Undergraduate Team Assignment: Ethical Dilemmas in Engineering Student Co-op Experiences

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Description

This activity is considered an NAE Exemplar in Engineering Ethics Education and was included in a 2016 report with other exemplary activities.

Body

exemplary activities.

Exemplary features:

Use of students' own experiences in co-ops and volunteering to tackle real-life problems; use of the pedagogical approach of having students learn from their peers

Why it is exemplary:

Our classes enroll engineering students at the junior and senior level for 12 ABET-accredited engineering programs. Many of these students come into the class already having had an engineering co-op experience, and we ask them to share their stories about ethical dilemmas they have faced in the workplace. We put them in small groups (of four to five students each) where they are asked to share their

experiences and then come to consensus on the most compelling, most troubling, most complex ethical dilemma from the group. They write up the case and give a presentation to the class about it, with at least three or four options for resolving it. Then they test their options using not only the NSPE Code of Ethics but also an ethical decision-making model that includes moral tests. They solicit class feedback on their analysis of their options; if the class can offer a better solution or an improvement of a particular solution, they consider that. Finally, they explain how they would communicate their solution to necessary stakeholders.

Program description:

Other undergraduate students and faculty participate in these presentation sessions. Our educational goals are to ensure that students are reflecting on their work experiences in thoughtful ways; they should be able to identify and articulate the ethical dilemmas that can arise in workplace contexts, disagree constructively if there is disagreement, listen carefully to conflicting perspectives on the case that may be provided by others in the team or in the class, resolve conflicts when possible, and learn to moderate a discussion about ethical issues with their peers in the class. We believe this exercise can help prepare students for the ethical challenges they will face; ultimately, successful completion of the project should also improve their leadership skills.

Team Ethics Presentation Assignment:

Step 1.   Self-reflection on past experiences.
First each student must spend at least one night reflecting on his/her past experiences in a co-op or internship setting. If the student has had other (non-engineering) work or volunteer experiences, those can also be acceptable. Typically we ask that students to consider a fairly recent experience. This self-reflection is very important: students may have experienced an ethical dilemma but simply did not recognize the ethical dimensions of the problem at the time. It can help to ask them to think of a time when they were given a particularly difficult problem to solve at work, perhaps one that involved communicating with difficult people. A typical ethical dilemma has potentially negative impacts for some stakeholders.   Sometimes we have a few students who have a lot of difficulty with this part either because they have no work experience at all, or because they really can't think of a significant conflict at work. In such cases it can be acceptable for them to choose an ethical dilemma from an academic experience in College, or

from involvement in their student organization.

[Note to instructors: Occasionally this self-reflection part of the assignment, if taken seriously, can be challenging for students: they may have a story they really don't want to share as their own story because it is too painful; they may be embarrassed or even nervous about an action that they have taken in the past. We make clear that they need not be the central character in the dilemma that they share: it is a case taken from an experience at work, but they need not have been the central decision-maker to understand what was at stake for different people and the company or institution. It is always up to the student to decide which story to share, of course: we tell them, if the story makes you too uncomfortable, think it through – but in the end it is probably not the story to share with anyone in the group.]

Students are reminded early and often that they should keep their stories as anonymous as possible: they should not share real names of the company or individuals in any story they share. We do this to ensure that they feel safe to share stories from experience.

Part A: Team discussion on the cases
When students have had a chance to reflect on their own experiences, we schedule a class day for team sharing and discussion of the different cases. By the end of class, we hope the team can reach consensus on which case they will choose to develop for the team case.   They should choose a complex case: the best cases have multiple stakeholders, and potentially conflicting values, duties, and obligations; the possible options have significant consequences for the stakeholders. After reaching consensus, the team then meets outside of class to prepare about a 25-minute discussion that covers the details below.   They must ensure that each member of the team has something worthwhile and significant to say to the class as part of this assignment. They should prepare to ask questions and involve the audience, and expect to be asked questions.

Part B: Team presentation elements
(1) Team provides some quick background on the case so we understand who the stakeholders are and what is at stake in the case. This background leaves out company names and any identifying information for the individuals involved, but gives us some generic information so we understand the purpose of the company and the roles of the stakeholders there. The team describes all stakeholders

involved in the decision and all others who might be affected. To the best of their ability, they should also describe any preexisting tensions or pressures that we need to know about with these different stakeholders. They must articulate why it is an ethical dilemma, not just a technical problem.

