MIT Faculty Newsletter

in this issue we address the final report of the Task Force on the Future of MIT Education (summary article and editorial below); offer our From The Faculty Chair co-authored by the Chancellor (page 4); submit an analysis of a course combining MITx and TEAL (page 12); and report on the transforming of Student Information Systems (page 18).

Over the Dome

Preventing and Addressing Sexual Misconduct at MIT: A Faculty Primer

Edmund Bertschinger, Sarah Rankin

ON OCTOBER 27, MIT publicly released the results of its Community Attitudes on Sexual Assault Survey, along with a letter from Chancellor Cynthia Barnhart [*newsoffice.mit.edu/2014/ letter-regarding-mits-steps-minimize- sexual-assault-campus*]. The letter and accompanying report offer data and perspectives on the sexual misconduct that happens on our campus and reports some steps that are being taken to address this serious problem. We strongly urge every faculty member to read the Chancellor's letter and to become informed about ways they can help our students and others who may come to them with concerns about sexual misconduct. This article offers background information and guidance to faculty members.

The Future of MIT Education

Sanjay Sarma, Karen Willcox, Israel Ruiz

IN LAUNCHING THE INSTITUTE-WIDE Task Force on the Future of MIT Education in February 2013, President Reif asked us to lead the charge in envisioning the future of education at MIT and beyond, an exciting but daunting task. He challenged us to "be bold in experimenting with ideas that would both enhance the education of our own students on our own campus and that would allow us to offer some version of our educational experience to learners around the world."

MIT has a long history of pedagogical innovation balanced with deep introspection. The 1949 report of the Lewis Commission, the 1998 report of the Presidential Task Force on Student Life and Learning, and the 2006 report of the Task Force on the Undergraduate Educational Commons all demonstrated

Editorial
Issues in Considering the Future of MIT Education

A LARGE BODY OF biography and autobiography describes productive scientific education and training as an apprentice process, critically dependent on the relationship between individual mentors and their individual students. Though these relationships take many forms, they absolutely depend on the human relations between particular individuals.

Among the most common answers to the question of what sparked your interest in physics, or chemistry, or science are "My seventh-grade chemistry teacher" or "My high school physics teacher." In these narratives, it was the teacher as engaging human being, a person passionate about the subject matter that catalyzed the connection to the subject matter. Furthermore, the interest of the teacher in the student as an individual person was a key part of the equation.

contents

Vol. XXVII No. 2   November/December 2014

Photo credit: *Page 1:* Christopher Harting

Issues in Considering the Future of MIT Education
continued from page 1

Similarly, almost all faculty have experienced the flowering of students when enabled to work directly on a project that is "their own," designing something or carrying out experiments, so that the data becomes part of their personal experiences.

In a MOOC (Massive Open Online Course) with thousands of students, the human dimensions of the pedagogical relationship are sharply diluted. Similarly, the individual instruction in experimental skills and the student's experience of the training are diluted as well.

Accordingly, the two central tensions that are clear in the Future of MIT Education report and in the summary on these pages are those between the direct encounter of students with dedicated teachers, and the deep value of direct hands-on engagement in the processes of science and engineering. Both of these dimensions are severely thinned by the MOOC model.

On the other hand, the apprentice mode above is not operating in introductory courses, and these have been the primary models for translation into a MOOC. As the material gets more advanced, as the direct transmission of experimental skills, perspective, taste, and critical judgment become more important, MOOCs are unlikely to represent any game-changing advance in pedagogy. Thus, we need to learn much more about which dimensions of knowledge can be imparted without the personal dimensions of the teacher's interest, and without the hands-on experience typical of a UROP project or a graduate thesis.

Unfortunately, even before the introduction of edX, research faculty and university leaders had not adequately described and explained the ways in which engagement in the direct activity of advancing knowledge enriches the teaching and learning environment. Research universities advertise this feature and claim it as their provenance, but that does not substitute for mechanistic explanation of how the research experience improves the instructional process.

Educational Outreach Initiatives

Thomas Piketty's recent book, *Capital in the Twenty-First Century*, has emphasized important lessons about wealth inequality. MIT should be concerned about this growing inequality and its impact on expanding inequality in education. Leadership for us must be partly defined through our efforts to raise the quality of science and engineering education in institutions less well endowed than ours. This will require having some faculty who are knowledgeable about education, knowledgeable about the training of teachers and their institutions, and the training of skilled labor, rather than researchers. Hopefully this is being put in place to coordinate the edX experiences among different departments, though there is some danger that computational mastery will trump educational experience.

A number of broader educational initiatives are worth pursuing: Offering a Masters degree for STEM teachers; a Sloan School program for school management; a MOOC training or certificate program for people who would apply the lessons in institutions not yet so engaged. We should develop versatile materials that could be used by community colleges, high schools, and other universities.

Historically our texts have been influential. Digital-media materials have the potential to be even more impactful. They will not, however, succeed unless they are well produced. Especially for commodity topics, the lone-wolf author model is fading very fast. E. O. Wilson's *Life on Earth* was produced by a large team and an impressive budget. When e-texts like it are Web-connected and continuously improving through feedback and enhanced by artificial-intelligence-based personal tutors, students all over the world will use them.

To lead, we need a carefully crafted strategy that allocates time and money. More cooperation among us will be needed. Such a strategy must be informed by data more than opinion or anecdote. The NAS metastudy *www.pnas.org/content/111/23/8410.abstract* provides clear evidence that the traditional lecture will not survive for most courses. The study is very close to "an inconvenient truth" for the academy. Two *MITx* studies, *www.irrodl.org/index.php/irrodl/article/view/1902/3009* and *web.mit.edu/3.091/www/3 091r Final report v2.pdf*, have concluded that online learning is effective and that digital modules coupled with a mastery model improves student learning. We can assert "They will never replace lectures!" but that will not change the future. We will be judged by how well we recognize and assess changing educational environments and make positive contributions. However, we also need to have the courage to defend and maintain the hands-on apprenticeship training needed to generate productive and creative scientists and engineers.

* * * * *

Four New Members Elected to FNL Editorial Board

PROFESSORS Manduhai Buyandelger (Anthropology), Christopher Cummins (Chemistry), Woodie Flowers (Mechanical Engineering), and Nasser Rabbat (Architecture) were elected new Editorial Board members of the MIT Faculty Newsletter during the Institute-wide elections held during the first week of November. Professor Jonathan King (Biology) was re-elected to the Board.

All MIT faculty members were sent electronic ballots, and the voting took place over a seven-day period. Congratulations to all our new Board members!

In addition, special thanks goes to the MIT Office of Institutional Research. Their help in providing the technological know-how was essential for us being able to conduct the seamless, state-of-the-art, Institute-wide election.

We also thank Institutional Research for providing or assisting with virtually all of our M.I.T. Numbers and other graphs and charts each issue. Our new color-blind readable material is a direct result of their input. ■

Editorial Subcommittee

From The Faculty Chair
Reflecting on "All Doors Open"

Steven Hall
Cynthia Barnhart

THE MIT COMMUNITY HAS suffered the loss of several students and faculty over the last year, including cases of suicide and others in which the cause has yet to be determined. In the wake of the most recent death, that of sophomore Phoebe Wang, the community held an event on September 29, "All Doors Open," to pause, reflect, and connect with one another. We, together with UA President Shruti Sharma and GSC President Kendall Nowocin, sent a letter inviting all members of the MIT community to participate in this campus-wide event. We wrote:

Monday at noon, we ask that everyone at MIT stop what they are doing and take 15 minutes or so to remember those we have lost, reflect on how their deaths have affected us and think broadly about how we as a community should respond.

We urge you to open your doors, literally. Gather together – or get up, walk around and engage the people nearby, those you know already and those you don't. If you prefer, we hope you will take the time for focused private reflection.

The event was deliberately flexible, allowing faculty, students, and staff to use the time in ways that they saw fit. In order to capture the wisdom, ideas, and energy of the whole community, we encouraged everyone to share their insights with us at *we-are@mit.edu*. As soon as the invitation was sent, we began to receive feedback and ideas. Some included suggestions for additional activities, and some came from faculty unsure of how to participate. For many of us, this was a new type of conversation to have in the classroom. Would

conversations feel awkward in a large GIR? How could we invite personal reflections?

Ultimately, the community observed the event in a variety of ways. We heard about professors who used the time for open conversation with their classes, faculty who paused meetings to discuss with one another, and mixed groups that gathered outside offices. Despite initial uncertainty, we heard from a number of faculty members who found the experience to be a positive one, and we heard from students about how meaningful those efforts were. Creating the space to stop and reflect, many said, should be a community priority.

Several students wrote to praise a faculty member who began a recent class by asking the students for their impressions of what makes the class so stressful. The discussion that followed not only helped the faculty member to understand the students' perceptions of the subject's demands, but made explicit an issue that we all experience but rarely address so openly. The students found the action so positive and impactful that they suggested all professors consider taking the time to do this.

In one class, an instructor had ended the lesson a few minutes early. After reminding students about the importance of occasionally taking a break, the instructor invited students to spend the final

minutes enjoying a snack and discussing their reaction to recent events. Although a modest gesture, it made a big impact on the student who wrote us, and demonstrates the importance of little moments and signs of caring.

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Hacking the MIT Culture

More generally, what we heard from faculty, students, parents, alumni, and staff is that MIT is a big, busy, intense place. We have a culture that encourages excellence and pushes us to challenge ourselves – sometimes at a cost to personal well-being. There is the risk of negative competition. One example is the notion that "sleep is for the weak," but as one student rightly pointed out, "sleep is for the healthy." Likewise, the idea that our devices make us available 24/7 means it can be hard to step away from the pressures of work. Whether faculty or student, we sometimes feel that there is an expectation that we answer e-mail at any hour.

Rigor and intensity are part of the essence of MIT, but we need to make sure that high standards are accompanied by the support and resources that make them attainable. Speaking for all of us, one writer noted a sentiment that arose in her discussion: "We want to be challenged, not broken."

