The MIT Faculty Newsletter

The Freshman Connection: An Experiment in Integrating Student Life and Learning

Lynn Roberson and Dr. Holly Sweet

Introduction

In the fall of 1998, a new freshman advising seminar was offered called The Freshman Connection. This seminar was designed during the spring and summer of 1998 by a group of staff members at MIT who wanted to offer a concrete, practical response to concerns put forth recently in the report from the Task Force on Student Life and Learning about the need to better integrate those two aspects of student experience at MIT. We were also concerned about providing an opportunity for students to explore the different changes that freshmen undergo in coming to university, integrating academic theory with personal experience within an interactive and informal environment.

What follows is the story of how the seminar was developed and taught, as well as how freshmen and associate advisors experienced the seminar from their respective viewpoints. The seminar was by all accounts very successful,

Editorial

Going Public

Last month, at the request of the Faculty Chair and others, we made selected areas of the *FNL* Website, normally limited to the MIT community, available to the public. This was in response to the extraordinary interest by both the popular press and other schools to "A Study on the Status of Women Faculty in Science at MIT" and to the MIT administration's rapid, unequivocal response to it. We think that making the report widely available, in all its detail and nuance, enhanced the level of public discussion.

We did not have a counter on the Website for the first week following release of the report. (We don't generally have much need for one.) We did get one in place as soon as we had a chance. We estimate, with a conservative extrapolation of the curve to its origin, that the *Faculty Newsletter* Website containing the report received more than 100,000 "hits" in the week following publication of the Web address (URL) in *The New York Times*. Now, more than a month later, the

Secret Meeting at MIT

Isaac M. Colbert, Sr., Boyce Rensberger, Nelson Y.S. Kiang

Can it be true that the MIT community is largely un-interested in one of today's most serious threats to academic freedom and the long tradition of open communication in academia?

That's the impression that *Boston Globe* science writer Richard A. Knox got when he attended an all-day colloquium held in Kresge Auditorium on March 29. His story the next day quoted one of the meeting's speakers, Lita Nelsen, head of the MIT Technology Licensing Office, as remarking that "It's astonishing how few faculty are at this meeting."

A principal speaker, U.S. Senator Daniel Patrick Moynihan, referred to the conference, which was designed to launch a nationwide discussion of the issues, as "a momentous academic initiative." Knox duly reported that statement and added his own observation: "But the sparse attendance left in doubt how many academic researchers would agree."

Contents

Authors

Lotte Bailyn is Professor of Management; Faculty Chair.
James Buzard is Associate Professor of Literature.
Lori Breslow is Senior Lecturer, School of Management.
Isaac M. Colbert, Sr. is Associate Dean for Graduate Education.
Carol Fleishauer is Associate Director of Libraries for Collection Services.
Nelson Y.S. Kiang is Professor Emeritus.
Boyce Rensberger is Director, Knight Science Journalism Fellowships.
Lynn Roberson is Coordinator of Programs and Supports for Women Students in Counseling and Support Service.
Janet Snover is Captain, Community Involvement Team.
Dr. Holly Sweet is Associate Director and Lecturer, Experimental Study Group; Director of GenderWorks.
Gayle C. Willman is a member of MIT's Y2K Team.

Editorial

Going Public

(Continued from Page 1)

Newsletter site containing the Report still receives several hundred hits per day.

Credit for the utilization of the resources of the *Faculty Newsletter* to expedite the electronic (as well as paper) release of the Report goes to a host of people, in addition to the *Newsletter* staff. The chair of the faculty, Lotte Bailyn, along with members of the Committee who wrote the report (and in particular Professor Nancy Hopkins) worked closely with us in preparing and modifying the Web version. Particular thanks go to Ms. Anna Frazer, staff associate in the President's office, who kept us up to date on last minute changes and modifications.

Thanks also needs to go to MIT Mail Services and its director, Penny Guyer, (and Administrative Assistant Deborah Puleo) who made it possible for the *Newsletter* to be labeled and mailed on virtually a moment's notice, thus providing the faculty with a hard copy of the report as soon as possible. (No small thanks as well go to the *Newsletter's* printing house, Eagle Graphics, for their extraordinary turnaround time.)

Responses to the Report and MIT's reply, almost universally favorable, have come from as near as Harvard and as far as Japan. Closer to home, we have the experience of one MIT class (see below) who incorporated it into their coursework. The authors are students in the class.

Editorial Committee

• • • • • • • • •

Women in Science:
Using the Report in the Classroom

Natalie Garner and Margaret Latocha

It's easy as a student to tune out news from the larger world, but sometimes it just bursts through. In 9.70 (Social Psychology) we had a chance to discuss and in our own way respond to the recent report on Women in Science. 9.70, taught by Professor Stephan Chorover, is in a case study format. Each week, a group of students lead the discussion of an area of social psychology using a particular social issue as a basis for discussion.

On April 15th, we discussed the recent report on Women in Science. Professor Lotte Bailyn graciously addressed the class on the topic, which led to a lively discussion.

One of the things Bailyn spoke about was the idea of gender schemas, which was formulated by Virginia Valian in her book, *Why So Slow?*. A gender schema is a mental image of a person based on their gender, a sort of rule of thumb, a way of looking at the world. The class quickly picked up on its role in gender inequities. Because gender schemas are rules of thumb and because they lie at an almost sub-conscious level, those that favor men as scientists can be insidious.

The degree of favoritism need not be large to make a difference. Bailyn mentioned a study from Valian's book that showed how even a 1% difference, where one gender was favored over the other, could compound over several generations to become a significant difference. The class was shocked by the extremity of the numbers and the idea of error propagation through the millennia.

The class was very interested in effects of the Women in Science report: responses from other universities and departments, as well as extensions of the study. We'd all read the special issue of the *Faculty Newsletter* and one of the concerns was how the junior faculty related to this report. A heated discussion started about whether things were more fair for junior faculty or if they hadn't hit the glass ceiling yet.

We were all impressed that the study was the result of collective action and as such, could be clearly seen as something whose time had come, rather than action by a single maverick. What was most shocking to some in the room were the students' own experiences with prejudice. Talking about the pipeline of female students into the sciences led to a discussion of MIT admissions and, more importantly, perceptions of MIT admissions. More than one student commented on negative perceptions of female MIT students as having gotten into MIT "just because they were female."

This shocking belief pointed out just how far we still have to go.✣

[Natalie Garner can be reached at ngarner@mit.edu; Margaret Latocha can be reached at mlatocha@mit.edu]

From The Faculty Chair

A Letter to My Successor

Lotte Bailyn

*[**Editor's note:** On June 15, Professor Steven R. Lerman, Department of Civil and Environmental Engineering, will begin his 2-year term as faculty chair.]*

Dear Steve:

Since this is my last report as faculty chair, I thought I would write to let you know that I and, I'm sure, the rest of the faculty are looking forward to your "reign." Your interests and skills in computing and in its role in education will stand us in good stead as we move ahead. I also want to take this opportunity to indicate some of the issues we have been working on that will continue into your term.

There are things left over from the Task Force that need continued attention. One relates to faculty governance. The Task Force recommended a new look at the structure of faculty governance and its relation to the administrative departments that implement educational policy. The need for rethinking these links has been commented on by the Nominations Committee and probably will be taken up by the Committee on Faculty Administration next year. I think the links to ODSUE need careful thought. The faculty committees must work together with ODSUE and it is not clear that our current structure is optimal for the most effective collaboration on educational innovation. And we also need closer links to the upper administration. There were a few constructive meetings between the chair of CUP and the Dean's Committee this past year. It might be well to continue these connections in order to link the effort of CUP directly to the provost, the chancellor, and the deans.

There is the continuous and vexing problem of exam policy and end-of-term regulations. These are regulations the faculty themselves make and therefore must abide by. The Sadoway Committee has laid out the principles that should govern these regulations, and their recommendations will be discussed by the faculty this spring. Next year, there will be continued discussion with department heads and within departments until there is convergence on specific regulations. When these are voted by the faculty, it assumes a responsibility to abide by them, so that students will no longer be faced with excessive pressure from violations that hinder their ability to learn. Concern has been expressed this year that the short reading period contributes to the difficulties, so a review of the calendar may become important. And even though the students decided against an honors system for the moment, that too could help ease evening exam and end of year pressure.

As to the report on Women in Science, I think we have all been surprised by the outpouring of response to its publication, and MIT has received some extraordinarily positive publicity because of it (never mind making Bob Birgeneau a hero!). But with this success comes a serious obligation to continue and extend this effort. For if we don't increase the numbers at all levels and ensure a supportive environment for those who are here, we could find ourselves seriously embarrassed.

In particular, we need to move in four directions: First, there needs to be continuing monitoring of the status of women faculty in the School of Science. Without such vigilance, the same dynamics that created the original situation will come into play again. Second, we need to extend this effort to the other schools at MIT. Third, we need to worry about the pipeline and why undergraduates don't go on to graduate school, and why those who do don't go into academia. Fourth, and critically important, we need to extend this effort to minority faculty: we need to understand why we have so few and put more creative energy into recruiting, and we must ensure that their experience at MIT is a constructive one. One other point: the MIT study has been held up as a model not only to other universities but to other kinds of institutions as well. Is there some way we can be helpful in this process of dissemination?

Finally, let me end with a personal concern about the quality of faculty life and the difficulty of combining it with children and family life or with serious community involvement, whether at MIT itself or outside. Some progress has been made on some fronts: there is planning for more childcare facilities, including infant care; the Council on Family and Work is being rejuvenated; and it looks as if we will be able to offer our junior faculty one semester of professional

A Letter to My Successor
Bailyn, from preceding page

leave to ease the pre-tenure years. But I would like to suggest, also, the possibility of half-time tenure appointments for what I call FMLA reasons. The Family and Medical Leave Act legislates leave for reasons of caring for a child, a spouse, or other needy dependent. I think we should provide tenured faculty the possibility of a half-time appointment (for up to 5 years) for such purposes. This would

not allow faculty to spend half their time consulting, or on an outside business, which would seriously compromise their commitment to MIT. Faculty who take this option for FMLA reasons, in contrast, are likely to increase their commitment to MIT, and to have stronger motivation and more energy when they return to full-time status than they would have had if they had continued to deal with

these multiple demands without some relief.

