

Report of the NEASC 1999 Evaluation Team

Report to the Faculty, Administration, Trustees, Students of the Massachusetts Institute of Technology, Cambridge, Massachusetts by an [Evaluation Team](#) representing the [Commission on Institutions of Higher Education of the New England Association of Schools and Colleges](#)

This report was prepared after study of the institution's [Self-Evaluation Report](#) and a visit to the MIT campus on November 7-10, 1999. The report represents the views of the evaluation team as interpreted by the Chair; it goes directly to the institution before being considered by the Commission. It is a confidential document prepared as an educational service for the benefit of the institution. All comments in the report are made in good faith, in an effort to assist the Massachusetts Institute of Technology. They are based solely on an educational evaluation of the institution and the manner in which it appears to be carrying out its educational mission.

At the invitation of the New England Association of Schools and Colleges, MIT has prepared a [Response to the Evaluation Team Report](#).

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I. Introduction

The team appointed by the Commission on Institutions of Higher Education of the Northeastern Association of Schools and Colleges (NEASC) visited the Massachusetts Institute of Technology (MIT) from November 7-10, 1999. The names and addresses of the team members are listed in Appendix I. The team was charged to make a recommendation concerning accreditation. This was a 10-year review.

This report is based upon selected reports and publications, including a thoughtful [Institutional Self-Study Report](#) provided by MIT, as well as extensive discussions that the team had individually or in groups with members of the MIT student body, faculty, administration, and trustees. The formal meetings are described in the team agenda, found in [Appendix 2](#).

The team found the members of the MIT community to be proud of their institution, willing to discuss its strengths and weaknesses, open, and objective in their approach to problems. We are grateful to them for the courtesy shown to us, their willingness to spend considerable time helping us achieve our mission, including providing extensive written materials, formal presentations, and many impromptu discussions.

Our team included a former student at MIT, some members who had visited the institution, and others who were on campus for the first time. All knew of MIT through reputation, but several learned a great deal about its distinctive culture during our visit. We all came away with a deeper appreciation of its mission, its goals, and its quality.

Before discussing each of the criteria relevant to reaccreditation, we note that like much of academia, MIT continues to change and adapt to serve its mission and purpose. The current Chairman of the Corporation now serves part-time instead of full-time. The President has chosen a modified top administrative structure that has been in position for just one year. The Institute has just announced the public phase of a major fund-raising campaign that is designed to strengthen its physical facilities, improve its students' life, and bolster its endowment. The Institute has recently announced major agreements of cooperation with universities overseas, in Asia and in England, and has also initiated a program of corporate research partnerships. In short, MIT is a dynamic institution, testing new initiatives, procedures, and arrangements to become even stronger. This dynamic seems to us most appropriate for a leading US research university, which surely MIT is. Such change can cause uncertainty and unrest among members of any university. While we detected such feelings among some in the MIT community, we also noted a virtually universal pride in the Institute's achievements to date, pride in the education offered and received, as well as pride in the research accomplishments that have served both MIT and the nation so well.

II. Mission and Purposes

MIT has a clear and definite mission statement, found in its [Institutional Self-Study Report](#) (Section III) and in its catalogue of courses of instruction. It is reproduced here.

"The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century."

The purposes and commitment follows:

"The Institute is committed to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges. MIT is dedicated to providing its students with an education that combines rigorous academic study and the excitement of discovery with the support and intellectual stimulation of a diverse campus community. We seek to develop in each member of the MIT community the ability and passion to work wisely, creatively, and effectively for the betterment of humankind."

The accreditation team found these statements about MIT to be exemplary; not only are members of the Institute familiar with them, they seem to be genuinely trying to accomplish the mission and purposes.

III. Planning and Evaluation

The NEASC standard on Planning and Evaluation requires that the institution undertake systematic and comprehensive planning to assure that its mission can be accomplished in light of internal and external opportunities and constraints. The standard also requires that the institution evaluate its effectiveness in achieving its mission and purposes. Our Committee finds at MIT both lively and effective processes for these purposes.

We were impressed with the role of the Corporation in planning and evaluation, particularly through the Visiting Committees. MIT seems to have found an effective way to involve trustees and outside experts in periodic and meaningful program reviews. Members of the Corporation report that their service on the Visiting Committees is very satisfying, and these committees seem to be taken quite seriously throughout the Institute. The members of the Corporation with whom we spoke were very enthusiastic and unusually well informed about the institution. The Executive Committee of the Corporation and the senior administration are also developing a long-term financial plan, based on clearly stated assumptions and measures, to assure the Institute's future.

The President has created the position of full-time Chancellor with a major responsibility for planning and institutional research. The President and his team are able to articulate certain specific priorities for the immediate future. These include strengthening certain academic programs, particularly environmental sciences, the neuro-sciences, and those programs at the intersection of the physical and life sciences. There is also much attention being given to student life and learning, with a particular emphasis on the need to create a stronger sense of community among members of the MIT community. Other priorities include the need to find new sources of support for graduate students and to renovate and replace facilities. Each of these priorities is reflected in the \$1.5 billion capital campaign. We note that the Chancellor, the Provost, and the Executive Vice President seem to be forming a close and effective partnership that brings close coordination among academic, financial, and capital planning.

The Chancellor chairs the Committee for Review of Institute Space Policy (CRISP). This committee determines space allocation and priorities for new construction, renovation, and maintenance. This committee's charge and *modus operandi* have recently changed appreciably, and are not fully understood yet by the faculty and lower levels of administration. As we understand it, plans that bubble up from the departments and research units are prioritized as to their academic impact related to their fiscal consequences.

For academic and research units, the strategic planning cycle has been separated from the annual budget cycle, in an attempt to get more imaginative long-term academic and research plans. This is intended to keep the five-year planning cycle from becoming routine and should increase the importance of the strategic plans when they are produced. It is not clear to us how annual budget allocations will be made in light of the five-year plans, but we recognize that the system is new. We expect the new Planning Committee will develop ways to make short-term decisions against the backdrop of the five-year plans and then will articulate to the campus how the connection between the two planning cycles will operate. This knowledge will further reinforce the importance of the five-year plans.

