

Proceedings
Teaching Entrepreneurship to Engineering
Students

Engineering Conferences International

Year 2003

Conference Summary

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This paper is posted at ECI Digital Archives.
<http://dc.engconfintl.org/teaching/34>

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


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- 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


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- Communication skills
 - Appreciation for context
 - International orientation
 - Optimistic, redefines failure
 - Leadership
 - Tolerance for ambiguity
 - Need for achievement
 - Visionary
 - Drive for commercialization

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- 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

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- 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?

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- 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?
 - ECI? ASEE? NSF? Etc.
 - 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?

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- 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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