Designing the 21st Century Engineer: Values and Innovation

Author(s)

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Description

This two-credit AHS course offers a chance to learn about a new approach to values-driven leadership development called "Giving Voice to Values" (GVV, www.GivingVoiceToValuesTheBook.com). This approach has made a dramatic impact on business education and business practice around the world, having been used in hundreds of schools and organizations, including engineering-driven businesses.

Body

- Master an entrepreneurial approach to managing values conflicts used around the globe
- Design & test curricular innovation for engineering educators at Olin and beyond. Do you want to contribute to a paradigm shift in the education of engineering professionals? Do you want to make a positive impact on engineering education at Olin and beyond?

The course begins with an exploration of the GVV framework and its applicability to engineers. Students then work in teams to research the most critical leadership and values conflicts faced by engineering professionals in their careers and to understand faculty aspirations and reservations around addressing these conflicts. They are supplied with some opening readings on these questions (see syllabus) but

then are encouraged to research and locate their own materials and share those with the class. The course concludes with a design project that gives students the chance to develop workshops or co-author educational materials for use in their own school's courses and beyond.

Students took up this challenge with enthusiasm in the pilot running of the course in the Spring semester 2016 at Olin College of Engineering (MA). They identified challenges facing engineers in general – for example, how responsible are engineers for the potential misuses or unintended applications of their innovations; how do engineering professionals manage the pressures of time and cost when they seem to conflict with quality concerns; how to ensure safety in the innovation process and in the eventual use of new products and applications; how to ensure "maintainability" of projects through effective documentation and communication when those processes are often less rewarded; how to identify and think about the ethical questions raised by "Big Data" – as well as more personal or individual ethical challenges they were facing as soon-to-be-minted engineering professionals – for example, how to think about working in the defense industry; how to find the skill and the confidence to effectively raise questions of safety, ethical use and so on in the workplace; how to balance the personal appeal of "cool" applications and challenging problem-solving with the larger impacts of their work; how much responsibility do they/can they/will they assume for the applications of their work; and so on.

They also spoke to faculty and administrators to explore ways to more frequently and more often address these questions in the engineering curriculum at their institution. One team of students developed and piloted a workshop on effective communication for engineers and another student worked with her professor to develop and deliver a class session on the ethical questions raised in Data Science.

In this way, the course not only helps students develop a keener sense of just what values conflicts they will encounter in their engineering careers, it also helps them to refine and rehearse their own abilities to raise them and influence others toward ethical action. And it provides the opportunity to develop, pilot and share new curricular materials for future use, ideally in partnership with faculty at the school who can pursue further applications after the class concludes. In this way, the course can serve as a "curriculum development engine" for creating engineering ethics materials and approaches. Finally the role of current students in the development and delivery of these pilot initiatives not only reduces the load on

faculty but also enhances the appeal and perceived relevancy of these exercises for other students.

Additional Materials included here:

- [Course Syllabus](#)
- [Description of Course Assignments](#)
- [One Page Course Promotion Flyer](#)
- [Two Page Overview "Sketch" of the "Giving Voice To Values" Approach](#)

Course piloted to Undergraduates at Olin College of Engineering in Spring Semester 2016.

Rights

Use of Materials on the OEC

Resource Type

Educational Activity Description

Topics

Workplace Ethics

Discipline(s)

Engineering