A Phenomenological Approach to Ethics Education

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ABSTRACT: *As a subject of education, Ethics in Engineering is very different from other topics in engineering curricula. Students find it difficult to see how an ethics course could improve their engineering skills. Therefore, it is important to keep the ethics courses closely connected with their engineering education.*

One practical approach that might stimulate the interest of students is to start with practical questions. Why should we be interested in professional ethics? Who benefits and how from there being a high ethical level in the engineering profession? These 'phenomenological' questions immediately lead to important practical aspects of professional ethics that should not be ignored by any practising engineer. The students can realise that professional ethics is not just academic interest in eternal religious or metaphysical concepts but part of the hard core of the profession.

Following this idea, an introductory course on professional ethics can be started with the observation that, for a respectable profession, ethical and moral legitimacy is as important as the scientific basis of knowledge and skills. This is why, in the 19th century, the first codes of conduct were written. In the turmoil of today's global business world, a high level of professional morality is more important than ever.

Recently, business ethics has become an important strategic element for multinational enterprises. Bad environmental practices or the violation of moral principles may be observed by the media and can seriously damage the business. Furthermore, companies are less likely to keep their best and most skilful employees if the moral code and values of the management are not acceptable.

For a business, ethical codes have only the instrumental value of making the enterprise more attractive to clients, investors, and employees. The interest of engineering associations is deeper, because they not only want to enhance the status of their members in society but also bring the expertise of their members to the attention of decision-makers in society and act as a channel for the moral intentions and ideas of their individual members concerning all aspects of the modern technological society.

At Helsinki University of Technology, these practical principles have been followed for a decade in elective ethics courses.

1 INTRODUCTION

Technology has taken a dominant role in a modern society which is characterised by giant industrial, business, and public service organisations. On the negative side, many economic, environmental, and social problems have been closely connected with technological change. Public mistrust of the willingness and ability of this *society of organisations* [Galbraith 1983] to control the harmful effects of technology has led to the active discussion of organisational ethics and the professional ethics and morality of engineers. As a result, both industrial enterprises and engineering associations have proposed that courses on professional ethics be included in engineering curricula, and the number of schools offering such courses has grown both in the U.S.A. and Europe. [Zandvoort 2000].

Professional ethics has always implicitly been part of engineering education. In earlier years, teachers with an industrial background were able to illustrate the moral aspects by giving real-life examples. This is not as common any more, because most teachers have only limited experience as engineers outside the academy. The inclusion of moral aspects in engineering courses is necessary, but the complex nature of moral problems also requires separate courses in engineering ethics. The purpose of these courses is to provide students with a toolbox of practical concepts and skills in identifying and solving ethical problems in their daily work.

2 PHENOMENOLOGICAL APPROACH

The concept of ethics in engineering can be introduced by a discussion of the general philosophical principles of ethics. A more practical starting-point is a code of conduct written by engineering associations. Most students find both these approaches too general and trivial to be interesting. It might be more practical to start by asking who the people are who require ethics to be a part of engineering studies, and what their public and hidden motives for doing so are. Ethics in engineering is then interpreted as a 'phenomenon' in today's society, with important political, social, and economic purposes. The approach proposed here can be called a *phenomenological*, or also *hermeneutical*, one because the concept of ethics in engineering is *deconstructed* by revealing the values, forces, interests, and mechanisms in society that create the need for engineering ethics. To illustrate the approach, this deconstruction process is outlined below by (1) identifying the moral interests of the social groups of engineers and the organisations employing them, (2) identifying the changes in society resulting from technology, (3) showing the limits on the freedom of engineers as members of the *innovation triangle* of developers, producers, and customers, and (4) considering the acceptable risks of technology, the liability problems, and the need to enhance the ethical profile of engineers by adopting the *'Nurenberg principle'* in the codes of conduct.