Another asked: Can we collectively "hack" MIT culture to encourage healthy

work-life balances? Several parents also suggested developing in-person or online student training sessions related to stress and well-being, particularly around nutrition, exercise, and alcohol abuse.

Another theme that emerged related to isolation and opportunities to create a more connected, inclusive environment. We heard repeatedly about the need to increase interaction and break down barriers that exist on campus, and we heard that fear of failing and imposter syndrome can be serious sources of stress. One researcher suggested that sharing personal stories, especially about periods of difficulty or doubt, could help foster a sense of belonging for new members. Another writer highlighted the tension of being too busy to attend events that are intended to build community. A third spoke to the role of mentorship and the importance of teaching students to manage failing. Occasional roadblocks are a critical part of learning, helping us to discover new strengths and perspectives. Broadly, many people told us that creating new pathways for connection will strengthen our community.

Words Matter

Although MIT is action-oriented, several writers called attention to the power of words. Last year, then-Chancellor Grimson issued a call to end the "praise-free zone." Before finding weaknesses or suggesting improvements, he invited faculty and students to acknowledge others' hard work. One student reinforced this point by suggesting that we could all take the time to encourage each other. As she explained, one of her professors e-mailed her, commending her for how she had handled an assignment. This simple, reassuring "job-well-done" seemed so unusual and felt so meaningful to her that she saved the e-mail in her inbox as a reminder of her ability to succeed.

On another communication-related point, a number of community members

told us that we need to be more forthcoming in naming the problems we are trying to solve, that we should acknowledge suicides if they occur, and we should not be afraid to use the word if we want to find

faculty to help recognize signs of distress and to identify those who may need help. Additionally, faculty can benefit from a greater understanding of how to assist students in need to navigate MIT's infra-

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ways to help. Many in our community assume if the cause is not stated in an announcement of the death of a member of our community that the cause must be suicide. However, there's also a need to respect the wishes of families in difficult times, and often the official cause of death is not confirmed until months later. Nevertheless, we heard clearly that transparency is seen as critical to tackling this difficult topic.

Resources and Asking For Help

Many are concerned that pride in MIT's degree of difficulty can leave faculty, students, and staff reluctant to ask for help. Asking for help, in whatever form, needs to be seen as a strategy, rather than a weakness.

While there was consensus that mental health resources are only one piece of the puzzle, this was a topic that came up many times. From those working to remove any stigma of seeking help to those who suggested improving awareness and access, we were grateful to hear people thinking about the types of services that will best support the community.

Feedback highlighted both the progress that has been made and the need for continued attention. One student proposed developing training exercises for

structure of support services. Among faculty and advisors, we learned that there are both real and perceived challenges in identifying those at risk and discussing such issues.

In our original e-mail, we described All Doors Open as the start of a long-term conversation for our community. We appreciated reading follow-up letters to *The Tech* and are grateful to everyone who took the time to share ideas, whether publicly or privately. Equally, we have been inspired by the number of people who offered concrete help. We expect to pursue these offers in the weeks and months ahead.

Because MIT is a place informed by facts and evidence, it is clear that we must do more to understand the challenges that so many in our community face. There is also an opportunity to look beyond our campus for best practices in meeting these needs. Many offices are actively engaged in these efforts. More immediately, we hope that both individuals and the community will find ways to carry forward the spirit of All Doors Open. ■

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the importance of critically analyzing our educational model in the context of the global landscape.

On November 21, 2013, the Task Force on the Future of MIT Education released its preliminary report, which explored a breadth of possibilities to consider in reimagining the Institute's future. In the final report, released on July 28, 2014, the Task Force offered a series of 16 recommendations for how MIT can continue to transform education for future generations of learners. The recommendations are intended to lay the groundwork for MIT to build on the momentum that the Task Force has created. These recommendations reflect the collaborative efforts of the 52 Task Force members [*future.mit.edu/membership*] – faculty, students, and staff who brought their experiences to this collective effort – working with the guidance of Corporation and alumni advisory groups, and the input of the broader MIT community through an Idea Bank and extensive surveys [*future.mit.edu*].

As Task Force co-chairs, we believe that the Institute has historic opportunities to reach more people, to reshape residential MIT education, and to impact lives and society in ways not previously thought possible. Tremendous opportunities lie before us, but there remains much to be done.

Enabling Bold Experimentation
"Recommendation 1: The Task Force recommends that MIT establish an Initiative for Educational Innovation to build on the momentum of the Task Force, enable bold experimentation, and realize the future the Task Force has imagined for education on campus and beyond."

The Task Force recommendations have potentially far-reaching consequences. In order to ensure success, we need to promote educational connections across the Institute and provide a sandbox for engaging in and thoughtfully assessing the kinds of experiments envisioned by the

Task Force Structure

Karen Willcox
Professor,
Aeronautics and Astronautics

Sanjay Sarma
Director of Digital Learning

Israel Ruiz
Executive Vice President
and
Treasurer

Task Force Coordinating Group

Corporation
Advisory Group

Alumni
Advisory Group

Working Group on MIT Education and Facilities for the Future

Working Group on the Future Global Implications of edX and the Opportunities It Creates

Working Group on a New Financial Model for Education

Community Engagement

Three Working Groups of Faculty, Students, and Staff

Task Force. Under the auspices of the Initiative for Educational Innovation and in concert with faculty governance, MIT will be able to conduct experiments in both the undergraduate and graduate programs.

Some of the suggested experiments involve: infusing greater flexibility into the core undergraduate curriculum, including the General Institute Requirements (GIRs); expanding the use of diverse pedagogies such as project-based and blended learning models; introducing modularity into the curriculum; and studying new approaches to the assessment of students.

The Working Group on MIT Education and Facilities for the Future offers additional recommendations aimed at transforming pedagogy. The Group recommends that MIT build on the success of freshman learning communities and consider future expansions of the cohort-based freshman community model; use online and blended learning to strengthen the teaching of communications; create an Undergraduate Service Opportunities Program; and explore online and blended learning models to improve graduate curriculum accessibility.

Extending MIT's Educational Impact to the World
MITx and edX have created an unprecedented opportunity for MIT to reach a global audience. Two and a half million unique learners have already participated in edX classes, with one million of these individuals accessing *MITx* content. 55 partner universities together offer over 250 courses reaching learners in close to 200 countries, and over 1,000 local grassroots edX communities have sprung up around the world.

The Working Group on the Future Global Implications of edX and the Opportunities it Creates offers recommendations aimed at extending MIT's educational impact and pedagogical innovation to the world. The Group encourages supporting efforts to create a lasting community and Wikipedia-like knowledge base for *MITx* learners to gather resources and share ideas and best practices. It calls upon MIT to define a K-12 strategy, and to consider the types of certifications that can be supported through *MITx* and edX along with pricing methodologies.

Lowering Barriers to Access
In a market that focuses on excellence,

MIT incurs high costs to attract and retain the best faculty and brightest students, and to provide the research facilities needed to promote discovery and innovation. While our model is inherently capital and labor intensive, this investment pays off in terms of educational outcomes, namely outstanding students and advances in knowledge. Two current sources of Institutional support – government research funding and tuition – are under pressure, and preserving MIT's exceptional research and educational environment will require consideration of new revenue opportunities.

The Working Group on a New Financial Model for Education offers recommendations aimed at enabling the future of MIT education. It recommends charging a working group to further evaluate revenue opportunities surrounding technology licensing and venture funding, and suggests bolstering infrastructure for executive and professional education to broaden program delivery. It also recommends establishing a working group on spaces for future student life and learning to bring together stakeholders from around campus to envision, plan, and create spaces for the future of MIT education.

Most importantly, the Task Force urges MIT to strengthen its commitment to access and affordability. For the current academic year only 7.9% of undergraduate applicants were admitted to MIT. Clearly, there is a vast unmet need for access to high-quality residential education, but we are unable to meet the demand due to the high cost of the residential experience. Through online and blended learning environments, MIT can reach more learners and lower barriers to access.

What We Have Heard

A number of themes have emerged from discussion forums conducted during the comment period over the past couple of months. The concern about impact on faculty time is of paramount importance. The number of MIT faculty has remained relatively constant over the past 30 years, with 996 faculty in 1981 and 1,022 in 2013

despite the significant growth in research funding and the number of graduate students and postdoctoral researchers. We may need to consider some growth in the faculty in order to address concerns about the impact on teaching loads. Additionally, online experiences present

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new opportunities for envisioning new educational roles that could offer support for teaching *MITx* classes.

Some are skeptical that we will be able to infuse the quality and magic of the MIT residential education into online offerings. Others worry that reduced time on campus could weaken the sense of affiliation and commitment to give back for future generations. We acknowledge that the serendipitous encounters between faculty, students, and staff in the living communities, classrooms, and common spaces cannot be replaced in online forums. At the same time, we have the opportunity to reach more people with the highest quality online experience possible, to complement classes through intensive on-campus experiences, and to explore opportunities for alumni and students to work abroad as mentors.

MIT's commitment to hands-on learning is still evident today. In weighing the importance of MIT values and principles [*future.mit.edu/charts/values-and-principles*], faculty responding to a survey ranked hands-on experience second only to commitment to excellence, and students ranked it as the most important.

Throughout the Task Force process, we have felt a tension between a desire to preserve many of the qualities that define an MIT education and a push to make grand, sweeping changes to MIT's very core. In order to achieve the Task Force's vision,

MIT will need to be receptive to new opportunities and approaches. We need to make it easier to work across School boundaries to develop interdisciplinary classes, to explore modular approaches to class material, and to experiment with flexible approaches.

We have been encouraged to do more to influence K-12 education. Recognizing that we have limited capability without a school of education, we still have an obligation to try. Today there are over 80 grassroots efforts on campus involved in K-12 outreach activities, and there may be further opportunities to connect faculty researching childhood learning with these efforts.

We have been reminded emphatically of MIT's unwavering commitment to hands-on learning, the need for maker spaces, the importance of undergraduate residences, and the vision for spaces to enable the future of education. And we have realized that we need to do a better job of telling MIT's story of affordability, and of exploring new revenue opportunities if we are to advance the residential model for future generations.