Federal research support has represented a larger percentage of MIT's annual budget than is the case at most other research universities. The decline in such support has led to concerns about the future of the Institute and has opened the door to serious conversations about future priorities and structures. Much attention has been given to building new sources of long-term support, to improving efficiency and the management of costs, and to seeking new kinds of alliances with corporations, academic institutions, and even foreign governments. In each of these three areas, major initiatives have been undertaken that derive from a strong sense on the part of the senior leadership that the MIT of the future may be quite different from the MIT of recent years.

Good planning should define not only those things that the institution will try to accomplish, but also should be a guide to saying "no" to certain possibilities. The MIT leadership plans neither faculty nor undergraduate student body growth, and expects the Institute to remain focused on its historic strengths in science, technology and management rather than to invest

heavily in new fields. The student body is expected to remain intensely residential. These objectives are especially important in guiding choices from among an increasingly large and divergent set of potential opportunities.

It seemed to us that faculty members take part in the planning process primarily at the departmental and laboratory level and on administrative committees. The Faculty Policy Committee told us they were not as involved as they would like in discussions about the future of the institution and its relevance to academic policies and priorities. When suggestions arise from the Policy Committee, the means by which the Committee can engage the administration's planning process are also somewhat unclear, even though the Chair of this committee sits on the Academic Policy Committee. The Committee clearly appreciates its periodic discussions with the President, the Provost, and the Chancellor. This trio may wish to make greater use of the Faculty Policy Committee as a sounding board during the planning process and even while setting priorities.

We encourage the Institute to build its capacity to gather and assess data relevant to planning and evaluation. While it is clear that the MIT culture places great value on evidence and analysis, we saw less evidence that data was guiding the planning process than one might expect. Bench-marking and comparative data among institutions can provide useful insights and raise important questions, even though MIT differs from most comprehensive research universities. As the new computer system is developed, it should be easier to get better internal data that will aid the planning process as well.

In planning land acquisition for future expansion, MIT looks ahead up to forty years. This happens in every five-year capital budget cycle. Their experience indicates that the time from gestation to occupancy of major buildings is about fifteen years. In the Capital Plan, we saw imaginative plans for new campus development that will improve the capacity and architectural beauty of MIT. These plans have been developed in conjunction with the financial campaign just publicly announced and are already partially funded. They relate to on-campus academic and research structures as well as to on-campus student residences. They are ambitious, as is the time schedule for final design and construction. We have some questions about the cost estimates we were given, especially on some of the more daring architectural designs. We also believe the current capital plan does not give sufficient priority to critical deferred maintenance problems faced by the older buildings. However, the planning process seems strong, and the questions we raise are uncertainties that the appropriate people at MIT share.

The products of planning include, among other things, specific plans. We reviewed plans in a few areas during the course of our review. The [report of the Task Force on Student Life and Learning](#) was the centerpiece of our accreditation review, and we found it to be an example of very thoughtful and comprehensive planning. The Task Force asked some very basic questions about the nature and purpose of an MIT education, considered a broad array of data, and its examination extended to many parts of the Institute. We understand that this plan will lead to more specific recommendations in the coming months, but we find it, as well as the parallel student report, to be a good basis for decision-making and implementation (as is discussed in more detail below).

These comments are meant as helpful observations against a much larger sense of approval for MIT's planning process. Many people with whom we spoke share a sense that MIT is at an important moment in its history. Decisions are being made that will affect the Institute for years to come. Some of these decisions appear to be opportunistic, but our team found an appropriate backdrop of good planning that seems to be informing these decisions.

IV. Organization and Governance

The organization and governance of the Institute are appropriate to its mission. The Institute's charter is comprised of various acts and resolves of the General Court of Massachusetts that incorporated the Institute in 1861. The Corporation as the Institute's board of trustees holds a public trust to ensure that MIT adheres to the purposes for which it was chartered and that its financial resources are carefully preserved to support both current and future needs. The Corporation and its committees have responsibility for reviewing and providing guidance on strategic directions, approving annual budgets, exercising overall fiduciary responsibility, approving the establishment of new degree programs and courses of study, awarding degrees, and electing the President and other officers. It is also understood that trustees are expected to represent the interests of MIT to outside constituencies and help generate financial support for the Institute.

The Institute's chief executive officer is the President. The Provost, Chancellor, and Executive Vice President report directly to the President. Senior officers concerned with the overall administration of the Institute, including the Deans and the elected Chair of the Faculty, constitute the Academic Council, which is chaired by the President and meets weekly during the academic year to confer on matters of Institute policy.

The composition of the Faculty of the Institute is defined in the *Rules of the Faculty*. The officers of the Faculty are its elected Chair, Associate Chair, Secretary, and, *ex officio*, the President of the Institute, who is President of the Faculty. The Faculty determines educational policy for the Institute. The Faculty meets each month during the academic year to consider such matters as educational policy, methods, curriculum, and degrees, both undergraduate and graduate. The Faculty develops and carries out policy through its elected Standing Committees, including Committees on Academic Performance, Corporate Relations, Curricula, Discipline, Faculty-Administration, Graduate School Programs, Library System, Nominations, Outside Professional Activities, Student Affairs, Undergraduate Admissions and Financial Services, and Undergraduate Program. The Faculty Policy Committee, which is chaired by the Chair of the Faculty and includes eight additional faculty members, two students, and two nonvoting members designated by the President and the Provost, maintains a broad overview of the Institute's academic programs and coordinates the work of the Faculty Committees.

Students are actively involved in the governance of the Institute. They serve on many of the Faculty Standing Committees and are regularly consulted on a broad range of issues. The MIT Undergraduate Association and the MIT Graduate Student Council serve as liaisons between students and MIT faculty, staff, and administration.

Strengths:

- The 78 members of the Corporation are exceptionally knowledgeable about the Institute. They have a deep understanding of both the academic and financial attributes of the Institute, and they seem passionately committed to its success. Some 30 Corporation Visiting Committees regularly evaluate the work of the Institute and keep all members of the Corporation fully apprised of its progress. These Visiting Committees are particularly important in ensuring the engagement of the members of the Corporation and the long-term excellence of the Institute.
- The senior officers of the Institute, including the President, Provost, Chancellor, and Executive Vice President, constitute a highly talented, energetic, and dynamic leadership team. They bring exceptional creativity and commitment to the management of the Institute. They not only seem to be functioning well as a team, but also provide internal support for one another.
- The Faculty Council and its committees provide leaders among the faculty an opportunity to meet with the administration and comment on the operation of the Institute.
- Students are well represented in the Institute's governance process. They participate as active members of all appropriate Faculty Standing Committees, and they are treated by faculty in this process with a high level of respect and consideration.

