Educating Leaders for the Emerging Global Economy

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Task Force Process

- One faculty face-to-face meeting to refine the task force charge and understand what "educating leaders" was about
- Three two-hour teleconferences with various overlapping participation of task force members
- Some background readings on B-school "leadership programs", Management of Technology program

High Stakes in Higher Education: California’s Competitiveness Starts with Research Universities

• UC President Robert Dynes
SF Chronicle, 16 April 2004:
- “When it comes to teaching students, UC provides much more than book learning. A UC education really is about teaching the next generation how to be innovative, creative, and competitive—how to take risks, learn from mistakes, and build on them. These characteristics are the fundamental underpinning of the California economy and the key to its future.”

Observations about Typical Engineering Programs

• Focus on taking as many "difficult" technical courses as possible
• Limited time/energy left for broadening one’s education
• Little exposure to the business environment within which most students will pursue their careers
• Little understanding of the product development cycle

Statement of the Problem

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  - Today’s engineering students are trained to develop technology but are left unprepared to assume management and executive positions given their current undergraduate experiences. Their greatest strengths are in problem solving, but they need better awareness of how to apply these skills to broader problems in more general contexts. Social integration and soft skills—the ability to work effectively in and to lead in interdisciplinary teams—are better developed. While leadership cannot be taught—it is learned by doing—students need and should acquire knowledge and experience that will prepare them for business leadership and career success in the emerging new world economy.

Desired Activities and Experiences

• Exposure to "applications-oriented" engineering and the practice of engineering outside the classroom:
  - Code studied that illustrates the process of turning business or organizational needs into technical and systems that can satisfy these needs;
  - Experience of participating in interdisciplinary projects of product design, spanning the processes of design, implementation, and evolution;
  - Greater awareness of global business and the world economy;
  - Greater awareness of careers and how engineering careers typically evolve over their lifetimes;
  - Practical work experiences through summer internships;
  - Integration of career skills development (e.g., communications and presentations, project group experience, finding mentors and role models) in technical curriculum.
Possible Approaches

- Application-oriented case studies courses (some of these already exist in the Management of Technology program at Berkeley);
- More project- and team-centered courses or projects that span courses (e.g., CS Software Engineering courses, where TAs is led by an MBA student);
- Appropriate course selections from the social sciences (economics, political science) and humanities (world cultures);
- Speaker series that bring successful business and political leaders with an engineering background to campus for lectures and meetings with students;
- Greater emphasis on for-credit effective internships (e.g., the EEC Internship Program can be extended to the College of Engineering);
- As part of ABET Course Objectives and Outcomes, integrate business and leadership skills development within the course curriculum (e.g., reports and oral presentations as part of technical course activities rather than teaching "communications" as a standalone course).

Task Force Recommendations

- Leadership
  - Review undergraduate admissions preferences to select for students with greater leadership potential and willingness to take risks in their studies.
  - Encourage students to accept non-classroom roles that display leadership and communication skills in order to enhance their own self-confidence (e.g., tutoring other students, teaching, and volunteering such as helping with IT and computing literacy in the local public schools). Facilitate such opportunities within the university and in collaboration with the local community with the support of the College's undergraduate staff and student organizations.

- Programs
  - Establish a five-year B.S./M.S. engineering program with enhanced emphasis on interdisciplinary design experiences and business awareness. As appropriate, to these goals within the engineering structure of the program, to balance between a traditional deep technical track and a more technically focused business track. The extra time in such a program should be used to allow the student to acquire breadth and understanding of the practice of the business world, as well as technical foundations. Charter a college-wide faculty committee, coordinated with subcommittees within specific departments and programs, to develop specific five-year programs.

- Curriculum
  - Organize a business case-directed course to instruct every engineering student in the foundations of financial literacy with skills for understanding and appreciation of the "business ecosystem" of management, marketing, sales, operations, product development, and engineering.
  - Recognize the increasing importance of the global economy and multicultural women-centered cultures; for future leaders, suggest course recommendations in the social sciences (economics, political science, public policy) and humanities (world cultures) to educate students to be knowledgeable and responsible world citizens.
  - Through the ABET requirement to document Course Objectives and Outcomes, integrate business and leadership skills acquisition throughout the curriculum; the course curriculum should be embedded within technical course activities. List course objectives and outcomes on departmental websites to assist students in making informed course choices.

- Culture
  - Evolve the "engineering ethos" to value leadership in public service and the practice of business through well-publicized speaker series and the integration of these concepts within the curriculum.
  - Encourage effective internships and opportunities for educational exchange and study abroad, to integrate educational, industrial, and world cultural experiences.