Massachusetts Institute of Technology

Vol. XXXI No. 4
March/April 2019

MIT Faculty Newsletter

http://web.mit.edu/fnl

in this issue we offer commentary on MIT's new outside funder review process (Editorial, below) and a related Open Letter to the MIT Corporation (page 5); a remembrance of the March 4, 1969 Scientists Strike for Peace and MIT's essential role (below); the results of the recent FNL Editorial Board election (page 4); and "Progress Towards an Improved First-Year Undergraduate Experience" (page 10).

1969 Science Action Coordinating Committee Office

The March 4, 1969 Scientists Strike for Peace: 50 Years Later

Jonathan King and Aron Bernstein

FIFTY YEARS AGO, ON March 4, 1969, much research and teaching at MIT came to a halt, as students, faculty, and staff held a "Scientists Strike for Peace." The strike protested the continuing U.S. war against the Vietnamese people, and university complicity in those policies. Most of the day was spent in intense public debate and analysis of the relationship among universities, scientists, and the prosecution of the war. It is still worth reading Nobel laureate George Wald's address that day (***site.www.umb.edu/faculty/salzman_g/SfHS/2005-05-23.htm***).

The MIT Press has republished its account of the events March 4, *Scientists Students and Society*, which reprints key talks, such as that by Noam Chomsky. Related activities were held at more than 30 other universities. The organizers were distressed, on the one hand, with the low

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From The Faculty Chair

A 21st Century Education at MIT

Susan S. Silbey

IN ANTICIPATION OF THE March 8, 2019 MacVicar Day symposium, I was asked to think about "What is important to a 21st century undergraduate education and what should MIT do about it." I answered more briefly along the following lines.

A 21st century undergraduate education should be quite the same as an excellent 20th or even 19th century education: a simultaneously broad and deep education, exploring across subjects and burying deep in a few. At its core, excellent education is about learning how to learn – more about developing habits of mind, more about both disciplined and imaginative inquiry than about particular substantive information, theories, or methodological techniques. Ultimately, education should destabilize taken-for-granted

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Editorial

The Proposed New Review Process for Outside Funders and MIT's Governance Problem

IN RESPONSE TO THE extensive criticism of MIT's ties to the Saudi regime, the Institute announced in April that it would not engage in relationships with two Chinese corporations. At the same time, MIT established a new committee structure and process that would examine certain "high risk" engagements, including those with Saudi Arabia.

The encouraging part of this new review is that it establishes, for the first time for MIT, adherence to human rights standards as a benchmark for evaluating outside partnerships, even though it does not commit to a real due diligence process. The process also establishes a multi-level risk assessment procedure instead of a one-stop approval, and involves faculty in at least one of those mechanisms, the International Advisory Committee (IAC). As a statement of

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Website
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Subscriptions
$15/year on campus
$25/year off campus

Review Process for Outside Funders
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policy, this is a step in the right direction. However, as a process of due diligence it is still highly problematic.

Let's examine three of the serious problems in the proposed new review process. The first is the listing of three countries as "high risk" – China, Russia, and Saudi Arabia – without any explanation of how they were selected. Further, it does not reveal why other countries, or entities other than countries (companies, universities, foundations – including, for example, the Blackstone Group, chaired by the College of Computing benefactor Stephen A. Schwarzman) were not selected. A robust human rights due diligence must provide reasoning behind the selections, which this review does not do. In addition, will these selected countries be periodically reviewed to see if further tightening or loosening of relations with them are warranted?

Listing ongoing federal investigations – against Huawei for example – is not a sound basis for putting countries on a suspect list. Investigations are inherently political and unreliable. Unless there is a judicial finding against a company or an official condemnation, for example by a UN body, there is little basis for putting countries on such a list, unless the MIT administration is willing to share information on how it arrives at these judgments.

The second problem is that the three-step review process reflects the same problem described above: It is not sufficiently independent of the MIT administration and is full of loopholes. The first stage of review, the International Coordinating Committee (ICC), consists of the same individuals – the Associate Provost or the General Counsel's Office for example – who will also be the third stage of review, the SRG (Senior Risk Group). It's hard to see how that constitutes a different level of review. Besides, the process states that the ICC will work to increase the odds of the project's approval (thus showing its inherent bias), and will either recommend that the project proceed (the process ends here presumably) or refer it to the Associate Provost (who is already a member of the ICC) for additional review. The next step is for action by the IAC, which may review "certain of these projects" (but not all) referred by the Associate Provost. A key point to note is that IAC review is not mandatory, even for projects which come from one of the three "high risk" countries in question here. On the whole, this is hardly what one could characterize as a robust and independent review.

The third and final problem is that this new process "normalizes" MIT's engagement with Saudi Arabia, making it appear as though the normalization results from a robust and ethically grounded process. Yet a large section of the MIT community vocally believes that all engagements with Saudi government entities must cease forthwith and many others agree.

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The flaws of this new review process stem from one problem: the absence of representative governance at MIT, and the resulting inability to collectively resolve intrinsic conflicts of interest and other substantive disagreements, or decide on and affirm our values. The decision to establish contractual relationships with the Saudi monarchy was made by the MIT administration. The evaluation of that decision requires a body that is independent of the administration. However, absent a faculty senate, or any other form of authentic representation of the faculty, all administration-driven evaluations remain fraught with conflict of interest. The solutions might start with small steps, e.g., the Chair of the Faculty chairing the faculty meetings. However, in most U.S. research universities, faculty representatives to a senate are elected by the faculty alone. Detailed proposals moving in this direction were last proposed by former Chair of the Faculty Raphael Bras ("Improving Our System of Faculty Governance," *MIT Faculty Newsletter*, February/March 2004), but no action was taken. In light of the current situation, the *Faculty Newsletter* will be reopening and revisiting this discussion in future issues.