Suggestions:

- In 1998, the President divided the responsibilities traditionally associated with the Office of the Provost between the Provost and the Chancellor, a newly configured position. In this new structure, the Chancellor coordinates Institute-wide educational programming at both the graduate and undergraduate levels, manages and develops the Institute's large-scale institutional partnerships (both industrial and international), and has a major role in long-range strategic planning for the Institute in education, research, and campus development. This restructuring was deemed necessary because the President concluded that the traditional responsibilities of the Provost at MIT can no longer satisfactorily be managed by a single individual. The initial reaction to this restructuring has generally been positive, and the Provost and Chancellor work together in a collegial and supportive manner. However, this reconfiguration has created some uncertainty among faculty and other administrators about appropriate lines of authority and responsibility. These issues should be carefully monitored, managed, and where necessary, clarified by the President to minimize future problems.
- A central tension in the Institute concerns the dichotomy between "centralization" and "decentralization." In many respects, the Institute is highly decentralized with unusually autonomous schools and departments. At the same time, the "central" Administration, represented by the President, Provost, Chancellor, and Executive Vice President, seems to have primary authority for setting Institute-wide priorities and for allocating Institute-wide discretionary resources. Such a bipolar structure seems to have generated some uncertainty about the appropriate locus of authority and responsibility between the "central" Administration on the one hand, and the schools and departments on the other. The Deans provide the interface between the central administration and the departments, and may have less influence at MIT than at comparable other institutions. This team had too short a time to be certain about some of these observations, but our collective experience teaches that it is important to ensure that lines of authority and responsibility are clearly understood and that faculty members have appropriate input into important decisions concerning Institute-wide matters.

A particular example of the problems created by this tension between central and departmental administrations relates to the roles of the Dean of Students and Undergraduate Education and the Committee on Undergraduate Program. As the Institute has clearly and correctly recognized, there are problems in the freshman-year core curriculum and experience. At least part of the reason for these problems seems evident. As the Institute is now structured, the departments generally take responsibility for the majors and for the upper-class curriculum, but as we understand it, there is no individual or faculty governing body with direct responsibility and authority for the core curriculum. No person or body has been tasked to monitor course content, workload imposed on students, and other factors that impact the freshman academic experience. If the Institute is serious about addressing the problems of the freshman year, it might well consider significant changes relating to these issues, as well as those associated with residence life. For example, the Institute might:

- (a) Appoint the Dean of Students and Undergraduate Education or a highly respected faculty member to chair of the Committee on Undergraduate Programs,
- (b) Charge the Committee on Undergraduate Programs with the responsibility for the core curriculum, and
- (c) Provide the Dean of Students and Undergraduate Education and the Committee on Undergraduate Programs with substantial discretionary resources with which to support innovation and excellence in undergraduate education. In any case, provide additional staff to support the administrative functions of the Dean in order to free the Dean's time to oversee academic matters.

We note in this regard that in the 1989 NEASC accreditation report, the visiting committee applauded the Institute for establishing "the new position of Dean of Undergraduate Education ... to provide leadership and influence in reshaping undergraduate education." The 1989 committee particularly praised "the arrangement whereby the Dean of Undergraduate Education has an annual budget to support and encourage imaginative initiatives in subjects, departments, and schools." This report furthermore suggested that the Institute "continue to support and strengthen the role of the Dean of Undergraduate Education, considering especially...the desirability of reinforcing the influence of the Dean in tenure and advancement decisions, in budget review and allocation, and in establishing campaign priorities for the support of undergraduate education." These recommendations strike us as reasonable in 1999 as they struck our predecessors a decade ago in 1989, and we encourage the Institute to consider them seriously.

One issue that does not appear to be addressed adequately either at the level of the School or by the strong departmental structure is the ability to shift teaching resources to meet changing enrollment pressures. This means that the work loads for faculty may differ widely between departments within a single School or between Schools. The most visible examples at present are the enrollments in Computer Science in the Electrical Engineering and Computer Sciences department and the student demand for courses in management and finance in the Sloan School. Both to insure that some faculty do not end up with teaching loads that adversely impact their ability to conduct research and also to insure that MIT as a whole can meet its commitments to freedom of choice for its students, the Institute should devise ways so that faculty teaching can be more easily directed both within and across Schools to high demand areas.

As noted above, students are actively involved in the governance of the Institute. Despite (or perhaps because of) this unusual level of engagement in MIT governance, students we met expressed strong disaffection with the President's decision to require all freshmen to live in MIT residence halls. We understand that since our visit, the Chancellor has issued a report entitled *The Design of the New Residence System*, and has met with a large number of students (reportedly filling a large lecture hall) to discuss this report. The chair was told that the Chancellor received an ovation from the students at the end of the meeting. This report is available for anyone to see on the MIT web site. It provides a clear overview of what now exists, a history of how it came to be and how it is still evolving, and the system design as now contemplated, with many details left to be worked out among students, faculty, and administration. It seems to address most of the "hot buttons" we were told about in a satisfactory way, and shows that MIT is engaged in a mature, consultative process to solve this problem.

V. Programs and Instruction

The Institute offers a wide array of academic programs at both the undergraduate and graduate levels. It is organized into five academic schools: the School of Architecture and Planning, the School of Engineering, the School of Humanities and Social Science, the Sloan School of Management, and the School of Science. The Whitaker College of Health Science and Technology also offers degrees jointly with the Harvard Medical School. MIT offers 22 undergraduate degree programs and an extensive array of graduate level programs leading to the masters and doctoral degrees. All degree programs are consistent with MIT's stated mission, and degree requirements are clearly stated and published in print and on the Internet. MIT has a long history of continuous academic planning and periodic evaluations to guide the evolution of the academic elements of its programs and the allocation of resources for their support. All programs are designed to allow the student ample opportunity for reflection and analysis of the subject matter.