But what we have heard most loudly amid all of the voices is the enormous widespread desire from the broad MIT community to engage in the future of MIT education.

The Future Is Here

A number of the ideas explored by the Task Force are already taking shape, giving us a glimpse of what the future may hold. Recently, 47 of the 54,856 students enrolled in 15.390x Entrepreneurship 101

The Future of MIT Education
Sarma et al., from preceding page

were invited to participate in the *MITx* Global Entrepreneurship Bootcamp. Students from 22 countries participated in the intensive on-campus experience, a highly successful program that presents new possibilities for reaching more people and expanding access to MIT.

Building on the work of the Task Force, and in collaboration with the Office of Digital Learning, MIT offered a small number of classes for credit this past summer on an experimental basis. The program, dubbed summer@future, drew 129 residential students during the course of an eight-week period; we are now assessing the results. The classes represent another step in the exploration of opportunities to enhance the residential learning experience with online educational materials and blended learning models. These are the kinds of experiments that will help us build the capacity to extend online offerings and modular approaches.

The Task Force envisions a future in which MIT's impact is even greater than it is today. We imagine a future that extends MIT's capacity to reach a global audience of learners, and in which the MIT residential education model is strengthened.

We wish to acknowledge the tireless efforts of all of those that have participated in the Institute-wide Task Force on the Future of MIT Education since its inception on February 6, 2013, and we are hopeful that the Task Force final report [*future.mit.edu/final-report*] will inspire all of us to continue to imagine the Institute's future. If you have not yet read it, we urge you to do so. ∎

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Preventing and Addressing Sexual Misconduct at MIT
Bertschinger and Rankin, from page 1

Addressing sexual assault is necessary to protect the rights of our community members to learn, live, and work in a safe environment free from sexual misconduct, harassment, and other forms of misconduct. Our response to ensure these rights is guided by our values, our institutional policies, and by the law. Recent guidances on how to comply with Title IX and amendments to certain federal laws create new expectations for faculty members. To understand these, one must first have a little background in laws relating to gender discrimination.

Title IX of the U.S. Higher Education Amendment of 1972 prohibits discrimination on the basis of sex in any education program or activity receiving federal financial aid. Sexual assault and sexual harassment are forms of sex discrimination prohibited by Title IX. The Department of Education's Office of Civil Rights enforces Title IX.

While much of the initial focus of Title IX compliance was on ensuring equal access to athletic and academic opportunities regardless of gender, in 2011, the Office of Civil Rights (OCR) issued a guidance – a statement of OCR's enforcement policies – laying out substantive and procedural requirements for schools, colleges, and universities to prevent and respond to sexual harassment, including sexual assault and violence. These requirements include the designation of a Title IX Coordinator to oversee all Title IX complaints and to identify and address any patterns or systemic problems concerning sexual misconduct. At MIT, Jennifer Walsh, Manager of Employee Relations, is the Interim Title IX Coordinator for employees, including faculty, and Judy Robinson, Senior Associate Dean in the Office of the Dean for Student Life, is the Title IX Coordinator for students. There are also a set of Deputy Coordinators throughout MIT. In addition, MIT has appointed a Title IX Investigator, Sarah Rankin, to handle the investigation of complaints brought by or against students. Faculty members with concerns or questions about sexual misconduct of any kind should contact a Title IX Coordinator or Deputy Coordinator, preferably the one in their area. [A complete listing of Title IX Coordinators and Deputy Coordinators is available at: *titleix.mit.edu/coordinators.*]

In 2013, Congress passed a new law, the Campus Sexual Violence Elimination (Campus SaVE) Act, as part of a reauthorization of the Violence Against Women Act of 1994. The Campus SaVE Act requires an education program to be in place for all new employees, including faculty, to promote the awareness of sexual assault, dating or domestic violence, and stalking. Additionally, the Campus SaVE Act amends the Clery Act of 1990, requiring MIT to publish statistics regarding all campus crimes, [*police.mit.edu/sites/default/files/MIT-Police-Files/Documents/MIT-Police-security-report-2014.pdf*] while maintaining the confidentiality of individuals reporting sexual misconduct. The Campus SaVE Act requires training for all

new employees. At MIT, this is being offered through a 20-minute online module required for all new employees hired since July 1, 2014. Current employees, including faculty, are also encouraged to take the training at this time. [MIT certificates are required for the "Preventing Sexual Harassment" training module *https://sbsjp601.mit.edu/irj/portal/learning?course=RCC91010w.*]

In addition to required training for new employees, under the law MIT must implement "ongoing prevention and awareness campaigns for students and faculty." The Chancellor's letter is an important step in this process. Another one is the notification to faculty and staff members about reporting obligations under Title IX, described next.

Reporting Obligations

If a student comes to you – to any MIT employee – and discloses that they have or might have experienced sexual harassment or sexual assault – then you are obligated to "do something." We suggest taking the following steps:

1. Listen and avoid judgmental questions – never blame a victim.

2. Be flexible, if possible, when it comes to class or lab assignments and deadlines.

3. Refer the student to MIT Medical's Violence Prevention and Response team [*mit.edu/wecanhelp*], with a 24-hour hotline (617-253-2300) and e-mail (*VPRadvocate@med.mit.edu*).

4. Inform the Title IX Office – by contacting a Title IX Coordinator or Deputy Coordinator, or sending e-mail to *titleix@mit.edu.*

The last obligation is significant: when an employee, including a faculty member, is informed about sexual misconduct, MIT is on notice and is obligated to respond promptly and equitably to eliminate any harassment, prevent any recurrence, and address any effects.

The last obligation is significant: when an employee, including a faculty member, is informed about sexual misconduct, MIT is on notice and is obligated to respond promptly and equitably to eliminate any harassment, prevent any recurrence, and address any effects.

The concept of confidentiality needs mention. OCR makes a distinction between confidential resources (medical personnel, clergy members and, at MIT, Ombuds) and private resources (faculty, staff, Title IX coordinators, police). Only the confidential resources can guarantee confidentiality. All others have an obligation to report. With that said, all of them can and should be empathetic and supportive of our students.

As the recent survey suggests, victims most often tell friends and not anyone in an official capacity (not even confidential resources). We need to lower the barrier students may feel to speaking up. By informing the Title IX office, a faculty member does not force a student to file any formal complaint or even meet with the Title IX Investigator. All that will happen is that the Title IX Investigator will invite the student to talk, which the student is free to refuse with no consequence. However, even if the student does not want anything further done, information given to the Title IX Investigator may help to uncover a pattern that MIT is obligated to act on to prevent future sexual violence. As much as possible, any steps taken will remain the student's decision.

We share the concerns of President Reif that "Sexual assault violates our core values. It has no place here." We appeal to faculty members to help eliminate it at MIT. More information is available at the MIT Title IX Website, *titleix.mit.edu.* ■

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Ed. Note: For results of the 2014 survey *Community Attitudes on Sexual Assault* see M.I.T. Numbers in this issue (page 23 and back page). Or visit: *web.mit.edu/surveys/health/*.

Are We Moving Toward a Two-Class Research-Educational Society at MIT?

Franz-Joseph Ulm

THERE IS MUCH TALK about the rising inequality in our societies worldwide; I am wondering aloud whether we, at MIT, are not falling prey to this trend as well. I am not talking about the wage differential between executives, faculty, and researchers, which appears to be still in reasonable proportions compared to the excess we see in the private sector. No, I fear that we are moving into a two-class system where tenured and tenure-track faculty are on one side of the fence, while research scientists, engineers, lecturers, and other non-tenure track members of our community are on the other, even if we all call MIT our home.

Although MIT often frowns upon writing and codifying many of the rules by which it governs itself and prefers instead to follow the common law principle of historical precedence, it is nonetheless still built on the classical Humboldtian model of tenure-track professors engaged in teaching and research which is supplemented by a robust team of what in MIT-speak is designated as the Sponsored Research Staff. The latter includes individuals with appointments of principal and senior scientists, engineers and associates, and miscellaneous other non-tenured lecturers with advanced degrees.

In an ideal academic world – such as in Sir Francis Bacon's 1627 utopian novel *New Atlantis* where he describes a modern research university by the name of Salomon's House which a few years later inspired the creation of the Royal Society – both the tenure and non-tenure-track teams should be held to the same standards and enjoy comparable, even if not

identical, privileges. And to a large extent, this holds true today: The processes for the promotion of professors and research scientists at MIT are almost indistinguishable from one another. Given these high standards, it would be safe to assume that the privilege of academic freedom granted to professors through the tenure system would also apply in some form to research staff. Or at least that is what could be inferred from the tight ratio of scientists to faculty in each department where principal and senior scientists are as precious a resource as the faculty.

As I was to discover first hand after arriving as a junior faculty in my department, the difference between research scientists, professors, and lecturers is mostly an administrative and contractual one, with budget-line distinctions that have no bearing on the intellectual, research, and educational environment that makes MIT unique. Many research scientists-lecturers are pillars of our academic community, and play a significant role in both undergraduate and graduate programs all over the Institute. [An inspirational example for us all is Alan J. Lazarus (1931 – 2014), Senior Research Scientist and Senior Lecturer in MIT's Department of Physics, whose dedication and devotion to advising and mentoring students is celebrated annually by the Institute through the Alan J. Lazarus (1953) Excellence in Advising Award. (For details, see: *newsoffice.mit.edu/ 2014/senior-research-scientist-emeritus-alan-lazarus-dies 82.*)] They are among the most talented, skilled, and inventive educators who, at least in my department, have often been the recipients of some of our most prestigious teaching awards,

although none of them was ever named to be a MacVicar Faculty Fellow.

Thus far in my 15 years at MIT, during which time I have witnessed five department heads, four Deans of Engineering, and three Institute Presidents, I have had no reason to believe that this august academic institution could be under any threat. Quite the contrary, in my firm belief in the principle of scholarly equality, I even encouraged senior colleagues in both research and industry to consider research scientist and lecturer positions at MIT, and managed to attract some of them to join our community and to participate in our commitment to MIT's excellence in research and education.