Editorial Subcommittee

FNL Elects Four New and One Returning Editorial Board Members

THE MIT FACULTY NEWSLETTER is maintained by a volunteer Editorial Board, who are elected through an Institute-wide, all-faculty election. In the recent election four new and one returning member of the *Faculty Newsletter* Editorial Board were voted onto the Editorial Board. The *Newsletter* Editorial Board is the only committee of the faculty that is not a joint faculty/administration committee. This often permits wider-ranging discussion of issues affecting MIT faculty, students, and staff, as well as relevant national and international issues.

The new FNL Editorial Board members include: Profs. Sally Haslanger (Linguistics and Philosophy); Ceasar McDowell (Urban Studies and Planning); Robert Redwine (Physics); and Warren Seering (Mechanical Engineering). Re-elected was Prof. Seth Lloyd (Mechanical Engineering).

The election received over 1200 total responses, and more than 25% of the MIT Faculty voted. This is particularly impressive considering the 3% quorum necessary for voting at monthly Institute Faculty Meetings (a percentage which is, sadly, not always achieved). Winning candidates garnered between 73% and 47% of the vote, with percentage votes divided virtually evenly between faculty and emeritus faculty.

Many thanks to MIT's Office of Institutional Research (part of the Office of the Provost) and in particular to Senior Project Manager Gregory Harris. The user-friendly electronic election would not have been possible without his assistance and skills.

letters

Public Forums at the Center for International Studies

To The Faculty Newsletter:

WE VERY MUCH APPRECIATED the suggestion of our nine History faculty colleagues who recommended in the January/February 2019 issue of the *Faculty Newsletter* that the Center for International Studies collaborate on a series of public forums to address the issues surrounding MIT's links to the Kingdom of Saudi Arabia (KSA). The Center has often addressed issues of human rights, war, and the U.S. role in the Middle East, including the KSA, through its Starr Forum and the Security Studies Program's Wednesday seminars, among other venues.

In June, our newest Robert E. Wilhelm Fellow, Dr. Hala Aldosari, a Saudi activist and writer who has recently accepted the invitation of *The Washington Post* to become its Jamal Khashoggi Fellow, will join us for a year to continue her research on women's rights and her outreach to end the guardianship system in KSA. We co-sponsored one recent forum on Saudi human-rights abuses and, with Dr. Aldosari's arrival, we intend to mount more events that will constructively engage with issues pertaining to the Saudi monarchy.

Richard Samuels, Director
John Tirman, Executive Director
MIT Center for International Studies

An Open Letter to the MIT Corporation

Dear Members of the MIT Corporation:

WE ARE MEMBERS OF the MIT community concerned about MIT's relationship with the Kingdom of Saudi Arabia and its state-controlled subsidiaries. Saudi Arabia is an authoritarian state with one of the worst human-rights records in the world. Its shameful record is by now familiar from international press coverage: thousands of deaths and millions on the brink of famine in the Yemeni Civil War since 2015; the 2018 assassination of journalist Jamal Khashoggi in the Saudi embassy in Istanbul; and the list goes on. Collaborative agreements with an authoritarian state with this record are antithetical to the mission, interests, and values of MIT and of open, democratic, societies worldwide. MIT's choice on this issue should take into account the needs and interests not only of researchers and students at MIT, but of those directly affected by Saudi Arabia's actions: civilians being bombed in Yemen, women activists being tortured for their efforts to secure basic civil rights, and the millions of children at risk of starvation.

After the assassination of Jamal Khashoggi, President Reif solicited input from the MIT community on MIT's engagements with Saudi Arabia. A subsequent report by Associate Provost Richard Lester states that 74% of MIT faculty who submitted comments either strongly objected or leaned against continuing engagements with Saudi Arabia, alongside 76% of non-faculty commenters. Yet MIT continues to accept funding from the Saudi Arabian government and government-controlled sources at the level of ~$8 million per year. The Saudi Arabia controversy underscores the need to build ethical principles deeply and fundamentally into MIT's international engagement policy.

Given the gravity of Saudi Arabia's human rights violations, we urge the Corporation to heed the judgment of a significant majority of those who weighed in, and to end MIT's relationship with the Kingdom of Saudi Arabia.

We call upon MIT to:

1. Terminate all sponsored research programs, partnerships, investments, and financial engagements with Saudi Aramco, SABIC, and KACST. These are state-controlled entities that do not serve a primarily educational mission. MIT's relations with these entities impugn the good name of the Institute and, by association, lends its prestige to the Saudi regime and risks being counted among its allies.

2. Provide a transparent justification for why continuing any other relationship with the Kingdom of Saudi Arabia is consistent with the values of the MIT community. This should take the form of a clear, detailed, and publicly accessible account of MIT's relationship with each remaining major Saudi sponsor, university, or donor, with avenues for MIT community input. We ask that the MIT Faculty Policy Committee, in coordination with the MIT International Advisory Committee, be charged with this task. If no such justification is possible, end the relationship.

3. Provide funds and resources to fully replace Saudi funding for any faculty member or student reliant on it. Continue to welcome students and researchers from Saudi Arabia to our campus, as we would students and researchers from any other country, and provide financial aid as appropriate.

4. Present to the MIT community a comprehensive statement on MIT's "Ethics of Engagement". This statement should address both research partnerships and endowment investments. It should describe the decision-making process regarding the ethics of investment in and engagement with companies, governments, and individuals; identify the MIT offices and individuals who are responsible for making such decisions; and clarify what avenues the broader MIT community has for providing input on these decisions.

MIT has power to make a difference in the world, but not only through its ability to support science and engineering. It is a powerful symbol of credibility and integrity. We object to MIT's ongoing relations with the Kingdom of Saudi Arabia in our name.

Editor's Note: At press time the above letter had been signed by 233 members of the MIT community. To add your name to the list of signatories go to: ***https://www.mit-ksa.org/***.

A 21st Century Education at MIT
Silbey, from page 1

ways of seeing to provide multiple lenses with which to encounter the world.

We could, of course, talk about education even more boldly, as MIT likes to say, "To make a better world." But, I am not persuaded that that is the best message for the students, even if it appears to be popular with generous philanthropists. Claiming such a bold agenda seems counter to the sort of humility that prompts the deepest sorts of learning and growth in our students, ourselves, and the institution as a whole.

