Proceedings

Teaching Entrepreneurship to Engineering Students

Engineering Conferences International Year 2003

Conference Summary

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Conference Summary
by
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Teaching Entrepreneurship to Engineering Students
Monterey CA January 12-16, 2003
Outline

- Summary of ideas
- Unanswered questions
- Where do we go from here?
Summary of ideas

- Attributes of entrepreneurs
- Role of universities
- Academic programs
- Role of industry/practitioners
- Sources of funds
Attributes Exhibited By Entrepreneurs

- Worked for big company, then quit
- Lone ranger
- Persistence, perseverance
- Disciplined
- Confident, self reliant
- Breadth of education
- Basic business skills
- Starts young
- Calculated risk-taking
- Opportunity driven, opportunity assessment skills
- Team building skills
- Strong technical skills
- Appreciation of mentorship
- Ability to manage growth
- Good listener
- Generalist
- Common sense
- Social interaction plays role
- Entrepreneurs play “not to lose”
- Serial entrepreneur
Faculty View Of Attributes Of Entrepreneur

- Risk takers
- Inventors/innovators
- Rule breakers
- Fresh eyes
- Disrupt status quo
- Multi-disciplinary
- Problem solver
- Communication skills
- Appreciation for context
- International orientation
- Optimistic, redefines failure
- Leadership
- Tolerance for ambiguity
- Need for achievement
- Visionary
- Drive for commercialization
Attributes of entrepreneur are diametrically opposed to those of engineering faculty

Intrapreneurs succeed best in corporations which have a risk-taking attitude (e.g. make sufficient R & D investments)
Role Of Universities

- Commercialize R&D
- Spawn startup companies
- Train entrepreneurs
- Establish rules for intellectual property
- Provide incubators, technology parks
- Provide services to alums
- Need to chose appropriate academic models and operating policies
- Impact of personnel policies
- Conflict of interest policies
- Workload policy
- Create teaching certification for adjuncts
- Patent royalty distribution policy
- Seed stage funding
- Cross-college collaboration
Academic Programs

- Course stream over four years
- Backbone project through four years, instead of capstone
- Expose all engineering students to elements of entrepreneurship, embedded in curriculum; elective courses in depth
- Residential experience
- Is entrepreneurship a niche or part of the core?
- Graduate or undergraduate?
- Co-curricular activities (clubs, boot camp, meet and eat, ...)
- Option or minor
- Joint engineering/business program (e.g., Engineering PhD + MBA team)
- Internet based learning space
- Competitions for seed funds
- One day event
- Experiential learning
- One semester survey course
Role of industry/practitioners

- Consultation services to small businesses
- Incubators, technology parks
- Student interns
- Entrepreneurs as instructors/lecturers
- Industry mentors for students
- Continuing education for industry employees
- Preparation of students for entrepreneurship or intrapreneurship
Sources of support

- Government grants (NSF, Dept. of Commerce, …)
- Institutional resources
- Industry contribution
- Foundation support
- Organizations (NAIIC, ASEE, etc.)
Unanswered questions

- Intrapreneurship vs. Entrepreneurship
- What should every engineering student get/know?
- Reward structure for faculty
- Role of adjuncts, industry returnees
- IP policies
- Assessment
- High-tech vs. Low-tech
Where do we go from here?

- Another conference?
  - Every year? Every ... years?
  - In US? Overseas?
  - Bring together business school and engineering faculty?

- Role of NSF?

- Summary paper/article on this conference?

- Website? Listserv?
Workshops for engineering faculty on principles of entrepreneurship?
Planning meeting at ASEE annual meeting?
Survey alums
  - How many are entrepreneurs?
  - What do they think is needed in curriculum?
Each participant go home and do something?
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