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Fourth Grade
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Second semester- Seventh Lecture

7. Ethical problems- Solving Technique

7.1. Introduction

Now that we have discussed codes of ethics, we are ready to tackle the problem of how to analyze and resolve ethical dilemmas when they occur. In solving engineering problems, it is always tempting to look for an appropriate formula, plug in the numbers, and calculate an answer. This type of problem-solving approach, while sometimes useful for engineering analysis problems, is less useful for ethical problem solving.

7.2. Analysis of Issues in Ethical problems

A first step in solving any ethical problem is to completely understand all of the issues involved. Once these issues are determined, frequently a solution to the problem becomes apparent. The issues involved in understanding ethical problems can be split into two categories: factual, conceptual. Understanding these issues helps to put an ethical problem in the proper framework and often helps point the way to a solution.

7.3. Types of Issues in Ethical problems solving

Let's begin by examining in depth each of the types of issues involved in ethical problems. Factual issues involve what is actually known about a case—i.e., what the facts are. Although this concept seems straightforward, the facts of a particular case are not always clear and may be controversial. An example of facts that are not necessarily clear can be found in the controversy in contemporary society regarding abortion rights. There is great disagreement over the point at which life begins and at which point a fetus can be legally protected. Roe v. Wade, the original Supreme Court decision legalizing abortion in the United States, was decided by the Supreme Court in a split decision. Even the justices of the Supreme Court were unable to agree on this "fact." In engineering, there are controversies over facts as well.

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For example, global warming is of great concern to society as we continue to emit greenhouse gases into the atmosphere. Greenhouse gases, such as carbon dioxide, trap heat in the atmosphere. This is thought by climate scientists to lead to a generalized warming of the atmosphere as emissions from automobiles and industrial plants increase the carbon dioxide concentration in the atmosphere. This issue is of great importance to engineers since they might be required to design new products or redesign old ones to comply with stricter environmental standards if this warming effect indeed proves to be a problem. However, the global warming process is not fully understood, and the need to curtail emission of these gases is a controversial topic. If it were known exactly what the effects of emitting greenhouse gases into the atmosphere would be, the engineer's role and responsibility in reducing this problem would be clearer.

Conceptual issues have to do with the meaning or applicability of an idea. In engineering ethics, this might mean defining what constitutes a bribe as opposed to an acceptable gift, or determining whether certain business information is proprietary. In the case of the bribe, the value of the gift is probably a well-known fact. What isn't known is whether accepting it will lead to unfair influence on a business decision. For example, conceptually it must be determined if the gift of tickets to a sporting event by a potential supplier of parts for your project is meant to influence your decision or is just a nice gesture between friends. Of course, like factual issues, conceptual issues are not always clear-cut and will often result in controversy as well. Once the factual and conceptual issues have been resolved, at least to the extent possible, all that remains is to determine which moral principle is applicable to the situation. Resolution of moral issues is often more obvious. Once the problem is defined, it is usually clear which moral concept applies, and the correct decision becomes obvious.

In our example of a "gift" offered by a sales representative, once it is determined whether it is simply a gift or is really a bribe, then the appropriate action is obvious. If we determine that it is indeed a bribe, then it cannot ethically be accepted. Given that the issues surrounding an ethical problem can be controversial, how can these controversies be resolved? Factual issues can often be resolved

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through research to establish the truth. It is not always possible to achieve a final determination of the "truth" that everyone can agree on, but generally, further research helps clarify the situation, can increase the areas of agreement, and can sometimes achieve consensus on the facts. Conceptual issues are resolved by agreeing on the meaning and applicability of terms and concepts. Sometimes agreement isn't possible, but as with factual issues, further analysis of the concepts at least clarifies some of the issues and helps to facilitate agreement.

Finally, moral issues are resolved by agreement as to which moral principles are pertinent and how they should be applied. Often, all that is required to solve a particular ethical problem is a deeper analysis of the issues involved according to the appropriate principles. Once the issues are analyzed and agreement is reached on the applicable moral principles, it is clear what the resolution should be.

7.4. Line Drawing

The line-drawing technique that will be described in this section is especially useful for situations in which the applicable moral principles are clear, but there seems to be a great deal of "gray area" about which ethical principle applies. Line drawing is performed by drawing a line along which various examples and hypothetical situations are placed. At one end is placed the "positive paradigm," an example of something that is unambiguously morally acceptable. At the other end, the "negative paradigm," an example of something that is unambiguously not morally acceptable, is placed. In between is placed the problem under consideration, along with other similar examples. Those examples that more closely conform to the positive paradigm are placed near it, and examples closer to the negative paradigm are placed near that paradigm. By carefully examining this continuum and placing the moral problem under consideration in the appropriate place along the line, it is possible to determine whether the problem is more like the positive or negative paradigm and therefore whether it is acceptable or unacceptable. Let's illustrate this technique using a hypothetical situation. Our company would like to dispose of a slightly toxic waste by dumping it into a local lake from which a nearby town gets its drinking water. How can we determine if this practice is acceptable? Let's start by defining the problem and the positive and negative paradigms.

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Problem: It is proposed that our company dispose of a slightly hazardous waste by dumping it into a lake. A nearby town takes its drinking water supply from this lake. Our research shows that with the amount of waste we plan to put into the lake, the average concentration of the waste in the lake will be 5 parts per million (ppm). The EPA limit for this material has been set at 10 ppm. At the 5-ppm level, we expect no health problems, and consumers would not be able to detect the compound in their drinking water.

Positive paradigm: The water supply for the town should be clean and safe.

Negative paradigm: Toxic levels of waste are put into the lake.

Negative Paradigm
(NP)

Positive Paradigm
(PP)

Dump toxic levels of
waste in lake

Water should be
clean and safe