To be sure, there is a risk of being too narrow in our ambitions. Personally, I wish we would push back also against the temptation to turn undergraduate education into professional or occupational training. Such an agenda is not even practical, for there is abundant evidence showing that there is not much of a connection between a student's college curriculum and her eventual career. Ten to 15 years after graduation most students will not be doing what they studied in college, whether they were engineering or history majors. (Those who lead the way in an occupational bubble may be rewarded for having picked – and stayed in – the proverbially "right" field, but when the bubble bursts – as it always does once the field is saturated – those who instrumentally chose a learning path to follow the herd will not experience the career benefits, while the general lack of correlation between college training and eventual career persists across the longer time spans.)

Further in this vein, I wish we would also push back against the impulse to turn all topics and subjects into "problem solving," as if life were a series of tests demanding that we produce *the* right or efficient answer. When it comes down to it, I do believe we "make a better world" through an MIT education, but simply because the best reason for getting an education at MIT or anywhere else is that education is a valuable end in itself, not just for the careers it enables or the immediate problems it solves. It is better to be educated rather than not to be, not simply because income and life chances are higher for those with a college education (although that is true) but because education recasts human beings' ways of being in the world and that, in and of itself, has transformative potential. An excellent education creates new instincts in the individual; a habit of looking for new meanings; of questioning comfortable thoughts; of being able to see multiple points of view at the same time; of perpetually playing with and fighting about the meanings we assign to events and texts and phenomena so that we can understand them more deeply and in their full complexity. It is about making each of life's experiences slower – as those events are apprehended as more layered and multidimensional, their contexts and consequences more fully appreciated. An excellent education creates citizens who experience the enduring quality of the present while recognizing in it the legacies of the past. This is not a new vision of education but a very old one.

An excellent education creates citizens who experience the enduring quality of the present while recognizing in it the legacies of the past. This is not a new vision of education but a very old one.

A Fundamental Education

Unfortunately, the commitment to fundamental education (even in science and engineering) is being challenged by market pressures that encourage students to see the world through one set of values and meanings to the exclusion of others. If we are not careful, students become conditioned to value and pursue only that which the current market values and pursues (disruptive innovations, profit) more than truth, critical thinking, empathy for differences, and learning how to learn. Across the nation, there are predictions about the demise of the humanities precisely because of this. Colleges and universities are closing departments to pursue more *training* – few seem to say *education* – in computation and algorithmic reasoning. People call this the consequences of computing and the digital transformation of everyday life; or, is it instead the consequence of us losing focus on the true meaning and value of a good education?

Fortunately, at last month's celebration of the founding of the MIT Schwarzman College of Computing, I heard something hopeful. I heard repeated calls for more humanistic education, for greater understanding of social processes, and moral challenges. I heard the same at the 2019 MacVicar celebration too.

This may be MIT's moment in history. I have also heard this from colleagues here and across the nation. As part of the deliberations on the possible shapes of the College, we have been reaching out widely. Although we are behind some other universities that began such adventures years before MIT and that are further along in developing new curriculum, research collaborations, and organizational units, I am told that whatever MIT does, we will be watched carefully and taken as a beacon and a benchmark. This is quite a challenge.

A beacon and a benchmark can be a heavy burden and special responsibility. Such ambition feeds persistent worries I harbor about MIT's own transformation over the last 20+ years from a modest institution that at times did extraordinary things, to an institution that regards itself (and is apparently regarded by others) as extraordinary. It is why I sometimes worry about the bold claim "to make a better world." If we aren't careful, that self-image could turn to hubris – could encourage self-pride and insularity, a focus on nourishing the brand rather than the product itself (education and

research). When MIT was less celebrated, we were willing to stand aside from our neighbors and peers. Recall that in the 1950s, MIT refused to supply the names of faculty whom some members of Congress regarded as threats to the nation, and again in the 1990s MIT refused to consent to federal anti-trust charges of collusion with the Ivy universities (known as the overlap case) in setting financial aid on the basis of need without considering a student's merit or trying to compete with the others for admitted students. In 1999, MIT shared with the world its study documenting widespread gender discrimination in the School of Science. Immediately upon seeing the report of this historic confession in the *New York Times*, some of MIT's peer institutions published vehement denials that such reprehensible practices could be found at their universities. According to their spokespersons, neither Harvard, Stanford, Berkeley, nor Yale practiced such gender discrimination. Or perhaps none had the humility and courage to take that hard, close look MIT did.

The Courage to Make Difficult Decisions

Do we have the courage today to make such difficult decisions again? Will the Schwarzman College become the impetus for MIT to offer a truly excellent education? I hope so. To educate a truly new kind of critical-thinking technologist, with a broad as well as deep education, computing will need to be integrated with just about every other subject at MIT. For MIT graduates to leave with the knowledge and resources to be wiser, more ethically-competent as well as technologically-competent citizens demands that students have more rather than less immersion in the humanities and social sciences. These cannot be requirements to get past – as they are often treated. Nor can attention to social organization, culture, and public policy be treated superficially as something everybody knows, ignoring the knowledge and expertise that characterizes the notoriously mislabeled "soft sciences."

We all seem to acknowledge that our contemporary digital world reflects certain fundamental misunderstandings of and disregard for human behavior and social organization, resulting from the actions and oversights of both its inventors and its objects/subjects (i.e., users). By ignoring human variation, social organization and context, tools that were designed to connect people across the globe in the open exchange of ideas and information have been turned into an efficient machine of incessant surveillance, a seemingly insatiable engine of profit at the expense of other values, a platform for organized hate, and a possible catalyst for the destruction of representative democracy. A well-educated technologist with greater understanding of the importance of context, of culture and its variations – a technologist with the ability to understand institutions and organizations – we hope would be less likely to make these kinds of mistakes.

