

Engaging cross-disciplinary faculty to incorporate humanities and social sciences into engineering classrooms

Introduction

The engineering faculty developed a strategy to reshape the University's engineering academic programs such that the engineering curricula are designed to produce an engineering graduate whose *profile is woven with the strands of technical excellence in science, mathematics, analysis and synthesis; innovative curiosity for creative adaptation from learning, unlearning and relearning; and humanistic consciousness grounded in humanities, arts and social sciences*¹. This project is focused toward creating the environment and providing the outcomes to help meet this academic strategy.

Mode of Operation

- Faculty with diverse disciplinary backgrounds were brought together for monthly meetings
- Focused discussion on the following questions
 - What content should be addressed to have a more socially conscious/humanistic engineering curriculum (units within classes, classes, programs)?
 - What teaching strategies would best work to address the changes in content?
- Development of a "teaching module" which incorporated the "content" material recommended by this faculty team

Members of the Faculty Team

- Dr. Nelson Hilton, Director of the Center for Teaching and Learning (Expertise: Literature)
- Dr. David Knauft, Associate Dean Graduate School, Chair of Service Learning Curriculum Committee (Expertise: Plant Genetics)
- Dr. Betty Jean Craige, Director of the Wilson Center for Humanities and Arts (Expertise: Comparative Literature)
- Monica Gaughan, Assistant Professor, Health Policy and Management (Expertise: Social issues in the workforce)
- Mary Ann Johnson, Professor, Foods and Nutrition (Expertise: Community-based nutrition services)
- Mark Callahan, Academic Professional, Artistic Director of I.C.E. (Expertise: Art, creative exploration)
- Nadia Kellam, Assistant Professor, Department of Biological and Agricultural Engineering (Expertise: Complex systems theory application in engineering education)

1. Penultimate Report outlining the profile of the UGA Engineer, The Faculty of Engineering, Feb. 2007

Tim Foutz*, Maria Navarro**, Sid Thompson*

*Professor, Department of Biological and Agricultural Engineering

**Assistant Professor, Department of Agricultural Leadership, Education, and Communication
The University of Georgia

Goals of current work

- To engage with colleagues from the humanities, social sciences and humanistic studies, in order to establish focus groups that help adapt engineering courses and curricula toward the humanistic needs of today's engineering student
- To establish "guidelines" that can be used to help engineering faculty (*we would like a draft of these guidelines to be one of the products of this group*)
 - Engage topics from social sciences and humanities and integrate those topics in engineering subjects
 - Understand and integrate the fundamental structure of reflection into engineering courses
 - Create service learning opportunities that truly engage the student in the holistic perspective of complex problems

Preliminary Results

The following presents an example of the "key elements" that the faculty team believed should be found within a project that is used to enhance the engineering student's *socially conscious/humanistic background*.

- Perception/point of view/awareness
- historic perspective of problem and solution
- Understand the conditions of problem and solution
- Assessing cultural, geographic, economic, etc. conditions that affect the problems. Being able to identify problems as well as issues and conditions
- Awareness of the operations of a community and patterns of operation
- Linkage
- A problem perspective
- Analysis of a complex problem vs. analysis of parts of the problem
- Reflection (past events to judge future outcomes)
- Technae (understanding technology, its application and history)
 - Criticality (consequences of failure modes and frequency of occurrences)
 - Appropriate technology (cultural issues, etc.)
- Scaling of the problem (reduction vs. complex)
- Rhetoric (Composition and Ethos)

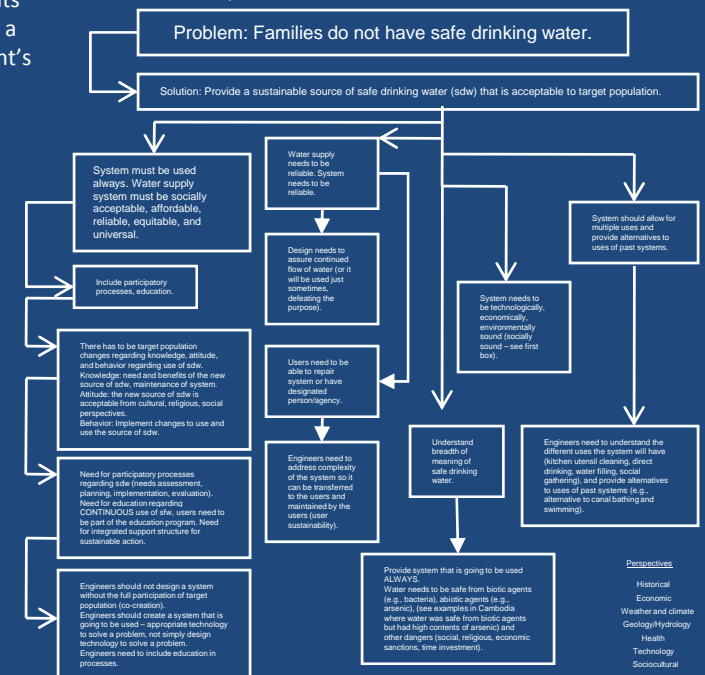
Strategy for helping faculty develop projects

There was a general agreement among the faculty team that a topic that would help demonstrate how to develop the dimensions of a socially conscious/ humanistic "engineering project" would be WATER.

Two modules were developed

- How is the community in Athens Georgia affected by water resources
- How is a community along the Nile Delta affected by water resources

Outlines of how to integrate the key elements listed above into this example problem are being developed.



Source: Bellows, D. B. (2000). *Adoption of Community Water Systems: An Area Study in Three Villages in Rural Cambodia*. Ph.D. Thesis, University of Denver.