsurveys of 2015 cohort
- Pilot 2016 survey
- Pre-experience of survey 2016 cohort

Office of Minority Education

Mentoring and Advising Program

- Participant experience survey analysis and report, 2015 cohort (Anne Marshall)

Interphase EDGE

- Student experience survey analysis, 2015 cohort (Leann Dobranski)
- Four-year assessment study (Barnett)
 - Statistical matching of scholars and nonscholars for 2012–2015 cohorts

- Comparison of cohort outcomes on quantitative measures for 2012 and 2013 cohorts
- Comparison of cohort outcomes on qualitative measures for 2012 and 2013 cohorts

Program for Research in Mathematics, Engineering and Science for High School Students

- Program assessment—Professor Pavel Etingof and Lecturer Slava Gerovitch (Dobranski and Barnett)
- Design of assessment study

Alumni Class Funds Projects

- Music Dictation Web Application—Lecturer Garo Saraydarian (Barnett)
- Incorporating State-of-the-Art Hands-on High-speed Videography and Image Analysis Lab Activities—Professor Lydia Bourouiba (Marshall)
- Coastal Ecology Primer for Engineers—Professor Chryssostomos Chryssostomidis, Research Engineer Juliet Simpson, and Research Scientist Carolina Bastidas (Marshall)
- Landscape Experiences, Lecturer Rebecca Uchill (Marshall)

d'Arbeloff Fund Projects

- An MIT Revolution in the Undergraduate Teaching of Neuroscience and Cognitive Science—Professors James DiCarlo, Michale Fee, and Associate Professor Laura Schulz (Dobranski and Barnett)
 - Administration of 2016 survey
 - Analysis of 2016 survey results
- 6.811 Principles and Practices of Assistive Technology—Senior Lecturer Julie Greenberg (Rudolph Mitchell)
 - Survey study and postsurvey statistical report of preliminary findings from spring 2015

Office of Digital Learning—MITx Grant Program

- Topical assessments for student learning—Professor David Pritchard (Marshall)

The Efficacy of Digital Poster Presentations

- Study design development—Research Engineer Jean-Francois Hamel (Marshall)

Instructional Innovations in 6.0001 and 6.0002—Professor John Guttag (Mitchell)

- Two descriptive statistics reports from 6.0001 and 6.0002 spring 2015 postsurveys
- Comparative study/report of spring 2015 6.0001 and 6.0002 cohort experiences
- Four descriptive statistics reports from 6.0001 and 6.0002 fall 2015 pre and postsurveys
- Comparative study/report of fall 2015 6.0001 and 6.0002 of problem set experience and study behavior
- Comparative study of six cohorts from 6.0001 and 6.0002 fall 2014 and fall 2015
- Four descriptive statistics reports from 6.0001 and 6.0002 spring 2016 pre- and postsurveys

M+Visión Participant Impact Study

- Report of the quantitative study of the first year experience of the 2013 cohort—Professor Martha Gray (Mitchell)

IMPACT Participant Impact Study—Professor Martha Gray

- Four presurvey statistical reports, winter 2016—Cohort A, Cohort B, A+B, and gender comparison
- Two postsurvey statistical reports—Cohorts A and B combined

Five-Year Retrospective Study of the Impact of 5.111 TA Training on Entering, First-Year Chemistry Graduate Students, fall 2007 and fall 2008

- Preliminary Report—Professor Catherine Drennan (Mitchell)

Dissemination of Knowledge

In fall 2016, Janet Rankin worked with Professor Haynes Miller and Dean Dennis Freeman to plan, organize, and host a visit of the American Association of Universities (AAU) as part of AAU's Undergraduate STEM (science, technology, engineering, and math) Education Initiative. The two-day visit brought together MIT faculty, instructors, and department chairs to share ideas and showcase current, evidence-based practices in STEM education at MIT.

Through the rejuvenation of TLL's Dean for Undergraduate Education Talks seminar series in spring 2016, TLL continued its commitment to sharing diverse perspectives and innovative practices in teaching and learning with the MIT community.

For the AY2016 series, TLL hosted four speakers from the education community (internal and external to MIT). The series was kicked off by Susan Ambrose, professor of education and history and senior vice provost for undergraduate education and experiential learning at Northeastern University, and continued with Pooja Agarwal,

education consultant; Benoit Escrig, Institut National Polytechnique de Toulouse; and Diane Soderholm (MIT).

