

Proceedings
Teaching Entrepreneurship to Engineering
Students

Engineering Conferences International

Year 2003

Creating an Entrepreneurial Culture at
MIT

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Some MIT Numbers

- **Number of faculty, about 950, about 350 in engineering**
- **Number of undergraduates, about 4500, 2/3 will graduate in engineering, about 1/3 in EECS**
- **Number of graduates, about 5500, about 2200 in engineering**
- **Sponsored research about \$450M, about \$180M in engineering**
- **Total budget about \$1.4B, \$400M at Lincoln Lab.**

Creating an Entrepreneurial Culture

- **MIT faculty, staff and students have founded companies for over a hundred years (e.g., Campbell Soup in the 190th century)**
- **One could say that the entrepreneurial culture is in the walls of MIT**
 - **Role Models**
 - **Shared history/experiences**
 - **Creating Momentum**
 - **Creating a Culture of Trust**
 - **Creating Processes**

Common Experiences/History

- **Radiation Laboratory developed radar during WWII-outgrowth was Lincoln Lab, RLE and EE version of engineering science**
- **RLE under Wiesner was broadly about electronics and communication - Modern linguistics (Chomsky) arose out of RLE. Bose rose out of RLE**
- **Entrepreneurial faculty are respected, if they remain full-time faculty members**

Creating a Culture of Trust

- National Research Council 1995 review of graduate programs - MIT in top three in the nation in 17 of 22 programs rated
 - Relatively uniform excellence leads to trust among faculty - interdisciplinary research flourishes
- Trust leads to flexibility - can do many things without getting (too much) prior approval

Creating Momentum

- **Route 128 was initially intended to be a fast way to circumnavigate Boston**
- **MIT's Radiation Lab led to MIT's Lincoln Lab (1951) near Rte 128. It led to DEC (1958) and other electronics and computer firms**
- **Venture capitalists learned their trade by investing in such firms (and teaching at HBS)**
- **Engineers moved into the area**
- **BankBoston study, ca. 1995, claims that the 4000 firms that were founded over the years by MIT students, faculty and staff had a \$232B annual volume**

Creating Processes

- **Intellectual property - EG&G started out on MIT space in 1930s - we had no patent or IP policy then; by the 1980s we were patenting more than any other university, but we learned how to license MIT IP from Stanford in 1985. In FY02 there were 132 patents, 112 licenses and 24 direct start-ups (total number of start-ups is not known)**
- **Money for MIT's bottom line is not the issue. Rather it is the desire to help faculty, staff and students get their ideas into the commercial world.**
- **Conflict of Interest Policy - Quite strict, an annual report to department heads regarding time spent on Outside Professional Activities and relationships of MIT people in one's firms**

Relationships between Engineering and Sloan

- MIT's School of Engineering has no Industrial Engineering Department - IE is usually done in the Sloan School of Management (and Sloan makes sure of that)
- Relationship between the schools have been quite good in the past 15 years - led to Leaders for Manufacturing program, Systems Design and Management program, and Sloan support for education in entrepreneurship

More Recent Events

- **ME Design Contest (2.70 - largely taken by sophomores) - finals were broadcast on PBS for several years - 800 students show up to cheer the contestants twice a year**
- **\$50k competition - Business plan written by teams of students from Engineering and Sloan - Evaluated by entrepreneurs- Akami proposal came in 2d place about four years ago - competition copied in Europe (£50k)**

Industry Relationships

- Industry partnerships (\$3M or more per firm per year) account for about 5% of all on-campus research - Total industry support of research is nearly 20% (FY02)
- Overall industry support at MIT in research, cash gifts, fellowships and equipment is over \$150M per year

Cambridge - MIT Institute

- **Outgrowth of MIT Partnership with Ford. Former chairman of Ford suggested to Tony Blair to make a deal with MIT in order to foster climate of entrepreneurship in Britain. Deal is worth more than \$100M over 5 years.**
- **50 Cambridge students study at MIT each year, 50 MIT students study at Cambridge University. Currently the former do better than the latter.**
- **Joint research between MIT and a consortium of British universities (mainly Cambridge).**

Examples of Education in Entrepreneurship

- **Entrepreneurship Center (Ken Morse) - Brings entrepreneurs together, teaches graduate level subjects in Sloan School**
- **TEEMS - Technical Entrepreneurship for Engineers and Management - proposal for undergraduate education program based in Sloan, 30 students from Engineering and Sloan - business plans, personality traits, etc. - to be taught during January intersession**