Online Ethics Center
FOR ENGINEERING AND SCIENCE

An Academic-Industry Partnership for Training the Next Generation of Ethical Engineers as Industry Leaders

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Description

In this project, a College-level Advisory Council for Ethical Engineering was established by engaging industry partners across engineering disciplines. Additionally, the project team facilitated a workshop to exchange best practices and the development of critical targets for pedagogical and assessment approaches for training in ethical engineering practice.

Body

The OEC Project Pages are intended to cultivate a community of practice and allow ethics researchers, educators, and practitioners to more effectively disseminate their work. This Project Page provides a detailed overview and relevant resources for an on-going science or engineering ethics project. Once you've explored this project, visit the "Projects" section under "Resources" to see more ethics projects.

Description

Background of Problem

In light of periodic and prevalent ethical failures in engineering practice (e.g. Volkswagen emissions scandal, as one example) there is clearly a problem with how engineering ethics education is impacting professional practice. While most engineering educators would likely agree that a course or two in ethics is not sufficient to promote ethical behavior among current and future engineers, few would say that they understand what is important and necessary for effective infusion of ethics into their curriculum or for cultivation of a culture of ethical engineering in practice which remains a central goal of ethics education. The hope remains that better preparation for ethical practice will result in safer and more just practices in engineering. Indeed, in the majority of individual cases this is true; however, ethical failures still occur far too regularly. There also remain significant limitations in the translation of current education in engineering ethics into ethical practice in industrial settings. We believe that there are pressures in the current culture of the engineering workplace that greatly challenge the ethical engineer on a daily basis to maintain a high ethical standard of practice. The National Business Ethics Survey (2009) indicated that five of the top eight pressures causing people to compromise ethical standards in the workplace are related to corporate culture and values. The top factor (in 70% of reported cases) was the pressure to meet unrealistic business goals. How do we address these pressures of the everyday workplace for engineers? How do we prepare future engineers to understand and to successfully deal with such enormous pressures on their ethical standards and understanding? Some leaders in business ethics have suggested that there are two important ways of preparing people to handle the stresses that are inevitable:

- Priming with understanding of the pressures of ethical dilemmas, and
- Practice with handling the pressure of ethical dilemmas.

We believe that overcoming these limitations requires more direct conversations and partnerships between industry and academia about the pressures engineers are facing and about developing more effective approaches in ethics education to prepare them to meet these challenges. Thus a gap that needs to be addressed is to find effective ways to engage our industry partners in the motivating and supporting

engineering educators toward placing a higher value on ethics and compliance.

Project Proposed to Overcome Challenges

In order to meet this need we established a College-level Advisory Council for Ethical Engineering that has representation from industry partners across engineering disciplines. We applied for and received a seed-grant from the College to fund an annual one-day workshop at Purdue University for this Advisory Council. The Council included faculty members responsible for ethics education from 12 disciplines of engineering along with 12 representatives from partner industries. In the workshop we facilitated exchange of best practices and development of critical targets for pedagogical and assessment approaches for training in ethical engineering practice.

Overview of Relevant Literature

A number of complex factors, from corporate cultures, laws and regulations to societal values, combine to create challenging environments in which engineers have to make ethical decisions they may not have imagined when they were training and studying for their careers. The multifaceted, “wicked” problems engineers face as practitioners are often beyond the scope of the typical preparation most receive, despite institutional efforts to prepare their graduates to have “an understanding of professional and ethical responsibility” (ABET, 2000). The lack of a comprehensive yet engineering-specific understanding of ethical practice, and the interrelated factors that inhibit or cultivate it, has limited the community of engineering educators to a “try and fail” approach to ethics education that is typically neither well-integrated nor context-specific. Thus, curricular approaches are often misaligned with the real-world experiences of practicing engineers, particularly those within industries where professional ethical issues arise in many aspects of work lives.

Theoretical Basis

The guiding principles behind our innovation for ethics training embraces both the micro and macro elements of professional ethics to promote a culture of ethical engineering practice. Partnership with industries that employ many engineers will lend credibility, urgency, and relevance to infusing ethics education into the curriculum. Case studies that are collaboratively developed should include both

memorable stories of recent disasters and realistic examples of everyday situations that engineers encounter. Global perspectives and intercultural components were also considered because both are critically important to industry. Reforming how engineering schools “do” ethics education will likely benefit from awareness and application of proven change management strategies/approaches developed collaboratively between academic and industry representatives.

Leadership

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Funding

Engineering of 2020 Seed Grant, College of Engineering, Purdue University; National Science Foundation Awards: SES-1045412, EESE-1237868, CCE STEM-1449479, EEC-1429114, DUE-1123274, and CCE STEM-1737303

Recipient Organization

Purdue University, West Lafayette, Indiana, USA

Start and End Date

January 2017-December 2020

Contact Information

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Publications, Presentations, and Other Products

Summary Report Paper currently being prepared for publication

Attached Resources

1. Ethics Advisory Council Workshop Presentation (April 2018)

Rights

Use of Materials on the OEC

Resource Type

Projects

Parent Collection

STEM Ethics Projects (2017-Present)

Topics

Collaboration
Organizational Climate

Discipline(s)

Engineering