There's lots more, Steve, but I'll stop for now. I hope you will enjoy your term as chair. I have only one serious piece of advice: don't eat the desserts!

Yours, Lotte
[Lotte Bailyn can be reached at lbailyn@mit.edu]

• • • • • • • • • • •

Excerpts from responses to:
"A Study on the Status of Women Faculty in Science at MIT"

"...I've just read the *New York Times* report as well as browsed through your Web report on discrimination against women in academia. Most interesting! As a junior female faculty member, I am especially intrigued by the statement that while junior women feel well-protected, the feeling dissipates over time.

Thanks for taking the initiative to do this, and I applaud MIT's openness to this issue."

────

"...Our institute offers programs of English language study to non-native speakers. At the upper levels of the program, students are assigned novels. This semester, students in the low advanced level of our Integrated Skills course are reading the novel Menachem's Seed and the MIT study documented in this report addresses a number of the major themes of this novel. We would like, therefore, to offer the newsletter as a supplementary reading assignment."

"...You are right on the mark. [our university] should be added to the list of prestigious institutions that have not made any effort to address subtle gender discrimination. Senior women on the faculty are almost non-existent."

────

From an editorial in the *San Francisco Chronicle,* March 24, 1999:

Subtle Discrimination
Spurs MIT to Change

"But for one significant difference, a Massachusetts Institute of Technology study confirming discrimination against women faculty members would probably have been ignored by college administrators across the country – like so many similar reports before it. The difference this time, however, is that the respected president of MIT – one of the most prestigious universities in the nation – not only did not ignore the report, he acknowledged existence of the

discrimination and took steps to redress it. "I have always believed that contemporary gender discrimination within universities is part reality and part perception," MIT President Charles Vest said in comments to be published in the faculty newsletter. "True, but I now understand that reality is by far the greater part of the balance."

The reasonableness of Vest's conclusion is seen in differences in salary, space and resources available to men and women faculty members.

…Since the report on the "exclusion and invisibility" of women was first issued four years ago, the school has increased salary, space and resources for women. MIT's experience is hardly unique. The study and Vest's willingness to admit discrimination – however subtle – should serve as a catalyst for colleges and universities throughout the country to seriously re-evaluate treatment of women faculty members."

TEACH TALK

Six Days to Bubble Gum Blowing
and Other Lessons in Learning

Lori Breslow

This semester Miriam Diamond, who is the educational coordinator for Course 5 (chemistry) and I have been co-teaching a subject called "Teaching College-Level Chemistry" (5.95). Eleven Ph.D. students from chemistry, material science, and biology are enrolled. The impetus for the course came from the students themselves. Besides having a natural inclination for teaching, they had heard that the demands of the job market are such that newly minted Ph.D.s are often asked to demonstrate their teaching ability, and they wanted to prepare themselves as best they could.

In designing the course, Miriam and I tried to touch upon as many facets of teaching on the university level as possible. So far during the semester, we have covered, for example, writing a syllabus, dealing with diversity in the classroom, lecturing, leading discussions, and using active learning techniques. In the first half of the course, Miriam and I planned and facilitated the classes; during the second half of the term, we turned the teaching over to the students.

Early in the semester, we assigned a short paper we called "Examine Your Own Learning" that was to set the stage for a class on that topic. We asked the students to spend some time over a two-week period becoming adept at a relatively simple task – baking a cake, playing a recorder, or naming all the kings and queens of England. They didn't have to become proficient at whatever they were studying; they simply had to begin to master the skill or data set. Of more importance, they were asked to

keep a journal in which they made observations on how they went about learning whatever it was they chose. Their journal entries were to be guided by a set of questions, including, for example: Why did you decide to learn this particular skill or concept? What kinds of authorities did you use to facilitate your learning? And, what were sources of frustration and satisfaction for you as you completed this assignment? They were then to write a short paper based on their journals in which they drew some tentative conclusions specifically about themselves as learners, and more generally about the learning process.

If truth be known, this was the first time I had ever given such an assignment, and I was a little nervous about how well it would work. I needn't have been anxious: When the students reported on what they had accomplished during the two weeks, it turned out they had not only discovered much about themselves as students, but they had also uncovered some well-established principles from educational research. The fact that even these quick, relatively easy learning tasks yielded some basic truisms about how humans learn astonished me, and so I decided the results of this experiment were worth reporting more widely. (In fact, the title of this "Teach Talk" is taken from the paper of one student, Mitch McVey, who, as you can tell, set upon the task of learning to blow bubble gum.) [The 5.95 students are: Course 5 – Dana Buske, Stacey Eckman, George Greco, David Green, Robert Kennedy III, Justin Miller, Deborah Perlstein, Kevin Shea; Course 3 – Mike Fasolka and Bindu Nair; Course 7 – Mitch

McVey.] I have pulled out 10 principles of learning from the 5.95 students' papers. In this "Teach Talk," I'll discuss five of them, all of which can be loosely categorized as having to do with cognition. In next issue's "Teach Talk," I'll deal with some of the social and emotional aspects of learning.

Principle #1: Prior Knowledge Plays an Important Role in Learning

Research in cognitive psychology has shown that one of the most effective ways to teach new material is to build upon what students already know. New knowledge that extends old knowledge is most easily assimilated. On the other hand, incorrect ideas that students hold as true can hamper learning. Thus Mitch McVey writes, "After my first unsuccessful attempts [at bubble blowing], I realized I had certain preconceived notions...that prevented me from being able to learn the skill." (Mitch thought the gum was supposed to be in front of his teeth before blowing air into it. He couldn't figure out why wads of gum kept shooting out of his mouth every time he tried to blow a bubble. He finally called in an "expert" – a friend who was an avid bubble gum blower – who explained the proper form was to have the gum *behind* the teeth before blowing.)

This problem of prior *incorrect* knowledge is a common and insidious one in technical subjects. Diana Laurillard in her book, *Rethinking University Teaching,* points out there are a handful of common misconceptions about the way the physical

Six Days to Bubble
Gum Blowing
Breslow, from preceding page

world works that can interfere with a student's ability to understand basic principles of physics. (The particular example she cites deals with the reason students have difficulty understanding Newton's Third Law; see pages 38-42.) The job of the instructor, then, is to identify – and surface – these common errors in order to remove the obstacles students face. Or as Mitch explains, "A teacher's role, as exemplified by what my friend did, is to make the students aware of their preconceptions and force them to wrestle with the discordance that results from...two different sets of ideas."

Principle #2: *Modeling is an Effective Way to Learn*

Several of the students saw the skill they were attempting to master modeled by an expert before they tried it themselves. Thus, when Kevin Shea and his wife, Jennifer, wanted to learn to make pasta, armed with a notebook and camera, they went to his Italian grandmother to watch her make the dish. And when George Greco decided to find out how to mend clothes, he asked his girlfriend to sew on a button and tear a rip seam while he observed her. "I know I learn best," George writes, "by watching an experienced person do something, imitating them, and practicing doing it until it becomes internalized."

Albert Bandura's social learning theory provides the classic description of the role of modeling in learning. George echoes Bandura when he comes to the conclusion that watching others and then practicing what they do is a powerful way to produce learning.

This finding has been substantiated by more recent research. In a highly regarded article in the *American*

Association for Higher Education Bulletin (December 1997), Peter T. Ewell, senior associate at the National Center for Higher Educational Management Systems (NCHEMS), identifies "approaches in which faculty constructively model the learning process" as one of the most effective means of instruction. "Apprenticeships," Ewell writes, "allow students to directly watch and internalize expert practice." (p. 5)

As instructors, we model for our students in a variety of ways. Some are obvious – using equipment in the laboratory or doing problems at the board. But what about the more subtle ways our behavior in the classroom or our interactions with students create models that they then imitate? For example, if we dismiss a wrong answer with silence, are students to infer that wrong answers are "bad"? If we concentrate on the mathematical representation of a problem without referring back to the physical phenomenon that it symbolizes, can we fault students for not being able to apply abstract principles to more practical problems?

Since the effect of modeling is so potent, it behooves us to think carefully and consciously about *what* we want to model for students, and *how* this principle of learning can best be utilized.

Principle #3: *Feedback is an Important Component of Learning*

Cognitive psychology also emphasizes the importance of feedback in the learning process. Three students – Kevin Shea, Mike Fasolka, and Justin Miller – specifically noted the role of feedback in improving their performance. A simple example: After adding a fourth egg to a mound of flour, Kevin, the novice pasta maker, found "eggs

flowed from my flour crater like lava onto the dining room table." Using feedback from this experience – something about the way he built the flour mound was wrong – Kevin tried again and was successful. In the process, he learned, "adequate instruction, practice, and feedback…are vital to master a complex skill." (He also decided the next time he and his wife want to make pasta, they will have his grandmother on hand.)

Mike wrote eloquently on mistakes as a source of feedback. To fulfill his assignment, Mike set out to teach himself how to play the video game, *Star Wars: Rogue Squadron.* After familiarizing himself with the objectives and rules of the game, he began a period of "rough experimentation," during which he made many mistakes. "In fact," he writes, "I am quite certain that making these mistakes was essential to my learning process." He identifies this process as figuring out the "boundaries" of the task. For example, he found that as he tried to shoot down enemy ships, he was also crashing into them. But after every unsuccessful attempt, he would vary some parameter. He finally discovered that applying his ship's brake lever allowed him to destroy the enemy without smashing himself to smithereens. "This experimentation stage," Mike writes, "seems to be the longest, but most fruitful, period in my learning process."

