

Research on the problems and Countermeasures of engineering ethics education for College Students

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Abstract

The College of engineering ethics education although have been put forward for many years, but in the process of China's rapid economic development, due to too much investment of the single economic growth, economic and technical education in engineering education is still the main education system, and engineering ethics education practical effect is poor. Combined with the future requirements of the future engineer professional ethics, in the context of the current economic development of the new normal, we should re-examine the engineering ethics education of College students. Taking Southwest Petroleum University as an example, this paper analyzes the current problems and its reasons, and puts forward the corresponding countermeasures, which provides reference for the current college students' engineering ethics education.

Keywords

Engineering ethics, higher education, Ideological and Political Education

1. Introduction

Engineering ethics education aims at promoting human well-being for people from the perspective of professional ethics to the engineer's engineering practice constraints. Western countries engineering ethics education began in early twentieth Century, and add the requirements of the engineering ethics to the engineering specifications. Research on engineering ethics in China began in the 90s of the 20th century, Xiaoping, Li Bocong and other experts and scholars in engineering ethics education discussed, and put forward that the contents of engineering ethics should be included in engineering talents training. I work in the Institute of civil engineering and architecture, through to the school where the five undergraduate majors and four research students professional talent training scheme analysis, and the 55 full-time teachers and 300 professional grade student survey found, at present 5 undergraduate majors and four graduate majors do not set up a separate engineering ethics or related courses, only 70.9% of the teachers would mention facile engineering ethics in the professional course, only 9.3% students heard of the concept of engineering ethics, 53.3% of the students will in the course of study, pay attention to safety engineering, engineering, quality and other knowledge. Thus, the author is not optimistic about the situation of college students engineering ethics education.

At present, China's economy has entered a new normal, the economic new normal for the development of engineering ethics put forward a lot of demands. For example, from the point of view of engineering ethics, considering the relationship between social responsibility and sustainable development of Engineering in the process of urbanization and the relationship between engineering ethics and socialist core values. College students as an engineer in the future. In the future in engineering practice to promote engineering ethics needs from the College of engineering ethics education of engineering ethics education objectives oriented, training their consciousness of engineering ethics, help them to master the engineering ethics, to improve their engineering ethics decision-making ability, make students in engineering practice and follow the engineering code of ethics.

2. Problems existing in engineering ethics education of College Students

2.1 Engineering ethics education has not been paid enough attention to

Since the reform and opening up, the society has a single pursuit of economic growth, resulting in the process of economic development, ignoring the social problems and ethical problems in the construction of the project. From the author's research results, whether it is from the talent training program or the given importance of teachers and students, engineering ethics education is an important part of engineering education, the university has not been given enough attention. In addition, the author visited Chengdu 12 large and medium-sized construction enterprises and their construction site, to carry out the engineering ethics research. Research found that the construction enterprises and their employees' understanding of engineering ethics remains in the narrow engineering quality level, the understanding of environmental engineering and engineering sustainable is not deep enough. In the project construction site, the employees also just put forward the requirements and measures of safety management and quality management. Because the importance of construction enterprises put into engineering ethics is not enough, so in the recruitment of personnel is more from the professional skills and work ability to consider, lacking of students' engineering ethics. It can be seen that no matter in the university or in the society, the importance of engineering ethics is not good enough, leading to the deviation of engineering ethics, and engineering ethics education has not been paid attention to.

2.2 The subject of education is not clear

Since the current engineering ethics education has not been systematically carried out in Colleges and universities, which leads to the subject of engineering ethics education is not clear. Should teachers undertaking the task of engineering ethics education are teachers majoring in engineering or ideological and political teachers or science and engineering college counselors or other broader range is not clear yet. In addition, the main implement is cooperate to catch condominium together or with each other focusing on different parts is not clear. The author after the interview learned that the university where the author works mostly in professional courses in the form of case mentioned knowledge of engineering ethics in the development of engineering ethics education of professional teachers, ideological and political theory course. Teachers teaching "Ideological and moral cultivation and the legal basis", "natural introduction to Dialectics" and other courses will mention engineering ethics and ethics of science and technology knowledge for undergraduate and graduate students. Counselors carry out the education of engineering ethics within the students' mind and after-school activities. Lacking of communication and collaboration between the various educational subjects, the main responsibility for the education of engineering ethics education is not yet clear.

2.3 Education content and the goal of narrow and one-sided

According to the three major objectives of engineering ethics education of college students: to cultivate awareness of engineering ethics, to master of engineering ethics, to improve the decision-making ability of engineering ethics. And the contents of the education of engineering ethics should contain knowledge of engineering and ethics two dimensions, and combine engineering ethics, engineering technology, engineering economy, project management, engineering and legal knowledge . Currently engineering ethics education in universities mostly remain in engineering quality and construction safety responsibility, education in the wider range of engineering society responsibility, the ethical awareness and decision-making ability of engineers is not adequate. In the curriculum, there is also a similar situation, engineering ethics education is always from case introduction of teacher's words, deeds and specialized course teaching. In the whole engineering education system, often in the depth of the professional knowledge, there is a certain lack of education in the foundation of engineering, which hinders the development of engineering ethics education.