3 INTERNAL AND EXTERNAL MORAL RULES

For all of us, the personal moral principles we follow in our private lives and at work are the basis of our personal integrity, but only a few of us are willing to seek moral advice from others. Ethics in engineering is more a matter of identifying and understanding the *external* moral norms originating from the various social groups and organisations around us. The employer expects his rules to be obeyed, but labour unions, engineering associations, the 'underground' society of co-workers, and other social groups, including the family, limit the moral freedom of engineers by their moral judgements. The unwritten moral rules of unorganised social groups such as the family and co-workers are less rational and more archaic than written codes of ethics. The emphasis is on the hierarchy of power in the group, and on basic values such as honour, loyalty, or security. Moral conflicts must be solved inside the group, and whistle-blowing is condemned. Problems arise when the external moral statements are in conflict with each other or with the internal morality.

More rational and well-defined external moral principles are written in law, employment contracts, and the ethical codes of employers and engineering associations. However, the archaic values of power, obedience, loyalty, and security are still there, but they are just expressed in a different way. As an example, obedience means voluntary participation in ethically justified missions.

A review study conducted in Finland in the late seventies actually showed that engineers themselves seldom meet ethical conflicts at work. Therefore, they do not find codes of conduct to be of much use. For the *professional associations* of engineers, the published professional ethical rules are much more important. The codes are published to strengthen solidarity, discipline, and professional pride among the members, and to enhance the credibility and ethical legitimacy [Airaksinen 1998] of the association and the profession.

For *industrial enterprises* and other business organisations, public 'corporate values' have recently become a strategic instrument for improving credibility among clients, investors, and employees, who often come from different countries and cultures. This especially applies to multinationals operating globally in all continents. The *media* has had a strong influence on business ethics, while giving much publicity to new non-governmental organisations (NGOs) advocating social responsibility in global business. One idea proposed by the NGOs and adopted by many multinationals has been the showing of *'three bottom lines'* in accounting and progress reports. The three bottom lines reveal progress in business, environmental conditions, and human rights (ethical aspects). Nevertheless, typical corporate values still emphasise values connected with traditional business, such as customer satisfaction, professional efficiency, loyalty, and correct behaviour as regards the intellectual property of the employer. Corporate values are instrumental, because their purpose is to enhance the business results of the company and to defend the organisation against its external critics. Corporate ethics have a direct connection to the daily duties of engineers, emphasising their ability to adjust their work to social and environmental conditions, and to communicate on such issues. This is an important guideline for ethics education.

Breaking external moral rules sometimes leads to sanctions. The most severe sanctions can be expected from the employer, because breaking the employment contract may lead to legal action, unemployment, and loss of prestige. The employment contract may therefore be an obstacle to an engineer who wishes to follow his ethical principles. Engineering associations seldom apply any sanctions, but collegial solidarity and professional pride maintain moral discipline among the members and make obedience to moral norms a matter of honour.

Although different codes of ethical conduct have varying viewpoints and emphasise different values and purposes, it is very hard to find conflicting statements. The weakest areas are the problems of the liability of individual engineers, acceptable risks, acceptable harm caused to other people, and minimum rules concerning globalised technology.

4 TECHNOLOGY AND SOCIETY

While making life more comfortable, technology has induced tremendous irreversible changes in societal economic, political, and occupational structures and lifestyles. As a result, a few hundred giant multinational corporations produce the majority of goods and services in the world. The growth of global business consists mainly of trade between units of these corporations. At the same time, free trade has turned the investment flow into the poorest countries into a negative balance. The largest multinationals are politically more powerful than many small nations and are thus able to pressure governments into changing their social and tax legislation.

On the national level, the public military, medical, cultural, and administrative services are also structured into large organisations. They need technology in order to develop, maintain, and control their services. The industrialised society has become a *society of organisations*.[Galbraith 1983] Most of the new technologies are developed by organisations for organisations. The role of private people has shrunk into those of employees and consumers. As manipulated by advertisements, they can control only a limited share of production. Because employment is necessary for living, the most important policy of governments is to maintain economic stability by keeping up a high employment rate [Galbraith 1969]. This is only possible if the productivity increases obtained by technology can be compensated for with increased consumption. Consumption has become almost an ethical responsibility for everybody.