Mike hit upon two essential points regarding the role of feedback in learning. First, educational research tell us that feedback is most effective when it is frequent and quickly follows upon the heels of the students' work. As Mike found, the learner can then immediately assess his or her mistake

Six Days to Bubble Gum Blowing

Breslow, from preceding page

and take steps to correct it. Second, as Ewell points out, recent research on the brain has led to the understanding that "building lasting cognitive connections requires considerable periods of reflective ('alpha-level') activity." (p. 4) Given that, it's not surprising that Mike found this process of taking action, examining the results of those actions, planning strategy, and experimenting again a long, but productive cycle.

Finally, Justin Miller learned how to cross-stitch for his assignment. But he did so in a vacuum because no one around him knew how to do that kind of handiwork. "I found it mildly annoying," he reported, "that I received no assistance and no feedback while working on the piece."

Principle #4: The Learner Benefits from Having a Framework in which to Work

Research into how learners process information has identified the importance of creating a "framework" or cognitive "map" so that information processors have a sense of where they are going and how pieces fit together. For example, before Mike Fasolka started to play the video game, he consulted the accompanying booklet that described what the game was about, gave a synopsis of the rules, and illustrated a controller diagram, a "visual map" that gave him an overview of the handset's capabilities.

Similarly, Bindu Nair, who set out to make *dosa*, a Southern Indian rice crepe, learned the hard way about the importance of an overview when her first batch failed miserably. Neither of the "experts" she had consulted – her mother and her aunt – had warned her that she needed to give the mixture "frequent breaks" during the blending

process in order to keep it from overheating. In reflecting on her first attempt, she writes, "I...realize that structure is very useful for students in general. Pitfalls such as my blender trauma can be minimized if students have a clear concept of the entire process before they start."

"The legacy from Gestalt psychology," writes James R. Davis in his book, *Better Teaching, More Learning,* "is that individuals organize their perceptions according to the whole configuration (gestalt).... The perceiver puts individual perceptions into the 'bigger picture' and sees things as part of a larger whole." (p. 147) In the classroom, this principle of providing the "bigger picture" can be honored through something as simple as writing an agenda on the board outlining the material to be covered for the day, or announcing the "thread" that will weave through the entire lecture. Including "objectives" on the course syllabus can also provide a "framework" for students by allowing them to see how each topic fits into and supports a coherent purpose.

Principle #5: Breaking the Task into Smaller Steps is Beneficial

The complementary principle to the idea that learners work best within a framework is, of course, that both skills and knowledge are best mastered when they are broken down into smaller pieces. In an earlier "Teach Talk," I likened teaching – especially teaching technical subjects – to a jigsaw puzzle. Students need to have the picture on the box to see what they are to build, but, ultimately, the puzzle is put together piece by piece. (See "The Jigsaw Puzzle of Teaching," Vol. VII, No. 4 of the *Faculty Newsletter* at <http://web.mit.edu/odsue/tll/.>

The challenge, of course, is to figure out where the boundaries of each "piece" are, and how small (or large) each individual item should be. For example, Dana Buske, in choosing to master skate skiing (a kind of cross-country skiing that is faster than traditional cross-country skiing), decided first to learn what to do with her feet before practicing with poles. "Having already mastered the lower body motions," she wrote, "it was much easier then to add the arms."

Bob Kennedy, recognizing that "some facts in science just need to be memorized," decided to learn the names of all the presidents of MIT, with the decades they were in office, for this assignment. Implementing a strategy similar to Dana's, he first broke down the list into 50-year segments. "By subgrouping the presidents," he explains, "I could work on learning a smaller portion of the list." Yet in thinking about what he would do differently, he writes, "I would set smaller goals along the way."

Bob found it hard to motivate himself to learn the list; setting smaller goals, he hypothesized, would have given him more opportunities for success, which, in turn, would have spurred him on. This point reinforces an earlier one on feedback. As Ewell writes, "Using weekly quizzes or nongraded practice assignments..." (i.e., by allowing students to practice working with subsets of the material to be learned) "...[instructors create] iterative opportunities for students to try out skills, to examine small failures, and to receive advice on how to correct them." (p. 5)

Next "Teach Talk": The role of motivation, context, and emotion in learning.✣

[Lori Breslow can be reached at lrb@mit.edu]

The Freshman Connection
Roberson and Sweet, from Page 1

accomplishing what we had hoped for, and leaving all of us with a wish that other faculty, staff, and students could have the opportunity to participate in a similar kind of seminar which meant so much to us in a variety of ways.

Developing the Freshman Connection
Lynn Roberson

In my many years working with students at MIT, I have been fortunate to be able to hear the minds and hearts of our students, their whispered struggles and quiet victories. In our work together, students speak of their experience of being opened and challenged into taking steps in growth they never imagined before. But so too, they speak of what has impeded, hurt, or shattered them. It is here that the impact of society's painful schism between outer performance and achievements versus an inner knowledge of personal self can show up in students' lives as a disconnection and prioritization of intellect over emotional health and well being. To whatever degree an absence or devaluation of the personal realms of mind and heart exist, this often serves to separate the person from their whole sense of self, thereby limiting access to their full potential, their strengths and their multiple intelligences. In this omission, I have witnessed students hobbled in their academic performance, their self-esteem, and hence their vision of what they can do and be.

When the human factor in an academic context is perceived to be a liability instead of a quality to be developed, misunderstandings can easily occur. Fearful of being ostracized as being "too soft," students may inadvertently sidestep important life questions, opportunities for self-understanding, and emotional development, and access to programs and supports. Students have sometimes assumed that wrestling with human concerns is evidence of their own inferiority rather than an understanding that these concerns might be indicative of their own depth, growth into adulthood, and integration as a person. Some students have mistakenly labeled the confusions and challenges of early adult transition as evidence of major psychiatric disorders. These perceptions are hurtful to students and are more often relics of outdated beliefs. What stands out over and over again is that personal life health issues *do* affect academic success.

Last year's student deaths were tragic examples that brought home to many how important it is to pay attention to the personal realm. For me, it felt imperative to do my part in offering a practical and effective action plan in response to the needs of our students. It also seemed appropriate to further address the focus on community that was outlined in MIT's mission statement and in the report from the Task Force on Student Life and Learning. What I wanted to see established at MIT was a class for freshmen that would introduce and develop an understanding and a balanced perspective of the "human factor" in the academic domain. I also wanted students to walk away with a set of tools and maps to better navigate their transition into college and early adulthood as well as their personal and academic directions.

I gathered together a group of interested staff who shared a strong dedication to fostering students' well being and excellence, whose roles and skills in developing and conducting programs were of high caliber, and who understood well the underlying needs that now called out for a new vision and approach. Starting in March 1998, this team got to work: Tracy Desovich (health educator in the MIT Medical Department), Carol Orme-Johnson (assistant dean in Residential Life and director of mediation@mit), Holly Sweet (associate director and lecturer in ESG and director of GenderWorks), and myself (coordinator of programs and supports for women students in Counseling and Support Services). Later we were joined by Marilee Jones (dean of Admissions) and Tobie Weiner (administrative assistant in Political Science).

Six months later we had developed an in-depth course curriculum for a semester-long class which we called The Freshman Connection. This seminar would look at the issues first-year students face from a psychological perspective, combining theory and practical experience wherever possible. In addition, we considered a year-long option that could include a second semester area of concentrated focus on one area of the curriculum such as health issues or gender relations. Our seminar was ready to be piloted as a freshman advising seminar, with the intention that it could be mainstreamed further if it was successful.

Teaching the Freshman Connection
Dr. Holly Sweet

In creating this seminar, we were clear that we wanted to cover the key issues which we felt freshmen would be likely to encounter in their first term at MIT, and we wanted to do this chronologically. Therefore, we started with theories about developmental stages of life, self image, and transitions in the first three weeks, covered relationships and emotions in the next three weeks, looked at physical health and stress management during the seventh and eighth weeks (timed to coincide with mid-term exams) and then addressed topics such as

The Freshman Connection
Roberson and Sweet, from preceding page

communication, diversity, and gender issues in the following weeks. The readings were drawn from a wide variety of sources, including both traditional psychological texts (such as Erikson's *Childhood and Society*) and more contemporary writings (such as Goleman's *Emotional Intelligence* and William Bridges' *Transitions*). We planned to end the term with presentations by students about interviews they had conducted with faculty or staff about their views on first-year education.

From my long-term exposure to student-based education in the Experimental Study Group (ESG), I knew the value of interactive education with ample room for student input. From my own experience teaching classes with an experiential focus (SEM051: Sex Roles and Relationships, 12A20: Gender Roles in Science, and SP290: Psychology in Action), I knew the importance of providing students with the opportunity to begin to integrate academic and personal material. Too often, first-year students have only the experience of large lectures and recitation sections, with minimal opportunity for interaction and integration. This seminar (like many of the freshman advising seminars) would provide a welcome contrast to traditional education at MIT.

We planned to begin each session with food (a "must" for late afternoon classes) and a thirty minute check-in period where students discussed how their academics were going, as well as their extra-curricular activities and personal lives. During the check-in period, we would ask students to relate (wherever possible) their experiences to the readings and topics we had previously discussed in the seminar. The following hour and a half would be spent introducing the topic for the week and conducting a

discussion and exercises related to the topic. We would be joined by speakers from the MIT community on four different occasions who would organize the talk, discussion, and exercises for the session. We would also require students to keep weekly journal entries on the topics in the syllabus, and to integrate theory and practice within those journal entries as much as possible.

After spending half a year helping develop the Freshman Connection, I looked forward to teaching it, especially since I was going to be teaching with Marilee Jones (with whom I had led support groups for graduate student women and academic administrators over the past 10 years). I had also picked two associate advisors for the seminar, Van Chu '99 and Michael Trupiano '00. I knew them both well (I had supervised Van as a tutor and associate advisor in ESG, and Mike as a student trainer in GenderWorks, MIT's peer training program in gender relations) and had a great deal of respect for them professionally and personally.