Undergraduate Degree Programs: MIT's undergraduate degree programs provide students with a substantive and coherent introduction to the broad areas of human knowledge, their theories and methods of inquiry, plus in-depth disciplinary or interdisciplinary courses of study beyond the introductory level. Each program includes a coherent and substantive general education requirement with an appropriate balance between the arts and humanities, the sciences, and the social sciences, and requires a major or concentration requirement. A key feature of these programs is a growing emphasis on preparing MIT graduates to communicate both orally and in writing and to understand the historical and ethical relationship between technology and society. The intent is to provide each MIT graduate with the ability for scientific and quantitative reasoning, for critical analysis and logical thinking, and the desire for continued life-long learning.

Undergraduate Core: An unusual aspect of an MIT education is the consistency of the mandatory core program that is designed to provide the mathematics and science base that forms the foundation for the student's election of a program beyond the core. This approach has certain disadvantages. There is a lack of flexibility in the first year program, and a very high percentage of the core is taught in a large class format. MIT, in its Report of the Task Force on Student Life and Learning, has called attention to these issues: "One problem with the current undergraduate curriculum is the perceived lack of student enthusiasm and excitement in the first-year program. Many students who come to MIT with exciting goals and ambitions rapidly become disillusioned about the education they receive here. There are, undoubtedly, multiple explanations for first year cynicism. For some, MIT represents the first exposure to hard work. For others, the steady flow of problem sets presents a stark contrast to their expectations of working on interesting projects and to the dreams they came to MIT to fulfill. Many students have few opportunities to overcome their initial perception that MIT is about drudgery and requirements rather than the thrill of discovery and progress." The Task Force has made a number of recommendations that would encourage experimentation in the general education requirement.

Leadership: MIT has embarked upon an ambitious effort to enhance the leadership, management, and teamwork skills of its students in order to prepare them well for the corporate world most will enter. The Sloan School of Management's commitment to maintain a tight integration of its programs with the rest of MIT is reflected in the popularity of its undergraduate Management Science Course XV and in its recent efforts to make an undergraduate minor in management available to all MIT undergraduates. Formalized programs such as Leadershape are reaching increasing numbers of students each year, showing that MIT understands that particular attention should be given to this growing need of MIT graduate and undergraduate students.

Humanities and Arts: A recurring theme, echoed by undergraduate and graduate students alike, is their desire for an MIT education to pay more attention to the humanistic aspects of their development into a well-rounded person. The students we met would welcome a greater emphasis within the Institute on the performing and visual arts, including a greater organizational visibility, as well. The "faculty of arts" is currently composed of faculty in various departments and overseen by an Associate Provost. Many members of this "faculty" have not even met each other and "students unify the program." We understand that at the end of this year, the appropriate faculty members will be united in the School of Humanities, Arts, and Social Science. These faculties can have a critical role in addressing the breadth of experiences and expectations of MIT students.

Undergraduate Research: A remarkable number of MIT undergraduates participate in undergraduate research opportunities. In the School of Engineering, for example, 80 percent of the students elect one of the Undergraduate Research Opportunity Program (UROP) experiences, which provide close engagement with faculty. The UROP not only exposes undergraduate students early in their careers to research, but also provides a diversion from the pressures of formal course work, especially for students able to participate in their freshman year. The ability of some incoming freshman to "get connected" during summer courses before entering laboratories in which to do UROP's is admirable and should be encouraged and assisted. Much of the UROP is "taught" by upper-level undergraduate student, and more faculty input would be beneficial. To encourage this, increased recognition and reward of active faculty participation in the UROP should be explored.

Admissions: MIT's admissions system and financial aid policy are presented with clarity, brevity, accessibility, and friendliness in the Institute's Application, a document that conveys the informality of the school. The tone of the approach is reassuring: students are encouraged "to present yourself, your abilities and your goals as fully as possible, and to consider carefully what you'd like us to know about you that test scores and transcripts won't reveal." MIT attempts to assess and quantify personal qualities in three arenas that MIT believes will contribute to a student's success at MIT: initiative, resilience, and risk taking. This reflects a strong connection between MIT's mission and goals and its admissions process. MIT's presentation of itself conveys the impression that the individual and the individual's capacity for innovation are prized. MIT uses a network of alumni interviewers in a mode that is as much recruitment as it is evaluation. The admission system is effective. The quality of MIT's entering undergraduate students is among the most accomplished in the nation. In 1999, MIT admitted 1744 students, about 19 percent of its 9138 applicants. This group had a mean verbal SAT score of 714 and a mean math score of 756. Of the admitted group, 1048 or 60 percent enrolled at MIT with mean verbal score of 702 and mean math score of 752, providing a very talented freshman class.

Diversity: MIT's achievement in creating significant diversity is notable, and is the product of an intense recruitment effort, which involves both outreach and bringing students to the campus. For each of the last four years, the entering class included either 17 or 18 percent underrepresented students. The class of 1999 included 71 African Americans, 62 Mexican Americans, 29 Native Americans, and 22 Puerto Ricans for a total of 184 students. In addition to these students from historically underrepresented groups, there were 270 Asian Americans in the class of 1024 students. MIT is also justifiably proud of its record in recruiting women: over 40 percent of MIT undergraduates are women this academic year, and almost 26 percent of MIT graduate students are women.

Retention: MIT's ability to retain and graduate its students is also impressive. In recent years 97 percent of first year students have returned for their second year, and six years after enrolling, over 91 percent of MIT students have graduated, an especially notable fact given the rigor of the program.

VI. Faculty

MIT is blessed with an extraordinary group of faculty who excel by almost any measure of performance. As world leaders in their fields, faculty members exemplify MIT's overall culture of intellectual achievement through the quality and reputation of their research as well as through their ability to attract support for their work from governmental sources and from the private sector. The overall vibrancy of the Institute stems in no small measure from the ability of the faculty to work together effectively within their departments as well as across departmental boundaries, and to forge research alliances through the Institute's many research centers and laboratories.

The five Schools within the Institute serve as administrative structures for aggregates of related disciplines, but the primary environment within which most Institute faculty work is their department. Departmental structure is strong, and department heads have primary control of and responsibility for the curriculum, teaching assignments, salaries, and other resources that support faculty work. Most faculty members are hired into the traditional tenured or tenure-track ranks of Assistant, Associate, and full Professor. While faculty filling these positions do both teaching and research, the Institute also maintains categories of research faculty, whose salaries are paid largely by externally sponsored research grants and contracts, and a category of Lecturers and Senior Lecturers, whose responsibilities center upon teaching, advising, and program administration. Standards of performance and requirements for promotion are set by individual departments, and promotion recommendations are reviewed at the level of the School and Institute-wide. Although concerns were raised by faculty members at every level about the pressure and demands placed on junior faculty, mentoring programs for them are the accepted norm throughout the Institute.

