

Ethics In Engineering

Semester 5 - Professionalism & Corporate Ethics

(303193304)

Resolving ethical dilemmas

Learning Objectives

By the end of this lecture, students should be able to:

- To understand that ethical dilemmas are inherent in engineering practice.
- To learn structured approaches and frameworks for analyzing and resolving ethical dilemmas.
- To develop critical thinking skills necessary for making morally sound engineering decisions.
- To appreciate the importance of professional codes of ethics as a guide in dilemma resolution.

Topics to be Covered

1. Introduction
2. Key Concept/Definitions
3. Content
4. Example
5. Activity
6. Conclusion
7. Learning outcome

Introduction

- Engineering often involves complex situations where technical decisions intertwine with moral considerations, leading to ethical dilemmas.
- An ethical dilemma is a situation in which a difficult choice has to be made between two or more ethical principles, where abiding by one means violating another. There's no clear "right" or "wrong" answer.
- Resolving these dilemmas is a core competency for responsible engineers, ensuring that their work upholds safety, public welfare, and professional integrity.

Key Concepts/Definitions:

- **Ethical Dilemma:** A situation where two or more ethical principles conflict, making it difficult to choose the "best" or "most ethical" course of action without compromising another ethical value.
- **Moral Agent:** The individual or entity making the ethical decision.
- **Stakeholders:** All individuals, groups, or entities affected by an engineering decision (e.g., clients, public, environment, employees, shareholders).
- **Ethical Frameworks:** Systematic approaches or theories used to analyze and guide ethical decision-making (e.g., Utilitarianism, Deontology, Virtue Ethics).

Key Concepts/Definitions:

- **Utilitarianism (Consequentialism):** An ethical framework that focuses on maximizing overall good or minimizing harm. The "best" action is the one that produces the greatest good for the greatest number.
- **Deontology (Duty-Based Ethics):** An ethical framework that emphasizes duties, rules, and moral obligations, regardless of the consequences. Actions are judged based on whether they adhere to a set of moral rules.
- **Virtue Ethics:** An ethical framework that focuses on the character of the moral agent rather than the actions themselves or their consequences. It asks what a virtuous engineer would do.
- **Code of Ethics:** A formalized set of ethical principles and guidelines that professional engineers are expected to follow, serving as a primary reference for dilemma resolution.

A Structured Approach to Ethical Dilemma Resolution

- **A. Recognizing the Ethical Dilemma:** Identify that an ethical conflict exists, not just a technical or legal one.
- Be sensitive to warning signs (e.g., pressure to cut corners, fear of speaking up, conflicting loyalties).

Content

- **B. Gather All Relevant Information:**
- **Facts:** What are the known facts of the situation?
Distinguish facts from assumptions.
- **Technical Data:** Any relevant engineering specifications, test results, design parameters.
- **Stakeholders:** Who will be affected by the decision?
What are their interests and rights?
- **Context:** Company policies, laws, regulations, industry standards.
- **Professional Codes:** Consult the relevant engineering code of ethics (e.g., ABET, NSPE, IEI).

Content

C. Identify the Ethical Issues/Principles in Conflict:

- What core ethical principles are at stake? (e.g., public safety vs. profit, honesty vs. loyalty, environmental protection vs. economic development).
- Frame the dilemma clearly.

D. Brainstorm Alternatives/Courses of Action:

- Generate as many possible solutions as you can, even seemingly unconventional ones.
- Consider both short-term and long-term implications.

Content

E. Evaluate Alternatives Using Ethical Frameworks:

- **Utilitarian Approach:** Which option produces the greatest good for the most stakeholders or the least harm?
- **Deontological Approach:** Which option adheres best to duties, rules, professional codes, and universal moral principles?
- **Virtue Ethics Approach:** What would a truly virtuous and responsible engineer do in this situation? What kind of professional do I want to be?
- **Rights-Based Approach:** Which option best respects the rights of all involved parties?

F. Choose the Best Ethical Course of Action:

- Based on your analysis, select the most ethically justifiable solution.
- Be prepared to articulate your reasoning.

Content

G. Act on the Decision:

- Implement the chosen course of action.
- This often requires courage and effective communication.

H. Reflect and Learn:

- Review the outcome of your decision.
- What lessons can be learned for future ethical dilemmas?

Activity (for discussion)

- **Mini Case Study Breakouts:** Provide small groups with a simplified engineering ethical dilemma. Ask them to apply the 8-step process outlined in the content to arrive at a solution and present their reasoning.
- **"Ethical Framework Application":** Take a single ethical dilemma and ask different groups to analyze it using a specific framework (e.g., one group uses Utilitarianism, another Deontology, another Virtue Ethics). Compare their conclusions and discuss the strengths/weaknesses of each framework.

Activity (for discussion)

- **"Personal Dilemma Reflection"**: Ask individuals to reflect on a past ethical dilemma (professional or personal) and consider how applying this structured approach might have helped them. (No sharing required, just reflection).
- **"Code of Ethics Scavenger Hunt"**: Provide excerpts from an engineering code of ethics. Present a dilemma and ask students to identify which clauses of the code are relevant and how they might guide the decision.

Conclusion

- Ethical dilemmas are an unavoidable part of engineering, demanding more than just technical expertise.
- A structured approach to resolving these dilemmas provides a powerful tool for navigating complex moral landscapes.
- By diligently applying ethical frameworks, considering all stakeholders, and referring to professional codes, engineers can make decisions that uphold public trust and professional integrity.
- Developing this ethical muscle is crucial for a responsible and successful engineering career.

Learning Outcomes

- Students will be able to define what constitutes an ethical dilemma in engineering.
- Students will be able to outline the key steps in a structured ethical dilemma resolution process.
- Students will demonstrate the ability to apply at least two ethical frameworks (e.g., Utilitarianism, Deontology) to analyze a given dilemma.
- Students will effectively identify relevant stakeholders and conflicting ethical principles in a given scenario.
- Students will articulate a reasoned ethical decision for a hypothetical engineering dilemma.

Related Video to the Topic

- **Title Suggestion:** "How to Solve Ethical Dilemmas" or "Ethical Decision Making for Engineers"
- **Link Suggestion:**
- Search YouTube for videos from university ethics centers, philosophy channels, or professional engineering organizations that explain ethical frameworks or provide case studies of ethical dilemma resolution.
- Look for animated explanations or clear didactic presentations.
- *Example Search Query:* "Ethical decision making process engineering" or "engineering ethics case study analysis"

Thank You