In August, Donna Friedman (from the Office of Academic Services) gave us a list of our six freshmen (two men and four women) who were a mixture of different ethnic backgrounds (one international student, two Hispanic, one African American, one Asian American, and one Caucasian student). We were ready to go and looked forward to our first class with anticipation. However, only four people showed up on time, with one person coming in half an hour late (she couldn't find the office), and one person not showing up at all (he overslept). The freshmen who did arrive on time were quiet and looked a bit uncomfortable. Uh-oh. Where was this going to head, we asked ourselves? But by the end of the first session, the students had relaxed and

were chatting openly about their experiences in high school and what the transition was like to MIT. It was clear to us at that point that we had embarked together on a trip which would be collaborative, lively, and exciting. As the weeks wore on, Marilee and I were continually pleasantly surprised at the enthusiasm and commitment which our students brought to the seminar.

All six students were unanimous in their enthusiasm for this seminar, not only voting with their feet (we had a 100% attendance rate after the first session), but giving the seminar high marks in their end of term evaluations. Several students wrote statements about their experiences in the seminar, which we have shared below to give you a flavor of what students thought.

Daniel Gonzalez '02

"Last semester, I took the Freshman Connection advising seminar. It was the most beneficial experience I have had at MIT. It was a wonderful stress reliever to come into class and discuss my problems with other freshmen over food. My advisors and associate advisors were wonderful and came up with an excellent curriculum. Some of the activities that we did that stand out for me were role playing (my favorite) and drawing our autobiographies. These interesting methods taught us a lot about ourselves, MIT, and our environment."

Maria Otero '02

"The Freshman Connection was one of my best experiences at MIT, not only academically, but also socially and emotionally. This semester offered me (and I think the rest of the group) two hours of time during the hectic week at MIT to reflect on what had happened and to better prepare ourselves for what was coming. The

The Freshman Connection
Roberson and Sweet, from preceding page

seminar taught us how to deal with the many different aspects of life that we would encounter, and the many changes that would take place. It helped us adapt to the new lives we were all undertaking. However, I think the most important part of this seminar is that it taught us about ourselves. Through topics such as emotional health and relationships, we learned individually how we dealt with our emotions and our expression of emotions. We also learned how to make the best of our feelings and our relationships. The seminar also offered a group separate from the rest of MIT where we knew we were comfortable and at home, and where we could open up without fear...it was like having a small family within MIT that we could count on for support. I am very happy to have put the Freshman Connection as one of my choices and I'm even happier that I got chosen to be part of the group. I would not trade the experience for any other."

Stephanie Wang '02
"For me, the Freshman Connection was like a home away from home. The first few weeks [at MIT] were a bit rough for me, and the group atmosphere of the seminar helped to alleviate the stress related to being so far from home and away from my family and friends. The topics we discussed (such as relationships and communication) were pertinent to the time, helping with life outside the seminar. For example, the discussion about personal health reminded me that there is life beyond academics at MIT. This Freshman Advising Seminar was about more than surviving MIT, but about living life as well."

The associate advisors were also very enthusiastic about the seminar, contributing actively to discussions and meeting regularly with the instructors to modify format as needed.

Students and associate advisors were emphatic that this seminar should continue and reach as many other freshmen as possible. When we asked students why they found this seminar so important, they said that it was their only opportunity to discuss their academic and personal lives with other students, associate advisors, and staff in a format which helped them feel

l-r:Stephanie Wang, Maria Otero, Betsy Krichten, Van Chu, Dan Gonzalez, Nathaniel Choge

safe in opening up, and which taught them theories and techniques that were directly applicable to their own lives.

Where do we go from here?
In response to student recommendations, the seminar will be continued in the fall under a new name (Transitions and Connections: Psychology Looks at the First Year) and a slighlty revised syllabus. The seminar will be taught by Professor Travis Merritt and Dr. Holly Sweet. If more students sign up for the seminar than can be accommodated in that section, faculty and staff will be recruited to run additional sections. If you are interested in participating in

this seminar, please contact Prof. Merritt (merritt@mit.edu) or Dr. Sweet (hbsweet@mit.edu) for more information.

First year students at MIT face significant hurdles, including erosion of self esteem, difficulty handling the pressure of academics, a disruption of lifelong relationships with family and friends, and the development of a new network of friends in a short period of time. As MIT continues to analyze the way it deals with first-year students and the issues they face, it is our hope that seminars like the Freshman Connection will become an integral part of the freshman curriculum. MIT is clearly a leader among peer institutions in technical and scientific fields. We would like the Institute to also become a leader in finding ways to better integrate student life and learning, and to root students in a community context from which they can both give and get support for their academic and personal endeavors.✤
[Lynn Roberson can be reached at roberson@mit.edu].

Secret Meeting at MIT
Colbert, Rensberger, & Kiang, from Page 1

As three of the organizers of this colloquium, we share Knox's doubt about whether the Institute's faculty, students, and administrators take this issue as seriously as we believe they should and as all of the event's 15 other speakers did.

The colloquium, jointly sponsored by MIT and the American Association for

Mary Good, president-elect of the AAAS. Other distinguished speakers and two panel discussions with a wide variety of experts rounded out the day's program.

The issues were deemed important enough that some two dozen journalists from daily newspapers, wire services, scientific journals and

anticipated that so few at MIT would come hear about these important issues. Perhaps the underlying reason for poor MIT attendance may be even more dismaying than the organizers realized.

Can it be that the MIT community is simply not interested in issues that do not directly affect our individual work on a day-to-day basis? Is the pressure for the next experiment, the next publication, the next grant, the next meeting, the next problem set so severe that many of us have become blind to the possibility that academicians are losing their freedom to communicate research findings openly? Can it be that we are so preoccupied with our own work that we are losing a sense of community?

> Can it be that the MIT community is simply not interested in issues that do not directly affect our individual work on a day-to-day basis? Is the pressure for the next experiment, the next publication, the next grant, the next meeting, the next problem set so severe that many of us have become blind to the possibility that academicians are losing their freedom to communicate research findings openly? Can it be that we are so preoccupied with our own work that we are losing a sense of community?

As evidence for this interpretation, we point to the low attendance at faculty meetings, where a quorum is often difficult to reach and sometimes meetings are cancelled. Perhaps MIT's size and complexity make it no longer possible to maintain the illusion of a cohesive community discussing and sharing ideals of academic freedom and responsibility.

the Advancement of Science, was intended to explore the influence of restrictions on communication of scientific findings imposed by industry and government on universities, where open discourse and scientific exchange has been held, at least theoretically, to be a primary credo. Along with Moynihan, who recently wrote a book entitled *Secrecy*, speakers included MIT Institute Professor John Deutch, a former director of the CIA, who declared that there should be no secrecy on campuses.

Also on the program were MIT Chairman Alex D'Arbeloff; President Charles Vest; Institute Professor Sheila Widnall, a former secretary of the U.S. Air Force; and Robert Cook-Deegan, director of the National Cancer Policy Board of the National Academy of Sciences. The closing speaker was

other trade publications covered the meeting, some flying in from the West Coast for the event.

However, it seemed that the vast majority of our faculty, administrators, and students had other priorities than participating in this "momentous academic initiative." It is not as if the event itself was a secret. For several weeks beforehand, hundreds of posters blanketed the campus and plans for the meeting were described in a front-page article in *Tech Talk*. The event was even "spotlighted" for several days on the Institute's home page.

Thus, the poor attendance of MIT people cannot likely be blamed on lack of awareness. We sought to provoke a national discussion of the pervasive and perverse influence of secrecy in our academic institutions. We had not

We write to alert MIT's administrators, faculty, and students to this concern and to suggest that we find ways to work together to create a better sense of community that can reverse this apparent trend toward fragmentation. If the pursuit of individual career goals overwhelms other values, then new generations of leaders in technical fields – the students we are teaching and supporting now – can hardly be expected to contribute to a healthy society that will be responsive to the true needs of our nation's citizens as a whole.✤

[Isaac M. Colbert, Sr., can be reached at ikec@mit.edu; Boyce Rensberger can be reached at boyce@mit.edu; Nelson Y.S. Kiang can be reached at ds@epl.meei.harvard.edu]

An Open Letter on "Communication" and the New Requirement

James Buzard

In a letter printed in the *Faculty Newsletter* some weeks ago, I argued that the new Communication Requirement should be designed with the aims of both professional competence and literate citizenship in mind. This letter outlines a four-year communication program in which different MIT departments would work as partners in a sequence emphasizing different aspects of communication at the stages of undergraduate education where they are most appropriate.

1. A Humanist's View

Let me begin by observing how strange the current efforts to construct new "communication-intensive" subjects, or to fit out existing subjects so that they can qualify for "communication-intensive credit" can appear, from the perspective of a core humanities professor such as myself. (A note of clarification: when I say "core humanities," I am referring in particular to such fields as literature, history, philosophy, and languages. I am not referring to all HASS disciplines. Unlike the social sciences, core humanities subjects make no claim to scientificity; unlike the creative or performing arts, they are essentially critical and hermeneutic.)

For a start, it is troubling that the very label "communication-intensive" so perfectly exemplifies the ungainly bureaucratese that already afflicts so many MIT students' writing. What do we mean by "communication-intensive subject?" Obviously, we mean a class that teaches writing and speaking skills, whatever else it may also be teaching. But because we can recognize that "communication" is an exchange, not just a unilateral action, we should add that a class designed to make students better participants in the process of communication must also teach the skills of receiving, interpreting, and responding to the "communications" of others. In other words, a "communication-intensive subject" ought to offer training in writing, speaking, listening, and reading. To divorce the skills of "message-production" from those of "message-reception" is to stunt the development of both. To omit the critical practice of reading from "communication" is to promulgate the tin-eared discourse of bureaucracy, and to offer us the vision of a future in which everybody will be energetically "communicating" but nobody will be getting the message.