If we, across the Institute, especially in the humanities, arts, and social sciences, take up the challenge, we may actually create that 21st century education I hope for. But, this cannot be achieved by simply wishing it to be so. Without doubt, it requires a redistribution of the current allocation of resources. Of course, we are a university built primarily on science and engineering; MIT's special mission is the foundation of all of our work here. We will not, however, be able to make that better world nor repair the problems that technologists have created if we do not provide more abundant resources for the humanities and social scientists to participate more fully imagining, developing, and critiquing technological inventions.

In the spirit of greater concreteness, I conclude this column with an example circulating around the Institute about ostensibly responsible innovation to illustrate a short sighted versus more capacious vision of a better world.

Research groups have been thinking about programming autonomous cars so that they will make "ethical" and "responsible" decisions when confronted with information demanding a distributive choice, an adaptation of the canonical trolley problem. Faced with a choice of hitting a trolley filled with people or killing a single person (perhaps a pregnant woman, a person pushing a baby carriage, perhaps a fat man whose weight can stop the car), what should the algorithm instruct the car to do? More recent discussions claim to have advanced in sophistication by moving from the dilemmas philosophers have been exploring for more than a century to questions of liability – who should bear the monetized costs of the accident? And yet, in all these projects the more significant question concerning the responsibilities of AI is ignored: why are we designing autonomous cars in the first place?

Indeed, this is precisely what I was referring to earlier when I said a good education should destabilize taken-for-granted ways of seeing, should provide multiple lenses through which to encounter the world. Why are we devoting talent and resources – including valuable and limited teaching and learning time – to this question rather than focusing on climate change, the rising seas, environmental degradation or – perhaps closer to the specific issue of moving persons from one place to another – the lack of reliable and effective public transportation here in Boston or the nation (e.g., high-speed rail)? Of course, I know the answer. Well-heeled philanthropists and corporations such as Google, Amazon, Uber, and Lyft are willing to pay for this research as part of long-term business strategies predicated on the reduction or elimination of labor costs. Where is MIT's public and historic responsibility? Where is our responsibility as educators to see the world through multiple lenses, to destabilize our own taken-for-granted ways of seeing, and to pass these habits of mind onto our students? Is MIT leading or following the nation?

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Open Access Task Force Draft Recommendations

Hal Abelson
Chris Bourg

THE OPEN SHARING OF products of scholarship promises to quicken the accumulation of knowledge and insight and enhance opportunities for collaboration. It also aligns with MIT's mission. At the Institute, we are "committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges."

We currently manifest that mission via the open sharing of educational materials through Open-CourseWare and MITx, and by openly sharing faculty research via the MIT Faculty Open Access Policy. In addition, as MIT makes bold moves to address the challenges and opportunities presented by the prevalence of computing and the rapid advances in artificial intelligence, our efforts in these areas will depend on the open availability of large, diverse, and inclusive sets of data in all formats.

Since 2017, the Ad Hoc Task Force on Open Access to MIT's Research (***https://open-access.mit.edu/***) has explored ways for MIT to remain a leader in this realm, by strengthening our activities in support of open access to MIT publications, data, software, and educational materials. Large proportions of MIT's research and teaching outputs are still unavailable for open dissemination. This includes the vast majority of faculty journal articles published before the adoption of the faculty OA policy in 2009, and more than 50% of faculty articles published since then.

Since 2017, the Ad Hoc Task Force on Open Access to MIT's Research has explored ways for MIT to remain a leader in this realm, by strengthening our activities in support of open access to MIT publications, data, software, and educational materials.

On March 18 – 10 years to the day since the MIT faculty passed the OA policy – the Task Force released a set of draft recommendations that aim to help MIT researchers increase open sharing. They were available for comment until April 17.

The recommendations include ratifying an Institute-wide set of principles for open science; broadening the faculty OA policy to cover all MIT authors; adopting an OA policy for monographs; and asking department heads to develop discipline-specific plans to encourage and support open sharing from their faculty, students, and staff.

Over 18 months, the Task Force gathered input from experts across campus and beyond to better understand local, national, and global practices and policies related to open access. At MIT, the Task Force hosted two community forums and met with the five School councils, the Technology Licensing Office, the Committee on Intellectual Property, the Vice President for Research, and others. Members also consulted with representatives from Google, the Gates Foundation, Creative Commons, and the Scholarly Publishing and Academic Resources Coalition (SPARC).

The MIT community offered feedback on the draft recommendations at a public forum, via the task force idea bank, on the open publishing platform PubPub, and via email to the Task Force (*openaccesstaskforce@mit.edu*). Final recommendations are expected this summer. ■

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The Octopus

Haynes Miller

THERE ARE A NUMBER OF initiatives active around the Institute that respond to the ever-increasing incursion of the methods of Computer Science into just about every discipline represented here. Principal among them, of course, is the creation and dominance of the "College of Computing." But this was preceded by others – notably, the creation of a spate of mixed majors involving Course 6. These include:

6-7 *Computer Science and Molecular Biology*
6-14 *Computer Science, Economics, and Data Science*

There are rumors of more in the works; at the Institute faculty meeting in November 2017 the Provost suggested that there might be 25 more such mixed degrees!

It seems to me that these joint majors represent an ill-conceived, even retrograde, response to the increasing penetration of computer science methodology into other disciplines. They represent a structural response to a transient problem.

I'm not suggesting that the relevance of Computer Science methodology will subside. On the contrary, it's here to stay, and its integration into intellectual endeavors of all sorts will only increase over time.

But as these new methods get established, the faculty will adjust. Comfort level with the project of constructing undergraduate pathways including Course 6 subjects, or parallel subjects in various Courses, will increase. The temptation to outsource control will decline. Jointly controlled majors will come to be an annoyance, an albatross.

This evolution is going to be accelerated by the birth of the College of Computing. This cataclysm in the political landscape at MIT will have many consequences, most of which we can't see yet. A sensible course of action would be to declare a moratorium on authorizing new joint majors of this sort.

