

Ethics and a PSM Applied Physics Program—Oil and Water?

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Abstract

PSM programs prepare their alumni for professional positions in companies and organizations—positions that often have significant pressures of time-crunches, short deadlines, and profit demands. Granted these pressures, and possible attendant urges to cut corners, the issue is what type of ethics instruction can best prepare PSM graduates for the workplace. A business ethics course might help, but there is no room for another course in an already-packed curriculum. This presentation discusses an ethics module embedded in a PSM Plus course at the University of Northern Iowa (Business Management for Science Professionals). The intent is to model the types of situations that an employee might face, both as an individual and as a member of a team. Real-life scenarios are used to prompt discussions, which are led by a specialist in business ethics. Scenarios appropriate to PSM Applied Physics students will be discussed.

Introduction

Planning for and implementation of the Professional Science Master's program in Applied Physics at the University of Northern Iowa (UNI) were funded by Sloan Foundation grants administered by the Council of Graduate Schools. In May 2006 the Iowa Board of Regents approved the PSM as a graduate degree at UNI, and the first PSM Applied Physics students matriculated in August that year. Enrollment has grown with each passing year, and the PSM Applied Physics program reached its goal of 10 enrolled students per year in the 2008-2009 academic year—an equilibrium which the

program attempts to maintain. There are currently five PSM degree programs at UNI¹

The planning phase involved extensive surveys of engineering and high-technology companies in Iowa and surrounding states. Their responses and the advice of an Applied Physics PSM Advisory Committee guided curriculum design. Courses in LabView software, computer simulations, design of experiments, and computer interfacing & signal processing were created. These technical courses were leavened with four broader courses—called

¹ Applied Physics, Applied Chemistry & Biochemistry, Biotechnology, Ecosystem Management, and Industrial Mathematics.

Plus courses—that educated the PSM students in areas of business practice, introduced them to business managers, encouraged them to work in teams to solve industrial problems, and placed them in company internships.

The business practices course, Business Management for Science Professionals, is taught by faculty from the UNI College of Business Administration. Classes emphasize team work and are highly interactive. The titles of the content modules show the course emphasis, as it was originally designed:

- The Road to Great Management
- Root Cause Analysis—How Did That Happen?
- Accounting Concepts for the Non-Accountant
- Organizational Analysis
- Communicating, Team Building, and Managing Conflict—Tools to Efficiently and Effectively Manage People
- Performance Management—Setting Goals, Coaching and Appraising Your Staff
- The Economics of Effective Business Decision Making
- What You Don't Know Will Hurt You—The Legal Environment of Business
- Beyond the Customer-Driven Organization—The Next Generation

Students from all five UNI PSM programs enroll in this course, and it is one of the highest ranked PSM courses at UNI by student feedback. Students often remark that they “never thought about things from the perspectives discussed in the course.” To them, it comes as a surprise—mostly pleasant—that business topics can be interesting.

It will be observed that the business practices course syllabus, as presented, is strong on management topics, but it neglects business ethics. This gap in course content became apparent as UNI's PSM graduates entered the workplace beginning in late 2007. It was not so much the wave of accounting frauds that resonated with UNI's PSM graduates—but rather a growing sense that the practical complications of ethically negotiating the modern business

environment deserved to be addressed in a constructive way. How could this be done for PSM Applied Physics students and other PSM students at UNI?

Building Agreement on Ethics—Mixing Oil and Water

Adding a Business Ethics module to the Business Management for Science Professionals course should require a consensus among PSM faculty. (We say “should” since it is often the case that a change like this can simply be instituted by the faculty member who is the lead instructor for the course.) At UNI the Business Management course is a hard-won success—disciplinary faculty are sometimes the last ones to see the importance of *Plus* topics (after students, graduates, and business community partners). Not that the faculty did not support creation of such a course in the planning stage, but they did not truly understand the course until their own graduates showed them the value. After three full years of program operation, UNI PSM faculty members truly understood the purpose and need for the Business Management course. But business ethics...is that really something that could be taught in a PSM program? Are ethical issues something that a PSM graduate will face in the workplace? These were typical faculty questions when the option of a business ethics module was first introduced for discussion.

Building consensus on answers to these questions in the UNI Department of Physics, home of the PSM Applied Physics program, was achieved first by helping physics faculty understand the context for such a module by discussing brief case studies. Several caselets by McBain² and Balassone [1] on

² John McBain is program coordinator for the Institute of Electrical and Electronics Engineers, Silicon Valley Chapter. James Balassone is executive-in-residence at the Markkula Center for Applied Ethics at Santa Clara University.

product safety issues were used, as these were considered appropriate examples given the company placement of PSM Applied Physics graduates.³ The general context for the caselets was as follows:

All employees are expected to act according to their organization's Code of Ethics or Conduct, based upon the values of the organization. Furthermore, product safety engineers are asked to:

- a) Determine the "safety" of products;
- b) Obtain various non-governmental agency certifications for products;
- c) Confirm that products comply with government regulations; and
- d) Examine and test products according to various standards.

