

Planned Departmental Change

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Change is a fact of life, more so now in higher education where multiple social, political, economic, and educational trends are rapidly changing the face of university teaching, learning, research, and administrative policies. Universities themselves are complex webs of personalities, committees, hierarchies, and governance processes that make decision making a drawn out process. It is no wonder that higher education has historically been slow to change, and continues to be that way today.

How then can change occur and be sustained in the academy? In this article we will describe strategies employed, and lessons learned, by the Department of Aeronautics and Astronautics at MIT as faculty members sought to create a new vision of education for that field. We hope to show that the most important lesson is this: In creating and sustaining change, a range of interventions, mechanisms, and reward structures need to be employed so that the approach is flexible, multi-faceted, and holistic.

Background. The Department of Aeronautics and Astronautics has achieved national ranking. That reputation was hard won through extensive and influential research. Despite this fact, enrollment was declining as government funding for space research was reduced. The department decided that something had to be done to revitalize both enrollment and faculty enthusiasm.

The first step was to create a sense of the “need for change” especially in faculty, staff, and students who either did not see that need, or who were anxious about it. In 1995, the department chair and several action-oriented faculty members, along with an outside consultant, created a departmental strategic plan. That plan outlined the need to redesign the curriculum to meet the needs of a changing profession. The report pointed out that the education then provided by the department was based on giving students a theoretical grounding in engineering when, in reality, engineers in the twenty-first century would need a more practical education that included skills and attributes not normally associated with MIT’s traditional curriculum (e.g., teamwork skills and systems thinking). Also, the teaching methodology used in the department was traditional lecture/recitation (“talk and chalk”) and did not facilitate practical application of theory. The task then became to: (1) design a new curriculum; (2) develop strategies to change teaching methods and assess learning; and (3) “sell” the new model to faculty, students, and staff.

The department quickly realized it did not have the educational expertise to conduct such an extensive and complex task alone. It enlisted the services of MIT’s Teaching and Learning Laboratory director who provided guidance in designing the initial strategies. Committees were formed to deal with changes in curriculum, assessment methods, and pedagogy. The department chair, in an effort to show visible support for this project, led the curriculum committee himself. Faculty committed to, and enthusiastic about, change chaired the teaching and assessment committees. (The former was led by a senior tenured professor; the latter by a new junior faculty member.) As the committees engaged in their work, they decided they needed more time from educational

experts than the Teaching and Learning Lab director could provide, so the department first hired its own faculty developer and then its own assessment expert (both of whom had Ph.D.s in their respective fields). When the faculty developer left the department for another position, an instructional designer was employed. She and the assessment professional continue to work with faculty in the department.

Strategies Employed and Lessons Learned. The plan for improvements in curriculum, pedagogy, and assessment is currently in its fifth year of existence. Many faculty now include “active learning” techniques in their classrooms. Assessment activities have been implemented across the curriculum. For example, all faculty members now list measurable, observable objectives on their course syllabi; they also write reflective memos at the end of the semester describing their experiences in the classroom during that semester. A multi million dollar teaching and learning laboratory has been built to allow students to engage in “hands on” learning. While the work is not completed, below are some of the major stratagems that were employed to create these changes, and examples of how these stratagems were implemented.

1. *Change is a two-way process.* Department chairs need to lead the process, but they also need to enlist the help of senior faculty. In addition, there must be buy-in from grass roots constituents who need a degree of freedom to help bring about change. Hard working, enthusiastic, and committed young faculty can serve important roles in the change process. In the above situation, the department chair worked closely with the junior faculty members so the contributions they made to educational reform would be valued for tenure.

2. *Leaders need to have and sustain a vision.* The strategic plan created for the department allowed the chair to present a unified vision to his faculty. He also had mechanisms in place that permitted him to keep that vision in the forefront such as an industry advisory board, frequent faculty meetings, department retreats on education, etc.

3. *Define change in terms of the discipline's culture.* The chair defined the process of educational change as a “systems-wide engineering problem.” He used engineering lingo; he presented the faculty with data to support his position; he provided them with a rationale for change that made sense to them as engineers. Similarly, the educational experts were careful not to overuse educational lingo when talking with the engineers. Instead, they sought to bridge the gap between their discipline and engineering by mostly using layperson's terms. On the other hand, it is important for faculty who may seem themselves primarily as discipline specialists to start to think like educators, so the chair gradually began to use some of the language of education to his conversations with faculty.

4. *Reinforce the message through a variety of media.* The chair used regular departmental meetings, retreats, faculty lunches, as well as written material, to keep the faculty apprised of the progress that was being made.

5. *If appropriate, use external validation and drivers.* Several all-day meetings were held to which the chair invited industry leaders to come to campus to meet with his faculty. The faculty heard firsthand what their “customers” wanted in the “products” (i.e., the students) they were producing. This strategy also allowed faculty and industry professionals to create a shared vision of excellence in engineering education.

6. *Realize that faculty, staff, and students are each at a different stage of recognizing and accepting change.* Not only does the introduction of something as novel as a new educational philosophy and new pedagogical techniques involve changing the culture of the department; it also involves changing individuals within that culture.

While much has been written about leadership and change in organizations, little attention has been given to the role of individual change within organizations. Prochaska and DiClemente explain that individuals progress through a continuum that begins with the pre-contemplative, the stage at which people are not even thinking about change.

From there individuals move to contemplative, action, and maintenance modes.

However, their trajectory is not often in a straight line, and they may well relapse if there are no mechanisms to support and sustain the innovation.

7. *Make all faculty accountable and tie change into rewards.* In year-end reviews, the chair asked faculty members to detail how they were contributing to the educational effort. He rewarded faculty members who contributed significantly to the department's educational activities by giving them both grants and release time to pursue their particular interests in educational innovation.

8. *Involve students in the change.* Students can be as conservative—if not more so—than faculty members. Many of them do not like change, especially if it requires a shift in the skills or knowledge they are expected to master or a change in classroom expectations or procedures. In the Aero/Astro department, students were asked to participate in departmental change by serving on committees, producing one of the course evaluation forms, and attending informal meetings with the faculty.

9. *Highlight the success in the department throughout the university and beyond.*

It became known throughout MIT that the department chair was undertaking this large-scale initiative in educational reform, and, in particular, that he had been successful in raising millions of dollars. (In fact, as word spread of the work being done, the chair was approached by funding agencies wishing to contribute to the effort.) This publicity cast both the department and the chair in a favorable light.

Managing educational change is difficult but succeeds more often when a plan is devised that respects the fact that change is slow, and that everyone in the department—faculty, staff, and students—must be addressed according to their willingness to change. Change also happens more readily when it is developed at the grassroots level but supported visibly and championed strongly by the senior administration of the department.