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PSYCHOLOGICAL ASPECTS OF FUTURE ENGINEER TRAINING IN HIGHER EDUCATIONAL ESTABLISHMENTS

The article reviews psychological aspects of vocational training of future engineers in the light of pedagogical issues. This process is examined with psychological structure of personality taken into consideration. It's justified the importance of psychological training of students, which contributes to their professional and personal growth. External and inner psychological components of personality, which should be paid attention to during specialists training, are outlined herein. Attention is paid to professional motivation, which primarily depends on the values of students. It's emphasized the importance of the psychological culture concept and theoretically grounded that it affects the self-knowledge and self-realization of the future engineer. It's showed the formation of such quality as self-dependence becomes especially important for a student.

Key words: *vocational training of future engineer, general and special courses, psychological structure of personality, professional self-identification, professional development, professional motivation, psychological culture.*

Problem statement. In the 21st century, engineering education should consider not only vocational content of future specialists but also psychological specifics of their personality, demands to their professional and personal qualities, social and economic changes in society, thus taking into account both humanistic and psychological aspects. Every year the concept of future engineer's personality development expands its borders. A large number of researchers work in this field and each one of them tries to prove that exclusively his thoughts and ideas are the most important and correct. Therefore, the problem of definition of the most important constituent in vocational training besides the professional one arises for us.

The aim of the article is to explain contemporary scientific approaches to future engineer training, to expand existing understanding of future specialists training with due account for psychological structure of personality.

Recent publications and researches analysis. Such scientists as V. Zeier, S.V. Maksimenko, T.B. Khomulenko and others have studied the problem of future specialists training from psychological aspect. The issues of engineers teaching in a higher educational establishment were investigated by such researches as O.H. Romanovsky, O.S. Ponomariov, S.U. Goncharenko, V.Yu. Bykov, H.P. Vasianovych, N.G. Nuchkalo, I.A. Ziaziun, M.B. Yevtukh, O.O. Romanovska, S.M. Pazynich, P.V. Stefanenko and others.

The studies of V.F. Bessarab, E.F. Zeier, V.G. Kuntysch, G.M. Neustroieva and others are dedicated to questions of future engineers' professional qualities development process. T. Gordon, Yu. Yemelianov, M. Kholodna, V. Kunitsyna, R. Khintch have turned their attention to the problem of psychological culture of professional's personality.

One of the first aspects necessary for future engineer's personality development studied by scientists is integration of humanitarian subjects into the process of vocational training. This can be explained by integration of Ukraine into the World economic system, which puts out new requirements to graduates of higher technical educational establishments. In the contemporary circumstances, they have to be not only professionals in their field but also well-informed persons of integrity with profound humanitarian education, who possess considerable skills of professional and personal communication.

According to O.H. Kaveryna, humanities that form and develop abilities of professional communication are essential and have to occupy a special place in universities' curriculum. The quality of education, vocational training and further successful activity of future engineers is related directly to the problem of formation and development of integrated knowledge and abilities and skills of future specialists in higher technical schools based on connection between humanitarian, natural and technical cycles of subjects and their practical use in further vocational activity [3].

P.V. Stefanenko and O.H. Kaveryna pay a lot of attention to all components of vocational training. The researchers emphasize two of the components, one of which is related to formation of syllabus and the other one is tied to the development of resources and methods that ensure the implementation of competency-oriented training. During this syllabus formation, the scientists underline necessity to take into account such issue as balance between fundamental and vocational components of training.

The challenge is in importance of fundamental subjects learning for acquirement of vocational knowledge. Future engineer's competency is formed in the process of studying not only vocational but also general subjects. The researchers believe that combination of general and vocational subjects ensures motivation to study them [10].

Consequently, synthesis of general and vocational disciplines is one of the keys to successful training of future specialist, comprehensive development of personality, learning motivation, development of communicative competence and also provides extended opportunities for self-realization.

In our opinion, it is not enough to consider only external factors in the process of education. We think it is reasonable to pay attention to the components related to psychological structure of personality. In other words it is impossible to ignore such constituents as motivation processes, cognitive processes, psychological characteristics and mental conditions.

While analyzing requirements for future engineers, N.V. Pidbutska summarized them the following way [9]:

- among the first ones the author emphasizes on conscious and positive attitude towards their profession, striving for continuous personal and professional improvement and development of intellectual potential;
- the next important factor is professional competence, acquirement of the totality of knowledge and practical skills needed for vocational activity;
- the author also underlines high communicative willingness to work in professional and social environments;
- and the final requirement includes integrity, focus on a healthy lifestyle of a professional personality as a representative of vocational society elite and so on.