Mathematics found itself in this position long before Computer Science. There was a time when engineering and other disciplines were much less dependent on mathematics than they are today. As the mathematical requirements of various fields has grown, the various Courses at MIT have added Course 18 subjects to their requirements or generated and taught subjects with significant mathematical content themselves. These latter developments have often been painful to the Mathematics faculty, which, naturally, feels that they have the best perspective on these subjects. But we recognize the reality: Course 18 does not have a monopoly on mathematics education at MIT.

Establishing joint majors such as 6-7 and 6-14, and the others, has the effect of removing from the non-Computer Science partner the responsibility of adapting to this new environment in which Computer Science is ubiquitous.

It provides the partner departments with an easy way out. They don't have to move, through hiring for example, to increase their own Computer Science capabilities. It seems to me that this represents a serious danger in the long run. These arrangements institutionalize a certain co-dependence between the Computer Science Department – which naturally wants to maintain control of as much Computer Science instruction as possible around the Institute – and the partner departments, which see this as a way to avoid any realignment of their faculty appointments.

Less questionable options have been adopted by several departments. For many years the Mathematics Department has offered two distinct majors: 18 Mathematics and 18C Mathematics with Computer Science. This second major has always included several Course 6 subjects (though exactly which ones has been changed rather frequently over the past few years in response to successive curricular reforms within Course 6). Many courses are cross-listed between the two departments, and teaching them often alternates between the two departments.

A second example is represented by the exemplary (though poorly named!) 14-2 Mathematical Economics. This major requires students to take several courses offered within the Mathematics Department, but it's not "14-18," and certainly not "18-14." The major itself is entirely controlled by Course 14. It specifies several mathematics subjects, including a choice of one of three of our Undergraduate Seminars. These requirements ensure that these students will have genuine mathematical experiences, and interact closely with Course 18 majors and faculty.

It is to be hoped that going forward models closer to these will become the norm.

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Progress Towards an Improved First-Year Undergraduate Experience

Ian A. Waitz

The CUP (Committee on the Undergraduate Program) experiment for the Class of 2022, which was designed to investigate ways to promote greater intellectual and personal exploration by students, is giving us crucial quantitative and qualitative data. I detail below some preliminary findings from the experiment.

A Look Back: Building on the Momentum

IN THE FALL OF 2017 (see "Designing the First Year at MIT," *MIT Faculty Newsletter*, November/December 2017), my office engaged with faculty, School councils, and other stakeholders about how we could enhance the first-year experience for our undergraduate students. As you can see in the timeline (next page), we built upon ideas and conversations that dated back to the 2014 Task Force on the Future of MIT Education, (and in some cases, even drew from insights of several decades ago, such as the 1949 Lewis Report).

Our recent efforts to enhance the first year were made possible because of the enthusiasm and dedication of the MIT community (see "A Collaboration in Learning," *MIT Faculty Newsletter*, September/October 2018) – in particular our students. The idea that began the CUP Class of 2022 experiment gained traction in the "Designing the First Year at MIT" class. However, the rationale and needs that the students described through their classwork had also been identified separately (and earlier) by faculty, most notably via the parallel work done by the CUP in studying major exploration by first-year students during the 2017-2018 school year.

The CUP Class of 2022 experiment also benefitted from a great deal of additional feedback and positive endorsements in multiple forums, culminating in early letters of support by the Schools of Science, Engineering, HASS, and Management, among many others, and later support from the School of Architecture & Planning. Of course, even those who were eager to experiment also raised important concerns and/or made helpful adjustments to our proposal. All were shared with the CUP. Following this, there was debate within the CUP, building on discussions they had been having for nearly a year and addressing the relative merits of specific policy features that could be implemented to limit anticipated risks. In short, it took a campus to create the experiment.

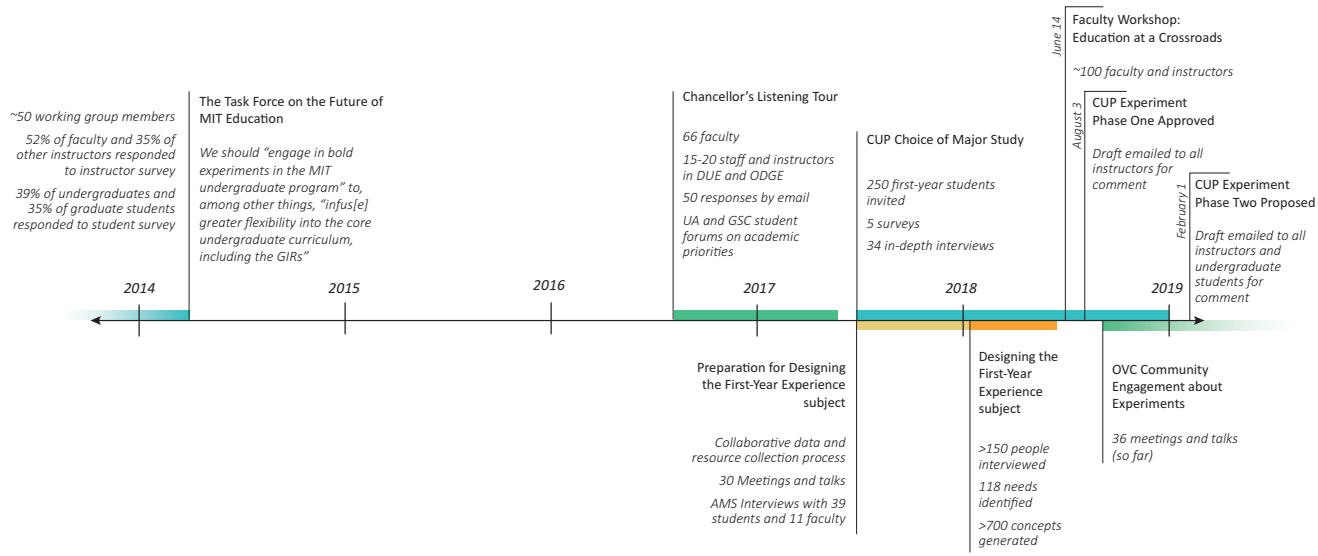
We have been working to respond to ongoing and new concerns as well. For example, to augment the experiment, my office has offered support to departments for developing subjects to aid students in exploring majors, minors, and concentrations.

