Proceedings

Teaching Entrepreneurship to Engineering Students

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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 leds 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**
- **MITs 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 of IP policy then; by the 1980s we were patenting more than any other university, but we learned how o 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 - Quire 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 sudy t 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**