But as I recently have come to realize, our colleagues in the non-tenure track are highly vulnerable to intrinsic inequities built into our (still imperfect) system. My wake-up call came with the appointment of a new department head. He believes strongly that only faculty should lead research projects and that only they should teach most subjects. Since the positions of the non-tenure track staff is at the pleasure of the departments, this change in policy immediately overruled the historical balance between tenured and non-tenured personnel, and exposed our non-tenure track colleagues to an unprecedented level of vulnerability. It opened the door for the termination of the excellent careers of many who had devoted years – or even decades – of their lives and talents to our institution. But don't get me wrong: This article is not about departmental policies, *per se*, or about department heads and their considerable executive power, given that this is

an administrative structure that has worked very well for our Institute. Instead, it is about the vulnerability of our colleagues in research scientist and lecturer positions to changes in the administrative chain and policies.

Over the past year in the new administration, I have seen the careers of some of the most gifted and transformational researchers-lecturers at the Institute come to an end. I witnessed the sudden change in the covenant between the administration and non-tenured research scientists and lecturers concerning the terms and conditions of their employment, with previous agreements with past department heads either voided or ignored. I have learned about the termination of their office and/or lab space allocation, and the cancellation of their administrative services by the department. On account of their eminent status beyond the walls of MIT, many have simply given up and resigned, and have sought more equitable employment elsewhere.

This vulnerability of a subset of our community to changes in the administrative chain exposes a true flaw in our system, which I believe endangers the very research and educational fabric that defines our community. I fear that this flaw makes us *de facto* a two-class society.

And then I realized that MIT's non-tenure-track faculty is not alone in this predicament. In an Op-Ed in the *Boston Globe* of February 2, 2014 entitled "The invisible Professor: On most campuses, adjuncts are an undervalued, invisible population," Jay Atkinson provides testimony of what some have come to call a "national crisis of academic labor." It is regrettable that MIT should be part of that crisis, and that the dual peril to non-tenure-track colleagues described by Atkinson should take also place at MIT: unequal pay and absence of job security. [As a data point, the non-tenured teaching staff in my department often carry out their teaching duties at pay levels far below market rates. Pay for a 12-unit

subject typically equals 30-40% of the price of a graduate teaching assistant (for the same time period)! In a survey of space allocation in my department, I also found out that office space allocation to faculty exceeds by 100% the office space allocated to full-time scientists and lecturers.]

My own sense is that this is an issue in urgent need of being addressed by the Institute. It is my belief that we faculty need to take a firm stand, irrespective of our tenure-status, and live up to the standards of the "MIT-Family." Given our demonstrated ability to solve hard problems with bold ideas and inspired solutions, MIT should act now to redress this injustice, and lead the way out of this crisis of academic labor. The 1999 landmark "Study on the Status of Women Faculty in Science at MIT" is a possible model for inspiration. ■

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letters

Being "Nice" at MIT

To The Faculty Newsletter:

I WAS INTRIGUED BY the article in the September/October *Faculty Newsletter,* "Can We Make Smart = Nice?", because I am working the same issue in another context. I am a retired Professor in Organizational Studies from the Sloan School and still very active writing about relationships at work and in general. In my recent book, *Humble Inquiry*, I note that we are an individualistic, pragmatic,

task driven culture in which being nice is strictly secondary to getting the job done, being professional, keeping your role distance, etc., etc., etc. We tell, we don't ask.

Not being nice to visitors is certainly one aspect of this problem, but a more serious aspect is that this same cultural attitude prevents subordinates from telling their bosses when things are going wrong, when there are safety problems, when quality is declining, when collaboration is more necessary as work gets more

complex. I think U.S. management (and maybe engineering) is still stuck on individual accountability and hasn't learned that being nice is no longer the nice thing to do, but absolutely necessary to establish mutual trust and open communication – or the job doesn't get done properly.

Ed Schein
Professor Emeritus
Sloan School of Managment

8.02 TEAL+x: Students Say "Yes" to MITx in 8.02 TEAL

Saif Rayyan
John Belcher

IN SPRING OF 2014, we ran an experiment to explore the use of the *MITx* platform in on-campus 8.02. The platform was developed by edX for presenting MOOCs (Massive Open Online Courses), and has the potential to be useful in MIT's residential courses. To this end MIT's Office of Digital Learning (ODL) has had its *MITx* group implement the edX platform on campus, and we have used it to enhance student experience in 8.02, MIT's physics course on electricity and magnetism taken by over 800 freshmen.

We concentrated on providing automated feedback to activities done outside class: mainly pre-class preparations, and homework. Students received the platform very favorably, and an overwhelming 95% answered "Yes" to the question of whether we should continue to use the *MITx* platform in physics courses. In the future, analyzing the voluminous click stream logs will enable us to better evaluate the efficacy of the online component.

TEAL and the "Flipped" Classroom

"Do no harm": when we set out to explore the potential of using the *MITx* platform to improve our teaching, our first priority was to avoid impacting negatively what we think already works well. 8.02 is currently taught using the TEAL (Technology Enabled Active Learning) classrooms. Class activities are motivated by a large volume of education research showing that effective use of peer instruction, group problem solving, and interaction between staff and students in class all lead to better learning. These elements exist in one way or another in what people call the "flipped" classroom, and, in a sense, we

have already done our first attempt to flip the classroom when we moved from lecture-recitation format to TEAL. We envisioned that the *MITx* platform could help us increase the time spent in TEAL on interactive activities, but, more importantly, we recognized the chance to improve student learning from activities outside class. We designed the *MITx* component to provide immediate feedback while students prepare for class and while they do their homework.

The x in TEAL+x

Pre-class

Getting students to prepare for class has always been a challenge. Previously, pre-class assignments in TEAL were a combination of assigned readings from the textbook and the submission of handwritten answers to one or two open-ended questions. The papers were collected at the beginning of each class, and graded by undergraduate TAs. That system did not work: We did not believe our students read the material, and they did not receive immediate feedback to their answers.

For 8.02 TEAL+x, pre-class assignments were transformed using the *MITx* platform to be due right before class three

times a week. The assignments started with a "reading summary" with links to the appropriate chapters in the textbook (all embedded in *MITx*, to the relevant page). The reading was followed by a few

> For 8.02 TEAL+x, we coded all homework problems into the *MITx* platform to enable students to check their intermediate and final answers. . . . Students could see whether their answer was correct or not, but they were not given answers or solutions until after the due date.

questions that targeted basic applications of the concepts discussed in the reading summary. These questions were automatically graded by the platform, and credit was based on effort: Students were able to look at feedback explaining the answer after submitting the first attempt; hence they could always get full credit. The goal was to allow students to test their understanding of the reading material by attempting these questions on their own first, and then providing them with immediate feedback. Pre-class assignments were worth 5% of the total grade.
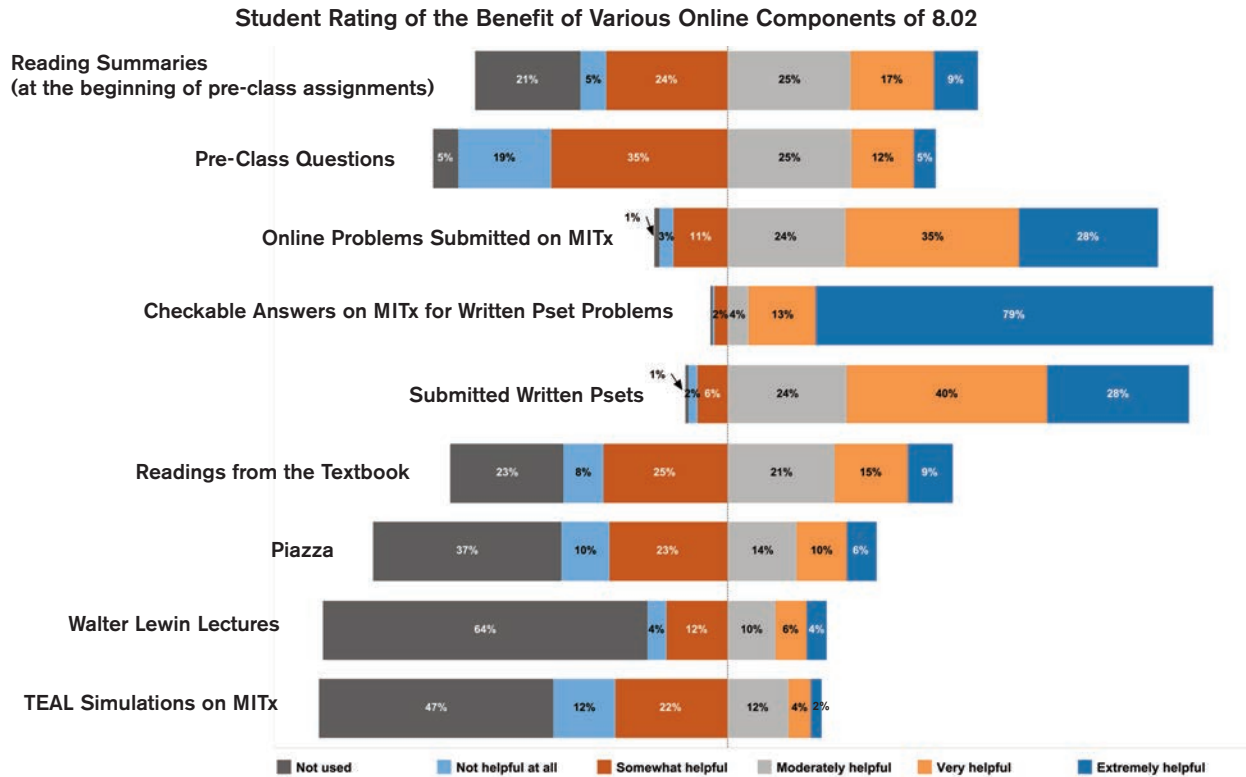
Homework

In previous semesters, 8.02 TEAL homework was submitted on paper, and graded by TAs. Ideally, TAs graded two-to-three problems out of eight, and were expected to return graded assignments within a week, by which time students were working on the next assignment and were no longer focused on the previous assignment.

