Chapter 13
Ethics in Design:
Teaching Engineering Ethics

James A. Stieb
Drexel University, USA

ABSTRACT

This chapter addresses how engineers can incorporate an understanding of human beings into their technological innovations as well as some risks, responsibilities, and social values involved in technological design. It also addresses how best to teach Engineering Ethics. In short, the chapter analyzes Engineering Ethics from a philosophical and educational perspective. The objectives of this chapter are to discuss ethical theories and their significance to Engineering Ethics and relevant and significant case studies of international and national import for future technological designs. Further, the importance of including social and moral values in the engineering design process and the advantages of abiding by the professional ethics code in Mechanical Engineering are also discussed. At the end, the chapter discusses the best way to teach an Engineering Ethics course.

A GOOD AND USABLE DEFINITION OF "ETHICS"

The embodiment of those values that the person or organization feels are important …, and spell our proper conduct and appropriate action –Merriam Webster[1]

How can engineers incorporate professional ethics into their practice to succeed at engineering? First they must straighten out their definition of Professional Ethics.

At first glance, Webster's definition of "Ethics" seems innocently correct. It is not. This first glance issue of what "Ethics" means signals a central difficulty within professional ethics. It also shows how much Ethics needs the humanities. Many a hard-nosed engineer disdains the *belles lettres* as superfluous. But, quite simply those who fail to see the glaring fault in Webster's definition have failed to read very carefully. Reading connects with thinking; so those who miss-define Ethics fail to think very carefully as well.

For, Ethics is not what a person or organization feels is important. Should we care what Charles Manson, mastermind behind a number of heinous murders, thought was ethically important? He was a person after all despite his efforts to become the

contrary. Nor should we care what Enron—an infamous and failed organization—thought was important for anything other than tracing the history of a disease. While they raised banners touting truth and integrity in their company parking lot and publicly lauded their financial stock and social utility, Enron executives underhandedly sold their personal stock from a sinking ship they abandoned.

This bad definition is hardly the simple province of laymen, if one can call lexicographers "laymen." More importantly, professionals in the field of Professional Ethics (hence, Engineering Ethics) also fall prey to it. Witness then a full article bedeviled by this mistaken view of ethics. O.C. Ferrell (2005), author of a book on Business Ethics, reminds one in the bureaucratic and vague language of business: "Organizational ethics initiatives have not been effectively implemented by many corporations, and there is still much debate concerning the usefulness of such initiatives in preventing ethical and legal misconduct" (p. 3). It is almost laughable to think that ethics has anything to do with business initiatives—as if this nondescript phrase "business initiative" is supposed to mean anything. How is such an ethics "initiative" to be "implemented?"

Ferrell (2005) tries his best to propose a framework that can be effectively "integrate[d]" into the business school curricula. Ferrell eschews "personal moral development and character" dependent as it is on the lottery of personal interests and upbringing. Neither do "ethics initiatives … arise inherently from corporate culture," nor does "hiring ethical employees" "limit unethical behavior." Only "proactive leadership" that provides "employees from diverse backgrounds" with "a common understanding of what is defined as ethical behavior through formal training" will create "an ethical organizational climate" (p. 3). In addition, he seems to know "how ethical decisions are made"(p. 4).

Ferrell is not alone. Recently, Magun-Jackson (2004) assumed a Kohlbergian approach to Engineering Ethics education. Rather she wrote a five page article for Science and Engineering Ethics describing a Kohlbergian approach and one that is related to it (that of Reimer et al., 1983). She provides no arguments, and certainly no considered objections. Many individuals think that arguments are not needed in Professional Ethics. What is ethical is clear; Ethics is whatever management wants.

However, arguments and attempts to answer objections are crucial to a field that is a branch of philosophy. Incredibly, one finds this kind of non-argumentative, oblivious, hand-waving pretty much everywhere in the literature on Engineering Ethics education. This is sad, not to mention counterproductive to the idea of trying to teach students how to think ethically. To think ethically, students must think and produce supporting arguments; and they do not see their professors often doing that. Many professors fail to demonstrate ethical thinking so scrupulously that one wonders if they even know how to do it. These really are deep philosophical issues—no less than what it is to be virtuous!

Virtue and how to make ethical decisions have stymied philosophers for centuries. To take a very old example, Plato, despite earnest efforts to transform both the citizens of Athens and indeed the government of the Italian Penninsula of Syracuse—a place he happened to visit once or twice—failed quite simply to show "how ethical decisions are made." Plato's friend and devoted student, Dion, invited him to one of the first recorded episodes of taming the tyrant. Meanwhile, Plato who detested tyrants almost as much as he detested democracies offended Dionysius, the ruler, so badly that he (Plato) ended up being sold as an Athenian slave at Aegina.

This, of course, improves upon the fate of his mentor, Socrates, who, in Christ-like fashion, was put to death by the very public he sought to show "how ethical decisions are made." Fortunately, Anniceris of Cyrene rescued Plato (Reale & Caton, 1990, p. 394). Had Anniceris not intervened, Plato would never have founded the Academy and

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