How do we really prepare engineers to face ethical problems – and are we doing enough? A proposal to study engineering pedagogies and practices in the community.

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I am interested in conducting some research this summer on the teaching and practice of engineering ethics. My proposed research would be somewhat limited in scope, because I would interview engineering faculty and professional engineers in the south-central Wisconsin area; however, my goal would be to arrive at some practical recommendations about how we should be preparing students for the real ethical dilemmas they will face in the workplace.

In the Technical Communication Program in the UW-Madison College of Engineering, I and my colleagues are attempting to provide some ethics instruction in our technical communication classes, mainly through the analysis of case studies. We know that other faculty in the College are also trying to be more deliberate about including ethics in their design courses and service courses. Yet, we do not have a clear idea of how the other faculty in our own college are approaching the teaching of ethics. Sadly, we just don't take opportunities to talk about exactly what we do. I suspect that the engineering faculty do not often formally introduce ethics, but rather they discuss good judgments that engineers have had to make while operating with only partial information. Or, they might commonly perform a failure analysis of a well-known disaster, and within that discussion they might discuss hasty decisions, poor supervision, flawed communication, or other problems that produced unforeseen negative consequences. Any analysis of possible engineering solutions would likely include a careful discussion of safety and environmental ramifications. My point is, the faculty here very likely have been teaching a kind of ethical problem-solving for some time in their classes, but they may not have used these words to describe what they do. We might get good ideas for practical and relevant approaches to teaching ethics from these colleagues, and if we had more conversations we could mutually enhance our teaching. This proposed paper is a way to launch such conversations.

In addition to the conversation I'd like to begin with my colleagues, I am curious about what engineering firms expect their new hires to understand about engineering ethics. Do they expect employees to simply be familiar with an engineering Code of Ethics? Or would they want new hires to have the advanced problem-solving and communication abilities that will help them avoid or resolve real ethical dilemmas? Some of them will face what I call "real ethical dilemmas" -- those difficult choices engineers must sometimes make when they have no good solution: when they have two or more possible solutions, all of which may have unknown consequences or potentially negative or potentially costly consequences. How do they make the really tough decisions, like those in which the costs for absolute safety of a design continue to mount as engineers spend more time perfecting that design? How do they decide when a design is "safe enough" so that they can meet the deadlines at the agreed-upon costs?

My proposed paper will analyze input from both the UW-Madison engineering faculty and local engineering professionals. I hope to reach conclusions that will contribute to the goal of your conference – creating partnerships in engineering education.