



Learning the Lessons of Change at MIT

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Agenda

- Idea of Perspectives
- Strategic Design of Curricula Change
- Political Issues
- Cultural Issues
- The aftermath

(John Van Mannen@ Sloan School)

Perspectives are organized ideas (e.g., metaphors) that fundamentally shape our understanding of things and events.

- They determine what data you see (hear, feel) in the organization
 - What questions you ask
 - Where your attention lies
- They determine how we interpret the data we see
 - They prioritize the data we receive and shape our actions
- No single perspective is adequate
 - It is easy to get locked into a single perspective, but difficult then to deal with complexity

Three Perspectives

Strategic Design

Organizations are machines

An organization is a mechanical system crafted to achieve a defined goal. Parts must fit well together and match the demands of the environment.

Action comes through planning.

Political

Organizations are contests

An organization is a social system encompassing diverse, and sometimes contradictory, interests and goals. Competition for resources is expected.

Action comes through power.

Cultural

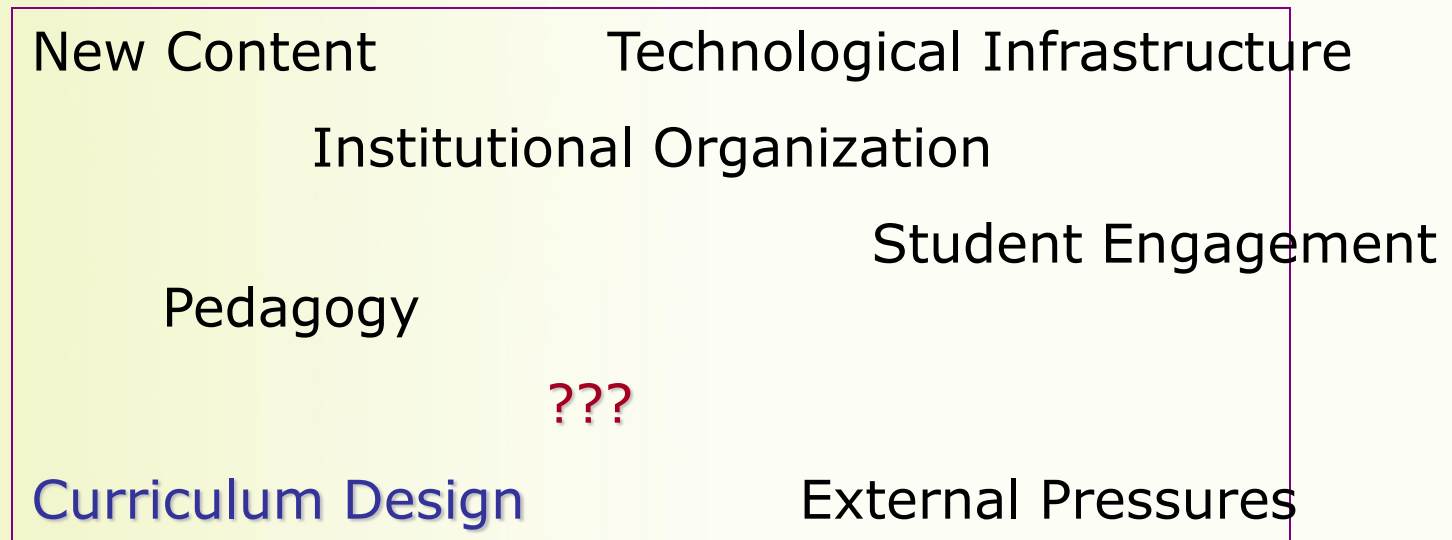
Organizations are institutions

An organization is a symbolic system of meanings, artifacts, values, and routines. Informal norms and traditions exert a strong influence on behavior.

Action comes through habit.

But first.... WHAT?

The curriculum is only one part of the educational enterprise--and sometimes the hardest part to change!



So why do we do it?

Curricular Innovation matters when it leads to:

- The inclusion of new knowledge and perspectives;
- Improvements in learning;
- Renewed attention to educational goals, excellence, and community;
- Accreditation, sponsorship, credentialing; and/or
- Widespread satisfaction among many constituencies.

WHO?

Who cares, who is involved, who helps curricular innovation succeed?

INSIDERS:

- students
- faculty
- other instructors, aides
- staff employees
- higher administration

and THOSE BEYOND:

- alumni
- accreditation boards, colleagues
- parents
- sponsors (private, public)
- the media
- the public

The stakeholders vary with the goals...but leaders need to be aware and ready for a diverse community to participate.

HOW?

How does innovation begin? How does it grow and become widely accepted?

