

FORMATION OF PROFESSIONAL AND VALUE ORIENTATIONS OF PROSPECTIVE ENGINEER'S PREPARATION PROCESS

The article studies the pedagogical foundations of the formation of professional and value orientations of prospective engineering specialists in higher technical educational institutions. Based on the analysis of modern approaches to the education of technical specialists, we determine peculiarities of the prospective engineers training focused on the formation of a professional and valuable attitude to the profession. The valuable approach to the training of professional engineering specialists is considered to be a necessary condition for the formation of a system of their universal and professional value orientations. The main professional and value orientations are revealed as a core characteristic of the prospective engineer's personality.

Professional training of engineering workers in higher technical educational institutions is defined as an organized process aimed at assimilating professionally necessary knowledge, mastering important skills in the organization of technological processes of industrial production, skills of a team leader. Effective training should be aimed at developing universal human, spiritual, national values of prospective engineers, their creative activity in the team work, ensuring self-realization and self-development of both their own and their subordinates in the process of work.

The stages of professional adaptation, professional intensification and professional identification of the training of prospective specialists in the engineering profile are described. The structural components of the training of prospective specialists in the engineering profile are characterized. The professional and value orientations of the prospective engineering specialist, which are formed in the process of humanitarian, engineering-theoretical, technological, practical, managerial, scientific-research, economic, economic-legal and environmental components of training, are substantiated. The effectiveness of the formation of professional value orientations of prospective engineers for the purpose of training highly qualified specialists of a technical profile in higher technical educational institutions is proven.

Key words: *higher technical educational institutions, professional training, prospective specialists in the engineering profile, individual values, professional value orientations.*

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Modern trends of the socio-economic position of the state, the need for informatization and modernization of industrial production lead to the need to strengthen the role of higher technical educational institutions as generators of innovative activity in the field of training prospective engineering specialists. In today's conditions, higher technical education is an important factor and catalyst for the development of the intellectual and spiritual forces of society, which ensures the economic, cultural, and social revival of the state and the improvement of the nation's well-being. From this perspective, higher technical educational institutions should provide training of a highly qualified, competent, competitive engineering specialist, a responsible manager, capable of effective work in the team at the level of European and world standards, ready for constant professional self-determination, self-development, social and professional mobility.

State reforms of education in Ukraine are aimed at building the future of the country, oriented towards the European and global educational space, therefore special emphasis is focused on education based on values. Such transformations are aimed not only at European and world integration, but also at ensuring a high standard of living in the country, development of the economy, culture, quality education, and preservation of the ecosystem. This requires a change in value orientations in the education of prospective specialists, namely giving priority to the values of freedom, equality, solidarity, tolerance, respect for nature and responsibility [9].

At the time when society appeals to universal values, the priority task of training prospective engineers in higher technical educational institutions is the formation of their professional and value orientations, which ensure the stability of both the individual and society as a whole.

The issue of value orientations of prospective specialists is studied both in the works of foreign scientists (M. Weber, A. Maslow, T. Parsons, E. Fromm, etc.) and internal ones (I. Beh, T. Butkivska, M. Boryshevskyi, T. Kirylenko, V. Klymenko, N. Logvinova, S. Maksymenko, O. Svetlichnyi, O. Sukhomlynska, O. Yatsenko, etc.). According to the researchers' conclusions, it is the student years that are important in the formation of value orientations of the individual, which form an axis of consciousness on the basis of values and this axis determines the level of stability and consistency of actions and decisions, the orientation of interests and needs.

The value orientations of the individual are the basis for solving the problem of choice, as they help to distinguish the positive from the negative both in the internal and external world. According to I. Beh, the formation of value orientations is related to the motivational sphere of the individual. According to the scientist, only as a result of upbringing based on "I-motivation", that is, the core of the personality, stable self-worth and spiritual orientations of the individual can be formed [2, p. 125].

The issue of the content of engineering education, theoretical basis and features of the training of prospective technical specialists in higher technical educational institutions are investigated in the works of S. Artyukh, O. Baranets,

N. Bryukhanova, P. Darvall, E. Zeyer, O. Kovalenko, Zh. Martin, A. Melecinek, A. Nizovtsev, Yu. Pazynich, N. Tymkiv and others. Modern pedagogical technologies of professional training of prospective engineers are researched by O. Baranets, K. Gomoyunov, O. Padalka, S. Sysoeva; the organization of independent educational activities became the subject of study by I. Bendera, N. Holub, and V. Tyurina. The researchers focus on the diverse nature of the engineer's profession, who should not only make the right technical decisions, design and adjust the operation of devices, but also implement one's own ideas in practice, be a researcher, organize the work of a team, and be a leader.