The Institute has recently undertaken an important, systematic review of the status and working conditions of its women and underrepresented minority faculty. This effort was initiated at the request of the women faculty within the School of Science and was embraced and supported by the Dean of Science. It was carried out with care and sensitivity. Building on its experience in the School of Science, the Institute has now extended the review to its other Schools. The overall effort has led to the correction of many of the factors that were working against the effective performance of the Institute's women and minority faculty, and the publicity surrounding the effort has put MIT into a national leadership role on these issues. The Institute is to be commended for its openness and forthright approach to this set of important and sensitive issues.

A significant strength of the Institute is the "One-ness Principle", which commits *all* faculty to participating in both undergraduate and graduate teaching. This means in principle that all undergraduates have the benefit of being instructed by and working with the most distinguished and productive senior researchers as well as with more junior faculty. It also means that the faculty resources of all the schools within MIT are accessible to all undergraduate and graduate students. However, with current limitations on enrollment in the Sloan School, this does not seem to be the case in practice. Faculty members appear to have a genuine commitment to teaching and to educational innovation, and students at all levels express a general satisfaction with and appreciation of the quality of the educational experience they have at MIT.

The Institute has recently committed itself to improving the quality of the campus community and to providing greater integration of academic and student life programs for undergraduates. However, many faculty members do not generally appear to have significant interactions with students outside of academic contexts. Members of both faculty and administration expressed concern about whether faculty members have either the time or incentive for such interactions. The success of the Institute's initiatives to create integrated living-learning environments for undergraduates will depend critically on its ability to extend the One-ness Principle to matters of community as well as to instruction. Similarly, the Institute's ability to improve the quality of the undergraduate first-year experience, in terms of teaching, advising, and student life, will also depend on imbuing faculty members with a sense of the importance of these activities. This may require creation of a set of explicit faculty incentives (e.g., including valuing such activities in the criteria for promotion, or counting advising and Freshman Advising Seminars as part of the teaching load) to contribute to them.

The Institute employs the services of upwards of 600 graduate student teaching assistants (TA's) each year whose main duties include the holding of office hours and the grading of problem sets, exams, and other written work. However, in some

departments TA's are being used in increasing numbers to staff recitation sections. The orientation and training of graduate students as teachers appear to be quite variable across departments, ranging from no training to intensive "boot camps" at the beginning of each academic year. MIT might consider an Institute-wide standard for the training of graduate teaching assistants, a standard that might be different for graders than for TA's who do significant amounts of undergraduate teaching. While the nature of such training will necessarily be discipline-specific, it will be necessary for the Institute to provide sufficient staffing and programmatic funds to the Teaching and Learning Laboratory in order that it can support and assist departments in developing their own TA training programs.

One of the key issues identified by faculty, students, and administrators that affects the quality of the undergraduate experience is that of "pace and pressure," the intensity of the learning experience sometimes characterized as "drinking from a fire hose." While the intensity of the academic experience is one of MIT's great strengths, it was also identified by many as having negative consequences for many students and for the quality of community life in general. The Institute will want to consider carefully the extent to which it wishes to change such a key component of its culture and success. However, one element that was identified by all campus constituencies as contributing to excess pressure is the propensity of some faculty members to violate the faculty's own Rules and Regulations in assigning work or examinations to students. At present, the Chair of the Faculty spends significant amounts of time, with very little leverage, mediating and correcting such violations. As a way of improving the undergraduate experience, the Institute may wish to consider establishing departmentally based procedures and penalties to correct faculty violations of such rules.

VII. Student Services

The Institute placed special emphasis on Student Life and Learning for this accreditation visit.

The [Task Force Report of Student Life and Learning](#), [The Student Advisory Committee Report](#), and [the Institute's Response to these Reports](#) are all thoughtful documents with a careful approach to community issues facing the Institute in both the near and long term. Many of the recommendations will have ramifications in what are normally considered student services on peer campuses. These services include, but are not limited to, student housing, dining, athletics, counseling, and providing facilities for student organizations.

Surveys show that students have remarkably high levels of satisfaction with current residence arrangements; however, such satisfaction does not mean that some other arrangement might serve both their developmental and educational interests better. Some students would like more convenient access to athletic facilities, and this we understand is being addressed. Food service is not up to MIT's high standard in terms of quality or cost-effectiveness; more on this below. It is clear that the Institute is in a period of transition and has some unique opportunities in the near future to refocus efforts in the provision of student services.

Strengths:

- Many extra-curricular opportunities are available to students. Students are involved in everything from community service to intercollegiate sports competition while maintaining a demanding academic schedule. There appears to be agreement that if an opportunity does not exist within the current range of clubs and organizations, there is sufficient flexibility to create a new organization without much difficulty.
- Students feel a strong sense of personal loyalty and identity with their living groups. The orientation program and the pre-orientation programs have been modified to provide additional small group experiences for students and opportunities to build connections with the broader MIT community beyond the living groups.
- There is an institutional commitment to the whole person as evidenced by the physical education requirement and the high levels of participation in recreation, club-sports, intramural, and intercollegiate athletic programs.
- A strong commitment to diversity is evident on the part of members of the Institute community. The Center for Religious Life and the range of student organizational activities are but two examples of that commitment.
- Career services are seen as a strong and vibrant component of the undergraduate student experience. However, examination of career services for graduate students may be warranted.
- New initiatives are being focused on the development of leadership and community. Student, faculty, and staff participation in the Leadershape program is but one example. A range of opportunities exist for students to both learn and practice leadership through community service, student government, living units and other student organizations.
- Psychological and medical services are available, used, and appreciated by students. Not surprisingly, there are some members of the community who would like to see these services expanded in a significant way.

Suggestions:

Although there are issues that might be approached differently, there are no fundamental areas of concern in Student Services at the Institute. There were at the time of our visit, however, some pressing issues concerning student interaction with the Institute that needed to be addressed. These are outlined below.

