

## THE NEED TO TEACH PROFESSIONAL ETHICS FOR FUTURE SPECIALISTS IN TECHNICAL HIGHER EDUCATION INSTITUTIONS

**Nadiia Shostakivska**

Ph.D. in Pedagogy, Associate Professor at the Department of Ukrainian Studies and Philosophy, Ivan Puluj Ternopil National University, Ukraine  
e-mail: Shostakivska@ukr.net, orcid.org/0000-0002-7732-6186

**Inna Savina**

Captain, Candidate of Pedagogical Sciences, Researcher at the Research Department of Problems of Development and Application of Units and Subdivisions of Air Assault Troops and Marines of the Scientific Center of the Military Academy, Ukraine  
e-mail: Savinainna48@gmail.com, orcid.org/0000-0002-7718-3488

### Summary

The most modern renewal of intellectual resources of our country begins first of all with the renewal of all levels of the education system. Special attention is paid to higher education and the choice of priorities for its qualitative change: intensity and efficiency of the cognitive process. Understanding by a technical university student of the reasons for the contradictory views of our contemporaries on traditional morals, morality, values, etiquette is a real need that allows him to avoid illusions and stereotypes in his professional activity. The ability of a future programmer to work effectively in a team, to communicate both within his profession and in society as a whole, following the rules of morality and morality, is formed during the study of ethical disciplines, especially professional ones. The need to teach ethics of professional activity in higher technical educational institution forms personal and social competences of future specialist as the most important element of professionalism (D'yachenko, 1976).

The article is devoted to the problem of the need to introduce professional ethics for students in technical higher education institutions. The emphasis of the work is on the need to strengthen the educational component in the system of higher education. To solve the problem, it is proposed to more actively introduce an ethical component into the professional training, which includes not only students' comprehension of the codes of professional ethics of future programmers, but also consideration of social and ethical issues related to IT activities and moral assessment of technology in general.

**Key words:** higher education, technology, moral responsibility, professional ethics, ethical disciplines, ethical competence, value orientations, modernization of higher education, educational environment of technical higher education institution, criteria of professional ethics.

DOI <https://doi.org/10.23856/5412>

### 1. Introduction

In the second half of the twentieth century, the progress of industrial civilization revealed its contradictory nature: while providing more and more new means to satisfy people's growing needs for comfort and security, it also sowed undesirable consequences.

Throughout history, technology has made people's lives safer, but with the improvement of technical means, human dependence on technology has undoubtedly increased. The creation of modern technologies of long-range action, cognition and implementation in the microcosm and genetic nature of man increasingly makes man himself the object of technical transformation. Humanity is increasingly turning into an "accomplice" of evolutionary processes in nature, which sharply increases the problem of responsibility for scientific and technological progress.

For the modern, and even more for the future world scientific community of particular importance is the further development of the trend of humanization of science and technology, their increasing subordination to the goals of mankind, the combination of research and value approaches, the development of their ethical principles (*Richard, 1994*).

## **2. Code of ethics of universities as the basis of corporate culture of technical university**

According to the Great Polytechnic Encyclopedia, the ethics of the programist is the specification of general norms and principles morality in relation to the conditions of engineering activity, designed to show ways to solve those moral problems and situations that arise in the professional activity of the future specialist, and requires a certain moral position. In a number of countries developed codes of ethics, which in detail define the moral responsibilities of a programmer: Programmer's Credo (Germany), Code of Engineering Ethics (USA), Code of Professional Ethics for Programmers (Hong Kong), etc.

Thus, according to the codes of ethics of the US communities, the future programmer should serve the society, not personal or group interests; to inform the public, employers or clients about the likely economic, environmental and social consequences of engineering activities; pay due attention to generally accepted technical and moral standards in the conduct of computing practice; to act honestly conscientiously, impartially and objectively, etc.

The main purpose of professional training in higher education is to acquire certain knowledge, skills and abilities necessary for the successful implementation of the chosen type of professional activity. In addition, professional interest, not burdened with universal moral values, can cause professional narrowness, so a significant component of vocational training should be moral education (*Klepko, 2003*).

The importance and necessity of ethical education in higher education is fully realized today. The process of studying new values, complicated by the fundamental nature of their status, is recognized as one of the main goals of higher education (*Baydenko, 2004*). There is also a growing understanding that this goal can be realized only with a harmonious combination of natural, technical, economic and humanities sciences in professional education, regardless of the specific specialization of training. The need to strengthen the educational component in the system of higher education determines the growing interest and attention to ethics as a doctrine of morality, as a practical philosophy that can still equip a person with the ability to correctly assess their actions, to harmonize the activities and interests of each person with the activities and interests of a particular team and society as a whole.