Monitoring and Measuring Progress, Responding to Concerns

Since the experiment's approval, we have been carefully monitoring how things are progressing and have made an effort to share our preliminary findings. Initial results suggest that the experiment is enabling students to explore more broadly, while many still continue to take science core GIR subjects early in their time at MIT. You can learn more details and see data online (***https://ovc.mit.edu/fy/***).

We have been working to respond to ongoing and new concerns as well. For example, to augment the experiment, my office has offered support to departments for developing subjects to aid students in exploring majors, minors, and concentrations. Further, we are considering important open questions about the experiment's current and longer-term impacts, such as the effects of P/NR grading (either in the first semester or thereafter) on performance in those classes and in subsequent classes that rely on that material. There are, of course, risks in experimenting with an MIT undergraduate education. Changes in policies, such as to P/NR, may not serve all students equally well.

Even with all of its strengths, however, our educational model can be continually improved. We agree with the recommendation of the Task Force on the Future of MIT Education about how this can best be achieved: ". . . engage in bold experiments that will help us learn about both the positive and negative aspects of pedagogical and curricular innovations."



FYE Initiatives: Engaging the Community
August 2013 - March 2019

Moving Forward: Class of 2023 Experiment, plus an Advising Pilot

Looking ahead, an experiment for the Class of 2023 has been just approved by CUP (what we are calling Phase Two). Our initial findings from the current experiment indicate a need to encourage more low-unit opportunities for discovery of majors, minors, and concentrations while continuing to enable more traditional student practices of exploring majors through introductory subjects. The Phase Two experiment is designed to balance these two approaches. In drafting the proposal we benefitted from many inputs we gathered from the community over the last six months, and most especially from a thoughtful proposal by the Faculty Officers.

We are also planning an advising pilot for the Class of 2023. Motivated by feedback from students and faculty, and drawing on the work of the CUP in 2005 and 2010-2011, the proposed pilot divides advising functions to a greater extent among a small network, including faculty, staff, and peers, rather than concentrating the many functions in a single faculty member.

Finally, based on ideas from students in the "Designing the First Year Experience" offerings, alongside recommendations from many faculty and instructors, we hope to evaluate some "blue-sky ideas" to spark more curiosity and excitement about learning in the first year. We intend to leverage the flexible and personalized nature of the First-Year Learning Communities (i.e., Concourse, Experimental Study Group, Media Arts and Sciences, and Terrascope) to pilot possible approaches.

Ultimately, the only way to know about the effects – both positive and negative – of new policies and pilots is to try them; and to try them in a way where we make sure we put students first and approach the evaluation with rigor, so that our conclusions can be based on substantive qualitative and quantitative data. That is what we are doing now.

Finally, based on ideas from students in the "Designing the First Year Experience" offerings, alongside recommendations from many faculty and instructors, we hope to evaluate some "blue-sky ideas" to spark more curiosity and excitement about learning in the first year.

I am very grateful to everyone who is providing input and contributing to our shared goal of creating the best first-year experience on the planet.

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March 4, 1969 Scientists Strike for Peace
King and Bernstein, from page 1

level of political engagement of the scientific community, and more specifically with the role of military research on university campuses.

The previous year, April 4, 1968, Martin Luther King, Jr. had been assassinated, one year after his speech at Riverside Church where he made the connection between militarism abroad and poverty and racism at home. Later that year Robert Kennedy was assassinated, ending the Kennedy family's drive to pull the U.S. out of Vietnam. Up to 1968, more than 36,956 American soldiers had died in the Vietnam conflict. In 1968, 16,988 more Americans died in the war. The national draft yearly continued to pull hundreds of thousands of primarily young men into the military.

Why was MIT the locus of the scientists' strike? The MIT Physics Department faculty had a long history of opposition to nuclear weapons. The scientific leaders of the Department were also leaders of the nuclear disarmament movement, including Profs. Viki Weisskopf, Herman Feshbach, Philip Morrison, Aron Bernstein (one of the co-authors of this article), and Kosta Tsipis. Prof. Bernard Feld was editor of the *Bulletin of the Atomic Scientists*, and future Nobel laureate Prof. Henry Kendall was in the process of founding the Union of Concerned Scientists, which became the faculty group helping organize the March 4 actions. Their presence provided a basis for institutional support. The practical leadership came not only from Physicists, but also from well-known faculty anti-war critics such as Noam Chomsky of Linguistics, James Fay of Civil Engineering, Louis Kampf from Literature, and future Nobel laureate Biologist Salvador Luria, a refugee from Mussolini's Italy and passionate anti-fascist and Democratic Socialist.

In the years following, other faculty stepped forward: in Biology Ethan Signer joined Yale's Arthur Galston in visting North Vietnam and their scientific community. David Baltimore was also a leading voice, supported by Luria, Annamaria Torriani-Gorini, and (the other co-author of this article) Jonathan King.

Of course also key, and the initiating force, were a cadre of undergraduate and graduate student leaders, including Undergraduate Association President Michael Albert, Joel Feigenbaum, and Jonathan Kabat, with dozens of others in support. Earlier Pfc. Michael O'Connor, a 19-year-old Army soldier, who had gone absent without leave, was given sanctuary in the MIT student center. Hundreds of MIT students began a six-day around-the-clock vigil, led by Albert, and members of the recently formed Science Action Coordinating Committee.

The March 4th Strike received national press coverage, and led at MIT to the divestment of the Instrumentation Laboratory (now Draper labs), the major on-campus contractor for the Department of Defense. This lowered the barrier to anti-war discussion and analysis on campus in the 1970s, as the Vietnam War continued, and sharply raised awareness of the need to carefully analyze the

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Members of the MIT Physics Department 1969

l.-r.: Profs. Viki Weisskopf, Herman Feshbach, Philip Morrison, Aron Bernstein, Kosta Tsipis

complicity of university faculty with government policies that should be rejected. In the years following, opposition to military solutions to international conflicts continued to broaden, as well as in engagement with other issues of social and economic justice. The culmination was probably the widespread calls for universities and other institutions to divest their endowments from investments in corporations doing business with the Apartheid regime in South Africa.

