Project-Based Learning at WPI

ABET Annual Conference

John Orr
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The “WPI Plan”

- Requirements for all students
  - Two major projects: The “Interactive” Qualify Project and the “Major Qualifying Project”
  - Humanities, with a culminating experience
  - Social Science
  - Major-specific requirements
  - Physical Education

- Four terms per academic year
- No recorded failing grades
First-year: Great Problems Seminars

- **Power the World** …………… (Physics & History)
- **Feed the World** …….. (Chemistry & Humanities)
- **Heal the World** ……… (Biology & Management)
- **Grand Challenges** …… (Engineering & Humanities)
Junior and Senior Projects

• Required of all WPI students
• Individually designed, registered, advised
• Generally in teams of 2-4 students
• Credit of ~9 semester hours each
• Conducted over ¼ to 1 academic year
• Major component of graduation honors
The Junior Project (IQP)

- >50% performed off campus
- Sites include Washington DC, Boston, San Juan, Venice, Hong Kong, Namibia, on-campus
- 20 – 40 students in residence with 1 or more faculty advisors
- Sponsored by governments, NGOs, corporations
- Seven weeks of full-time work
The Senior Project (MQP)

• For engineering students, usually represents Capstone Design
• ~50% performed for an external sponsor
• Residential sites in Silicon Valley, Ireland, China…
• Commuter sites at Lincoln Labs, Gillette…
Scalability/Sustainability

- WPI enrollment: ~ 3500 undergraduates
- All students complete two major projects
- Approximately 300 junior and 300 senior projects each year (1-4 students/project)
- This program was implemented in 1970
Lessons Learned

• “No champion, no project, no discussion”
• Faculty, sponsor, and student engagement are critical
• Full-time student commitment helps substantially
• Off-campus residential experience is extremely valuable
• “Sink or Swim” is not the best pedagogy for educationally successful projects
• It takes courage to give up some technical topics to create time for the important educational aspects of project work (including the professional soft skills)
• Institutional support (president, provost, dean…) is essential for a comprehensive, sustained program
ABET is *not* a Hindrance to Innovation

• WPI implemented a radical approach to engineering education in 1970, with *no* required courses, only 2 grades (Distinction, Acceptable), a “Competency Examination,” and 7-week academic terms.

• All of our engineering programs have been continuously accredited, and we have introduced and accredited several new engineering programs.

• Our Degree Requirements have been modified since 1970, but would still be considered radical in comparison to many engineering programs.
Thank you!!

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