Typical features of the lifestyle in this society of organisations are the requirement for loyalty and strict discipline, maintaining the synchronisation of complicated processes, and reliability and high professional quality in daily routines. We are too deeply involved in this kind of living to see that our actions have actually been adjusted according to the optimum efficiency of the technical facilities for production, transportation, communication, and daily consumption. Despite the high rate of entertaining information we have to continuously process, most of us feel quite comfortable enjoying daily commercial entertainment and reading advertisements. Sometimes there are moments of happiness, until the next terrorist jumps from the TV screen into our living room.

We have made it, but it has also become evident that only people with a certain cultural background are able and willing to follow us. It will never be possible for everybody, because on the earth there would not be enough energy, clean air, water, and other natural resources for all of us. Furthermore, the present technological society is becoming extremely vulnerable with respect to disturbances in information flow and its supplies of water, energy, or food.

Global problems have already been recognised both in business and professional ethics. Usually, the cure proposed by engineers is better engineering, accompanied by fair business rules to rectify the problems of free trade. Unfortunately, the United Nations, the only organisation representing both poor and rich nations and cultures, has no power, ideas, or consensus concerning what should and could be done. In the meantime, the human suffering, anger, and shame of poor nations grows and produces violent political movements against the hegemony of the rich countries. The suffering of the poorest nations cannot be fully eliminated by technical help, but appropriate technical projects would be an effective and politically neutral stabilising element to change the route of globalisation. It should be part of the social responsibility of engineers to intervene in these issues by launching such international initiatives.

5 DECISIONS ON TECHNOLOGY AND THE INNOVATION TRIANGLE

As a professional group in organisations, engineers are responsible for technical functions. Most of them serve industrial enterprises, but technical skills are needed in all other organisations as well in order to keep up and develop their technical structures.

Engineers typically work in teams together with colleagues and customers. Progress in technology is not controlled by engineers but by organisations, which have the need to improve their efficiency and operations. Many of the ideas come from other sides of the *'innovation triangle'*: developers, producers, and customers (users). There are often long time gaps between the design, production, and application, which makes corrective feedback impossible. Engineers coming to the project during different phases of the work do not know each other, and the important decisions are not made by them but by their superiors. This is why engineers do not consider themselves responsible for the harmful consequences of their work. Ethical conflicts are normally solved inside the company. Whistle-blowing is considered to be a shameful action against the team and the employer.

The delays in the interaction between the parties involved in the innovation triangle lead to a kind of determinism or autonomy of technology. It is almost impossible to predict many of the harmful effects. When they become visible, the products are already in full use by customers, and it is too late to cancel their production. The only way to avoid mistakes is careful technology assessment before production commences and very low tolerance of risks.

6 RISKS AND LIABILITY – NURENBERG PRINCIPLE

Technology is always developed and produced for human use, and the designer can never be sure of the product being safely operated. Scientific approaches are always based on simplified models, and the manufacturing tolerances cannot be guaranteed. Therefore, an engineer should always ask what the risks of this technology to its user and other people are, and what the acceptable risk is if we start using the technology.

The answer of western civilisation to this question has always been very permissive. Almost intuitively, we consider new technologies progressive and blame the users for harmful consequences. The positive values of technology are the utilisation of natural resources and increased efficiency in the production of goods and daily human activities. We accept as just the growing inequality of people and cultures caused by technology-based business.

The introduction of the limited liability presently granted by law to industrial enterprises has certainly led to higher risks. On the other hand, the transfer of the liability of individual engineers to their employers has made it difficult for engineers to adopt the 'Nurenberg principle' in engineering ethics, as pointed out in [Zandvoort 2003]. In global business these problems are magnified because of the uneven and unfair competition between poor traditional cultures and rich industrial nations or rich minorities.

7 CONCLUSION

Teaching engineering ethics to students gains new momentum if the moral rules are analysed by deconstruction of the interests and intentions of the social groups and organisations involved in the development of new technologies. Large global and national social, environmental, and economic problems can be shown to have roots in the rapid and unstable progress of technology. It turns out that in the future, an ethically-justified control of technology will be urgently needed. Although engineers are not responsible for the decisions made concerning new technologies, they are in a key position as specialists who are able to inform the politicians and the decision-makers on the risks and, if necessary, to steer the development in a new direction. The approach has been selectively applied in the ethics courses at Helsinki University of Technology [Kuuva, Porra, 2002].

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