- As mentioned in section IV, students perceived a lack of communication between themselves and decision-makers in the Institution. This is a perennial problem in higher education, especially during periods of rapid change. [The Chancellor's report concerning the Design of the New Residence System](#), and his discussion of this with the students, is a giant step in the right direction to improve such communication.
- There seems to be some confusion generated by lumping Fraternities, Sororities, and Independent Living Groups (FSILG's) into a single acronym. In our short visit, there seemed to be differences between concerns expressed about

the Fraternities and Sororities, on the one hand, and Independent Living Groups, on the other. If our impression is correct, these concerns should be differentiated, and a plan designed to resolve them.

- Decisions about the type, quality, and financial expectations for food service probably should be made sooner rather than later. Given some of the issues facing the Institute in the area of student life, improvements in food service could be achieved in a rather short time frame and could be resolved as a win-win issue for both students and the Institute.
- We recognize that adequate facilities are always a concern for students and their organizations. We understand that the Institute is developing a long-range plan for activity space for athletics, recreation, student organizations and groups. This plan hopefully will address both the need for maintenance of present facilities as well as the need for new ones.
- We understand that identification of additional resources for financial aid is one goal of the new campaign. This focus will help reduce the high debt burden of financial aid recipients.
- Support services for graduate students need to be reexamined in light of the changing expectations of students for support and the less traditional careers being pursued by both masters and doctoral students.
- The involvement of faculty as House Masters, in the Leadershape program, and in other activities is commendable. We agree with the recommendation of the MIT Task Force of Student Life and Learning that encourages increased involvement of faculty in the extracurricular life of students. We recognize that such involvement is not easy to accomplish, but urge the Institute to develop unique approaches as outlined in the Institute's report to the New England Association of Schools and Colleges.
- MIT may wish to review both staffing levels and scope of responsibilities in key administrative units. Both students and staff members commented on the need for more staff.

The Institute is to be commended for the time and effort it has recently invested in examining issues related to student life and the provision of student services for undergraduate students. The issues are complex and often generate strong emotional responses among various constituency groups.

VIII. Library and Information Resources

While the following assessment is focused primarily on library and information support for MIT undergraduates, issues such as digital library development and infrastructure, Web gateway access, library management system, and facilities apply as well to graduate and professional education and research.

Information resources: Information resources in paper, digital, and CD-ROM formats are more than adequate to support undergraduate instructional programs, undergraduate learning, and undergraduate research in fields of instruction at MIT. Development of the digital library has progressed rapidly, and plans and directions are excellent, clear, appropriate, and – as far as undergraduate study and learning are concerned – adequately supported by the present budget.

Digital library resources for graduate students and faculty study and research are less adequate, and sufficient growth and development of the digital journal collection may not be adequately supported by the current library budget. Journals in science and technology are rapidly converting to digital form, but such journals are not cheap. Their availability relative to graduate student and faculty need should be evaluated, and if inadequate, should be addressed.

The Task Force recommendation that MIT "focus information technology resources around the library system" is commendable and should be considered seriously. Desktop digital library access is adequate for undergraduate needs – as a consequence of the existing good relationship between Information Systems and the Library – and the digital library is actively in construction. Its content of some 115 important data bases and some 800 e-journals – a modest number for an institution of MIT's functional ambition—should be adequate for undergraduate use. There are sufficient desktop computers for student use, though the campus infrastructure may not be adequate to support the level of system-wide graphic and media access that is becoming the standard.

Access: The Library has a distributed web access gateway, a digital library management system and web online public access catalog, and a web information gateway-in-progress, as well as a card catalog. Many services, forms, procedures, and a good deal of local information have been made available. The Library Strategic Plan, a set of specific plans for web design and construction, and major library functions are online and of high quality. The planned choice and installation of a new advanced, high-quality, library management system and online public catalog needs to be given higher Institute priority. MIT is behind its peers in providing scholars this important enabler of learning, teaching, and research.

The newly formed alliance between the Library and the Vice President and the Associate Provost for Information Systems is commendable. Its focus is rapid and effective access to digital information and data of all kinds, and Recommendation 5.6.2 of the Task Force on Student Life and Learning (Focus information technology resources around the library system) deserves full and prompt implementation. Recognition by MIT of the value of a partnership in which experts on information content and instruction collaborate with experts on means of access and learning should be most productive.

Staff: The staff of the Library is adequate to support existing operations, and genuine tradeoffs of existing staff, as well as re-definitions of existing positions, have been made to support digital library and information system growth. A small staff increment may be needed over the next few years to support the crucial outreach and instructional component of the Library's information literacy program.

Space: A number of the MIT libraries are obsolete and nonfunctional as spaces despite recent efforts to make the best of the poor facilities. Notable exceptions are the music and aero-astro libraries, which are excellent in design, scale, and function, and which represent commendable collaboration between academic departments and the Library. Libraries in academia are growing in importance as integrative learning centers for both undergraduate and graduate students; existing libraries should be evaluated with this in mind and upgraded where needed over the next five to ten years. Campus libraries provide the kind of community learning facilities students say are lacking on campus – and they can draw together student and faculty scholars from different disciplines and departments.

Current conceptual plans to create a central, advanced interdisciplinary information center-library facility in Building 14, incorporating library and group study capacities with a wired cafe and community commons, are outstanding and deserve support.

IX. Physical Resources

The MIT campus is impressive and generally appropriate to the Institute's academic plans and programs. At the same time, there are a number of facility issues as on many older campuses, as the administration knows and is working to correct.

There is clearly a deferred maintenance problem of considerable proportions, which MIT estimates at as much as \$400 million not including utility infrastructure costs that could well add several hundred million dollars more. We noted holes in walls of several buildings; the window frames in the buildings on the original quad are distressed; most, if not all, of the elevators we rode on could use attention. Our visit was during the mid-fall, so we probably did not see the campus at its best. Nevertheless, we were surprised by the condition of the grounds in many areas: untrimmed bushes, leaves not picked up, cracked sidewalks, and more trash about than one would normally expect to see at an institution of MIT's reputation and resources. We suspect the current ground's maintenance budget is either insufficient or could be administered better. Interestingly, we did not tour the interior spaces of any of the newer science buildings, and therefore have no opinion as to their suitability (we heard nothing to suggest there are problems; we simply don't know).