Under such conditions, the need to develop innovative approaches to the organization of the education of prospective engineering workers becomes a priority, which involves qualitative changes in the system of guidelines for material and spiritual values, which directly affect the level of professional training of specialists, ensuring the implementation of the idea of forming national and universal values as a priority direction of the state policy in the field of education.

The analysis of scientific sources from modern perspective has shown the growing intensity of research of the education of prospective engineers, but the issue of forming professional value orientations in the process of their training in higher technical educational institutions remains insufficiently developed.

Aim of research. The realities of the modern system of higher technical education, oriented to the European and world space, require the professional development of the prospective engineer, who is a carrier of socio-cultural values. Therefore, we see the purpose of our article in understanding the concept of professional value orientation of prospective engineering specialists and researching the specifics and pedagogical foundations of their formation in the process of training in higher technical educational institutions.

The current stage of the development of the system of higher technical education is characterized by deep processes that lead to qualitative changes in the training of prospective engineering professionals based on humanistic principles. In the conditions of globalization, informatization, and updating of industrial production technologies, the effective functioning of an engineering specialist is possible provided that universal, national, professionally important value orientations are formed, which will ensure the stability of their personal and professional development, social mobility, creative personal position in professional activities, flexibility to transformations in industrial industry. These factors necessitate a transition from a traditional, knowledge-oriented paradigm of education to a value-oriented one that meets the current demands and development needs of both society and prospective engineering specialists.

The definition of value as a worldview principle determines the ways of perception and evaluation of the phenomena of reality by the individual, the concept of the formation of meaning and understanding in the process of communication. Value as a worldview principle means the procedure of establishing a logical emphasis, differentiating the essential and important from the changing and unstable processes or phenomena. Values are the cause and goal of active human actions, therefore they make up the motivational sphere of the individual. The idea of values as an evolutionary mechanism of transformation into a single standard for evaluating objects and processes, determining the criteria for their relationship with each other, with a certain standard, unites society and forms public opinion. The phenomenon of value also means individual moral and emotional satisfaction from observing value-meaningful ideals and principles [9].

Introduction of universal and professional values is the basis of the implementation of the value approach, which is one of the main methodological principles of training prospective engineering professionals in higher technical educational institutions. A value-based approach to professional training involves the formation of a system of value orientations of prospective specialists, which set a general orientation to the interests and aspirations of the individual, a hierarchy of individual preferences, a motivational activity program and, as a result, determine the level of readiness of the prospective specialist to implement life and professional plans [8].

Value orientations are the basis of the motivational and value sphere of the personality of prospective engineers; these values reflect the fact of engineer's inclusion in social relations, which is characterized by the unity of self-regulation and awareness of personal and professional self-development. The professional and value orientations of future graduates of higher technical educational institutions are currently an indicator of their readiness for future professional activity and an active role in public life.

The profession of an engineer, by its objective and communicative essence, combines innovative ideas, interdisciplinary knowledge and features of the environment with one's own personal capabilities of synthesizing information for the development of a new objective reality. Given the modern requirements for specialists in the technical field, the prospective engineer must be a designer, an organizer of the team work; developer of scientific and technical documentation, technical and technological projects, plans and regulations; the manager of the production process, the developer of measures to improve production efficiency and environmental protection. Other important professional and valuable characteristics of engineering specialists include the ability to use the means of production, management, practical, constructive-technological, research activities; the ability to introduce the achievements of modern science and production into the production process; the ability to use regulatory references, scientific and technical, production information [4].

Professional training of prospective specialists is implemented according to the following stages: professional adaptation, professional intensification and professional identification. An important factor that determines professional development at the stage of professional adaptation is the student's personal development. The stage

of professional intensification is characterized by the development of general and intellectual abilities, intellect, emotional and volitional regulation, self-management of the prospective specialist. The stage of professional identification, which involves the professional self-determination of an engineering specialist, is carried out as a result of the analysis of the internal resources of his personality, comparing them with the requirements of the profession [3].

The changes that occur during the stages of professional training of prospective specialists should be related to the orientation to human and life values. The main role in this process is given to the humanization of professional training: from natural and technical disciplines to philosophy, sociology, jurisprudence, etc. According to this approach, professional training should include the following aspects: approval of the concept of humanistic education; the introduction of the irrational component of human spirituality – universal scientific knowledge; ensuring people-centeredness of disciplines of the natural and technical profile [1].

We consider the professional training of engineering workers in higher technical educational institutions as a specially organized psychological and pedagogical process, which consists in the development of professionally important personality qualities of the prospective specialist in the technical sphere; it is also aimed at assimilation of professionally necessary knowledge, mastery of important skills of organization of technological processes of industrial production, work skills of a leader of a team of employees; and has the goal of forming a complete personality of a competent specialist in the technical field. Effective training should be aimed at universal, spiritual, national values; creative activity of future engineers in the workforce, ensuring self-realization and self-development of both their own and their subordinates in the process of organizing production.