The obvious question which anyone setting out to design a new MIT program of communication training ought to ask is, *"Where is communication training already going on at MIT?"* – or, in other words, *"What existing strengths can we draw upon?"*

And here I must draw back for a moment, to observe that this issue of "communication" leads me down a path I often find myself traveling as a professor of humanities at MIT.

To be a humanist at this institution is to find oneself constantly on call to articulate the most basic principles of humanistic study – principles that professional humanists may easily forget how to articulate, since their work is occupied with higher-order questions sky-scraping far above those foundations. Now, the atmosphere of skepticism surrounding what we do is actually one of the things I value most about being a humanist at MIT: it kills complacency and makes impossible the kind of hubris, product of the hot-house Ph.D. programs, that has earned our disciplines (especially mine) such a bad name in the general culture.

But so tenuous a hold does the rationale of humanistic study have on the institutional imagination of MIT that it does not seem to occur to people to consult our disciplines on problems especially germane to them. For a humanist, it can be uncanny to move about the Institute and to encounter people in several different settings groping with questions for which an obvious place to look for solutions is in

> When the Task Force on Student Life and Learning recommends that MIT take up the goal "educating the whole student," it enunciates the most classical of humanistic ideals, that of Bildung or "culture," the shaping of an entire mature self; but does this recommendation lead anyone to conclude that the core humanities disciplines ought to play a much greater role in MIT's undergraduate curriculum, so that students can have a chance to develop in more well-rounded ways?

An Open Letter on "Communication"

Buzard, from preceding page

the humanities. When the Task Force on Student Life and Learning recommends that MIT take up the goal "educating the whole student," it enunciates the most classical of humanistic ideals, that of Bildung or "culture," the shaping of an entire mature self; but does this recommendation lead anyone to conclude that the core humanities disciplines ought to play a much greater role in MIT's undergraduate curriculum, so that students can have a chance to develop in more well-rounded ways?

When the Committee on Student Affairs hears testimony about the "lack of community feeling" among the student body and the lack of identification students feel for the Institute, does anyone acknowledge that this alienating atmosphere stems at least in part from the anti-humanistic bias of what students call MIT's "education-with-a-firehose?" And does anyone then consider that increasing the importance and visibility of the core humanistic disciplines would be an invaluable step to take in redressing the situation? Alas, not without some pugnacious Humanistic evangelist on the scene to argue the point. A humanist at MIT must be prepared to make a case for "the obvious," at the risk of being thought a cockeyed idealist or a curricular claim-jumper. To return, then, to the questions: where is communication training already going on at MIT? What existing strengths can the new requirement draw upon?

Communication training is what the core disciplines do, all the time, in every class we offer. Every core Humanities class – introductory, intermediate, and advanced – ought to carry "communication-intensive credit." But not all humanities disciplines bear the same relationship to the problem of

communication, so we should pose the above questions more specifically. In which disciplines does the teaching of communication skills bear the most direct relationship to the intellectual core or content of the discipline? *Literature and writing are the disciplines in which the teaching of communication skills bears the most direct relationship to the intellectual content of the discipline. These*

> **Communication training is what the core disciplines do, all the time, in every class we offer. Every core humanities class – introductory, intermediate, and advanced – ought to carry "communication-intensive credit."…Literature and writing are the disciplines in which the teaching of communication skills bears the most direct relationship to the intellectual content of the discipline. These programs should be the backbone of the new requirement.**

programs should be the backbone of the new requirement.

Let me speak for my own field only. What professors of literature do, as our normal course of business, is teach students how to respond to language, in language. We try to help students develop a sensitivity to many different uses of language and a familiarity with different literary traditions. This familiarity makes them more sensitive and alert participants in the process of communication: it allows them to bring more and richer resources with them to that process. We operate in comparatively small classes placing a premium on active student discussion (including, at the advanced level, formal oral reports). We base our students' grades largely on their ability

to write persuasive prose, and consequently we require a significant number of written assignments, with ample provision for rewriting. Speaking, writing, listening, and reading, functioning not as separate elements but as interacting components of a literate sensibility: our curriculum helps students mature as users of language. From where we stand, any "Communication

Requirement" that does not envision a vital role for the discipline of Literary Study is going to seem seriously misguided.

2. Outline of a Program

These questions and answers suggest that a properly conceived four-year program of communication training might divide communication-intensive (CI) credit into three tiers:

CI#1 (freshman year), CI#2 (sophomore year), and CI#3 (junior and senior years).

At each successive stage, the pool of MIT departments eligible to participate should broaden:

• CI#1: Literature and Writing
• CI#2: All core Humanities sections

An Open Letter on "Communication"

• CI#3: All MIT departments

Different disciplines could offer different levels of CI credit:

• CI#s 1, 2, and 3: Literature and Writing

• CI #s 2 and 3: All core Humanities sections

• CI #3: All MIT departments

Commitment to sequence would be essential to the program:

• freshman and sophomore years: general ("humanistic") communication skills;

• junior and senior years: either professional communication or advanced humanities.

Let me now fill out this sketch with some details:

Freshman Year: Those students whose placement essays receive a grade of "Subject Required" must take one of the following writing or literature subjects: "Expository Writing," "Writing and Experience," or "Writing About Literature." (ESL students will require a special arrangement.) Others take another CI#1 writing or literature subject, most likely a HASS-D. CI#1 class size should be small, tutorial assistance should be available, and there should be ample opportunity for revision of written work. Readings will be briefer than in more advanced courses so as to provide class time for discussion of writing issues and student essays. HASS-D courses also eligible for CI#1 credit should be limited to 18 students (preferably fewer). Funding must be made available to staff a sufficient number of these essential small classes.

Sophomore Year: Students may choose among CI#2 courses offered in core humanities disciplines. Current HASS-D offerings and Intermediate courses would be eligible here, though it would be beneficial to provide tutorial assistance at this level, too. Current HASS-D classes in social science or creative and performing arts could qualify for

CI#2 credit if they are prepared to meet CI#2 criteria, but they would not be required to do so. This would free up instructors of HASS-D courses in these areas to decide whether or not to participate in the communication program.

Junior and Senior Years: Students may take a CI#3 course in their major field or in humanities. Although many students at this point may move on to pre-professional communication training in their majors, those who wish may satisfy their CI#3 requirements by taking additional Intermediate or Advanced subjects in literature, writing, or other core humanities subjects.

3. Conclusion

You will not need me to point out that the plan outlined above is an ambitious and expensive plan, a radical plan. And it is no doubt a sociological fact that all institutions offer disincentives against radicalism; every entrenched system will favor limited inquiries and minor adjustments. In the case of MIT, institutional tradition and identity are at odds with the questions the Institute now finds itself compelled to ask. Like the question of student life, the question of "communication" is a radical one that will lead us, if we debate it fully and candidly, to the root question of what kind of institution MIT wants to be. If it wants to implement the recommendations of the Task Force on Student

Life and Learning, its dedication to the ideal of "educating the whole student" must be reflected in its curriculum. The new Communication Requirement offers us the opportunity and the challenge to do just that.

In closing, I would ask you to consider what message the Institute will be sending if it adopts a plan that does not recognize (by awarding "CI" credit to) the communication training already taking place as the standard operating procedure of humanities classes. Speaking for myself, it will be

> **In the case of MIT, institutional tradition and identity are at odds with the questions the Institute now finds itself compelled to ask. Like the question of student life, the question of "communication" is a radical one that will lead us, if we debate it fully and candidly, to the root question of what kind of institution MIT wants to be.**

difficult not to interpret the denial of CI credit to my middle and upper-level classes as an invitation to drop all those time-consuming student essays from my syllabi, to give quick-grading true-false or short-answer exams rather than paper assignments, to read out prepared lectures instead of undertaking the much more laborious practice of trying to engage students in classroom dialogue – in short, to save time now "wasted" on improving students' writing and speaking. Instead of using the opportunity which the communication problem offers us to make humanities and other MIT disciplines partners in a common cause, such a plan would widen the gap between them, and it would encourage further declines, not improvements, in our students' communication skills.✢

[James Buzard can be reached at jmbuzard@mit.edu]

The Year 2000 Team

Y2K: Questioning the Questioner

Gayle C. Willman

"I'm not even sure that it's paved," the incredulous executive said, on receiving a form asking if his parking lot is "Y2K compliant." As related by the *Wall Street Journal*, the questionnaire asked, "Who is leading your Y2K efforts?" The executive, mocking the document wrote, "There are large rodents on the property who are in charge of our...Y2K efforts." In the margin he scribbled, "This is the best proof I've seen that the Y2K situation is a...scheme...to sell software."

The use of Y2K questionnaires has become a widespread practice. The occasional foolish inquiry may occur – and the leap from software to parking lot "Y2K-readiness" may seem odd. Yet most of MIT's parking facilities require card access, and magnetic card systems are known to be vulnerable to Y2K-related failures. Our questioning the card-reader vendor makes sense. Avoiding a parking lot traffic jam on January 4, 2000 is but one of many such issues that must be tackled over the remaining months of 1999.

Y2K questionnaires have been received by most departments within MIT. The proper handling of these documents is very important. In this column, these and related concerns will be discussed.

Y2K requirements have been made clear. Government research and contract sponsors, recognizing that data errors could impact a broad range of activities, have issued stringent regulations for Y2K compliance. Questionnaires are often used to follow up with researchers.

The Federal Acquisition Regulations (FAR), Section 39.002 requires that "...information technology accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date/time data with it."

A simple date example comes from Peter de Jager: "I was born in 1955 and if I ask the computer how old I am today, it subtracts 55 from 93 and announces I am 38. So far so good, but what happens in the year 2000? The computer will subtract 55 from 00 and will state I am – 55 years old. This error will affect any calculations that produce or use time spans." (*Computerworld*, September 1993)

It's easy to envision how time-span calculations in computer software can be impacted, and why sponsoring agencies would be concerned. Scientific data logging and analysis, financial calculations and process controls all use time-span calculations. For example, every time a data log is created or modified on a computer, it is date stamped. On a computer that is not Y2K-ready, a data log created on 12/30/99 will be considered 99 years newer than one created on 1/4/00.

