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SOFT SKILLS AND HARD SKILLS AS THE BASIS FOR THE FORMATION AND DEVELOPMENT OF EMPLOYEES IN CONDITIONS OF TECHNOLOGICAL INNOVATIONS

Abstract. The paper contains analysis of reasons prompting development of educational standards and curricula for higher education students in Ukraine based on the formation and development of their professional (hard skills) and supra-subject (soft skills) skills in a rapidly changing world. Keywords: higher education, competencies, globalization, national educational systems, student-centered learning, contextual learning.

Introduction.

Education is one of the main factors in socio-economic transformation of society. The accumulation of capital, formation of the economy of knowledge, introduction of new technologies are indicators of the civilization progress in the twentieth century. In the same century, Nobel laureates T. Schultz [1] and G. Becker [2] presented a fundamentally new view of the role of man in the development of the economy. Among the most powerful factors of economic growth, researchers pointed to general literacy and professional training. This approach to assessing the resources of a person were also confirmed in modern research by the World Bank. Thus, educational potential, as the basis of human capital, was recognized as the engine that drives economic growth and creates an innovative environment.

The educational process is closely linked to the general development strategy of state and its ideology. The pace of globalization processes determines the modernization of the educational system in Ukraine. In the context of globalization processes national educational systems while maintaining their specific features direct their capabilities towards the formation of human knowledge as «a product»
that can be sold at a profit in the labor market. However, the results of knowledge
cumulation do not equal to an ability of a person to apply it in practice, therefore,
educators currently face an issue of the formation and development of a wide range
of competencies (soft skills and hard skills) among future employees in a rapidly
changing world.

The purpose of our research piece is to describe reasons prompting
development of national educational programs for higher education students as
future employees in the context of creating new specialties and jobs in today’s world.

Research methods: generalization and analysis of psychological, pedagogical
and sociological data on the topic.

Presentation of materials.

The speed of change taking place in the social and educational fields is much
lower than the speed of change taking place in the technological sphere, which, in
turn, creates a shortage of highly qualified personnel, whose activity would meet the
demands of the modern labor market. The main consequence of the mismatch
between the educational systems of many countries and the changes related to the
third industrial revolution and computerization and processes that reflect differences
in the abilities of members of society to use information as a necessary tool for their
self-development. Thus, it is the person’s ability to receive information, and to apply
skills in specific types of activity that contemporary researchers [3: p. 117] saw as a
new factor of inequality.

In conditions of the fourth industrial revolution (Industry 4.0), caused by
achievements in the field of artificial intelligence and robotics, as well as in the area
of bio-technologies and information-and-communication technologies, it becomes
more difficult for a person to sell his work that is not in demand due to the
proliferation of these technologies in the market. Based on the analysis of a number
of foreign sources M. Yudina [4: p. 199] concludes that Industry 4.0, based on
virtualization, decentralization, real-time operation, interoperability and
compatibility, is a conglomerate of biological, physical, and digital systems. Taking
into account the fact that all industrial revolutions resulted into changes in the labor
market, the fourth industrial revolution placed in a risk zone representatives of a
number of professions whose activity can be replaced by computer programs or robots. The consequences of a new round of technological revolution could be as follows: reduction of significance and value of a person as a result of growth of unemployment caused by the extinction of many professions [5: p. 41]; economic and gender inequality [6: p. 141; 7] growing demand for skilled workers driven by the need to design industrial systems by means of digital modernization [8].

Performing work in the context of new professions will require people to bring their knowledge, skills and abilities to a new level and new forms of labor automation. Among these abilities the most popular will be the following: advanced communication and negotiation skills; interpersonal communication skills and empathy; leadership and management over others; entrepreneurship and initiative; adaptability and nonstop learning; educating and training others [9].

Noting the advantages of computerization of cognitive tasks in various areas of activity, the researchers [10] point to the scalability as a way to increase productivity in the direct proportion to the use of additional resources and the lack of irrationality of thinking, which is clearly characterized by human prejudice and bias. Thus, for example on-line courses and forums have become a positive consequence of the use of new technologies in the area of education where students in the process of interaction generate and discuss new ideas in the context of the material they study [11] and also have the opportunity of choosing strategies of education and assessing their own achievements in accordance with individual needs, capabilities and characteristics. Promoting the idea of the need to computerize intellectual work and stressing the effects of the use of new technologies, the researchers are consistent in their statement that «... robots, however, cannot correspond to the breadth and depth of human perception» [10].