For 8.02 TEAL+x, we coded all homework problems into the *MITx* platform to enable students to check their intermediate and final answers. There they enter an answer and the system tells them if they are

Supplementary Material
The full set of lectures by Prof. Walter Lewin was included as a supplementary resource. TEAL simulations, video visualizations, and the textbook were all

many of our group meetings for designing 8.02 TEAL+x, and were an invaluable source of student perspective. We arranged to collect as much feedback from students as possible, including

Student Rating of the Benefit of Various Online Components of 8.02

Component	Not used	Not helpful at all	Somewhat helpful	Moderately helpful	Very helpful	Extremely helpful
Reading Summaries (at the beginning of pre-class assignments)	21%	5%	24%	25%	17%	9%
Pre-Class Questions	5%	19%	35%	25%	12%	5%
Online Problems Submitted on MITx	1%	3%	11%	24%	35%	28%
Checkable Answers on MITx for Written Pset Problems	2%	4%	13%			79%
Submitted Written Psets	1%	2%	6%	24%	40%	28%
Readings from the Textbook	23%	8%	25%	21%	15%	9%
Piazza	37%	10%	23%	14%	10%	6%
Walter Lewin Lectures	64%	4%	12%	10%	6%	4%
TEAL Simulations on MITx	47%	12%	22%	12%	4%	2%

correct or not, with a green check mark if correct, or a red cross if incorrect. Students could see whether their answer was correct or not, but they were not given answers or solutions until after the due date.

Students were asked to submit answers to two of the homework problems online, and submit handwritten solutions to the remaining six problems. Students were offered the use of the online checker for the handwritten problems, but it was not required. We hoped the checker would encourage students to focus on the process of solving the problems rather than getting the final answer. Because we were not sure we could transform all problems into the *MITx* platform to be automatically checkable, we kept most of the process of submitting written homework unchanged. Homework was worth 10% of the total grade.

included in the platform – material that was available from the past offering of 8.02x on edX. We also linked to "Piazza," an online forum for discussions where students can ask and answer questions.

Feedback from TLL and Student Committees

We assembled a team of instructors and students to plan and create the online course supplement on *MITx*. In the planning stages, we also consulted the Undergraduate Association Student Committee on Education (CoE), chaired by Anubhav Sinha '14, and the Undergraduate Association Student Committee on *MITx*, chaired by Colin McDonnell '16. We also consulted with Dr. Lori Breslow, Dr. Glenda Stump, and Dr. Jennifer DeBoer from the Teaching and Learning Lab (TLL), who attended

surveys and personal meetings with some students.

In Week 11 of the course, we conducted an anonymous survey (replacing one of the pre-class assignments) to collect feedback from students on various online resources in *MITx*. Of the 800 students, we had 573 respondents. An amazing 95% of students answered "Yes" when asked if they thought 8.02 should continue to use *MITx*, and 92% thought that other physics courses could benefit from using the *MITx* platform. It was clear from the responses that students appreciated the value of immediate feedback, especially for the homework checkable answers.

The figure above shows the responses to the question "Indicate how helpful the

8.02 TEAL+x
Rayyan and Belcher, from preceding page

following resources and activities are in learning the 8.02 material." An over-

of pre-class material, 85% thought that it is better to do the assignments on *MITx* rather than submitting them on paper. We were able to ask that question because most of the students in 8.02 took 8.01the

> There remains the question of how much students actually benefited from the platform. While we have a lot of anecdotal evidence . . . that the platform helped in learning, we need to look at the data logged by the system and analyze it to correlate with performance, self-efficacy, and learning habits.

whelming majority of the students (92%) rated the checkable answers on *MITx* for written homework problems to be "extremely helpful" (79%) or "very helpful" (13%). When asked to justify their answers, the majority of students raved about the value of automated feedback for checking homework answers on the *MITx* platform. It enabled them to know when they made a mistake and learn from it before submitting the homework. It also reduced their stress about the homework, and raised their self-confidence.

In contrast, the reaction to pre-class assignments was mixed. More than 20% of students indicated that they did not use the reading summaries or the readings from the textbook. Students split on the value of the reading material and the pre-class questions. The split also was evident in their comments, where some of them found the pre-class assignments very useful in preparing for class, and others found them difficult to complete in time and did not see the point of the exercises. In spite of the mixed reviews on the value

previous semester, where the old paper format reading questions were used, so students were able to compare the two from direct experience.

While we believe that Prof. Lewin's lectures are phenomenal, watching them would add an additional 2-3 hours per week for a student, which would explain why most of our students did not use them. Similarly, students did not report extensive use of the TEAL simulations, and most did not find them very useful. This can be attributed to the fact that these simulations were already used in class to build discussion on key concepts, and there was no clear plan for how to use them online.

There remains the question of how much students actually benefited from the platform. While we have a lot of anecdotal evidence (including the subjective impression of the faculty who taught 8.02) that the platform helped in learning, we need to look at the data logged by the system and analyze it to correlate with performance, self-efficacy, and learning habits.

Challenges

The Physics Department is building on the success of 8.02 TEAL+x by developing similar tools for 8.01, and 8.01 TEAL+x is running for the first time this semester (fall 2014). At this stage, a substantial effort by many people is required to get the entire content ready in time with minimal bugs, especially for the online checkable answers. As we continue to use the platform, we hope to build a library with enough validated problems to draw from year after year, reducing the effort needed to use the platform. With less time required to mount and manage the course, we will be able to focus more on using course data to improve the pedagogy and content for future use.

Acknowledgements

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Addressing Student Mental Health Issues at MIT

activeminds @ MIT

activeminds.mit.edu

YOU SEE MIT AS an enriching environment for students to grow in unique and exciting ways – and in many respects, you're correct. After all, MIT students find themselves amidst the most influential scientists, innovators, and leaders of today and tomorrow, all in an institution known for its world-class education. However, as the typical onset age of mental illness is between 18 and 24, and one-in-four students lives with some form of diagnosable mental illness, many students struggle with mental health at some point while at MIT. Most do so in silence.

Mental illnesses, unlike most other illnesses, are still shamed and stigmatized, discouraging those living with mental illness from getting help or speaking out about their struggle. In fact, as many as two-thirds of students who could benefit from professional help don't get it. And, although mental illnesses can be extremely difficult to live with, many of those struggling with them manage to nearly completely hide their struggles from those around them – even their closest friends and family. Stanford University refers to this concept as "duck syndrome," likening the illusion students create of effortless success, despite actually feeling distraught or overwhelmed, to the illusion ducks create of peacefully gliding on a pond while actually paddling frantically. When nobody appears to be suffering from a mental illness – as relatively few cases of mental illness are readily apparent – it can pressure others to maintain a facade of composure to the detriment of their well-being.

Over the last 10 years, a non-profit organization, called Active Minds, has fought the stigma surrounding mental illness and discussions around mental well-being by empowering students to educate and advocate for themselves and their peers. Today, over 400 chapters nationwide and outside the United States have embraced this charge and have worked toward a world where people with mental illness are accepted instead of shamed.

As student mental health advocates on campus, it is our responsibility to increase the faculty's awareness of the pressures that students are regularly subjected to and the sometimes detrimental effects of these pressures. MIT students are a unique breed – we strive to exceed expectations and achieve perfection. While this quality allows us to achieve great things, it also makes us extremely vulnerable to feeling inadequate when we cannot meet our own high standards. During a semester at MIT, an undergraduate student will typically take four-to-seven classes and also participate in various extracurriculars including sports, music groups, volunteer organizations, and more. Students are skilled jugglers – managing commitments in their classes, activities, and relationships by any means necessary – often neglecting their own well-being in the process.

MIT students are provided with a multitude of resources assisting them in traversing the difficulties of MIT. While students are told of all the resources during orientation, many students forget or are reluctant to reach out. If you are knowledgeable about these services and remind students about them when necessary (or through your class syllabus), students will feel more comfortable accessing them when they need it most.

One direct resource students can use is Student Support Services (S^3). When personal or medical circumstances arise and students miss work or exams, S^3 is the intermediary between the student and the faculty, with S^3 deans writing notes to excuse the students from missed work and working with them to schedule a timeline for makeups.

Another direct resource for students is MIT Mental Health and Counseling, the branch of MIT Medical best equipped to help students who are feeling overwhelmed or unhappy. The clinicians at MIT Mental Health and Counseling devote their time to working one-on-one with students to remediate whatever personal issues they are facing and move forward to a healthier life.

If you are concerned about a particular student and want to reach out to someone, we suggest you speak to their academic administrators and academic advisors. These administrators and advisors work directly with the students in their department and know how to reach out to other resources like S^3 and Mental Health when their students are in need of help.

Keeping in mind these, and other, resources that are available to students will allow you to step in and help if you ever suspect a student is struggling.

While it's nearly impossible to get through MIT without stress, we believe it is essential for students to recognize the fine line between healthy stress and greater issues requiring attention. As faculty, you can help by reminding students that they can, and should, prioritize their mental health and well-being. We hope that with increased effort and awareness on the part of both students and faculty, MIT can foster an accepting environment where students are able to speak openly and be supported in seeking help for mental illness.

Advising Undergraduates or Teaching a CI-H/HW Subject? New Enrollment Tools Can Help

Diana Henderson

THIS YEAR A NEW suite of online tools is available to help you and your students as they seek appropriate subjects designated as Communication Intensive in the Humanities, Arts, and Social Sciences (CI-H). CI-H subjects are part of the Communication Requirement within the undergraduate General Institute Requirements, and include a subset concentrating more particularly on the writing process, designated CI-HW.

The tools and process changes have been designed to ease chronic enrollment issues within the CI-H/HW subjects. Every undergraduate must take at least two of these subjects, and enrollment in each subject is capped in order to guarantee sufficient attention to student writing and ample opportunity for oral expression.

