

Proceedings
Teaching Entrepreneurship to Engineering
Students

Engineering Conferences International

Year 2003

Reaching out to Entrepreneurial
Engineers

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IME x577

Engineering Entrepreneurship

- **Experimental Class**
- **Graduate/Senior Undergraduate Level**
- **10 weeks, Seminar-Style + Lab (Business Plan)**
- **“Multidisciplinary”**
 - **3 IME**
 - **5 MFGE**
 - **3 ME**
 - **3 EE**
 - **1 MBA/MS**
 - **6 ENGR**

Why Engineering Entrepreneurship?

- **My Observations in Previous Engineering Management Classes**
 - **Project Management, Engineering R&D, Product Development**
 - **40-50% Express Serious Interest in Participating in a Technology-Based Startup Company**
 - **~10% Believe They Are Ready to Set Out on Own**
 - **Consistent Patterns of Limitations**
- **Hugh Interest**
- **Departmental Barriers**
 - **Often mechanical, not philosophical (# free units in engineering)**
 - **Self-inflicted intimidation**

Engineering Entrepreneurs An Oxymoron?

ENGINEERING STEREOTYPES

- Defined problem-solving focus
- Reactive
- Team orientation
- Low tolerance of ambiguity, uncertainty
- Team orientation
- Low risk propensity
- Creativity, innovative
- “Shy, geeky...”
- Teamwork
- Belief in personal efficacy
- Niche-craft
- Persistence, determination
- Empirical, pragmatic, experimental
- “Muddle through” is unacceptable

Attributes of Engineers

- **Misuse/Over-reliance of Precision**
 - Lose “gut instinct”
- **Tendency to Over-analyze**
- **Focus on Technology**
- **Severe Discomfort with Open-Ended/Vague Problems**
 - “Look for the odd answers in back of the book...”
- **Withhold Data Until Complete Solution**

Multi-Disciplinary Approach Is Best

- **But Engineering class with “special needs” focus is OK**
- **Speakers**
 - **Sales & Marketing**
 - **Intellectual Property**
 - **VCs/Angels**
 - **Local Technology Entrepreneurs**
- **Mentor-Based Group Project**
 - **Outside Mentor if Possible**

Some Solutions...

- **Disturbing Ground Rules**
 - “Ideas are dime a dozen”
 - “Engineering is a commodity”
- **Uncomfortable Homework**
 - Forced Assumptions
 - Max Page Limit/Word Count/Presentation Time Limit
- **Iteration Exercises**
- **Creative Session: “Brain Teasers”**
- **Case Studies**
- **Focus on “Trivial” Product**