2.4 The form of education is not innovative, the student participation is inadequate

At present, the engineering ethics education is mainly educating students in the mind layer, regulating the engineering behavior of college students, mainly in the theoretical education. From a practical

point of view, it is usually using engineering cases to expand the theoretical teaching. In the course of teaching, engineering ethics is the standard of engineering ethics education to students, requiring students to master the engineering ethics. In the course of education, it is unable to guide the students to combine the engineering technology knowledge and engineering ethics knowledge, the guidance and cultivation of students' engineering ethics consciousness is not enough. Ultimately caused the students just study case instead of ascending the engineering ethics to the level of consciousness. It is difficult to improve their ability of decision-making in the face of engineering ethics issues, so students in engineering ethics education in the process of active participation degree is not high. A professor at the Institute opened the engineering ethics as an elective course, only 13 students chose it, failed to meet the standard classes, which shows the fact that it's hard for the traditional forms of education to gain its popularity.

3. Causes of the current situation of College Students' engineering ethics education

In combination with the research results of the relevant researchers and the research conducted by the author at Southwest Petroleum University, we can summarize the current situation of College Students' engineering ethics education into 4 parts. They are as follows:

3.1 Awareness of engineering ethics is not comprehensive enough

Because understanding is not comprehensive enough, so in the implementation of the understanding of deviation, resulting in engineering ethics education in Colleges and universities has not been put enough attention. On the one hand, the understanding and definition of the concept of engineering ethics is not clear, on the other hand, the decision-making level of the university is not paid enough attention to the engineering ethics education. The main reasons are as follows:

(1) the society and the university generally pay attention to the engineering technology and the economy, but not enough attention to the engineering ethics. There is a "technology" in the long-term process of engineering education that only stress that the technology is the real ability, and overlook the ethical engineering practice, resulting in engineering ethics education in the implementation process is very difficult to be fulfilled, which cause a severe hinder to the development of the education of engineering ethics.

(2) The understanding of engineering ethics is not comprehensive enough. At present, the understanding of engineering ethics in society and colleges and universities mainly remain in the level of engineering quality and safety, and consider less about engineering sustainability.

(3) In the period of rapid economic development, all kinds of value orientation have a harmful impact on the ethics of engineers. Such as engineer in engineering practice, strive to maximize the economic benefits to the employer, however ethical requirements in engineering practice has weakened, such as Jerry building, engineering environmental pollution is serious and so on. These social phenomena are gradually affecting the engineering ethics education and college students' engineering value standards, leading to their ignorance of the professional ethics of engineers and disregard of ethical responsibility.

3.2 The system mechanism of engineering ethics education in Colleges and universities is not perfect

As the main executor of engineering ethics education, Colleges and universities, the construction of the system is not perfect. In recent years, due to the phenomenon of engineering ethics is more severe, some colleges and universities have opened a number of related courses. For example, the Southwest Jiao Tong University open the "engineering ethics" course, Tsinghua University, opened the "ecological ethics" course, Fuzhou University has opened "engineering ethics" elective course. But most colleges and universities do not consider from the decision-making level of engineering ethics education operation mechanism and implementation path, lacking the corresponding system and the College of engineering ethics education only stay at the point where it's not dispensable. It has also led to that fact that the teaching content and method are not innovative enough, engineering ethics

education has not been accepted by the students, which hinders the further development of engineering ethics education.

3.3 The combination of engineering ethics education and multi subject background is inadequate

Current engineering ethics education steps into the two errors, one is that professional background cannot fit students, who think engineering ethics education is the common ideological and moral education. They cannot combine it with their own specialty, nor well stimulate students to engineering ethics teaching education initiative, resulting in engineering ethics education deviate from the engineering professional technique, and it's vague to impart knowledge to students. Two is the engineering ethics education hasn't been combined enough with politics, economy, society, ecology, culture and so on. Modern engineering project has developed into a large-scale complex projects, not only in the large scale, investment, but the development of the project involves a number of different students. The ethical problems faced in the process of project development, often need to be integrated with the knowledge of many subjects to make the right choice. However in current engineering ethics education, often based on different subject ethics ethical, which makes students unable to grasp the full understanding of the knowledge system, and it's hard to grasp the development direction of engineering. When facing the problem of engineering ethics, it is difficult to make the right decision.

3.4 The lack of engineering ethics education and the interaction of Ideological and Political Education

In 2004 after the release of the central 16 documents, Universities attach great importance to the ideological and political education of college students. To build up a completely ideological and political education work mechanism and a number of highly qualified ideological and political education team is of vital importance. Current engineering ethics education although as a necessary extension of the ideological and political education, but do not interact with the ideological and political education. Thus it unable to take advantage of the ways and means of Ideological and political education, such as extracurricular activities, new media, and these methods are often most easily-accepted ways when students absorb knowledge. The lack of interaction with the ideological and political education leads to the lack of effective integration of educational resources, so it also affects the development of engineering ethics education.