Today national needs once again call for a Scientists Mobilization for Peace and Justice; we have a national government hostile to science and to democracy. Having invaded and contributed to the continuing disruption of civilian life in Afghanistan, Iraq, and Syria, our government currently enables the Saudi attacks on the people of Yemen. The President even threatens military intervention in our own hemisphere, in Venezuela, hearkening back to the days of U.S. gunboat diplomacy in Latin America. The President has announced pulling the U.S. out of the Intermediate Nuclear Forces treaty with Russia, threatening a new nuclear arms race. The U.S. Congress supports spending $1.7 trillion of our tax dollars on modernizing all three legs of the nuclear weapons triad, which would decrease national security and undermine the desperately needed public investment in our civilian economy. Last year the Congress appropriated more than $700 billion for the Pentagon and weapons procurement, more than half the entire Congressional Discretionary Budget. In a period when five million aging Americans are suffering from Alzheimer's Disease, costing about $250 billion of the Medicare budget, the NIH budget for such research is in the range of a completely inadequate $1 billion. The increase in the Pentagon budget was more than double the size of the entire NIH budget – funding research on all disease plaguing our citizenry.

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Ironically, MIT is currently engaged in a debate with similarities to the earlier I-lab divestment controversy, over the Institute's agreement with the amoral Saudi Prince Mohammed bin Salman and his regime.

As happened 50 years ago, we need Introductory Physics faculty to include in their teaching of fission and fusion the consequences of the dropping of nuclear bombs on Hiroshima and Nagasaki. We need Geology and Earth Science faculty to intensify their lessons on the dangers of nuclear winter, as well as the rate and consequences of global warming. We need Chemistry faculty to make sure their students understand the human toxicity of dioxins and pesticides, and how chlorofluorohydrocarbons damage the ozone layer. We need Political Science faculty to make clear that U.S. military support for the Saudi Monarchy war on Yemen is absolutely at odds with American constitutional and civic values. We need Economics faculty to make clear that a majority of Americans are hurt when housing, healthcare, education, environmental protection, sustainable energy development, and basic and biomedical research are sacrificed to ensure the profits of a limited number of corporations; corporations that profit from the bloated defense budget at home, and profit abroad from the lucrative private contracts to service our hundreds of thousands of troops at more than 800 bases around the world.

Though the tradition of academics as voices in the public interest has eroded, the struggle to press for science for peace, rather than war, is even more pressing today than it was 50 years ago. The Presidential and electoral debates that will penetrate public consciousness leading into 2020 provides an environment to speak out for peace, diplomacy, and civilian economic development.

Editor's Note: The above article is an expanded version of the Editorial published in the March 1, 2019 *Science Magazine*, "Mobilize for peace."

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Update on the Academic Climate Survey

Jonathan Schwarz
Lydia Snover

THIS FALL, WE INTRODUCED the Academic Climate Survey (ACS) in the pages of the *Faculty Newsletter*, and have been invited to share some early observations of faculty data with FNL readers.

We are grateful to all the members of the MIT community who took the time to share their experiences with us in the Academic Climate Survey. A response rate of nearly 70% is an indication that the topic of workplace climate in academic departments and research units is important to MIT faculty. The public report of overall results from the ACS can be found on the Institutional Research website (***ir.mit.edu/ acs-2018***).

Overall, 89% of MIT faculty are satisfied (very satisfied + somewhat satisfied) with their role at MIT. While the overall story is positive, there are some indicators that suggest room for improvement.

- At an Institute level, female faculty respondents report higher levels of stress than male faculty respondents.

- Underrepresented minority (Hispanic or Latino, American Indian or Alaska Native, Black or African American) faculty respondents are more likely to agree with the statements, "I have to work harder than my colleagues to be taken seriously," and "I feel called on to represent a social identity or demographic group in my DLC (department, lab, or center)."

- Faculty who identify as lesbian/gay/bisexual/pansexual/other sexuality disagree that their DLC is diverse, and report feeling isolated very often at higher rates compared to faculty respondents who identify as straight or heterosexual.

For the first time, we asked respondents whether or not they have a disability. Data from faculty respondents who identified as having a disability suggest they feel less integrated in their departments. For example, they agree (somewhat agree + strongly agree) at a higher rate that they feel excluded from informal networks in their DLC and have felt isolated somewhat more frequently than faculty respondents who do not identify as having a disability.

We continue to be concerned about the number and length of surveys on campus. As the Council on Family and Work revises the quadrennial Quality of Life (QoL) Survey, they are seeking opportunities to reduce the overall length of the QoL while incorporating the ACS as a module within that survey, which will be administered during the 2020 Independent Activities Period (IAP).

The culture of MIT is important – it binds us together in our mission to advance cutting-edge research and education. The Academic Climate Survey results show that not everyone experiences the same culture, and through the MindHandHeart initiative we will be able to share innovation across departments and better access expert campus resources. MIT remains committed to examining these issues so that we can continue to grow and improve. IR and MindHandHeart will continue to work with department heads and directors of centers and labs across campus to leverage these data as part of both new and ongoing efforts to ensure that MIT is a welcoming workplace.

Underrepresented minority (Hispanic or Latino, American Indian or Alaska Native, Black or African American) faculty respondents are more likely to agree with the statements, "I have to work harder than my colleagues to be taken seriously," and "I feel called on to represent a social identity or demographic group in my DLC (department, lab, or center)."

For the ACS responses of faculty with regard to stress, see MIT Numbers (back page).

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Undergraduate Admissions: A Recommendation

Alan White

EACH YEAR FACULTY ARE invited to participate in the undergraduate admissions process and this year I decided to do this.

If you have been at MIT for a while it is likely you've been asked how a daughter, son, or friend might successfully apply for undergraduate admission. I now feel I can accurately say to anyone who asks me about being admitted, "It is practically impossible."