- Localized grassroots efforts of **faculty**
- Student** responses to experimentation
- Top-down initiatives from **senior leadership**
- Outside sponsorship from **alumni, industry, organizations**
- Educational staff** efforts
- Cross-disciplinary** contact

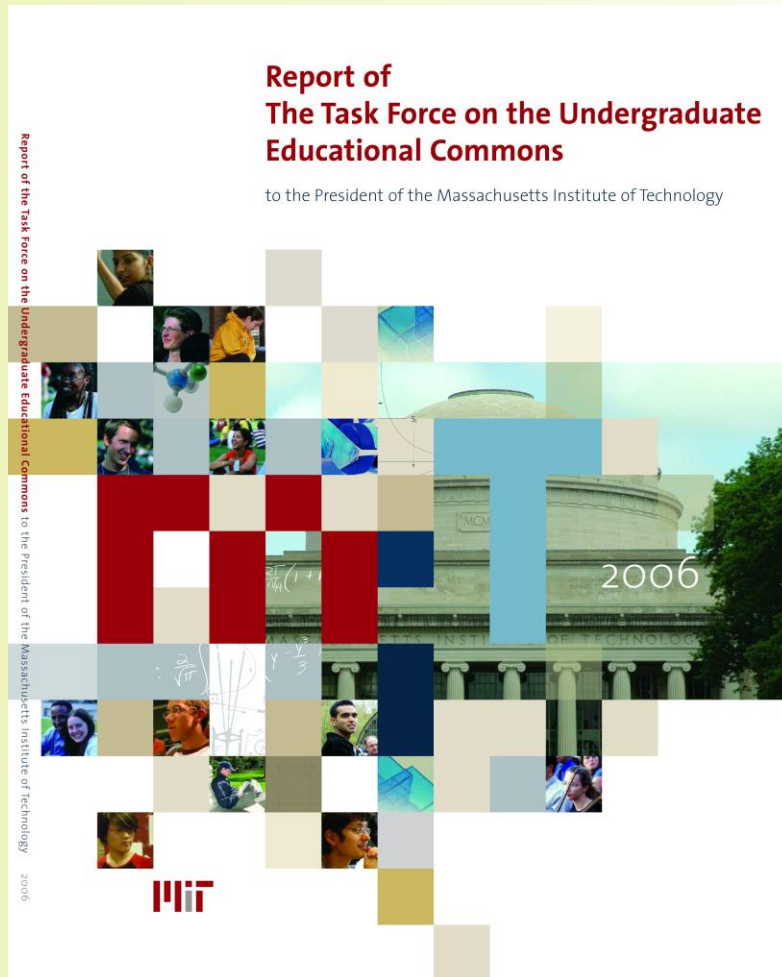
The most successful initiatives include **grassroots support from diverse faculty**--which may be the hardest outcome to attain!

There is a silver lining.

- Thoughtful curricular reform takes time.
- Taking more time to ramp up allows experimentation, pilots, formative assessment, and modifications.
- It is harder to overcome resistance to bad implementation than to address impatience.
- It is not all about faculty and students; staff need time to adapt, advise, and implement.
- Without proper communication and buy-in, “the best laid plans of mice and men...”

So be patient, tenacious...!

Let's get specific:



Lessons learned

from the past
decade

at MIT.

MIT's Educational Mission

In 1998 the Task Force on Student Life and Learning , as part of two years of intensive study, consultation and reflection, developed a formal statement of MIT's educational mission:

The Massachusetts Institute of Technology is devoted to the advancement of knowledge and education of students in areas that contribute to or prosper in an environment of science and technology. Its mission is to contribute to society through excellence in education, research, and public service, drawing on core strengths in science, engineering, architecture, humanities and social sciences, and management. This mission is accomplished by an educational program combining rigorous academic study and the excitement of research with the support and intellectual stimulation of a diverse campus community.

The message matters...

Senior Leadership matters.