The Institute administration appears to understand these issues and has formulated plans to deal with them. They will be expensive, but should be within the fiscal resources of the Institute if the inevitable internal compromises can be successfully negotiated and the recently announced Campaign raises as much as expected. The Chancellor and the Dean of Architecture clearly share a desire to ensure that necessary renovations are done in a consistent way, in part to reduce costs, but perhaps more importantly, to insure that the MIT campus regains some sense of continuity that it seems to have lost. For example, signs denoting building names or numbers are virtually nonexistent, making the campus difficult for a visitor to navigate. This problem is accentuated by the building numbering system that seems to make sense to members of the MIT community, but is incomprehensible to many outsiders.

The Institute is about to embark on a major new building program, perhaps costing as much as \$700 million in the near term. In anticipation of that effort, it has hired an impressive group of planners and architects. One of the challenges of such a program, well recognized by the planners and the administration, is to use this opportunity to transform the campus. For example, one might create important gathering spaces on campus and significantly improve campus landscaping, pedestrian circulation, and, one might hope, pay additional attention to many of the smaller details (similar lighting, consistent signs, compatible and well-planned landscaping, etc.) that can help create a cohesive feel of "campus." The proposed rehabilitation of building 14 as an information and intellectual community center is one example of how this can be achieved, and deserves support.

It was not clear to us how widely understood the physical planning process is, or the extent to which faculty feel involved. This could become a later problem. And we were struck by the expense of some of the new buildings (\$100,000 per bed for a new dormitory and almost \$200 million for a new science complex, numbers that are quite a bit higher than we have seen on other campuses). While these numbers may well be appropriate for the next important projects on the MIT campus, they will strain the capital budget, and may require careful management to avoid a substantial withdrawal from existing funds.

All of this is complicated by the fact that MIT lives in a city, and within existing city streets. Relationships with the City of Cambridge are clearly complicated, and some of MIT's plans are therefore constrained. This issue seems well understood, and receives considerable attention.

X. Financial Resources

The Institute's finances are in good shape by almost any test. The simplest measure is perhaps its credit (bond) rating. MIT is one of only a handful of universities with AAA credit rating from all the major agencies. The endowment has doubled in the past four years to over \$4 billion. Investment policies are consistent with those of most similar institutions, and recent returns are quite good. Standards on audit, budgeting, risk management and development appear to be fully met.

MIT has recently installed a new financial computing system (SAP). While this system will likely produce benefits in the long run, in the short term it is causing difficulty for those who use it, a matter that will require continuing attention.

We were somewhat surprised to note that the Institute has recently run a small annual operating deficit, which is then written off against quasi-endowment. This practice, in effect, increases the endowment pay out rate, which is not formally recognized in the financial statements. So long as the endowment after pay out grows faster than inflation, this is not a matter for grave concern.

MIT's historic dependence on federal funding has been reduced substantially in recent years, from a traditional 60 percent to now about 45 percent, with expectations that it will go lower in the near future. The gaps are being filled with increasing private and corporate support. The MIT campus is fortunate to have its research funding spread among the various agencies and industry (DoD~17 percent, DoE~18 percent, HHS~15 percent, NSF~9 percent, NASA~8 percent, Industry~19 percent, and other non-profits~9 percent). The funding for Lincoln Laboratory, primarily DoD, may be a concern. The administration foresees no problems with indirect cost rates or reimbursements, and we saw nothing to suggest otherwise.

The current funding of auxiliary services (especially dining) seems anomalous; they are included in the general fund budget. We heard dissatisfaction from students about the quality and variety of food on campus, and were therefore bewildered to learn that dining is losing money, which is then subsidized from the general fund. There are apparently plans underway to correct this situation, and we would hope that they are promptly pursued.

While the current balance sheet is quite robust, so are MIT's deferred expenses and immediate ambitions. We would urge considerable caution in constructing financing plans for all of this. If fundraising goals or internal financing strategies for these plans are not fully realized, they could force the Institute to dip into its current substantial fund balances, which, once they are gone, could be extremely difficult to replace.

XI. Public Disclosure

MIT provides prospective and present students, faculty, and the general public with abundant, relevant, and clear information. The MIT public information service is effective and innovative. Institute publications are abundant, timely, and well thought out.

The MIT Web page is adequate, but given the position of MIT at the center of the digital universe, it could be a more effective source of information about the institute and its component parts. At present, it reflects the diversity and individual entrepreneurship that characterize the institution, and is not always optimal. Components vary in format, design, content, presentation completeness, and quality. It is easy for outsiders to get lost.

The Institute catalog is complete and thorough. Information for new students is well designed, attractive, and creative and when read carefully, adequately advises applicants about the intensity of focus and sustained work implied by matriculation at MIT.

XII. Integrity

The integrity of MIT seems exemplary. The Institute takes its mission and goals seriously, and seems successful in keeping its actions consistent with its words. When the Ivy League institutions and MIT were accused of collusion in admissions by a federal agency during the past decade, MIT alone fought the federal government on this issue – and prevailed in the courts.

The Institute has made commendable progress in admitting students and hiring faculty that are more representative of the American population than many other institutions. Moreover, it continues to monitor progress, and provide support for underrepresented minorities and for women. Its report on problems faced by women (mentioned above) demonstrates leadership in facing problems with integrity.

Its Faculty Policy Committee has discussed several important issues that are controversial in academia in general, issues that impact behavior by members of the Institute as it evolves, and impact the perception of MIT by the outside world. A partial list of these issues would include the use of Intellectual Property, the financing of research by industrial concerns, constraints on the dissemination of research results, and attendant patent issues.

The Institute is trying to design a modified on-campus ROTC program that would be open to all MIT students, including those of all sexual orientations. This is additional evidence of its attempt to face situations with which it does not agree with integrity.

Policies and procedures are in place to deal with students or faculty who feel they have not been treated fairly.

XIII. Conclusion

The New England Association of Schools and Colleges is fortunate to have MIT within its jurisdiction. We note that MIT has rated very highly in both research and education, its faculty have received many prizes, and have garnered considerable research support for the Institute (and the region). In our discussion with undergraduates, graduate students, faculty, administrators, and trustees, we found that all were proud of MIT and all believed they were empowered to proceed toward their goals through their association with the Institute. Our assessment of the intelligence and sincerity of all of these individuals was very positive.