Last year MIT received some 21,000 applications and admitted approximately 1500. How does MIT accomplish this task?

Reading the applications is a humbling process and I felt "Who am I to decide on such excellent applicants?" Fortunately, faculty inputs are only one of many inputs.

Most applicants are interviewed worldwide. This is accomplished by alumni volunteers. And then, a very impressive MIT Admissions staff takes over and committee meetings are held to reach consensus on candidates. Faculty who have read applications are invited to attend these committee meetings.

The time commitment to participate in the admission process is minimal. Faculty attend a one-hour orientation and then are asked to evaluate applications. The evaluation is accomplished on line.

I found the process gave me a new appreciation for MIT's undergraduates. They are all remarkable in academic achievement, but their life stories are the compelling differentiators. You are left with a desire to get to know them better.

I fully recommend faculty consider participating in the process. Like many areas of MIT, you open a portal (in this case Undergraduate Admissions), and enter a new area of discovery.

Alan White is Senior Associate Dean and Lecturer, Emeritus, Sloan School of Management *(awhite@.mit.edu).*

letters

International Collaborations and Donations to the Endowment

To The Faculty Newsletter:

THE INSTITUTE IS NOW engaged in an important discussion on the topic of large international collaborations. Unfortunately, one aspect of those collaborations has, until now, received no attention. That element of these collaborations is the matter of large donations to the endowment by the sponsoring entity.

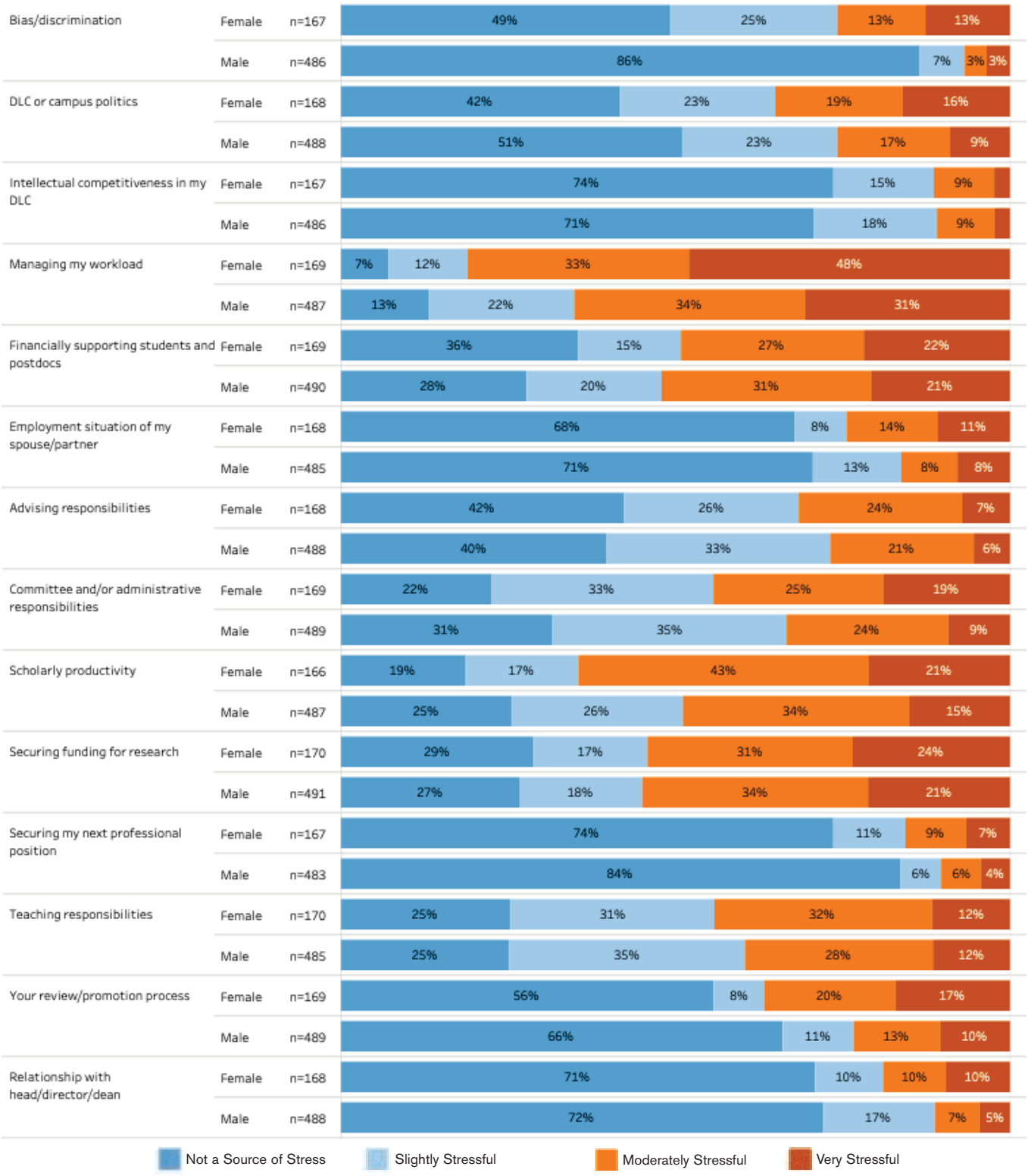
In at least some cases, MIT's participation in these collaborations has been conditioned upon receipt of such a donation. I understand that the rationale is simply that the usual cost accounting procedures do not adequately represent the true cost of MIT's participation and that a donation is therefore required to make it possible. I believe that this position has a great deal of merit. However, I also believe that the existence of all such arrangements should be publicly acknowledged and described in some detail so that we can move forward in full possession of all the facts.

Ken Smith
Professor Emeritus
Department of Chemical Engineering

M.I.T. Numbers

Faculty Responses to the 2019 Academic Climate Survey

Please indicate the extent to which each of the following has been a source of stress for you over the past twelve months.



Source: Office of the Provost/Institutional Research