In March 2016, Janet Rankin worked with Mary Callahan, senior associate dean and registrar, and Kathleen MacArthur, associate dean for curriculum and faculty, to plan and create MacVicar Day 2016, titled “From Hand to Mind: Advances in Evidence-Based Teaching.” The symposium showcased the work of five MIT faculty (Professors Martin Culpepper, Michael Cuthbert, David Darmofal, Catherine Drennan, and Robert Miller). Specifically, it highlighted their implementations of evidence-based practices and tools to support student learning, from active learning to project-based subjects to blended learning to making.

In April 2016, Rankin traveled to Mongolia to facilitate a two-day workshop on teaching and learning in higher education at the Mongolia University of Science and Technology. This workshop was the inaugural event of the MIT-Mongolia Program.

In May 2016, Melissa Barnett presented an invited seminar on Utilizing Data for Improvement at the Course-level at the Cottrell Scholars Collaborative, hosted by the American Association of Universities.

TLL staff also presented their work and shared their expertise at a wide range of national and international meetings and venues, including the Role of Calculus Workshop in Washington, DC; the annual meeting of the American Educational Research Association in Washington, DC; the Latin American Scholarship Program of American Universities in Cambridge, MA; and the Centro Universitário de São Paulo, Brazil.

This year saw the enhancement of TLL’s social media presence. We have strengthened our Twitter presence (@mit_tll) by tweeting news, events, and temporally relevant content for MIT educators as well as for the teaching community, writ large. These efforts have been orchestrated and executed by TLL’s administrative assistant, Daniel Nocivelli.

Collaborations

TLL continues to provide support for teaching and learning to the Office of Minority Education, the Office of Undergraduate Advising and Academic Programming, the Global Education and Career Development Office, the MIT Summer Research Program administered through the Office of Graduate Education, the MIT-Singapore University of Technology and Design Program, the MIT-Africa Program, the MIT-Mongolia Program, D-Lab, and the MIT International Science and Technology Initiatives. We hosted visitors from over 15 countries who wished to explore undergraduate teaching and learning at the Institute.

Teaching

Janet Rankin taught 5.95J Teaching College-Level Science and Engineering in fall 2015. During that time, she worked with OCW to produce an MIT Educator Site for this subject. OpenCourseWare filmed individual classes and interviewed Rankin to create the

Instructor Insights portion of the site. The MIT Educator Site will be available on OCW in the fall of 2016.

Funding

TLL received over \$125,000 in nonbase funding during FY2016.

Table 6. Source, use, and amount of nonbase funding received by TLL in FY2016.

Source	Use	Amount
d'Arbeloff Grant Fund for Excellence in Education	Project assessment	\$15,592
Office of Vice President for Research	Support of postdoctoral participants in the Kaufman Teaching Certificate Program	\$36,528
Office of the Dean for Graduate Education	Support of graduate students in the Kaufman Teaching Certificate Program	\$10,000
Office of the Dean for Undergraduate Education	General program support for the Kaufman Teaching Certificate Program	\$25,493
MIT-Singapore University of Technology and Design (SUTD) Collaboration	Support of SUTD faculty participants in the Kaufman Teaching Certificate Program	\$4,800
MIT IMPACT Program	Support of Rudy Mitchell's work on the grant	\$18,043
Funding from the National Institutes of Health, through Professor Martha Gray		
Fly-by-Wire Project, <i>Scalable Differentiated Instruction</i> . Funding from the US Department of Education through Professor Karen Willcox	Support of Dipa Shah's work on the grant	\$15,121
MIT-Mongolia Program	Support of the development and delivery of workshops on teaching and learning for Mongolian faculty in Ulaanbaatar, Mongolia	\$4,256
Funding from the Mongolia Ministry of Education, Culture, and Science		
Total		\$129,833

Personnel

The Teaching and Learning Laboratory conducted two searches to identify qualified candidates for the position of associate director of assessment and evaluation (two-year term). The first search failed to identify a suitable candidate. However, the second search resulted in the hiring of Anne Marshall, who brings a portfolio of experiences and expertise that diversifies and enhances TLL's assessment and evaluation services and support.

We wish to acknowledge the support of Daniel Nocivelli, administrative assistant, who has made significant contributions to many aspects of the work described above.

Janet Rankin
Interim Director
Teaching and Learning Laboratory