The specificity of ethics also lies in the fact that it is important and necessary in the education system, aimed not only at learning, broadening the mental horizons, but also at education, improvement, spiritual growth of the individual. In modern conditions, the entire institution of culture, science, education should be imbued with ethical will, without which it

will not be able to fulfill its main task – the education of a mature, moral personality, a high-level professional.

All this is especially relevant today for technical universities. The contradictory nature of modern scientific and technological progress puts forward special, higher social, moral and ethical requirements for programmers. The degree of their responsibility in modern society is high. Therefore, the professionalism of an engineer today is determined not only by his professional knowledge and skills, but also by the civic maturity of the individual, psychological stability, a sense of patriotism, moral reliability (*Lytvyn, 2011*).

### 3. Programmer's social responsibility in modern conditions

The modern programmer is obliged not only to be guided by the requirements of the scientific and professional community, but also to listen carefully to the internal and external ethical mechanisms of self-control of the individual – conscience and public opinion. The present is so dynamic, and science, technology and human life are interconnected that any technical solution inevitably entails consequences that ultimately affect the life, health and safety of people (*Lytvyn, 2011*).

Therefore, the degree of professional responsibility of the programmer today is steadily increasing. The implementation of ethical principles in the field of technical activity becomes possible only if the ethical sense and sense of duty in future programmers is fostered at the stage of professional education.

The World Congress on Engineering Education defined the range of requirements for engineering graduates:

- professional competence (unity of theoretical knowledge and practical skills of a specialist, his/her readiness to carry out various types of professional activities within the framework of the educational standard in this field or specialty);
- communication readiness (the ability to communicate within the framework of professional duties), which includes: good command of written and oral (literary and business) speech in the native language; knowledge of at least one foreign language (preferably several), including the ability to read professional literature, discuss professional problems in a foreign language; ability to prepare technical documentation and understand it; possession of computer skills at the level of confident use.
- ability to creativity, creative approaches in solving professional problems, ability to analyze and solve non-standard problems, tasks, readiness to develop and implement a plan of professional action; awareness of responsibility for its implementation;
- stable, conscious, positive attitude to the profession, focus on continuous professional and personal improvement, development of professionalism (*Zimnyaya, 2003*).

The analysis of these requirements allows us to conclude that for further successful professional work, a student in a technical institution must not only master knowledge, skills and abilities, but also assimilate the cultural heritage of society, make it the property of his inner world. The purpose of professional education in a modern technical university should be not only professional but also personal development of students, the formation of professional attitudes, motives, relationships, values that ensure continuous development, self-actualization and full participation in further professional life (*Serikov, 2001*). Ethical disciplines play a huge role in the professional moral education of future engineers.

The introduction of humanitarian disciplines into the curricula of future programmers, which, as a rule, touch upon the issues of ethics, is primarily due to the dominant humanistic

principles in higher education in the world today. Courses on ethical problems of programming are taught at the Massachusetts Institute of Technology, Stanford University, California Institute of Technology and other leading universities in the United States and Europe (Kotlyarova, 2012).

The introduction of an ethical component in the working curricula of technical universities is currently one of the most urgent tasks facing higher education. The urgency of this issue is determined by both the transition to European educational standards and the widening gap between the special knowledge and skills acquired during vocational education and social and humanitarian knowledge that contribute to the formation of moral and social position of the individual, his professional and moral education.

The cornerstone of the discussion of experts and specialists on this topic was the question of whether to create a specialized course devoted to ethical issues and social consequences in the field of creation and use of technical devices, or to evenly distribute ethical issues in different courses of the entire educational program (Serikov, 2002). The problem of students' lack of time for fundamental training in natural sciences and mathematics, which exists in our technical higher education institutions, leads to the fact that in most cases the second approach prevails. However, in this approach, the most important thing for teachers is "not to consider ethical issues as secondary and to carefully integrate ethical content into the technical context of the courses" (Baydenko, 2004).

There are a number of problems with such a solution to the issue of ethics education in technical universities. Firstly, there is a danger that if ethics is included in the curricula of special disciplines, the course may be overloaded, which will eventually lead to ignoring or reducing attention to the necessary basic technical issues and poor training of specialists. Secondly, technical universities may lack teaching staff with experience in teaching ethics. It is necessary to take into account the specific nature of ethics as a philosophical discipline, which is fundamentally different from what most teachers of technical courses are familiar with. If ethics teachers do not have a professional philosophical basis for teaching these subjects, ethics may become a purely formal addition to the course, and the issues it raises will be addressed last, if at all. Existing academic standards, with their limited number of teaching hours, will not allow ethical issues to be incorporated into technical curricula in a way that allows them to be fully explored and understood. Under such circumstances, any teaching of ethics may be too simplistic or even erroneous (Serikov, 2002).

Professional ethics should occupy a special place in the ethical education of a programmer. It is in the technical university that the foundation of professional ethics is laid.