This fall term 2184 students used the tools. Almost 45% of them (971) were freshmen, and more than 30% (681) were sophomores. This is not surprising, given that the Communication Requirement is a paced requirement, and most students complete one CI-H/HW subject in each of their first two years.

The tools will continue to be piloted for spring term beginning with pre-registration in December. Advisors of undergraduates who have yet to take their CI-H/HW subjects should make sure that their advisees know about the new tools.

For undergraduates and their advisors, the tools include:

• **A subject selection process during pre-registration, in which students can request prioritized placement** by listing up to two preferred CI-H/HW subjects with two alternatives to each. **The deadline for making these selections for spring semester is Wednesday, December 31.** This is the only way students can be scheduled into the subjects before classes begin. Thus, advisor-student and teacher-student consultations could become more meaningful in December during pre-registration.

• **A scheduling algorithm that places students into guaranteed spaces in the CI-H/HW subjects, based on their pre-registration preferences and priorities set by the Subcommittee on the Communication Requirement (SOCR).** Students will know whether or not they got into a CI-H/HW subject when their schedules are available on Thursday, January 22. Most students should get their first or second choice – 85% did for fall semester.

• **Waitlists** will be available on WebSIS as soon as schedules are published. The waitlists contain real-time information on enrollments and make it easy to identify which subjects have openings. If students don't select their CI-H/HW subjects by December 31 or they want other subjects, they must place themselves on waitlists in order to be eligible for enrollment offers from instructors, should spaces be available. Students cannot add themselves to CI-H/HW subjects without first receiving an enrollment offer.

Advisors can help the process by making sure that students remove themselves promptly from subjects they no longer want, either during registration or via the online add/drop form, and by approving the changes quickly. Students should also be urged to remove themselves from waitlists of subjects in which they are no longer interested. This way other students can be admitted to the subjects, and instructors have a more accurate sense of the number of interested students in a timely way. Since many instructors require attendance in their CI subjects, it is especially important that decisions be made swiftly.

For instructors of CI-H/HW subjects:

• **Enrollments are capped throughout the process.** After initial scheduling, instructors can make enrollment offerings and students can add subjects only when there are openings.

> The tools and process changes have been designed to ease chronic enrollment issues within the CI-H/HW subjects.

• **Waitlists, available with class lists on WebSIS beginning January 22, provide information on students who have declared an interest in joining the class; they also provide a more appropriate and equitable system for filling open slots once classes begin.** Students are grouped on the waitlists based on the priorities set by SOCR, and instructors are encouraged to select students in priority group order. For the spring a new bulk e-mail feature will make it easier for instructors to send students on the waitlist specific information – for example, whether they expect students to show up on the first day of classes.

For more information on this project, visit: *enrollmenttools.mit.edu*. The help section of the site includes FAQs, Quick Guides, and an eLearning video.

I am the business lead for this project, and the Office of Faculty Support, Registrar's Office, and Information Systems & Technology are jointly providing sponsorship and staffing. Faculty champions for this change include the Subcommittee on the Communication Requirement (SOCR) and the Dean's Office in the School of Humanities, Arts, and Social Sciences.

The tools in this pilot are being assessed by the project team, which is currently analyzing data on how the tools worked. We have also surveyed all students and instructors who used the tools and are compiling the results. If you have comments or suggestions for the team, please e-mail them at: *enrollment-tools@mit.edu*. ■

Diana Henderson is Dean for Curriculum and Faculty Support *(dianah@mit.edu).*

The Alumni Class Funds Seek Proposals for Teaching and Education Enhancement

THE OFFICE OF FACULTY SUPPORT is requesting proposals for projects for the 2015-2016 academic year that improve the quality of teaching, enrich students' learning experiences, and uphold the tradition of innovation at the Institute. The Alumni Class Funds are comprised of gifts from the classes of 1951, 1955, 1972, and 1999.

Over the past 20 years more than 200 projects were made possible through the generous assistance of The Alumni Class Funds. These projects have had substantial impact on education both inside and outside MIT. Grants typically range from $10,000 to $50,000 and cover a wide variety of creative curricular and pedagogical projects. Larger scale projects will also be considered, as well as project renewals and multiple year projects, but funding commitments will be made on a year-by-year basis.

Collaboration both within and across disciplines is encouraged, as are projects that could contribute to more than one subject, could test ideas about effective education, or serve as a model for subjects or portions of subjects taught by other faculty. Proposals that explore ways in which online or blended learning experiments can help MIT faculty teach more effectively within the residential educational system are welcomed, as are projects that strive to demonstrate the special and specific value of a residentially based education.

Proposals are due on Friday, January 30, 2015. Guidelines, forms, instructions, and descriptions of previously funded projects can be found at: *web.mit.edu/alumnifunds.* Please contact the Office of Faculty Support at 617-253-6776 or *alumnifunds@mit.edu* for more information. ■

Transforming Student Information Systems

Mary Callahan
Eamon Kearns

DURING THE PAST FOUR YEARS, our community has experienced a transformation of MIT's Student Information Systems (SIS). Antiquated, paper-based processes have been replaced by streamlined, digitized processes that have improved the user experience for faculty, students, and staff while providing better support for MIT's educational priorities. This progress has been guided by the 2011-2014 Education Systems Roadmap.

The Roadmap was the outcome of a multi-year, user-focused analysis of MIT's aging SIS, which identified five strategic priorities for modernizing the systems: digitize paper-based processes; enrich advising support; create a seamless user experience; ensure technical stabilization; and fulfill mandated changes. Projects were identified by aligning student, faculty, and staff needs, expectations, and pain points with these priorities. The resulting portfolio of projects covered a broad spectrum of systems that support the student life cycle.

The Roadmap was approved in September 2010 by the IT Governance Committee [*web.mit.edu/itgc/members.html*] and an aggressive timeline has yielded significant benefits across the community of SIS users. Roadmap projects focused on digitization have had the most visible impact. The new systems have eliminated the need to physically manage and track paper. Registration, subject add/drop, grade submission, and electronic transcript ordering are among the processes that were migrated to an online, self-service model. The new systems focus on facilitating a streamlined process, supporting informed decision-making within

a secure environment, and enabling access any time from any type of device.

Faculty have embraced these changes, which were planned, piloted, and launched to minimize disruption and maximize potential benefits. Professor Krishna Rajagopal commented, "When Online Grading, Registration and

Add/Drop were launched, in each case the transition from paper to the new online process was completely smooth, impressively so." In describing her experience with the new Enrollment Tools, which facilitate enrollment in communication-intensive subjects, Professor Emma Teng noted, "The new system has made all the difference. It has eliminated the chaos and stress of trying to sort out student enrollments the first day of class, and streamlined the entire process so that I can focus on what I'm supposed to be doing – teaching." Professor Alex Slocum added, "MIT's online resources bring advisor administrative functions into the 21st century so we can act easily, quickly, and remotely on advisor tasks from registration to add/drop to managing our classes."

Many of the Roadmap digitization projects also prioritized high-impact advising support. Integrated intelligent messaging provides automatic, subject-related and student-specific messages that inform academic planning. An early warning system monitors student performance and sends an alert when a

> Many of the Roadmap digitization projects also prioritized high-impact advising support . . . . An early warning system monitors student performance and sends an alert when a student is struggling academically and may need help. A built-in communication tool enables students and advisors to connect online, a feature that is being used frequently.

student is struggling academically and may need help. A built-in communication tool enables students and advisors to connect online, a feature that is being used frequently. As an undergraduate advisor, Professor Krishna Rajagopal explained, "I have found that these new systems help me and my advisees to address straightforward questions quickly and efficiently online. This means that in our in-person meetings we have more time for real advising: talking through goals, challenges, and short- and long-term opportunities and options."

Behind the scenes, Roadmap projects have modernized the technical infrastructure of MIT's SIS to ensure a seamless user experience and the replacement of obsolete system components. These fundamental and broad-ranging changes have

had a profound impact on the user experience and have been vital to the success of both new and existing systems. The evolution of components, such as authentication services, scheduling, and learning management modules, has resulted in a more sustainable environment that is flexible, eliminates redundancy, and provides the foundation for a consistent user experience in current and future systems.

While we celebrate the transformative progress achieved through the 2011-2014 Education Systems Roadmap, work on the SIS is a continuous process that needs to address evolving educational priorities. We are developing the next phase of the Roadmap, 2014-2017, with a focus on continued modernization and support for new educational paradigms. Based on feedback from students, faculty, and our SIS partners in the Offices of the Dean for Undergraduate Education, Graduate Education, and Division of Student Life, four strategic priorities have emerged:

Support for Changing Academic Paradigms and Innovations: As MIT experiments with modularity as well as online and blended learning models, key systems need to provide the underpinnings to support these innovations. This could include the learning management system, scheduling system, and student accounts.

Lowering Barriers to Student Success: We should reduce barriers to help students succeed both academically and personally. This includes supporting advising and mentoring, creating a supportive environ-

ment, and reducing student stress. An important project in this area is the ongoing digitization of forms and petitions that replace the time-consuming and sometimes difficult process of manually gathering approvals and submitting paper forms.

Refreshing Signature Gateways: We should modernize and enhance the primary gateways used by students, faculty, and staff. Central to this priority is the development of the Student Dashboard, which provides a personalized, transactional hub that enables students to conduct key academic and administrative functions. The goal is to migrate many of the Student WebSIS functions to the Dashboard over time.

Implementing IT@MIT Vision: We will leverage platform technologies to scale capacity for projects and innovation within MIT's complex ecosystem of IT service providers and IT service consumers. The vision focuses on excellence through modernization and providing innovative IT services that respond to the diverse needs of research, education,

student life, and administrative functions. IT services will be packaged for intuitive, mobile, self-service use.

The updated 2014-2017 Roadmap, which will include a detailed timeline of projects, will be shared with the commu-

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nity in early 2015. We look forward to continued faculty involvement in the Roadmap projects and welcome your feedback any time.