The essential characteristic of the professional training of the prospective engineer is its implementation on the basis of general and personal development, goal setting in education, formulated in the context of humanistic psychological and pedagogical concepts of developing and personally oriented education, in organic unity with human values, that is, in conditions of deep personal interest in a certain kind activity. Under such conditions, the organization of training should take into account the experience of the personal and value attitude of the prospective engineering specialist to the world, others, and the profession.

The priority characteristic of the value-oriented personality of the prospective specialist of a technical profile is the development of his activity abilities. Therefore, it should not only be the transmission of knowledge of the subject, but the awareness of the educational material due to the feeling of need for it. The ability to self-organize and reflect is a specific feature of training prospective engineers in higher technical educational institutions.

V. Petruk emphasizes the importance of the specialist's professional and value orientations, motives for his activity, general culture, style of interaction with others, awareness of the world around him and himself in the world, the value attitude of the personality of the prospective engineer to the solution of professional tasks, who defines a competent specialist through his willingness to mobilize his own resources, organized into a system of knowledge, skills, abilities and personal qualities, necessary for the effective performance of professional tasks in both typical and non-standard situations [5].

Therefore, we define professional value orientations as a systemic component of the general professional culture of an engineering specialist due to his readiness for future professional activity according to high moral and spiritual norms and values.

The necessity to solve complex scientific, technical, organizational, management tasks in the course of professional activity requires, according to L. Tovazhnyanskyi, the formation of prospective engineers' skills and abilities to predict the consequences of their own decisions (social, economic, environmental, etc.) [6]. The professionalism of a modern specialist in the technical field is determined by his training in the industry, namely: organizational and managerial, design and construction, operational and technological, and scientific and research. Other important components of the professional training of prospective specialists in the technical field, as O. Romanovsky claims, are psychological, managerial, economic and legal [7].

Organizational and substantive components of the professional training of students in higher technical educational institutions include humanitarian, engineering-theoretical, technological, practical, managerial, scientific-research, economic, economic-legal, and environmental training, which provides for the formation of prospective engineering professionals in the relevant professional-valued profile orientations to future activities in the field of industrial production.

The characterized components of the professional training of the prospective engineer are attributed to the system of values of the general culture of the individual – legal, psychological, pedagogical, economic, ecological, aesthetic. Therefore, the goal of humanitarian training of a student of a higher technical educational institution is the formation of an intelligent specialist in the technical field who respects the rights and opinions of the people around him. Such training is aimed at forming a valuable attitude towards the individual, establishing his role and place in the national and world cultural environments. Humanitarian training involves the formation of basic value orientations, such as good, nobility, wisdom. Patriotism, love for the Motherland, nation, respect for national symbols, traditions, and language are necessary characteristics of a holistic, value-oriented personality of an engineering specialist. Other important professional value orientations include respect for human rights and freedoms, national dignity, honesty and decency, and observance of socially significant and professionally important norms of behavior. The general culture of the engineer, the culture of appearance or dress code, the culture of communication and behavior are also important.

Value orientations are directly related to activity, act as its update and regulator. Therefore, it is important in the process of engineering and theoretical training of prospective engineers, which involves the formation of professional knowledge, skills, and abilities based on knowledge of laws, principles and models of the industry, to form a valuable attitude to the engineering profession, conscientiousness in the performance of professional duties and tasks, responsibility for one's actions to oneself, colleagues, the state. The prospective engineer's acquisition of professional value orientations is important not only for production, but also for the specialist himself, as they enhance correct decisions.

In the process of technological training, which involves students' acquisition of higher technical educational institutions the technologies of industrial processing of materials and products, such important professional value orientations as cooperation, trust, mutual assistance, self-criticism of oneself and the results of one's work, demanding oneself, initiative and self confidence. Practical training of prospective engineers involves mastering the skills of implementing technological processes of industrial production of high-quality goods. Independence in decision-making and responsibility for the results of one's work; industriousness aimed at satisfying one's own requests and needs, the family, the state – these are the value orientations that are formed during the practical training of prospective engineering specialists.

Management training involves the formation of culture and management skills of the team; the ability to formulate and solve strategic and tactical tasks of industrial production; skills of the social organization of work, which meets modern market requirements based on the competition of technical ideas, high-quality goods and services. The goal of management training is the formation of such motivations for activity, features and qualities of a person, which are characteristic of an educated, creative, highly moral person and ensure the individual formation of the spiritual values of an engineer. Professional value orientations that must be formed in the prospective engineer as an employee and head of a team of employees are: humanity, respectful attitude towards others, benevolence in relations in the work team, reasonable demands, justice, mutual understanding, compassion, the ability to come to the rescue.

