

Ethics and Engineers

Ishwar K. Puri

N. Waldo Harrison Professor of Engineering Science & Mechanics



A little bit of history

- Cicero's creed – Marcus Tullius Cicero (106–43 B.C.E.)
 - *Salus populi suprema est lex, or the safety of the public shall be their highest law*
- Hippocrates (Greek, ~200 B.C.E.)
 - ἐπὶ δηλήσει δὲ καὶ ἀδικίῃ εἴρξειν, *primum non nocere, or first do no harm*

Modern interpretation

- Pinkus *et al.*(1997) regarding a professional
 - Competence
 - Responsibility
 - Cicero's Creed II: *ethical engineer should be cognizant of, sensitive to, and strive to avoid the potential for harm and opt for doing good*

Put simply

- *[Ethics is] knowing the difference between what you have a right to do and what is the right thing to do – Supreme Court Justice Potter Stewart*
- *It takes years to build a reputation - and five minutes to ruin it. If you think about that, you'll do things differently – Warren Buffet to his son*

What not to do

- The Charlie Brown school of ethics as per NAE member Norm Augustine
- *... one day the peripatetic Charlie Brown's friend Lucy observes him shooting an arrow at a fence and then drawing a target around the spot where the arrow landed - with the point smack in the bulls-eye! Needless to say, Lucy becomes hysterical over Charlie's behavior - and her frame of mind is not helped when Charlie calmly explains, "But if you do it my way, you never miss."*

Does Academic Dishonesty Relate to Unethical Behavior in Professional Practice? An Exploratory Study*

Trevor S. Harding,* Donald D. Carpenter,[†] Cynthia J. Finelli[‡] and Honor J. Passow[‡]

* Kettering University, Flint, Michigan; [†] Lawrence Technological University, Southfield, Michigan; [‡] University of Michigan, Ann Arbor, Michigan

Keywords: academic dishonesty, cheating, professional ethics, engineering education

ABSTRACT: *Previous research indicates that students in engineering self-report cheating in college at higher rates than those in most other disciplines. Prior work also suggests that participation in one deviant behavior is a reasonable predictor of future deviant behavior. This combination of factors leads to a situation where engineering students who frequently participate in academic dishonesty are more likely to make unethical decisions in professional practice. To investigate this scenario, we propose the hypotheses that (1) there are similarities in the decision-making processes used by engineering students when considering whether or not to participate in academic and professional dishonesty, and (2) prior academic dishonesty by engineering students is an indicator of future decisions to act dishonestly. Our sample consisted of undergraduate engineering students from two technically-oriented private universities. As a group, the sample reported working full-time an average of six months per year as professionals in addition to attending classes during the remaining six months. This combination of both academic and professional experience provides a sample of students who are experienced in both settings. Responses to open-ended questions on an exploratory survey indicate that students identify common themes in describing both temptations to cheat or to violate workplace policies and factors which caused them to*

In the largest study to date, conducted in 1964, Bowers reported that 58% of engineering students self-reported cheating in college. By comparison, in 1996 McCabe reported that 82% of engineering students self-reported cheating. In both cases, students in engineering reported the second-highest rates of cheating by academic discipline, behind only business students.

From the paper

- Students who cheat [miss] the opportunity to develop a deep understanding of the content material.
- Over time, such students may develop a sense that everyone else cheats, that it is easy to do, and that it is a normal part of life.
- Faculty evaluate students who cheat on the basis that the falsely-completed work is a valid assessment. This provides prospective employers with an inaccurate impression of students' abilities.
- Behaviors that result in low academic integrity could extend into professional practice—resulting in significant consequences for the individual, the employer, its customers, and society in general.

Their conclusion

- There appears to be a strong relationship between self-reported involvement in prior academic dishonesty (high school) and self-reported involvement in present dishonest behavior (college and workplace) of engineering students.