> **The use of Y2K questionnaires has become a widespread practice. The occasional foolish inquiry may occur – and the leap from software to parking lot "Y2K-readiness" may seem odd. Yet most of MIT's parking facilities require card access, and magnetic card systems are known to be vulnerable to Y2K-related failures. Our questioning the card-reader vendor makes sense. Avoiding a parking lot traffic jam on January 4, 2000 is but one of many such issues that must be tackled over the remaining months of 1999.**

Embedded microchips, which have hard-coded instructions including date calculations, are also affected. Embedded chips are ubiquitous – found in scientific and medical equipment, security systems, elevators, and other devices. Where 2-digit dates have been used, there is a Y2K risk. FAR Section 39.002 applies to these devices as well. As mentioned in my last *Newsletter* article, MIT has retained embedded systems specialists to assess non-computer equipment, and to make recommendations on steps that can be taken toward Y2K-readiness. However, it is important to note, the repairs and testing of suspect research equipment is the responsibility of the individual research areas.

In the meantime, questionnaires have been received from sponsoring agencies

Y2K: Questioning the Questioner

Willman, from preceding page

by MIT researchers, to confirm the Y2K-readiness of sponsored projects. Questionnaires received from sponsors should be forwarded directly to OSP, and should not be handled by individual researchers.

Other questionnaires, from a variety of sources, have been received on campus. The standard response to outside inquiries is available at: <http://mitvma.mit.edu/mity2k/mitstatus.html#inquiries>.

Another aspect of the MIT Y2K effort involves other questionnaires: those being sent by MIT to our primary vendors and suppliers. Is our parking lot equipment Y2K compliant? Have our vendors recognized the Y2K issue? Have they taken steps to correct their processes? A minor disruption in a vendor's normal operations could have consequences on campus.

Suppose, in January 2000, an animal feed supplier becomes unable to deliver products because a scheduling system fails. The use of another type of animal feed would introduce a new variable into an ongoing experiment. What can be done?

Risk mitigation is the key. Questionnaires are being sent by MIT to the Institute's primary vendors and suppliers, to determine their ability to provide goods and services without interruption after December 31, 1999. An important additional strategy within research areas is to consult critical providers of goods and services for research projects, paying particular attention to those providers who are sole resources for essential products, materials, and service contracts.

In many cases, there are legal concerns behind the exchange of questionnaires and requests for assurances. Questionnaire authors seek to avoid costly computer breakdowns, dis-ruptions in the normal workflow, corruption of important data – as well as legal liability for Y2K-related failures. Because of the interconnectedness of our society, a Y2K-related failure in one organization could easily disrupt normal operations in many others.

According to a Palmer & Dodge LLP publication, "Behind all the remediation efforts, the specter of litigation looms. If the predictions are correct, Y2K litigation will be more costly and affect more businesses than any other type of litigation to date." Lloyd's of London and others have predicted that claims worldwide could exceed $1 trillion.

In response to the legal issues anticipated, a number of pieces of legislation have been, or are being considered by the U.S. Congress. The Year 2000 Information and Readiness Disclosure Act of 1998 (Public Law 105-271, 112 Stat. 2386), passed in October 1998, reduced risks involved when companies share information about their Y2K readiness. The act is credited with improving the information flow among companies. Prior to the act, organizations would often say nothing about their Y2K compliance status, rather than risk being wrong. Other proposed legislation includes moves to cap punitive damages and attorney's fees in Y2K litigation, and raise the plaintiff's burden of proof above the current standard.

The MIT Year 2000 Team was created to assist the entire MIT community in effecting a successful and uneventful transition from 1999 to 2000. The primary goal of the team's work, undertaken with the cooperation of the MIT community, is to minimize Y2K-related risks.

> **Risk mitigation is the key. Questionnaires are being sent by MIT to the Institute's primary vendors and suppliers... An important additional strategy within research areas is to consult critical providers of goods and services for research projects, paying particular attention to those providers who are sole resources for essential products, materials, and service contracts.**

MIT is committed to a goal of "no y2k-driven material systems failures or disruptions." (Material systems are defined as those required to support life, safety, security, and the environment on campus. Other vital systems may also be designated as "material.")

Detailed, up-to-date information is available at the MIT Year 2000 Team's site: <http://mitvma.mit.edu/mity2k/>. Team members are also available to make meeting presentations to departments, labs, and centers. Call 253-2000.

In the months to come, this column will address questions about individual preparations and frequently asked questions, as well as contingency planning and other work. Questions are welcome, and should be addressed to: <y2k-help@mit.edu>. ✣

[Gayle C. Willman can be reached at willman@mit.edu]

Toward a Master Plan
for Libraries' Space

Carol Fleishauer

*T*he MIT Libraries are creative partners in the research and learning processes. We select, organize, present, and preserve information resources relevant to education and research at MIT. We sustain these world-class resources and provide quality services on behalf of the present and future research and scholarly community. We build intellectual connections among these resources and educate the MIT community in the effective use of information. We want to be the place people in the MIT community think of first when they need information.

**Mission Statement
of the MIT Libraries**
March, 1999

A Revised Forecast

A decade ago, predictions that libraries would no longer be necessary by the end of the century, or that they would be totally digital, were not uncommon. Indeed, the use of networks to distribute information in digital forms has mushroomed over the course of that decade. Print has proven to be a useful and enduring medium, however. Instead of disappearing or migrating exclusively to digital, libraries have incorporated digital information sources into their services while at the same time sustaining traditional means of fulfilling their missions.

For example, the MIT Libraries currently subscribe to approximately 100 networked databases <http://libraries.mit.edu/lists/db-web.html> and 500 electronic journals <http://libraries.mit.edu/lists/ejrnls-short.html> with more on the way. We have experimental programs to provide course

reserve materials on the network and to accept electronic submission of theses. We provide a substantial and continually growing Website <http://libraries.mit.edu/> which presents information about library services and resources, and points to world-wide information resources related to disciplines of interest at MIT. None of this existed a decade ago, and yet these digital resources have not

supplanted, but instead have supplemented, our print resources.

In most cases, the electronic products the Libraries provide to the MIT community via MITnet are licensed by the Libraries for a finite period of time. The Libraries do not own these resources "in perpetuity" as they do books and journals. Therefore, even when these digital resources are identical to print resources, print continues to provide the important historical archive. In fact, even if the Libraries did own the digital versions, the challenges of maintaining the integrity of digital text and migrating it to comply with new technical environments are still not resolved to a degree that is practical and reliable for wide-scale use in archiving library collections. An article by Katie Haffner in the April 8, *New York Times*, "Books to Bytes: the Electronic Archive,"

(available through Lexis/Nexis on the Libraries' databases page) explicated these challenges.

Growth of Print Collections

The MIT Libraries' print resources continue to grow. Volumes held by the Libraries have grown 20% over the last decade and surpassed 2.5 million volumes at the end of the 1998 fiscal year. The acquisition of non-print

> **The Libraries currently provide over 300 computers for the use of library databases. In addition, there are several Athena clusters within the Libraries' space, comprising approximately 50 workstations. Many students and faculty prefer to come to the Libraries to use the networked resources at the same time they use other library resources.**

formats (microforms, maps, slides, recordings, and video) has grown at an even greater pace over that decade. The pie charts [next page] illustrate the composition of MIT's library collections. It should be noted that the only areas of print publication where digital publishing and/or distribution are a factor at present are in the categories "bound periodicals" and "standard serials." In all other categories, representing 63% of the Libraries' print volumes, electronic publishing is nearly non-existent.

Space Planning for the Libraries

Now that the turn of the century is imminent, there is every indication that our physical collections will continue to grow for several decades. Digital resources will not replace physical resources, at least in the foreseeable future, but will rather provide an

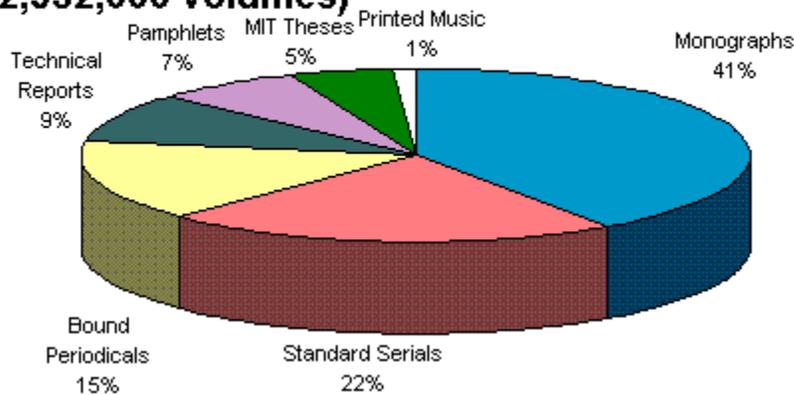### Toward a Master Plan for Libraries' Space
Fleishauer, from preceding page

additional layer of service. Faced with extreme space shortages for housing collections and making them useable, the Libraries will undertake a long-range space planning process. We want to use this process to build consensus regarding

library space issues and the place of the Libraries within the Institute's space-planning agenda. While the space issues related to housing collections have forced the issue, there are other compelling reasons to reconsider space allocation and configuration for library services.