An important component of intrapersonal growth is a vocational self-determination. Its basis lies in the acquisition of professional knowledge, self-understanding and evaluation of individual characteristics, synthesis of knowledge about yourself and professional activity (professional identity). In our understanding, it is also impossible to ignore psychological readiness to work. Professional activity, its structure and professionally important personal qualities of future engineers of various specialties were examined in theory and practice of pedagogy and educational psychology.

In the process of future engineering specialists training in higher technical educational establishments, V.M. Oleksenko accentuates the contradictions between increasing amounts of information in the fields of engineering disciplines and limited capacity for its assimilation by students due to lack of class hours, as well as contradictions between growing demands to

professional level of contemporary engineers and effectiveness of pedagogical methods developed by now [8].

From the standpoint of psychological structure of personality, a special attention in this aspect should be paid to cognitive processes. When it comes to the development of pedagogical technologies, we can not ignore a future engineer's personality in psychological aspect.

The scientists outline such component as determination of professional and personality growth process – that is a possibility for future specialist to manage their activities, their behavior, their emotional state, to put goals for their improvement, to form and develop their qualities and skills.

Numerous external actions often have a destabilizing effect, which holds back development of student's skills. Thus finding necessary conceptual bases that ensure means for mastering of subjective position in relation to the process of professional development by a student is very relevant.

In the situation of informatization of all sides of student's personality and his activities, formation of such quality as self-dependence becomes especially important for a student. This personality trait combines multilevel psychological phenomena, certain mental processes, dominating mental states, some qualities and certain features of a personality. Among these phenomena, N.S. Nemtseva distinguishes the following ones:

- peculiarities of perception and thinking: empirical perception of transparency, specifics of incentives selection, to which one should respond, thinking characteristics (flexibility, criticizing, realism), style of thinking, specifics of events interpretation and decision-making;
- peculiarities of motivation: determination and localization of emotions and leading motives, need for self-actualization;
- structure of experience: skills of self-discovery, self-regulation and behavioral self-organization, specifics of mindset, qualities of "I-concept", social competence and vocational proficiency.

The last feature is related to the fact that in contemporary characterology associative nature of character development prevails, according to which the traits of personality are combined and connected to each other, forming up complexes. These complexes together constitute individual character [7].

It is necessary to note that becoming an engineer specialist involves formation of his computability, fundamental properties of which, according to D. Chernylevsky and O. Filatov, include clarity of goals and values, diligence, abilities to take risks and continuously self-improve, to submit to continuous professional growth, to handle stress and others [13].

Future specialist must have qualities which reflect the professional competence (a sum-total of knowledge, skills and ability to use them in a particular area of professional activity, an ability to learn throughout the whole life, an ability to navigate in real-life situations, to work on his development), values, social orientation . And also future engineer must be the bearer of human and cultural values, to strive for self-perfection. A.V. Kochubei emphasizes that the liberalization of training in universities helps to enrich, to enhance the intellectual and mental development of future engineers, because only through personal maturity it's able to achieve professionalism [6].

A lot of investigations dedicated to the concept of "psychological culture" of a specialist's personality have studied such of its components as competence in communication, intellectual competence, social competence, values and semantic formations, self-consciousness.

In modern studies an idea that psychological culture defines the vector of effective self-knowing and self-realization of a personality in life and contributes to successful adaptation and self-development has formed.

It is preferable to have in mind that psychological culture is a result of not only socialization of a personality, but also of education of a highly cultured specialist, who would be able to undergo considerable inner advancement and transformation of fundamental interests and needs in order to harmonize and consolidate them with the interests of the world and society.

According to V.E. Turianska's definition, psychological culture of a specialist's personality is a capability to assimilate scientific information consciously, purposeful self-organization of behavior and communication at work, in educational groups, creative performance during professional activities based on legislative, ethical and moral orientations [11].

Psychological culture of the future professional provides the ability to understand other people, adequately to respond to their behavior, successfully to interact with them. Also there's need to form students' ability to manage their own mental states, the ability to develop their memory, attention,to train the will, character et al. That is all that doosn't advantage only their growth as a professional, but as a person who strives for self-perfection.

Practical, vital importance of psychology is in its transformative function, in the providing of individual means of the work on yourself, in changing and self-development, in own psychic processes and states management [12].

In the view of motivational sphere of a personality, the problem of values orientation is one of the priorities in contemporary science too, since in the process of future specialist's personality formation the values orientation determine the direction and level of activity and significantly influence his or her professional qualities [4].