Comparison of Engagement with Ethics Between an Engineering and a Business Program

Steven M. Culver · Ishwar K. Puri ·
Richard E. Wokutch · Vinod Lohani

Received: 16 August 2011 / Accepted: 13 December 2011
© Springer Science+Business Media B.V. 2011

Abstract Increasing university students' engagement with ethics is becoming a prominent call to action for higher education institutions, particularly professional schools like business and engineering. This paper provides an examination of student attitudes regarding ethics and their perceptions of ethics coverage in the curriculum at one institution. A particular focus is the comparison between results in the business college, which has incorporated ethics in the curriculum and has been involved in ethics education for a longer period, with the engineering college, which is in the nascent stages of developing ethics education in its courses. Results show that student attitudes and perceptions are related to the curriculum. In addition, results indicate that it might be useful for engineering faculty to use business faculty as resources in the development of their ethics curricula.

The largest ethics survey of engineering students to date

Virginia Tech survey

- Responses from 566 engineering and 276 business undergraduate and graduate students; response rates of ~10%
- Business: 51% male, 80% between 18-24 years, 6% freshmen, 16% sophomores, 22% juniors, 32% seniors, 24% master's, and less than 1% doctoral
- Engineering: 74% male, 85% between 18-24 years, 21% freshmen, 17% sophomores, 15% juniors, 25% seniors, 10% master's, and 12% doctoral

Ethics education

- Business students perceived greater engagement with ethics education than engineering students
- But no difference regarding “substantial emphasis on teaching ethics”

Perceptions of majors

- Business: more likely to believe their textbooks and course materials often covered ethical issues
- More likely to agree their professors
 - “demonstrate a great deal of knowledge regarding ethical issues”,
 - “expressed concern over ethical issues in applied settings.”
- Engineering: more likely to respond “my professors have avoided discussions of difficult ethical issues.”

Another difference

- Engineering majors more likely to believe
 - “ethics is accepted as the same across cultures and nations.”
 - “if an engineering practice is legal, then it is also necessarily ethical.”
 - “professional ethics and personal ethics are two separate things.”
 - “in general, ethics is independent of the country or culture in which it occurs.”
- Business majors more likely to believe “accepted practice of cultures in other countries determine what is ethical.”

Collaborative Dual-Degree Programs and Value Added for Students: Lessons Learned Through the Evaluate-E Project

Journal of Studies in International Education

16(1) 40–61

© 2012 Nuffic

Reprints and permission:

sagepub.com/journalsPermissions.nav

DOI: 10.1177/1028315311403934

<http://jsie.sagepub.com>



**Steven M. Culver¹, Ishwar K. Puri¹, Giancarlo Spinelli²,
Karen P. K. DePauw¹, and John E. Dooley¹**

Abstract

Dual-degree programs are intended to prepare graduates to work in a global job market by providing more extensive international experiences, thus enhancing their employability. These programs typically take longer to complete and cost more, yet there is little documentation regarding their effectiveness. This study was designed to examine strengths and weakness of a sample of existing formalized programs at the graduate level in engineering through surveys and focus groups with four key stakeholder groups: students currently enrolled in dual- or joint-degree programs, faculty teaching in those programs, alumni who have recently graduated from those programs, and employers who have either hired alumni from these programs or are in a position to hire future graduates. Results indicate that all stakeholder groups were positive about these programs, and there is demand for them among students though gains were indicated in personal dimensions (e.g., self-reliance) rather than professional ones. In addition, employers were unclear about what dual-degree programs were and did not tend to view graduates as more marketable. Further study with more diverse groups is indicated.

A survey of European engineering students

Faculty, students, alumni

- Low ratings by Europeans regarding
 - “engineer’s core values and their relationship to effective ethical leadership”
 - students’ “ability to understand and effectively discuss ethical issues in engineering,”
 - “textbooks and course materials in my program often cover ethical issues.”

Hence, overall

- There are many concerns about
 - What students are not learning, and
 - What they are not taking with them into their professional careers

The problem is

- We focus on individual professionals, on “feelings” and “beliefs” of what is good, on individual integrity, i.e., on *microethics*
- Not on context, how and why their work is performed, i.e., on *macroethics*

How should we solve
this problem?