**Digital Library
Space Requirements**

Even digital resources and services place pressure on the Libraries' space. The Libraries currently provide over 300 computers for the use of library databases. In addition, there are several Athena clusters within the Libraries' space, comprising approximately 50 workstations. Many students and faculty prefer to come to the Libraries to use the networked resources at the same time they use other library resources. In addition, the Libraries provide a large array of CD-ROM databases that are available only within the individual

libraries. As the digital component of the Libraries' services grows, we are experiencing significant infrastructure issues. Most of our libraries are not well equipped with data and power sources. Some libraries have concrete walls where

adding channels for data lines is exorbitantly expensive, and others are in buildings that have inadequate electrical supply. Even when data and power sources are sufficient, the only way to add workstations is to take space away from collections or from study areas, both of which are already very limited.

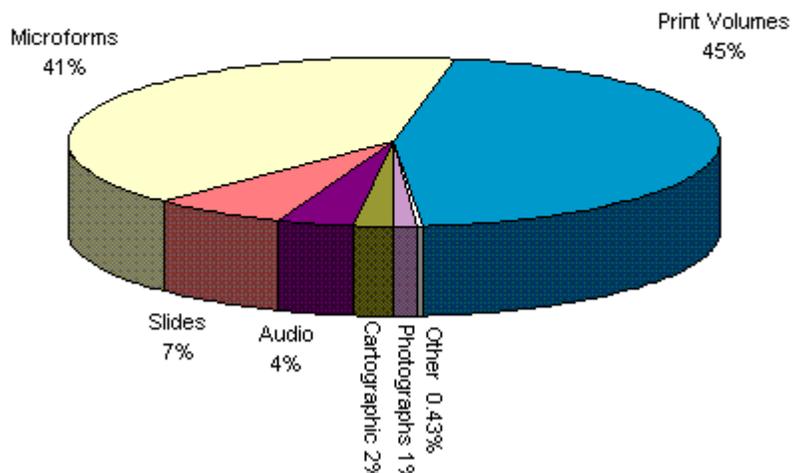**Task Force on Student
Life and Learning**

A master plan for the Libraries' spaces will further the goals of the Task Force on Student Life and Learning. The Libraries contribute in significant ways to all three elements of the education triad: academics, research, and community. Furthermore, the Libraries are places where formal learning and informal learning naturally come together; explicit attention to this in a planning process can result in spaces which facilitate that relationship.

Academics

There is growing recognition of and concern about the limited study spaces

MIT Libraries: Print Collections (2,532,000 volumes)

- Monographs 41%
- Standard Serials 22%
- Bound Periodicals 15%
- Technical Reports 9%
- Pamphlets 7%
- MIT Theses 5%
- Printed Music 1%

MIT Libraries: Total Collections (5,378,000 pieces*)

*Exception: Archival collections measured in linear feet.

- Print Volumes 45%
- Microforms 41%
- Slides 7%
- Audio 4%
- Cartographic 2%
- Photographs 19
- Other 0.43%

Toward a Master Plan for
Libraries' Space
Fleishauer, from preceding page

available on the MIT campus. While the Libraries provide the bulk of the available spaces, we provide seating for only 13% of the student body. Seating for 25% is the recommended standard. In addition, for the most part the Libraries' seating areas are far from ideal. Seats are primarily at large open tables, without partitions to block eye contact and reduce noise. Wired study spaces, or spaces where wireless technologies can be effectively implemented, are needed to support various uses of online resources in class projects. In addition, we need electronic teaching spaces where librarians can demonstrate the features of new digital databases, and, as the Task Force recommends, "assist students in acquiring lifelong skills in finding, evaluating, and using information" in an increasingly complicated environment.

Research

While the primary locale for research at MIT is the laboratory, the Libraries provide a secondary research locus for many and the central research focus for some. Graduate students constitute the Libraries' largest user group; many junior faculty and researchers are also heavily dependent on the Libraries. While the Libraries' collections provide solid support in most of the areas of research conducted at MIT, the facilities do not encourage their use. There are no cubicles or carrels for graduate students where they can have the quiet concentration required for graduate level research, or the ability to leave checked-out materials in a secure area and return to them later undisturbed. The journal shelving

areas that many graduate students and faculty rely on to keep current on topics of research interest have not kept up with the growth in journal titles. Space shortages have mandated narrowed selection which reduces the effectiveness of these areas.

Community

Improvements to space design could enable the Libraries' space to be an important factor in building community and the informal learning opportunities that the Task Force recognized as lacking. While our major Divisional Libraries were originally developed to serve MIT's five schools, in fact today most library users use at least three of the five Divisional Libraries. The individual campus libraries are places where students and faculty from various programs and disciplines come together on a daily basis. Planning should be designed to ensure that physical spaces are provided to capitalize on this proximity. Coffee and conversation spaces near the entry of some of the libraries would give students who come to the libraries for study and research

the opportunity for important informal contacts. Small meeting spaces could be used for book-talks and other cultural events. Exhibition spaces could highlight library collections related to topical interests. These are only the most obvious ideas; the planning process should provide opportunities to engender more creative ones.

Coffee and conversation spaces near the entry of some of the libraries would give students who come to the libraries for study and research the opportunity for important informal contacts. Small meeting spaces could be used for book-talks and other cultural events. Exhibition spaces could highlight library collections related to topical interests.

Usability of the Physical Collections

Most universities, faced with growing library collections and with the rising value of central campus real estate, have begun to use off-site storage for lesser-used library collections. The MIT Libraries, however, adopted this solution very early and have significantly more of their collections in storage than other university libraries. At the end of 1998, 24% of MIT's library collections were in storage: 473,500 volumes in Building 57, the Libraries' Retro-Spective Collection, and 137,500 volumes in Harvard Depository in Southboro, where we rent space because N57 is now full.

In spite of having such a large percentage of our collections already in storage, at the beginning of the 98/

Toward a Master Plan for Libraries' Space

Fleishauer, from preceding page

99 fiscal year, we came to the reluctant, but obvious, conclusion that we needed to accelerate our storage program. A 1997 shelf study showed that the Libraries' shelves were between 83% and 84% full, in the middle of an academic term, when circulation levels are high. In spite of the move of an additional 15,000 volumes to storage in 1998, there was a net addition of 22,500 volumes to shelves within our libraries. In *Planning Academic and Research Library Buildings*, the "bible" of library building planning, Leighton and Weber warn that 86% full should be considered "complete working capacity," adding that "new space should be available, not just planned for, by the time that figure is reached..."

At the beginning of 1998/99, we adopted a schedule for moving volumes from Science, Humanities, and Barker Libraries on a three-year cycle, with large moves equal to three years of acquisitions in every third year. We initiated this process in the Science Library this year, and subject specialists have spent many hours selecting volumes for storage. Those of you who regularly visit Hayden basement will have seen volumes with slips indicating we are planning to store them and inviting your comments. We have selected over 25,000 volumes, most of which will be moved this summer. Next fall, we will begin the same kind of review process in the Humanities Library.

While our staff strive to make decisions that will have the least possible impact on students and faculty, it is clear that this level of storage activity, on top of the 24% of the collection already in storage, will be consequential. Volumes are delivered from the RetroSpective Collection in 24 hours and from Harvard Depository in 48 hours, but many users simply give up instead of requesting retrieval. At best, the effect of having a high percentage of collections in storage is an interrupted research process and reduced effectiveness of physical browsing, which can play an important function in collocating scholarly resources.

The Planning Process

During the next year, the Libraries will be seeking ways to solicit faculty and student input into space planning directed toward improving our technical infrastructure, enabling the Libraries to be part of an enhanced student life and learning environment, and solving our significant collections housing issues. Over the course of the summer, we will gather and review pertinent data, define a series of formative issues and related planning principles, and develop a process for discussion and review. We look forward to engaging your interest in this process at the beginning of the next academic year. We will work closely with the Faculty Committee on the Library System (Andrew Whittle, Civil and Environmental Engineering, Chairperson) throughout the process. ✣

[Carol Fleishauer can be reached at fleish@mit.edu]

• • • • • • • • • •

The MIT Libraries are looking for a few classes who would like to assist in designing, evaluating, and testing an Electronic Reserves service this fall.

The Libraries' electronic reserve service will offer a convenient Web interface to materials placed on reserve for class use. Access to the materials will be limited to students registered for each class. Scanned journal articles, electronic files (such as Word documents or links to Web pages) lecture notes, practice exams or sample problem sets, and visual images can all be placed on electronic reserve. The virtual reserve collection will be available to students 24 hours a day, wherever they have access to the Web. The Libraries will handle all the scanning, file management, and copyright compliance.

We will be testing and refining a prototype of electronic reserves next fall; we are particularly hoping to find participants willing to contribute their patience, enthusiasm, and thoughtful suggestions to the development of this new service. For more information, please contact Nina Davis-Millis, 253-5652, ninadm@mit.edu.

New Financial Organization to Coordinate Institute Financial Systems

Janet Snover

With MIT's SAP financial system now installed across the campus and with Reengineering ending, the senior administration needed to determine how financial services would be provided in the future. Executive Vice President John Curry recently announced the formation of a new organization called Financial Systems Services (FSS) which will coordinate the development, delivery, and maintenance of effective financial systems for the Institute.

More specifically, FSS will continue to support the implementation of SAP; ensure that the software increasingly meets the needs of departments, labs, and centers (DLCs); keep MIT current in terms of installing the appropriate new versions of SAP and other related software; and work to integrate MIT's business processes.

FSS will be led by Charles A. Shaw, who has been the Institute auditor since 1988. His experience is in accounting and information systems as well as internal auditing. Staff in FSS will come from the Management Reporting Project (including the School and Area Coordinators), Information Systems, the Controller's Accounting Office, and Procurement. The new organization will report to Mr. Curry.

In order to meet the needs of the overall financial community at MIT, FSS must be sensitive to issues related to academic and research areas. One of the common themes expressed by administrators to the presidentially appointed "Listening Group" last summer, was that MIT was not doing a good job of coordinating all the new initiatives that were coming simultaneously at the DLCs. For example, in addition to SAP, there were other new systems to learn like COEUS from the Office of Sponsored Programs and Brio Query for using the Data Warehouse. There were also significant changes in

the ways that the Departments of Facilities and Procurement were providing administrative services to the community, and there was a complete reorganization of the Office of the Dean of Students and Undergraduate Education. Though all of these initiatives were important, community members felt overwhelmed by both the number and the timing of the changes.