Appendix I. NEASC Evaluation Team Members

Thomas E. Everhart (Team Chair), President Emeritus, California Institute of Technology.

Margaret J. Barr, Vice President for Student Affairs, Northwestern University.

Geoffrey M. Cox, Vice Provost and Dean for Institutional Planning and Operations, Stanford University.

Richard W. Miksad, Dean of the School of Engineering and Applied Science, the University of Virginia.

Paul H. Mosher, Vice Provost and Director of the Libraries, University of Pennsylvania.

Susan Westerberg Prager, Provost, Dartmouth College.

Kathryn T. Spoehr, Provost and Dean of the Faculty and Professor of Cognitive and Linguistic Sciences, Brown University.

Geoffrey R. Stone, Provost and Harry Kalven, Jr., Distinguished Service Professor of Law, University of Chicago.

Guenther Stotzky, Professor of Biology, New York University.

Tallman Trask III, Executive Vice President, Duke University.

Appendix 2. Schedule for NEASC Accreditation Team to MIT, November 7–10, 1999

Sun. Nov. 7	Afternoon Arrival
3:50 p.m.	Assemble in Marriott Hotel lobby.
4:00 p.m.	1. Tour of the Campus – Full Team <i>Leader:</i> Mr. Ted E. Johnson
6:15 p.m.	Assemble in Marriott Hotel lobby.
6:30 p.m.	2. Dinner at the President’s House – Full Team Mrs. Rebecca M. Vest and Prof. Lawrence S. Bacow, Prof. Robert A. Brown, and Prof. Steven R. Lerman, Dean Rosalind H. Williams, Ms. Kathryn A. Willmore (President’s House)
8:30 p.m.	3. Team Planning Session (Longfellow Room, Marriott Hotel)
Mon. Nov. 8	
7:30 a.m.	4. Team Breakfast and Work Session (Longfellow Room, Marriott Hotel)
8:15 a.m.	Assemble in Marriott Hotel lobby.
8:30–10:00 a.m.	5. Presentation of Report of the Task Force on Student Life and Learning – Full Team <i>Chair:</i> Dean Rosalind H. Williams, with Prof. R. John Hansman, Prof. Robert J. Silbey, and others (E25-401)
10:15–11:45 a.m.	6. Residential Planning and Student Life – Full Team <i>Chair:</i> Mr. William J. Hecht (E25-401)
12:00–1:45 p.m.	7. Lunch Discussion on Excellence in Undergraduate Teaching – Full Team <i>Chair:</i> Dr. Lori Breslow (Faculty Club, Dining Room 2)
2:00–3:30 p.m.	Simultaneous Breakout Sessions 8. Undergraduate Involvement in Research and Design <i>Chair:</i> Prof. J. Kim Vandiver (3–207) 9. Status of Women and Minority Faculty and Students <i>Chair:</i> Prof. Robert A. Brown (4-206) 10. Financial Resources and Operations <i>Chair:</i> Mr. John R. Curry (1-236)
4:00–5:30 p.m.	11. Open Forum – Full Team <i>Chair:</i> Dr. Thomas E. Everhart (4-237) This is an opportunity for any member of the mit community to raise questions or comments with the Accreditation Team.

- 6:00–8:00 p.m. **12. Dinner with the Committee on the Undergraduate Program and the Undergraduate Association Officers – Full Team**
"Issues in Undergraduate Education"
Chairs: Prof. Suzanne Flynn and Dean Rosalind H. Williams
(Faculty Club, Dining Room 2)
- 8:00 p.m. **13. Team Work Session**
(Longfellow Room, Marriott Hotel)
- Tue. Nov. 9**
- 7:30–8:45 a.m. **14. Breakfast with the Trustees – Full Team**
Chair: Mr. Alexander V. d'Arbeloff (Maclaurin Room, 10-300)
- 9:00–10:30 a.m. **Simultaneous Breakout Sessions**
15. Student Support Services
Chair: Dean Rosalind H. Williams (3-207)
16. Campus Development
Chair: Dean William J. Mitchell (1-236)
17. Management Education
Chair: Dean Richard Schmalensee (1-214)
- 10:45 a.m.–12:15 p.m. **Simultaneous Breakout Sessions**
18. Educational Technology
Chair: Prof. Robert A. Brown (3-207)
19. Humanities and Social Sciences
Chair: Dean Philip S. Khoury (1-236)
20. Admissions and Financial Aid
Chair: Dean Marilee Jones (1-214)
- 12:30–2:00 p.m. **21. Lunch with the Faculty Policy Committee – Full Team**
"Faculty Issues"
Chair: Prof. Steven R. Lerman (Faculty Club, Dining Room 3)
- 2:15–3:45 p.m. **Simultaneous Breakout Sessions**
22. Long-range Planning
Chair: Prof. Robert A. Brown (3-207)
23. Student Activities and Athletics
Chair: Dean Margaret R. Bates (1-214)
24. The Arts at mit
Chair: Prof. Alan Brody (1-236)
- 4:00–5:00 p.m. **Simultaneous Breakout Sessions**
25. Educational Innovation
Chair: Prof. Rosalind H. Williams (3-207)
26. Libraries
Chair: Ms. Ann J. Wolpert (1-214)
27. Building Community and Leadership
Chair: Dr. Kirk D. Kolenbrander (1-236)
- 5:00–6:00 p.m. **Team Work Session**

(Faculty Club, Dining Room 3)

6:00–8:00 p.m.

28. Dinner with the Graduate Strategy Group and Graduate Student Council Officers – Full Team

"Issues in Graduate Education"

Chairs: Dean Isaac M. Colbert with Prof. J. David Litster

(Faculty Club, Dining Room 3)

8:00 p.m.

29. Team Work Session

(Longfellow Room, Marriott Hotel)

Wed. Nov. 10

8:00–11:45 a.m.

30. Team Breakfast and Work Session

(Longfellow Room, Marriott Hotel)

12:00–2:00 p.m.

31. Lunch and Exit Interview – Full Team

Dr. Charles M. Vest, Prof. Lawrence S. Bacow, Prof. Robert A. Brown, Dean Rosalind H. Williams, Ms. Kathryn A. Willmore

(Faculty Club, Dining Room 3)