In the process of scientific and research training of prospective engineering specialists, they are involved in fundamental research in the field of modern industrial production, mastering the skills to apply engineering science innovations in the course of future professional activities. Therefore, important professional and value orientations, which are formed in students of engineering specialties in the course of their research activities, are the scientific culture of the prospective engineer, respect for the results of scientists' work; integrity, decency in applying the results of scientific research of colleagues.

Economic training of prospective engineers ensures the formation of their economic culture of professional activity in the conditions of a market economy, since the economic feasibility of production depends on the engineering decision of the technical worker. The system of values, which must be formed during the implementation of economic training, includes the economic literacy of the prospective engineering specialist, his economic culture, rational economic behavior. The system of state legal regulations, laws, rules is the basis of the economic and legal training of the prospective engineer, during which the legal and legal foundations of his professional activity are formed. Appropriate professional value orientations include: respect for private property rights; lawful behavior; compliance with the legality of actions of both one's own and those of one's subordinates.

In the process of ecological training of specialists of the "man-machine-environment" system, knowledge about the influence of production technologies and technical systems on the surrounding world and human health takes place. Professionally important values that are formed in the process of ecological training of prospective engineers are harmony with nature, respectful attitude to the natural resources of the state, responsibility for the ecological consequences of the production process.

Conclusions and research perspectives. Therefore, the combination of fundamental and applied knowledge, modern technologies, their effective application with a practical purpose is the main task of training technical specialists in their innovative activities in the field of industrial production, which necessitated the formation not only knowledge, abilities and skills, but also their personal professional and value orientations of prospective engineers. The professionalism and success of the prospective engineer, as evidenced by the results of our research, are determined by the level of his professional education, experience, individual abilities, a motivated desire for continuous self-education and self-development, a creative and professional and valuable attitude to professional activity.

Value orientations are one of the important characteristics of the prospective engineer's personality, and their development is one of the tasks of professional training of engineers in higher technical educational institutions. The effectiveness of the professional activity of prospective specialists in the technical sphere is ensured by thorough engineering education, which combines abstract and theoretical provisions and concrete tasks of industrial production, which in turn requires the implementation of a systematic approach to the organization of professional training (humanitarian, engineering-theoretical, technological, practical, managerial, scientific-research, economic, economic-legal and environmental) of prospective specialists of a technical profile.

The formation of professional and value orientations that ensure the effectiveness of the innovative and creative activity of an engineer in a broad social, cultural, and economic sense is determined in the context of meeting the material and spiritual needs of prospective engineering specialists through their awareness and acceptance of universal and professionally important ideals and values.

Further research can be aimed at the review of the results of approbation of the presented material in real conditions as well as the design of plans and programs for the formation of value attitude to professional training of prospective engineers in higher technical education institutions.

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Романчук Н. О. Формування професійно-ціннісних орієнтацій у процесі підготовки майбутніх інженерів

У статті досліджуються педагогічні основи формування професійно-ціннісних орієнтацій майбутніх інженерних фахівців у вищих технічних закладах освіти. На основі аналізу сучасних підходів до освіти фахівців технічного профілю визначаються особливості підготовки майбутніх інженерів зорієнтованої на формування професійно-ціннісного ставлення до професії. Ціннісний підхід до підготовки майбутніх фахівців інженерного профілю розглядається як необхідна умова формування системи їх загальнолюдських і професійних ціннісних орієнтацій. Розкриваються основні професійно-ціннісні орієнтації як стрижнева характеристика особистості майбутнього інженера.

Професійна підготовка інженерних працівників у вищих технічних закладах освіти визначається як організований процес, спрямований на засвоєння професійно необхідних знань, оволодіння важливими вміннями організації технологічних процесів промислового виробництва, навичками роботи керівника колективу. Ефективна підготовка майбутніх інженерів має бути спрямована на загальнолюдські, духовні, національні цінності, їх творчу діяльність у трудовому колективі, забезпечуючи самореалізацію та саморозвиток як власний так і своїх підлеглих в процесі роботи.

Описуються етапи професійної адаптації, професійної інтенсифікації та професійної ідентифікації підготовки майбутніх фахівців інженерного профілю. Характеризуються структурні компоненти підготовки майбутніх фахівців інженерного профілю. Обґрунтовуються професійно-ціннісні орієнтації майбутнього інженерного фахівця, які формуються в процесі гуманітарної, інженерно-теоретичної, технологічної, практичної, управлінської, науково-дослідницької, економічної, господарсько-правової та екологічної складових підготовки. Доводиться ефективність формування професійно-ціннісних орієнтацій майбутніх інженерів з метою підготовки висококваліфікованих фахівців технічного профілю у вищих технічних закладах освіти.

Ключові слова: вищі технічні заклади освіти, професійна підготовка, майбутні фахівці інженерного профілю, особистісні цінності, професійно-ціннісні орієнтації.