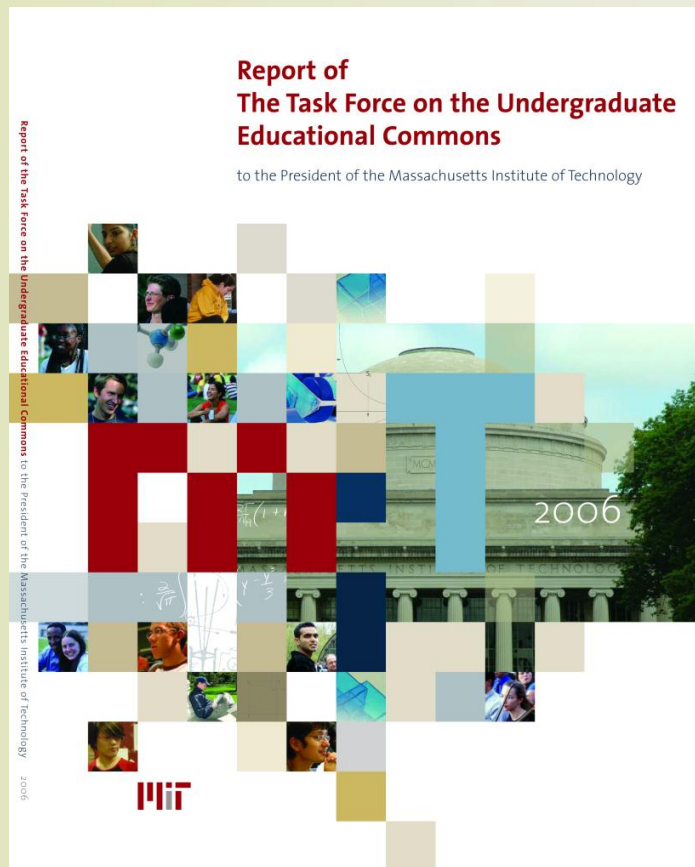
- The presidentially appointed Task Force on Student Life & Learning was charged in 1996 with undertaking a comprehensive review of MIT's educational mission on the threshold of the 21st century.
 - President Vest asked: “What does MIT have to do to be the pre-eminent university in Science and Technology in 2020?”
- The final report published in 1998 provided insight into the principles that define MIT and the attributes of an educated individual.
- In addition, the Task Force made recommendations regarding the General Institute Requirements (GIRs), advising, the first year, teaching, and undergraduate research.

The Core Curriculum remained untouched.

- The first Task Force focused on student life issues that had become more overtly challenging.
- Advising was perceived as in serious need of improvement.
- The core curriculum was not seen as ‘broken.’
- And after two years of hard work, that group needed reinforcements.

And so...

MIT Task Force on the Undergraduate Educational Commons



The Massachusetts Institute of Technology established a Presidential Task Force on the Undergraduate Educational Commons in order to undertake a fundamental, comprehensive review of the common educational experience of our undergraduates in the early years of the twenty-first century.

Task Force Overview

- The Task Force on the Undergraduate Educational Commons was a committee of two dozen MIT faculty members and undergraduates.
- The Task Force comprehensively reviewed MIT's "General Institute Requirements" (GIRs), the rigorous foundation in natural science, mathematics, technology, humanities, arts, and social sciences that forms the core curriculum of every undergraduate's MIT education.
- The Task Force Report affirmed the many ways in which this common curriculum has successfully prepared MIT's graduates for a lifetime of learning and leadership, but also recognized that changes in the wider cultural context require curricular change.

Strategic Design

- After 2.5 years of work, a committee of 24 faculty presented a new core curriculum to the entire faculty at MIT
- Tried to get input via
 - Departmental meetings
 - Town Hall meetings
 - Presentations to senior administrators and School Councils
 - Email to faculty/students and a website
 - An independent student committee

Curriculum Design Changes

- The portion of the General Institute Requirements that focuses on **science and technology should provide greater flexibility** in the choice of classes in the fundamental sciences while retaining the rigor that has been the historic hallmark of these classes.
- The **Humanities, Arts, and Social Sciences Requirement should be clarified** in order to provide a rigorous foundation in the study of human culture, expression, and social organization.
- MIT should make it clear that acquiring experience living and working abroad is an essential feature of an undergraduate education, and work to expand current **international education** programs that have proven successful in the MIT environment, and develop strategies to create other [global] opportunities.

[http://web.mit.edu/committees/edcommons/documents/task_force_report.html]

33 Recommendations including:

- Emphasis on Diversity in curriculum and pedagogy;
- Infrastructural improvements, affecting classrooms, scheduling, student systems;
- Best practices and investment in Educational Technology;
- Emphasis on Teaching and Learning, including use of data and curricular innovation; and
- The need for staff support and funds.

Several
reforms passed....

Double Majors: Passed

- A **consensus emerged** concerning the intellectual and educational advantages of replacing the second SB program with double majors. The Committee concluded:
 - That **multidisciplinary education has never been more important, especially as more subjects and fields of study are becoming interdisciplinary in nature.**
 - That the 90-unit requirement for a second SB has only indirect educational value and by eliminating the obstacle, students are able to explore multidisciplinary opportunities.
 - The concept of “double major” more accurately reflects the educational content and purpose of the program.
- In April 2008, the faculty approved the first curricular change to the undergraduate program recommended by the 2006 Task Force: allowing undergraduate students to earn **a single Bachelor of Science (SB) degree with two majors.**
- This change applied to all undergraduates who planned to graduate June 2010 or later.