4. Improvement measures of engineering ethics education for College Students

4.1 Design and perfect the system of engineering ethics education from the top level

College Students' engineering ethics education should be carried out from top to bottom in Colleges and universities, improve the system of engineering ethics education from the decision-making level of the University, so that teachers and students pay attention to engineering ethics education. In terms of set up an organizational structure, the author suggests to set up three levels of three-dimensional organization and management systems in universities, as shown in figure 1. First, the school Party committee on behalf of the school responsible for school of the College of engineering ethics education leads the establishment of the College of Engineering Ethics Education Committee, and to establish and perfect the College of engineering ethics education system, ensuring the smooth implementation of engineering ethics education of college students. Secondly, the establishment of the engineering ethics education for college students in the implementation of the specific work of institutions engaged in engineering ethics education and research work, such as the University of Engineering Ethics Education (Research) center. The center is composed of engineering teachers and teachers engaged in engineering ethics research. In addition, the Student Work Department of the Communist Youth League and the school combined with extracurricular education activities related to the practice of students, but also related to the establishment of the student association assisted education activities carried out. The relevant departments can also carry out some engineering ethics activities according to their professional characteristics. On the basis of a sound organizational structure, we should also formulate the engineering ethics education related to the implementation of

planning and rules, such as the embodiment of talent training programs, credit identification, curriculum system settings, etc.. Only from the top level design and sound engineering ethics education mechanism, in order to provide institutional and organizational guarantee for the implementation of engineering ethics education in Colleges and universities.

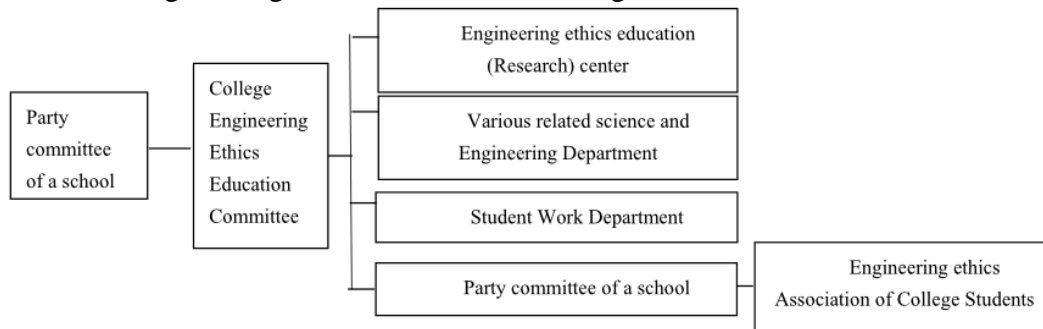


Figure 1. College students engineering ethics education organization

4.2 Combining theoretical study with practical training

Engineering ethics education needs to combine theoretical study with practical training in order to cultivate students' ability of engineering ethics and decision-making ability. Each semester there is a professional practice, from the first semester of the professional cognition practice to the graduation design of the eighth semester, students can experience engineering practice, and in the practice, students discover, study and solve the problem of engineering ethics. Through systematic theoretical study and practical training to achieve the three goals of engineering ethics education.

4.3 The combination of classroom education and extracurricular activities

College Students' engineering ethics education is far from enough, it should be combined with ideological and political education to carry out a variety of college students' favorite extracurricular activities. The 2015 under the guidance of the Ministry of colleges and universities, students carried out "engineering ethics declaration network transfer", "engineering ethics theme lectures", "engineering ethics pictures Exhibition", "engineering ethics swearing in ceremony" many forms of engineering ethics education in a series of activities. When students get involved in extracurricular activities, interest can be cultivated, thus, students may become more active in learning engineering ethics related knowledge. After class activities, the students are transformed from the recipients of engineering ethics education to the implementation of engineering ethics education, which improves the effectiveness of engineering ethics education. In addition to the development of extracurricular activities, the establishment of similar College of engineering ethics Association of student societies, by the student societies independently carry out corresponding engineering ethics extracurricular activities, make the engineering ethics into more college students learning life, help students in career in engineering ethics requirements of their own.

5. Conclusions

Aiming at the present situation of engineering ethics education, it is necessary to put forward and innovate the engineering ethics education again, which is the inevitable requirement and trend of the future development of China's engineering talents. Although China's engineering ethics education is not an ideal and effective way, but the engineering ethics education still has a strong vitality and leading. We should base on the requirements of the professional ethics of engineers to develop students' engineering ethics consciousness and master the engineering ethics decision-making ability. It's also of great significance to cultivate college students' in the engineering activities in the social sense of responsibility, so that they'll have the treatment of engineering activities of consciousness and behavior from the perspective of engineering ethics, eventually pushing the engineering industry and social healthy development.

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