In reflecting on the state of MIT's SIS, Dean Christine Ortiz stated, "Recent enhancements to the Student Information System have enabled students to be increasingly well-informed and engaged in their academic progress and success. With community input, we will continue to evolve systems that help us to support students even better."

Mary Callahan is Registrar *(callahan@mit.edu);*
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They co-lead the definition and implementation of the Education Systems Roadmap.

The A2 Problem Set in Undergraduate Education

Elizabeth Hicks

ACCESS AND AFFORDABILITY ARE two concepts that have become inseparable. Google them as a single term and there is no end to the mention of access and affordability in housing, food, energy, health care, and higher education. Access: the ability to reach, approach, or enter. Affordability: the ability to purchase. Together, they form the A2 problem.

Within higher education, access and affordability refer to removing the financial barriers to achieving one's educational aspirations, with access most often associated with students from lower socioeconomic backgrounds and affordability with middle-class students. Together access and affordability are a weighty term that becomes a lightning rod for the ever-growing public concern that undergraduate higher education in the U.S. is out of reach for ordinary citizens.

Access and affordability are as much about perception as reality, if not more so. Often, changing the belief that something is not possible is the major obstacle to overcome. So to put this all in perspective, our core question becomes, "Is MIT affordable for all families?" The simple answer is yes, but proving that is more complicated.

So let's unpack this A2 problem set. We operate on a high tuition/high aid model, as many private selective research universities do. It is true that our undergraduate tuition rate (which covers about half of what it costs us to educate a student) is high relative to other higher education institutions. But, hand-in-hand with this high tuition is our generous undergraduate scholarship budget of $95M for AY15. We are one of six institutions in the nation

that admits all students on a need-blind basis, awards all aid based on need, and meets full need each year.

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The cost of educating a student is comparable across public and private research universities. The difference is that in the public sector, the state subsidizes this cost, whereas in the private sector, the subsidy comes from the institution. In each case, the subsidy allows the institution to set tuition at a rate lower than the actual cost to educate the student. To parlay this into business terms, we sell a product for less than it costs us to make it. In our case, we subsidize our cost of educating an undergraduate, or for that matter a graduate student, with revenues generated from our annual endowment payout.

We could lower the tuition rate further by increasing our institutional subsidy. However, we prefer to set our tuition at a rate comparable to other private research universities and then grant further subsidies in the form of need-based scholarships to those demonstrating the inability to pay our "sticker price."

The takeaway is that families paying the full "sticker price" are not subsidizing those who are unable to do this. All our students receive a generous subsidy from the endowment payout and some of them receive an additional subsidy to ensure their access and affordability.

In 2013-2014, we provided 75.9 percent of the total financial aid our

undergraduates received, 92 percent of which was provided in the form of scholarships. From the students' perspective, scholarships or grants – terms that are used interchangeably – are the sole forms of aid that unambiguously increase the financial accessibility and affordability of college, since they do not require repayment and do not increase the students' indebtedness.

The primary form of undergraduate financial aid in the U.S. is student loans, and the primary source is the federal government. The preponderance of institutional scholarships at MIT is what sets us apart from most higher education institutions and should, in and of itself, secure us a position as one of the most affordable higher education institutions in the U.S.

Recent national initiatives are attempting to develop metrics that measure and then compare access and affordability across higher education. One metric, which is often used to measure an institution's record of success in enrolling lower-income students, is the percent of Pell Grant recipients. And MIT ranks well here, with 18 percent of undergraduates receiving Pell Grants in 2013-2014. But this metric has limitations that are worth understanding.

The Pell Grant program is the second largest federal financial aid program after the Direct Stafford Loan program. Families making less than $60,000 annu-

ally may qualify. According to Sandy Baum, an economist who studies higher education pricing and financing, 80 percent of households earning less than $30,000 annually qualify for a Pell Grant, 60 percent from households earning between $30,000 and $50,000, and 44 percent from households in the $50,000 to $60,000 range.

A better measure for access and affordability would be to capture all students below $60,000, not just the Pell Grant recipients, and in fact would probably include students just above that threshold, some of whom may be first-generation students. At MIT, about one-third of our students come from families with

collects from higher education institutions through the Integrated Post-secondary Education Data System (IPEDS) survey. Net price is most often defined as the difference between the total cost of attendance and scholarships and grants. In other words, it is what the family pays, including student loans and wages. But the IPEDS methodology does not include the full cost of attendance, as it excludes costs associated with personal expenses and travel. The methodology also excludes private scholarships when netting out scholarships and grants.

By their own admission, the NYT indicates that "Ideally, colleges would release a consistent set of net-price data, covering

earning more than $200K generally have more than one child in college at the same time. This chart provides families with a tool for understanding how families with comparable incomes are able to afford sending a child to MIT.

Has MIT solved the A2 problem? Is it a problem of perception, of reality, or both? There is a preponderance of evidence leading to the conclusion that we have: the income distribution of our undergraduate student body; our high admissions yield across all income ranges; the percent of first-generation and of Pell Grant recipients we enroll; our high retention and graduation rates; and our students' low reliance on student debts. We may believe

2013-2014 Net Price for Students with Need
Published Student Expense: $59,520*

Family Income	All Scholarships & Grants	Student Loans	Student Employment	What Families Pay
$200+ K	$11,774	$5,335	$2,074	$40,336
$175-200K	$15,768	$3,999	$2,157	$37,596
$150-175K	$20,602	$4,513	$2,202	$32,203
$125-150K	$26,336	$4,277	$2,257	$26,651
$100-125K	$32,967	$3,470	$2,072	$21,011
$75-100K	$41,460	$2,709	$2,284	$13,066
$50-75K	$46,094	$1,842	$2,325	$9,259
$25-50K	$51,261	$959	$2,198	$5,102
$0-25K	$51,440	$1,165	$2,777	$4,138

☐ All Scholarships & Grants   ☐ Student Loans   ☐ Student Employment   ☐ What Families Pay

including estimated travel allowance

incomes under $75,000 and we ensure that they will receive sufficient scholarships to attend tuition-free.

The best metric to emerge for measuring and comparing affordability across institutions, and the standard that is most often used, is "net price." The problem is that there is no consistent definition of net price, and some methodologies have more limitations than others.

Take for example the recent *New York Times* article, "Top Colleges That Enroll Rich, Middle Class and Poor." The NYT chose to use the net price methodology used by the National Center of Education Statistics (NCES) based on information it

all students, in narrow income buckets." That's exactly what we do, and we believe our methodology is sounder. For us, "net price," or what the family pays, is the difference between the total cost of attendance and all sources and forms of financial aid, including student loans and term-time employment. The reason we include student loans and employment is that, while they are less desirable forms of financial aid, their terms and conditions provide subsidies to students.

The chart above displays our 2013-2014 net price for families demonstrating financial need. We group families into $25K income bands up to $200K. Families

that this is compelling information. But access and affordability are "in the eyes of the beholder." Ultimately, each family must decide for themselves whether MIT is affordable. In the meantime, we will continue to strive to find new and better ways to solve the A2 problem. ■

Ed. Note: This article was originally published in the September 2014 DUE Newsletter.

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Work-Life Center Announces Senior Planning Benefit and Seminar Series

Maura Rizzuto

AS REPORTED IN THE 2012 MIT Faculty Survey, 16% of MIT faculty are currently caring for or managing care for someone who is ill, disabled, aging and/or in need of special services. In addition, 11% of faculty experience extensive stress about providing care for someone who is ill, disabled, aging and/or in need of special services; another 18% of faculty are somewhat stressed by such caregiving responsibilities.

A new resource for faculty (as well as postdoctoral scholars and employees) is now available to address some of this stress. The MIT-Work Life Center has introduced a Senior Care Planning Benefit through Care.com. The following services are provided at no cost:

• **In-depth phone consultations with a Masters level Social Worker,** who can assist faculty members with a customized action plan; facilitate family meetings; and provide a list of vetted providers in communities across the U.S. These providers include geriatric care managers, attorneys who specialize in elder law, in-home care services, senior housing, adult day programs, transportation, and Alzheimer's/dementia care.

• **In-person consultations with Jennifer Gibbons, MSW, LCSW, a Care Advisor on the Care.com team,** who will be available twice a month by appointment at the MIT Work-Life Center, located in E19-607.

• **Monthly lunchtime senior caregiver support groups, facilitated by Jennifer Gibbons at the Work-Life Center.** Two groups are being offered this fall: Caring From a Distance, and Caring for a Family Member with Alzheimer's/Dementia.

Care.com reports that some of the use among faculty in academic institutions has included dementia care, end-of-life care, and locating skilled nursing facilities.

Ronnie Mae Weiss, MIT Program Manager, recently used the Senior Care Planning Service through Care.com to find a quality assisted living community for her parents in Florida. "The ability to speak with an experienced senior care advisor has proven invaluable for my family," says Weiss. "Not only was I able to take care of my parents' immediate needs, but Care.com has continued to engage my whole family in an honest and productive conversation around ongoing care that works for us."

Certainly some of the stress that faculty members experience concerns the time required for caretaking responsibilities, such as taking family members to medical appointments. Through Care.com, the Work-Life Center is also able to offer short-term in-home care, providing access to back-up adult care for transportation to medical appointments, meal preparation, medication prompting, and assistance with bathing and dressing. Faculty members pay an hourly fee to the adult caregiver for this service. This adult in-home care service can directly benefit faculty members as well; for example, faculty members who have had surgery and require in-home care or help with medical appointments can take advantage of this benefit.

Additional Benefits Available to Faculty

As a reminder, there are other family-related benefits that MIT offers to faculty members. Typically, tenured faculty members (women and men) who need time for family care (children, partners, elders) may request a reduced-time (but not below 50% time), reduced-pay appointment for one or more semesters up to five years, with possible renewal. For more information, see *MIT Policies & Procedures*, Section 3.2 Tenure Process *web.mit.edu/policies/3/3.2.html#sub2*.

