Proceedings

Teaching Entrepreneurship to Engineering Students

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What is the Culture at the University that Fosters a Spirit of Innovation and Entrepreneurship?

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Fostering a SpiRIT of Innovation

Introduction

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Fostering a SpiRIT of Innovation

**Agenda**

- What got us into entrepreneurial education
- What we do to foster Innovation
- Supporting Technology and Innovation through Projects
- Example
What got us here

• Connect students to careers
• Connect careers to courses
• Retention issues
• Student morale (comfort zone)
• Moving beyond abstract to real
What we do to foster Innovation

• Emphasis on creating ‘things’ in coursework
• Start early and often
  – First quarter Freshmen through Senior projects
  – Facilitate student driven activities
• Involve students with multidisciplinary teams
Support through Projects

- Backbone instead of Capstone project
- Projects run independent of courses
- Team responsible for ‘Infusing’ work into classes
  - Involve Freshmen to Seniors
  - Interview for position on teams
- Courses act as Consultants
- Projects cross department, College, and even Institution lines
Gates and Phases of a Project

Phase 1 – From Problem Identification to Concept selection

Phase 2 – From Initial Design to Assembly and Manufacturing feasibility

Phase 3 – From Finished Design to Manufactured and Packaged product.

(Phase 4 – Team breaks free of the ‘Studentbator’ to pursue profit.)
Sample Roadmap

Phase 1
- Problem Identification
- Voice of Customer
- Requirements Document
- Concept Selection
- Models and /or Prototype

Phase 2
- Product Specification
- Detail Design
- Simulation
- Engineering Models

Phase 3
- Process Selection
- Fabrication and Tooling
- Analysis
- Alternate Process Models
- Assembly
- Packaging

Phase 4
- Industrial Design
- Business Issues
- Intellectual Property
- Design Materials
- Analysis
- Packaging Manufacturing Automation
Projects

- **Three types of project generators**
  1. Industrial
  2. Student team driven (Entrepreneurial)
  3. Faculty

- **Several projects ongoing simultaneously**

- **First and second generation products**
  - Apply what was learned
  - Greater experience
Product Realization

Phase 1 - Concept

- Problem Identification
- Voice of the Customer
- Intellectual Property Search
- Industrial Design
- Customer Requirements
Product Realization

Phase 2 - Development

- Detail Design
- Component Selection
- Simulation and Analysis
- Prototyping
Product Realization

Phase 3 - Manufacture

- Manufacture
  - Part Fabrication
  - Hard Tooling
- Assembly
- Packaging
Summary

• Students Seem be more involved and happier
  – Improved Grades*
  – Better Attraction and Retention*

• See a much greater interest in Industry
  – Morse Manufacturing, Inc. (Barrel handling equip)
  – Crosskates, Inc. (All terrain roller-skis)

• Increased enrollment. (15% This year alone with 40% over the past three years)

*(Not enough data to statistically prove yet)