Online Subject Evaluations: Implemented

- Previously MIT did not have one uniform subject evaluation system. Some departments ran their own online subject evaluations, while most used paper forms provided and processed through the Office of Faculty Support.
- The “system” was a patchwork of processes which did not provide the tools needed by faculty and academic administrators to compare or discern patterns in student responses over the semesters.
- Gradual scale-up & careful piloting has led to positive community response.
- Expected Benefits of the online system include:
 - More thorough data collection and longitudinal analysis
 - Simplified administration
 - Better reporting capabilities.

The Proposed New General Institute Requirements

Humanities, Arts, and Social Sciences Requirement (8 Subjects)

Foundational Subjects

1 subject from each of 3 categories,
1 of which must be from the First-Year Experience Program

HUMANITIES	ARTS	SOCIAL SCIENCES
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Expository Writing (if necessary) or HASS Elective

Concentration Subjects

4 subjects specified for each Concentration;
Concentrations may allow HASS Elective as 4th Subject

Science, Mathematics, and Engineering Requirement (8 Subjects)

Required Subjects

MECHANICS	SINGLE-VARIABLE CALCULUS	MULTI-VARIABLE CALCULUS
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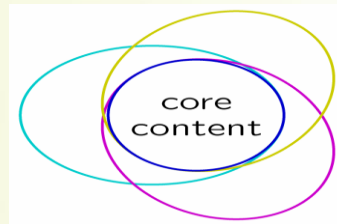
Foundational Subjects

1 subject from 5 of 6 categories

CHEMICAL SCIENCES	COMPUTATION & ENGINEERING	LIFE SCIENCES	MATHEMATICS	PHYSICAL SCIENCES	PROJECT-BASED EXPERIENCE
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Political Perspective: School of Science

- New Science Math and **Engineering (SME)** core called for more “flavors” for science and for Engineering to have a Project Based Experiences as well as a design class to be in the core
- Each 12-unit SME GIR Element should be offered in a variety of flavors that share core content (~ 6 units).



- Disadvantaged in this would be the science departments particularly physics, math and chemistry
 - Budgets are influenced by how many Undergraduates they teach; maybe even future faculty slots
 - Math and Chemistry support many graduate students as TAs
- These Departments all opposed the changes
- Dean of Science was in favor but could not carry the School

Political Perspective: School of Engineering

- Engineering did not care enough to push hard
- Engineering could not or would not articulate a coherent core subject with broad support
- There was disagreement on the intellectual content of the project based course
- Dean of Engineering was noticeable by his absence

Political perspective: School of Humanities

- Humanities, Arts and Social Science requirement stayed entirely in that School so while there were some who were disadvantaged they could be accommodated
- Proposal was seen as providing more coherence which was endorsed by many
- Advocates worked to create trust in advance, to speak within the community and build consensus, both bottom up and top down
- Dean of Humanities, Arts and Social Science was visibly behind the proposal

Cultural Perspective

- The proposed SME changes raised deep questions
 - What is modern science (and how can you devalue my science by throwing it out!)
 - Who can teach this modern science
 - Can only physicists teach physics (Dept said yes)
 - Can only mathematicians teach math (Dept said yes)
 - Is Engineering really a fundamental subject like physics and math
 - Are there deep foundations which are not science (Some in SoE said yes, around design; many in SoS said no)

Cultural Perspective

- Very deep in MIT culture is idea of analytic rigor.
- Strategic Design by introducing Engineering GIR (in design, for example) required some Science subject to go
 - Raised deep issues about “watering down” the rigor of MIT
 - Some Engineers proposed removing Humanities or Arts subjects but that School objected (power issue)
 - The Project based course was heavily critiqued as lacking rigor and unworthy of being in the core

Aftermath

- Humanities changes passed faculty vote
- Science Math and Engineering proposal did not pass (required 60%)
- Engineering still not part of core, Math has reached out to work more with Engineering.
- No energy for another try. Probably another 40 years for major curricular change in science core
- Several departments have created new degrees and made changes in major programs
- Globalization emphasis is proceeding (but did not require a faculty vote!)

Much curricula change has happened

- Often at local level (Individual faculty) or departments – call this second order change
- Funds exist to make this happen
- Dissemination, scalability, and broader coordination remain challenges
- MIT is a dynamic exciting place to teach and learn