MIT also offers long-term care insurance, which can reimburse expenses for the care faculty members or their family members may need if a chronic illness occurs, or if help is needed with everyday activities, such as eating, bathing, or dressing. It also reimburses for the cost of care if supervision is needed due to a cognitive impairment such as Alzheimer's disease.

Seminar Series Focused on Eldercare

The MIT Work-Life Center sponsors eldercare seminars providing practical, research-based insights and strategies on topics led by experts in the field. *Aging in Place: Promoting Independent Living for Seniors* will be held on December 16, 2014; past seminars include *Choosing a Long Term Care Community* and *Checking in with Elderly Family Members*.

For more information on the Senior Care Planning Benefit, visit: *hrweb.mit.edu/worklife/adult-senior-care*. For more information on the seminars, visit: *hrweb.mit.edu/worklife/seminars*. Materials from past sessions are also available. To receive a copy, please e-mail: *worklife-seminars@mit.edu* or call the Work-Life Center at 617-253-1592. ∎

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M.I.T. Numbers
from the 2014 survey "Community Attitudes on Sexual Assault"*

**Please indicate if you had any of the following experiences while at MIT, and where they took place:
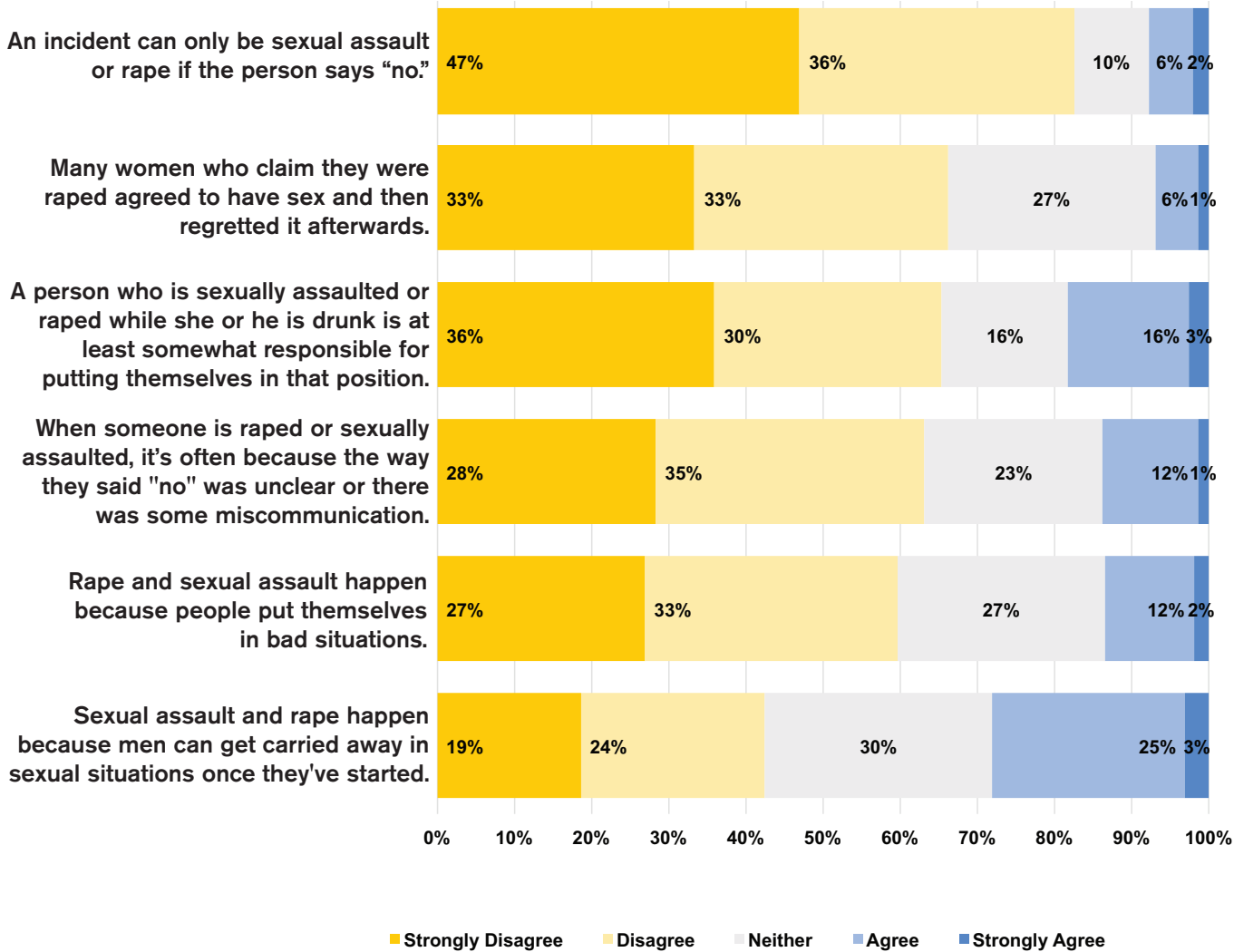Responses to "In class, lab or work" (Class) and "In social setting" (Social)**
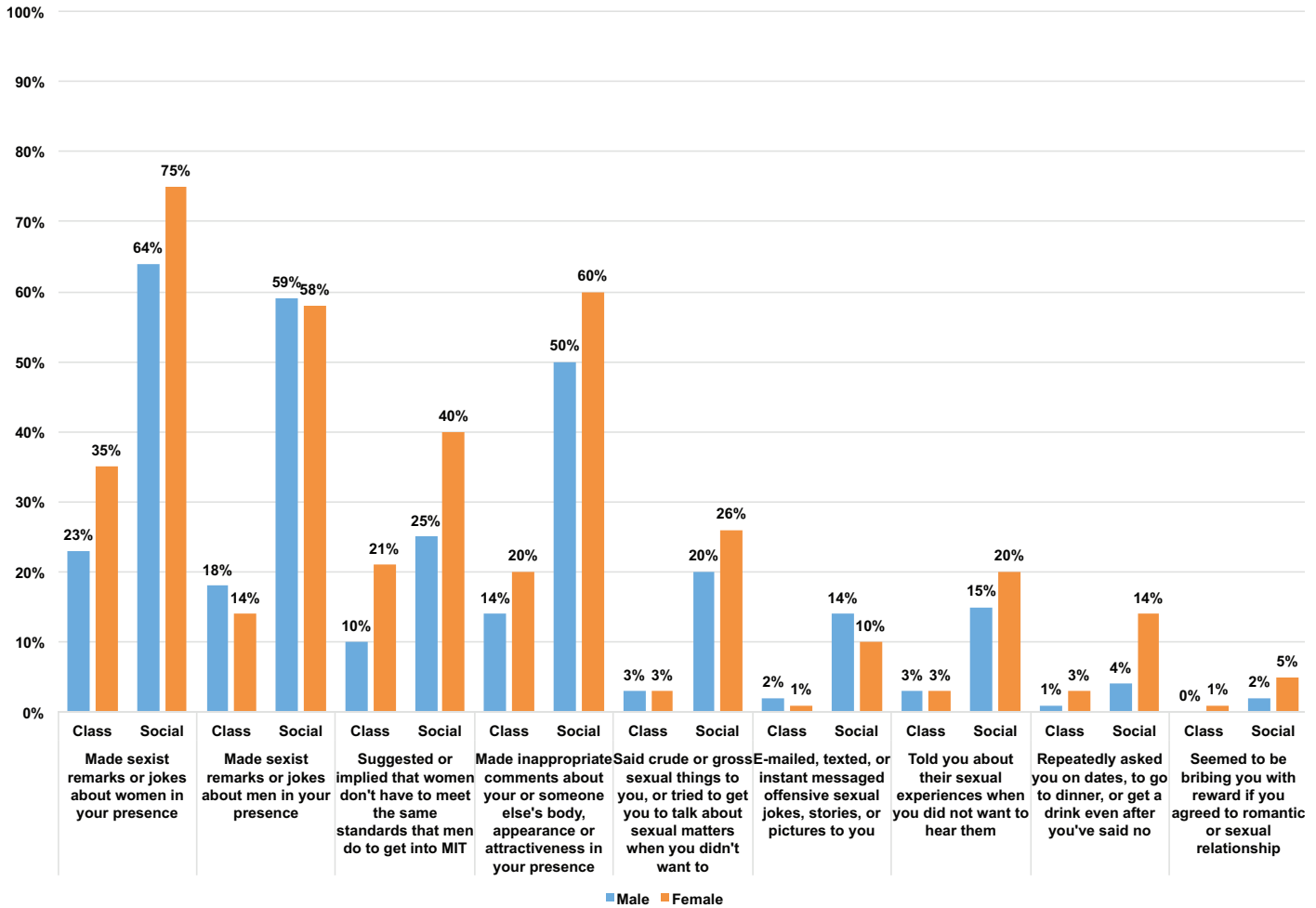
*Survey administered to all undergraduate and graduate students in April 2014.

Source: Office of the Provost/Institutional Research

M.I.T. Numbers
from the 2014 survey "Community Attitudes on Sexual Assault"*

How strongly do YOU agree or disagree with the following statements?
There is no correct answer.

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
An incident can only be sexual assault or rape if the person says "no."	47%	36%	10%	6%	2%
Many women who claim they were raped agreed to have sex and then regretted it afterwards.	33%	33%	27%	6%	1%
A person who is sexually assaulted or raped while she or he is drunk is at least somewhat responsible for putting themselves in that position.	36%	30%	16%	16%	3%
When someone is raped or sexually assaulted, it's often because the way they said "no" was unclear or there was some miscommunication.	28%	35%	23%	12%	1%
Rape and sexual assault happen because people put themselves in bad situations.	27%	33%	27%	12%	2%
Sexual assault and rape happen because men can get carried away in sexual situations once they've started.	19%	24%	30%	25%	3%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

■ **Strongly Disagree** ■ **Disagree** ■ **Neither** ■ **Agree** ■ **Strongly Agree**

*Survey administered to all undergraduate and graduate students in April 2014.

Source: Office of the Provost/Institutional Research