S.A. Yerohin has interesting views which and he emphasizes that professional motivation is heterogeneous, and it depends on many psychological and sociological factors. Their correlation is determined by the system of values. The intensity of professional motivation's development depends on the way of human values system correlates with the value system of society [2].

Professional motivation of students actively forms at 3-4 courses of studying, when professional-focused disciplines are studied depth and it is an inspection with the practice. Its structural components are:

- motivation of initiation (encourages activity);
- motivation of selection (purpose selection);
- motivation of implementation (regulates, supervises the implementation of appropriate implementation action);
- motivation after implementation (completes the action and encourages the other).

Professional motivation can be summarized in three main systems:

- Interest. Duty. Self proficiency.
- Direct interest (attraction on the basis of content and processes of specific activity).
- Indirect interest (it's caused by some organizational, social other characteristics of profession) [1].

The researcher L. Korvat emphasizes the importance of personal growth processes. Personal growth is determined as positive personality changes as a process and result of knowledge and understanding of yourself, the individual psychological characteristics, the inner world. It's the knowledge and understanding of the psychological aspects of the interaction of the individual with the world and others, getting skills and abilities of self-

development, self-regulation, the desire of self-improvement, self-actualization in everyday life and professional activity [5].

We rely on the idea that psychological preparation of students promotes their professional and personal growth during their development as professionals.

The problem of future engineer training takes a substantial place in psychological and pedagogical sciences. We have examined a number of constituents of the training process (external and inner personal) and some of their components (in the aspect of psychological structure of a personality exploration):

• integration of humanities into the process of vocational training – psychological readiness and communicative competence;

• integration of general and special (vocational) disciplines - motivation component;

• vocational self-determination – self-evaluation of student's personality, psychological readiness to vocational activities, vocational identity;

• professional and personal development – control over one's own behavior, activities, emotional states, determination of goals of personal growth;

• psychological culture – competence in communication, intellectual competence, social competence, values and semantic formations, self-consciousness.

Conclusions. In summary, we can say that for effective training of future engineers both psychological and pedagogical specifics of vocational training should be given consideration.

It can't be ignored the need to prepare not only competent specialist, but also the person with regard to its psychological characteristics. The effectiveness of studying and future careers depend on mastered skills and personal qualities that student acquires in the learning process at the university.

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ПСИХОЛОГІЧНІ АСПЕКТИ ПІДГОТОВКИ МАЙБУТНЬОГО ІНЖЕНЕРА У ВНЗ

У статті розглянуто психологічні аспекти професійної підготовки майбутніх інженерів з урахуванням педагогічних умов і психологічної структури особистості. Обґрунтовано важливість психологічної підготовки студентів, яка сприяє їх професійному та особистісному зростанню. Зазначено зовнішні та внутрішньоособистісні психологічні компоненти, яким треба приділяти увагу при підготовці фахівців. Приділено увагу професійній мотивації, яка насамперед залежить від ціннісних орієнтацій студента. Підкреслюється важливість концепції розвитку психологічної культури фахівця, теоретично обґрунтовано, що вона впливає на самопізнання та самореалізацію майбутнього інженера. Показано, що формування такої якості як самостійність стає особливо важливим для студента.

Ключові слова: *професійна підготовка майбутнього інженера, загальні та спеціальні дисципліни, психологічна структура особистості, професійне самовизначення, професійне становлення, професійна мотивація, психологічна культура.*

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Я.А. Мовчан

ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ ПОДГОТОВКИ БУДУЩЕГО ИНЖЕНЕРА В ВУЗЕ

В статье рассмотрены психологические аспекты профессиональной подготовки будущих инженеров с учетом педагогических условий и психологической структуры личности. Обоснована значимость психологической подготовки студентов, которая способствует их профессиональному и личностному росту. Выделены внешние и внутриличностные психологические компоненты, которым следует уделять внимание при подготовке специалистов. Уделено внимание профессиональной мотивации, которая прежде всего зависит от ценностных ориентаций студента. Подчеркивается важность концепции развития психологической культуры специалиста, теоретически обосновано, что она влияет на самопознание и самореализацию будущего инженера. Показано, что формирование такого качества как самостоятельность становится особенно важным для студента.

Ключевые слова: *профессиональная подготовка будущего инженера, общие и специальные дисциплины, психологическая структура личности, профессиональное самоопределение, профессиональное становление, профессиональная мотивация, психологическая культура.*

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