LEAP Challenge Signature Work: WPI’s Project-Based Curriculum

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- Science & technology focus
- 4000 UG, 2000 G, 350 FTE
- The WPI Plan since 1970
  - Project-based curriculum
  - Authentic problem solving
  - Collaborative learning
- “Technological Humanism”
  - Addressing important needs
  - Considering impacts of technology
  - Understanding, working with others
  - Emphasis outside the major
Signature Work at WPI

- **1st year**: Great Problems Seminars
  - 6 credit hours, optional
  - Interdisciplinary, project-based

- **2nd year**: Humanities and Arts Capstone
  - Culminating seminar or practicum
  - Creative/original work

- **3rd year**: Interactive Qualifying Project (IQP)
  - 9 credit hours, interdisciplinary gen ed

- **4th year**: Major Qualifying Project (MQP)
  - 9 credit hours, capstone in major field
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Interactive Qualifying Project (IQP)

- Third year research project
- Not a course – student teams conduct inquiry with faculty guidance
- Students, faculty from all fields work together
- Problem-based, at interface of society and technology
- Most sponsored by NGOs, gov’t, nonprofits
Educational Objectives of the IQP

- Research skills
- Problem solving
- Critical thinking
- Communication
- Teamwork & leadership
- Ethical awareness
- Contextual understanding
Examples of IQPs

• Improving nutrition through community gardens
  – AIDS Project Worcester

• Erosion and flood control in informal settlements
  – Namibia Housing Action Group

• Alerting systems and egress for the deaf
  – VicDeaf, Melbourne, Australia
Major Qualifying Project (MQP)

- Senior capstone in major
- Not a course
- Small teams, faculty guidance
- Professional-level challenge, e.g., design or research
- Typically sponsored by private sector or research lab
Educational Objectives of the MQP

- Application of knowledge and skills in major
- Preparation for workplace or graduate school
- Research/design experience
- Problem solving
- Critical thinking
- Communication
- Teamwork & leadership
Examples of MQPs

- Water supply modeling for Wachusett Reservoir
  - Massachusetts Dept. of Conservation & Recreation

- Sustainable landscape architecture design
  - Stantec, Canada

- Human artery plaque progression
  - National Science Foundation
WPI Global Projects Program

- 70% of students complete at least one project in a fulltime immersion off campus
- About 50% do at least one project overseas
- WPI operates 46 off-campus Project Centers around the globe
- Typical cohort: 24 students (6 teams of 4) and 2 faculty
Alumni Study Findings

• IQP and MQP convey many long-term benefits
  – Wide range of professional abilities and skills
  – Career success, leadership abilities
  – Broader world views, appreciation of difference
  – Self-efficacy, stronger personal character

• Some groups report especially positive impacts
  – Women (36/39 areas)
  – those who went off campus (33/39 areas)

• Interviews reveal compelling stories of growth and transformation
Alumni Voices

“I think the [projects] just really mimic, at a very early age, a formative age ... in your learning process ... how to work, how to be successful.”

“[The projects]... give you the opportunity to become independent, work on your own, find ... solutions...it just gave me the opportunity to develop my character and drive.”

“To have something that really takes you out of your comfort zone ... where you can’t predict exactly what’s going to happen. ... helped me to become a stronger person as I headed out of college.”
Changing Faculty and Student Roles

- Faculty move away from
  - Dispensing information
  - Authority and expert
  - and toward
  - Monitoring inquiry
  - Coach and facilitator

- Students move away from
  - Listening/watching
  - Dependence
  - Gaining knowledge
  - and toward
  - Creating/discovering
  - Independence
  - Making knowledge
Institutional Impacts of PBL

- Student learning and culture
  - “impact” mindset
  - broader perspectives

- Faculty culture
  - broad involvement
  - pride in “signature program”
  - interdisciplinary collaboration

- Institutional identity
  - student/faculty recruitment
  - marketing, advancement

- Community and academic partnerships
  - sustainable relationships
  - mutual benefits
Institute on Project-Based Learning

• Offered in partnership with AAC&U
• Next offering: June 22-25, 2016
• Workshop topics
  – PBL in the first-year and gen ed
  – Partnering with external organizations
  – Team development and mentoring
  – Feedback, evaluation, and assessment
  – PBL in capstones
• Applications now being accepted at wpi.edu/+2016Institute
Center for Project-Based Learning

• Support efforts by campuses looking to advance project-based learning

• Custom workshops, consultation visits, resources, publications and related offerings

• Learn more at our reception
  – Friday January 22
  – 5:30 to 7:00 pm
  – Wilson and Roosevelt Rooms
  – Constitution Level (3B)