(2) Sometimes ethical dilemmas arise because of a lack of information: the team should make clear if there were uncertainty factors, unknowns, or risks that were difficult to quantify; they should lay out the facts for all sides of the problem as clearly as possible, but identify the gaps that existed for the decision-makers if that is possible. The team should be sure to ask themselves: Were any elements unknown or uncertain to different stakeholders at the time, which may have had a bearing on the dilemma?

(3) The team should develop a list of creative options (aiming for three to five), including a few that a logical but extremely self-interested person might feel tempted to choose even though those solutions may be recognizably unethical. (In other words, the team should provide us with a real range of potential, realistic behaviors, not just the options they have predetermined are ethical.)

(4) The team should then analyze each option using the following questions.

- **Harm test**: does this option have fewer negative consequences (both short and long term) than the other options?
- **Publicity test**: would I want my choice of this option published online, or in the newspaper? If everyone were to find out I made this decision, would I still feel good about it?
- **Reversibility test**: would I still think the choice of this option is good if I or someone I loved were one of those adversely affected by it?
- **Universality test**: if everyone else out there confronted with this kind of problem were to make exactly this kind of decision that I am contemplating, would that produce the kind of world I want to live in? (Would I still think this is a good decision if any others out there might begin making the same sorts of decisions?)
- **Respect for persons test**: does this option trample on anyone's rights? If so, is there anything that can be done to avoid trampling on individual rights?
- **Utilitarian test**: does this option do the greatest good for the greatest number of people, without abusing any minority groups who might be negatively impacted?

- **Social Justice test**: does choosing this option impact a minority group negatively? If there is no way to avoid negative impacts of this decision, is there any way to distribute the negative impacts so that no one minority group has to bear the full burden of the negative impacts?

(5) Team should arrive at an ethical solution using the tests above and the NSPE Code (or any code of ethics relevant to the case). Use an explicit reference to the tests above and references to any relevant part of the NSPE Code (available at the course homepage). Did your team reach consensus on the solution, or have no consensus? Why?

(6) Typically even the best solution requires a challenging communication of some kind. The team should describe next steps, and be clear about how they would communicate their resolution of the case, and to whom.

(7)   Team should conclude their presentation by telling us what they think we can all learn from the case. What could have been done differently that might have helped people avoid the whole dilemma? Is there any way to prevent this sort of dilemma from happening again?

Tips on the Presentation Itself: Teams must distribute the work as evenly as they can within reason. Everyone on the team should have something valuable to say, with roughly equivalent time to say it. Time team members and keep the team on track. Visuals should follow course guidelines for strong visuals. Powerpoint is allowed to help the team anchor the discussion; be sure we understand the background on the case, the different stakeholders, your options, your analysis, and your solution. Teams should aim for no more than seven or eight slides, including the title slide. Delivery matters.. The presentation should not be memorized; it should be known well enough that each team member can speak naturally to us and use effective emphasis and energy.   Teams must make efforts to make effective eye contact and interact with the audience so that the presentation can become a class discussion starter.

Q&A: The team should ask useful questions of the audience at the end of the presentation, to ensure that all are engaged in thinking about the dilemma and the team's analysis.   Class feedback on the solution is important.

Assessment information:

We use a rubric to ensure that students are meeting the goals described above, based on the following:

1. Clarity of the context/background information.
2. Complexity of the options/solutions or consequences of the solutions. Are assumptions carefully analyzed? Are reasonable negative ramifications anticipated?
3. Ethical reasoning skills: What systems were used to arrive at conclusions? Was the NSPE Code appropriately applied? the Ethical Decision-Making System used, with insightful use of moral tests?
4. Further development needed for any particular idea or option?
5. Teamwork: Well organized and fluid functioning as a unit? Reasonable management of ethical dissent?
6. Class discussion moderated with fairness and strong critical thinking?

Please see the attached rubric as a starting point, and modify to suit goals of your course.

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Resource Type

Educational Activity Description

Parent Collection

NAE Exemplars in Engineering Ethics Education

Topics

Research and Practice
Workplace Ethics

Discipline(s)

Engineering
Teaching Ethics in STEM