They are required to do this using the minimum time, money, and number of product samples—usually at the end of the product development process, when changes are more difficult and everyone wants to ship products.

The scenarios for discussion all flowed from the general context:

Scenario 1

Background⁴: Some agencies authorize companies to test products, provide the data to the agency, and ship the product bearing the agency mark. The company's capability has been evaluated by the agency and a contract signed to allow this.

Situation 1a: A new high-end computer is ready to ship except for one test that you will not complete for another three weeks. The probability of failure is low—and even if the test fails, corrections can be made and sent out later to customers. Marketing is VERY anxious to ship because the end of the fiscal quarter is next week. Should you put on the agency mark and ship while finishing the test?

Situation 1b: Your boss tells you that this has occurred before; the company shipped the product, and there was no problem. He also says that if you do not want to sign off, then he will do so. What should you do?

Situation 1c: Products were shipped before this test was completed, but it happened when you were on a business trip. The production manager apologizes, but doesn't want to take any action. What should you do?

Scenario 2

Background: The company records-retention policy instructs employees to discard development records and test results for products five years after End-of-Life is declared. This policy is in compliance with local legal requirements.

Situation: Because of the press of work you have not disposed of some old records, and they are a couple of years over the limit for the company policy. You finally get time to clean out your files, but you receive a legal request for any information about the old product that is involved in an injury case. Your records may or may not be applicable to the case.

Should you destroy the records?

The character and intensity of these "real world" situations engaged the physics faculty. They agreed to support an ethics module in the Business Management for Science Professionals course.

The Goals for a UNI Business Ethics Module

Business ethics is an applied field that draws upon philosophical ethics as well as the pragmatic discipline of management and the social science disciplines of sociology, political science, economics and psychology. Its aim is to help managers grapple with the tough questions and the temptations of business in ways that are socially, economically and personally satisfying [2].

³ PSM Applied Physics graduates have found employment in engineering and high-technology companies such as Rockwell-Collins (Cedar Rapids, IA), DISTek Integration (Cedar Falls, IA), and Prometric (Baltimore, MD).

⁴ The subheadings "Background" and "Situation" have been added to the quoted scenarios for greater clarity.

A semester-long business ethics course would examine issues of identifying and defining situations where ethical decision-making is required, various philosophical foundations of ethical thought, psychological dimensions such as self-deception and cognitive dissonance, and sociological dimensions such as work group pressures, hierarchical processes, obedience to authority, and the nature of organizational incentives. Detailed cases would be examined for red flags, decision points, and analysis of options. Clearly, a 3-hour module cannot cover the ground so extensively. Thus, the primary goal of the Business Ethics module is to help PSM students recognize situations in which their own ethical judgment should be exercised.

There are a number of reasons why people in business fall prey to poor ethical decision making. Some of the more important reasons involve specialized business language, the division of labor that characterizes large organizations, trust in and obedience to authority, and psychological mechanisms of justification and self-deception.

First, business has a specialized language that can have the effect of “mathematizing” and dehumanizing situations and decisions that are ethical in nature because of the potential for harm. For example, employees can be “labor units,” work teams can be “cost centers,” and the analysis of decision options in terms of *harms* and benefits to all parties readily becomes analysis of *costs* and benefits to the company alone. What matters is “the bottom line” and “meeting the number” for a financial reporting period. When the use of such language has become routine, businesspeople can be led to make decisions based on narrow company self-interest without considering potential, even probable, harms to living beings or the earth.

Second, organizational division of labor and trust in authority are considered by most people to be

essential attributes of modern life, and most of the time these mechanisms function effectively and without causing harm. However, respect for division of labor can cause a “silo” effect wherein scientists defer to managers who are demanding action that the scientists consider outside their realm of expertise, resulting in great harm, as in the Challenger situation. And obedience to authority, sometimes based on respect and sometimes on fear, has been shown over and over to play a role in business frauds and disasters [3].

Third, psychological defenses can keep a decision-maker from seeing a situation as it is and accepting personal responsibility for the consequences of personal decisions and actions. Psychologists have documented the limiting and sometimes destructive effects of selective perception, confabulation, denial, feelings of entitlement, escalation of commitment, and more, on decision making.

So, for PSM students, the essential task of a business ethics module is to introduce them to real-world situations involving ethical content and requiring ethical decision making, and through discussion and analysis, help them learn to recognize and appropriately define such situations. Caselets such as those above help to ground students in the realities of life in business organizations; discussion and analysis can show them the need to apply the values they have already absorbed to situations that might otherwise be defined as “just business.” And can point them toward conceptual, psychological, and organizational tools that can be helpful when they must act in such situations.

References

1. Web article (active as of October 1, 2009) <http://www.scu.edu/ethics/dialogue/candc/cases/product-safety.html>.
2. Donna J. Wood, <http://globalbusinessethics.com>.
3. Carol Tavis and Elliot Aronson, *Mistakes were made (but not by me): why we justify foolish beliefs, bad decisions, and hurtful acts*. Orlando, FL: Harcourt, 2007.