The problem of forming the ethical and personal competence of the future engineer is multifaceted. It is formed not only in the process of forming one's own idea of the categories of morality, morality, etiquette, professional ethics, and other humanitarian knowledge (philosophical, cultural, historical, political, legal).

Within professional disciplines, course projects, research and development and industrial practices. During the training of students in engineering programs, ethical competence is formed by such methods as:

- interdisciplinary case study (resonant events or hypothetical situations that led to eco- and technological disaster are considered);
- analysis of ethical issues in different academic disciplines (for example, a number of topics related to professional ethics of engineers are included in special disciplines);
- so-called "public works" (practical activities of students at the city level within the framework of mastering the educational program gives a broad idea of the chosen profession:

for example, students monitor the level of radioactivity in the territory adjacent to the nuclear power plant, and if there are inconsistencies with the norms, they inform the public and the necessary authorities). Such methods make it possible to identify the criteria of ethical competence of students: knowledge, understanding, skills, desire to act in accordance with the principles of professional ethics; to realize personal responsibility in conducting engineering activities (Klepko, 2003).

#### 4. Conclusions

However, the modern world is so "permeated" with technology that the professional ethics of a programmer does not exhaust the totality of moral and ethical problems associated with software work. Therefore, it is so important for the future programmer to form in the process of professional training a stable moral outlook, an active life position, imbued with the ability to moral will and adequate moral assessment of their own professional actions and decisions.

Based on the analysis of the existence of professional ethics for future programmers in a technical higher education institution, it is possible to identify the main organizational and pedagogical conditions that will be necessary for the successful implementation of the professional and ethical component of vocational education:

- compliance of the content of educational programs and topics of qualification works of students (trainees) of a technical institution with priority issues of ethics in the development of culture, society, science, technology and engineering;
- implementation of the ethical component of the educational programs of the technical institution on the basis of integrated educational, scientific and production structures;
- high level of professional and ethical competence of teachers of the technical university; their active participation in the development, dissemination and implementation of ethical components in all spheres of educational and educational space of the university;
- practical participation of students, undergraduates, graduate students, specialists, teachers in all professional and ethical innovations of the university;
- a systematic approach to the organization of ethically oriented training of students in higher technical education programs in order to form a professionally and ethically competent specialist.

#### References

1. Baydenko V. (2004). *Higher Education Today*, no. [Competencies in Vocational Education (to Mastering the Competence Approach)]. 11, pp. 3–13. (in Russia).
2. D'yachenko M.I., Kandybovich L.A. (1976). *Psikhologicheskie problemy gotovnosti k deyatel'nosti* [Psychological Problems of Readiness for Activity]. Minsk, 176 p. (in Belarus).
3. International Engineering Alliance. [Graduate Attributes and Professional Competencies]. (2013). Retrieved from: <http://www.washingtonaccord.org/IEA%20Grad%20Attr%20Prof%20Competencies.pdf>. Moscow. (accessed 02 October 2022) (in Russia).
4. Klepko S. (2003). *Rol biznes-etuku y formyvani socialnoi vidpovidalnosti biznesu*. [The role of business ethics in the formation of social responsibility of business]. Business education as a business: quality of services and social responsibility. Kyiv, 350 p. (in Ukraine).
5. Kotlyarova I.O., Serikov G.N. (2012). *Konstatatsia retrospektuvu and stanu rishena*

- pedagogichnoi problem. [*Statement of Retrospection and State of Solving a Pedagogical Problem*]. *Bulletin of the South Ural State University. Ser. Education, Health Care, Physical Culture*, iss. 4, no. 15 (55), pp. 12–17. (in Russia).
6. Lytvyn A. V. (2011). *Informatization of vocational educational institutions of construction profile: monograph*. [*Informatization of vocational educational institutions of construction profile: monograph*]. Andriy Viktorovych Lytvyn. Lviv. (in Ukraine).
7. Richard M. (1994). *Zahlung und Achtung Die Interpenetration von Okonomie und Moral* *Zeitschrift fur Soziologie. Heft 5. Oktober*. pp. 388-411. Retrieved from: <http://www.academy-go.ru/Site/English/Englpage.shtml> (accessed 22 october 2022)
8. Serikov G.N. (2001). *Samoobrazovanie: Sovershenstvovanie podgotovki studentov*. [*Self-Education: Improving the Preparation of Students*]. Irkutsk, Irkutskiy Universitet Publ., 232 p. (in Russia).
9. Serikov G.N. (2002). *Obrazovanie i razvitie cheloveka* [*Education and Development of Human*]. Moscow, Mnemozina Publ., 416 p. (in Russia).
10. Zimnyaya I.A. (2003). *Competence of a Person is a New Quality of the Result of Education*. [*Competence of Human – a New Quality of the Result of Education*]. *Materialy XIII Vserossiyskogo soveshchaniya. Problems of the Quality of Education. Book*. pp. 4–15. (in Russia).