To ensure that administrative changes will be paced more reasonably in the future, Vice President Curry has announced the formation of a Coordinating Council that will develop a comprehensive strategy for introducing new initiatives. The Council also will be charged with establishing effective feedback mechanisms with the community.

Mr. Curry will lead the Coordinating Council, whose other members include Provost Robert A. Brown, Vice President for Information Systems James D. Bruce, Controller James L. Morgan, Assistant Provost Doreen Morris, Interim Vice President for Human Resources Phillip L. Clay, FSS Director Charles A. Shaw, Community Involvement Leader Janet Snover, and Vice President and Secretary of the Institute Kathryn A. Willmore.

Here are some more details on the organization of Financial Systems Services. It will consist of the following teams: community support, procurement and labor distribution, infrastructure, and the financial team.

The *community support team* will serve as an important bridge between FSS and the MIT community. In addition to the School and Area Coordinators (a group of experienced DLC administrators), the team also will include training and documentation staff. Each of its members is committed to continuous improvement of central financial systems, increased community understanding and use of central databases and tools, and

customized service to the departments, labs, and centers.

The *procurement and labor distribution team* will support business processes for all of the Institute's requisitioning, purchase order, inventory, electronic commerce, VIP card, and labor distribution activities. The labor distribution system is a planning tool for DLC administrators to use in managing current and future salary commitments and related expenses for up to nine years in the future. It will help areas to more effectively manage and control their departmental salary budgets.

The *infrastructure team* will be concerned with issues like the connections between our SAP and non-SAP systems, data exchanged with internal and external business partners, MIT's SAP development and documentation standards, and technical support on programming.

The *financial team* will work on business processes related to external and internal accounting and reporting. These activities include the following: financial applications such as general ledger accounting, accounts payable and receivable, travel, funds management, and cost accounting and sponsored billing. The financial team also has responsibility for business authorizations, testing and quality assurance, and cost object master data.

The FSS teams will focus on utilizing standard modules of SAP, supplemented by customized applications to serve the varied needs of the MIT community.

The combination of longer-range planning by the Coordinating Council, continued support to users by Financial Systems Services, and effective feedback methods should help to ensure ongoing improvements to these services for both the DLCs and the central administration. ✣
[Janet Snover can be reached at jsnover@mit.edu].

M.I.T. Numbers

from the: MIT Alumni Survey

Importance in Current Life of:
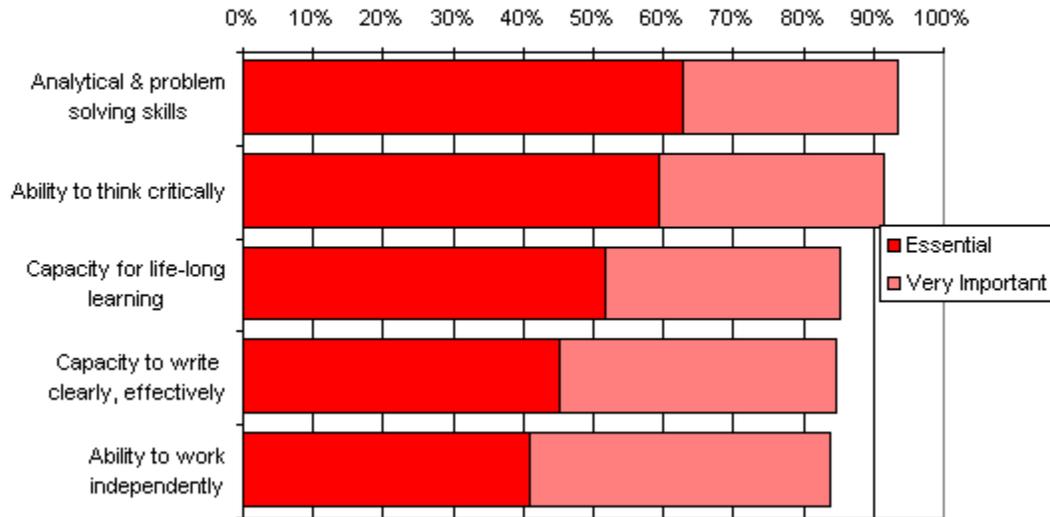
MIT's Contribution to Development of:
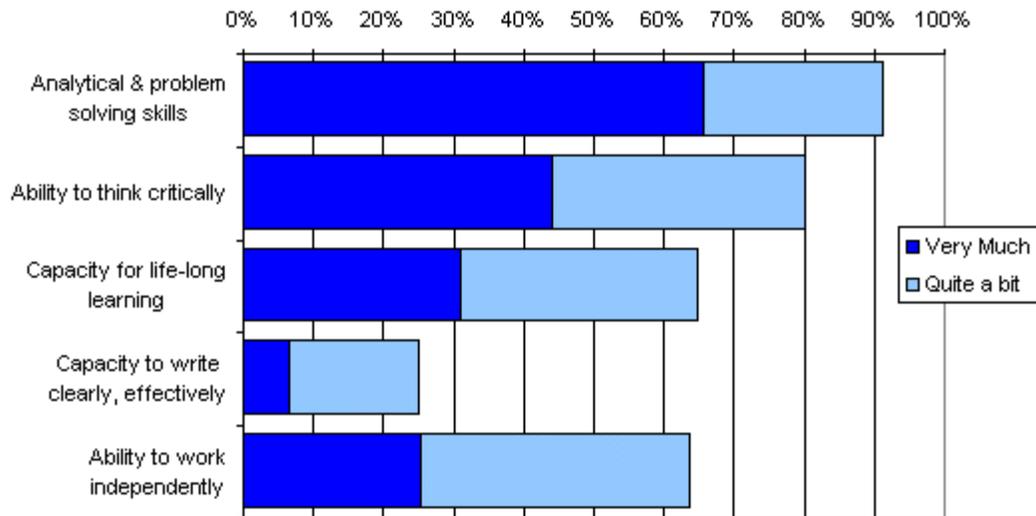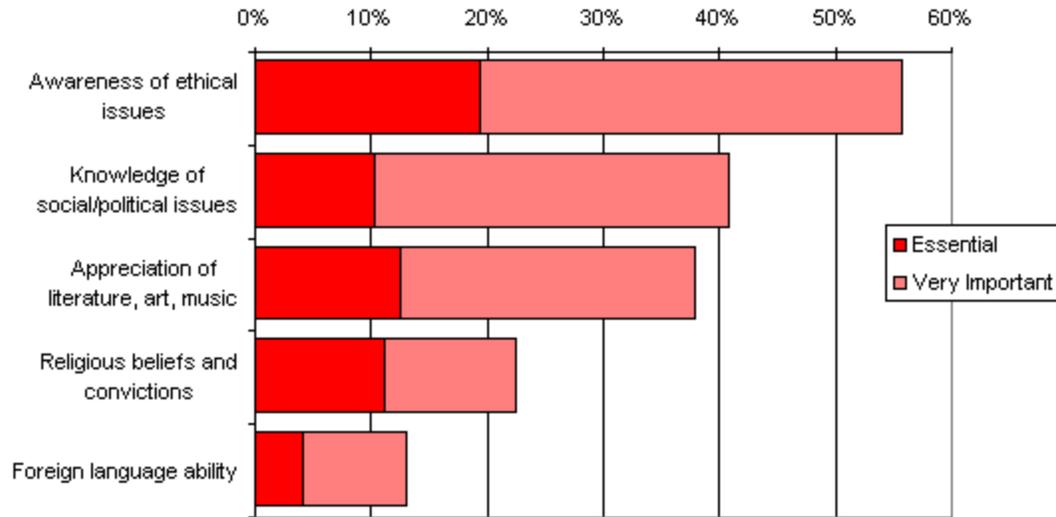

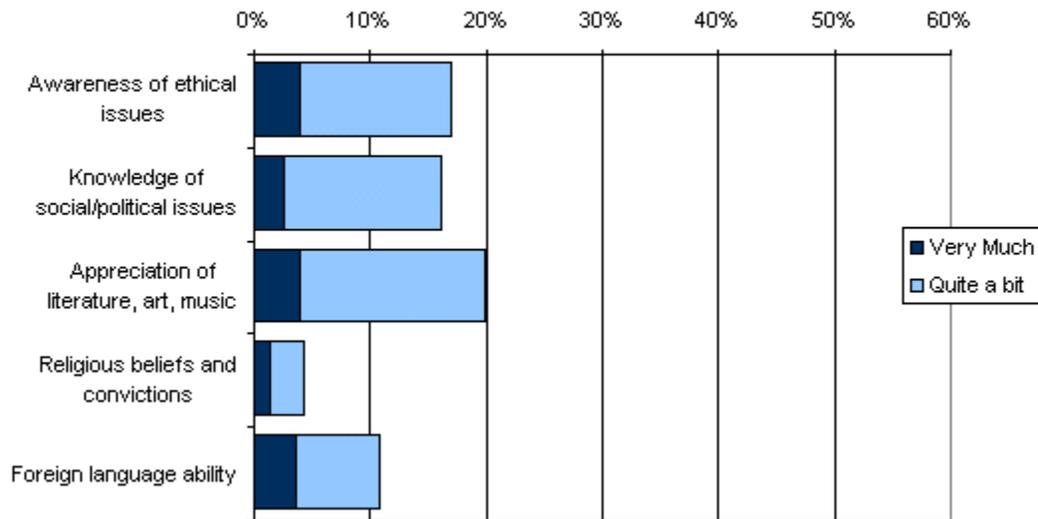**Source:** MIT Planning Office

M.I.T. Numbers

from the: MIT Alumni Survey

Importance in Current Life of:

MIT'S Contribution to Development of:

Source: MIT Planning Office