According to K. Schwab [7], professions that involve creative and social skills that require the generation of new ideas in an ever-changing world will have a low level of automation. So, in the hierarchy of professional skills most demanded by 2020, the leading positions are occupied by the skills related to solving complex problems (36%) and communication skills (19%). Among the equally important were the following: processing skills (18%), systemic abilities (17%), cognitive
abilities (15%), resource management skills (13%), technical skills (12%), physical abilities (4%) [7]. Naturally, over time, this gradation may change.

The President and founder of the Davos World Economic Forum notes difficulties in defining both areas of competencies and those professional skills and their characteristics that will be in demand by the society in the future in the context of creating new professions and jobs. However, he makes reasonable assumptions regarding the increased demand for those types of skills that will be connected to designing, constructing and using specific technological operations, processes and systems, as well as those professions where human activity would make up for the shortcomings and gaps appearing as a result of technological innovations [7].

K. Schwab states widening of a number of professions will be determined not only by the arrival of new technologies as a result of the fourth industrial revolution. Changes in geopolitics, socio-cultural life, demographic problems will become those factors that will have an equally important impact on the formation of the market for professions. And yet, as he fairly notes, it is the workforce potential and not the human capital that will become the main factor in production. Schwab states that the lack of competent workers will be the main limitation for the introduction of innovations and a factor that will restrain the growth and competitiveness of different segments of the labor market [7]. Thus, the separation of the employment market according to criteria such as highly skilled - highly paid and low skilled - low paid work will lead to an increased conflict in the public opinion and as a result in behavior.

As he fairly states, in the context of Industry 4.0, the definition «high qualification» itself is subject to revision [7]. Traditional interpretations of this concept put the emphasis on the employee having a high level of education, which is manifested by his abilities in the specific area of expertise or a particular profession. In the conditions of the fourth industrial revolution, special attention will be given to such abilities as constant adaptation to new working conditions and development of such approaches and skills that can be used in different types of professional activity.
Based on these provisions education of students based on contextual education is a necessary component of professional training. The basis of this theory, the author and developer of which is A. Verbitsky [12], consists of the following concepts: the activity theory, considered as an interaction of the student with the environment in order to acquire, assimilate, and use social experience and knowledge; the analysis and summarization (in the theoretical plane) of the experience gained during the innovative learning; the definition of «context», viewed through the prism of conditions that have a social and objective nature and affect the content of the entire complex of measures for mastering by students knowledge and social experience [12: p. 69].

One of the measuring units is the content of education as a comprehensive system the basis of which are philosophical and moral ideas, as well as scientific knowledge, skills and abilities. Being at the same time a «means» of training and a «factor» of education [13: p. 377], it determines the development in a person of natural, social, and cultural principles, the elements of cognitive and creative experience in the context of universal values and also national and regional features.

The realization of the content of taught disciplines in the framework of contextual education occurs through the creation of problem situations [12: p. 69]. Their recurring use by the teacher promotes creative thinking among students, creates the need for generating ideas, as well as the need for the search of additional information to resolve these situations. The measuring unit of students’ activity is the «event» representing the sequence of specific actions performed by them by means of modeling and imitating future professional activities. Thus, students as potential employees gain experience of performing certain types of work in accordance with the requirements and rules accepted in a particular professional community.

Pointing to the invariance of professionalism in modern world and outlining the range of problems associated with a person achieving high production results, the researchers [14] pay attention to the connection of educational problems with deep paradigm changes that open up a way to a slightly different interpretation of
the meaning of education and understanding of its importance for human development.

Among many interpretations of the definition of «paradigm,» we will rely on the definition of this concept given by T. Kuhn [15] who viewed it as a conceptual scheme or a unit of measurement of changes that occur in the process of the development of science, as well as from the perspective of the «mental window» K. Baiby [16: p. 25] allowing the researcher to study the world. The analysis of the content of pedagogical paradigms makes it possible to determine the system of values, techniques and methods put into the basic models of education [17] and determining their relation to the functioning of the educational system in general. Studying the experience of inter-paradigmatic reflection [18], the attempts to harmonize different directions [19] and to study poly-paradigms as the foundation of modern pedagogy [20] have given the impetus to further research aimed at studying the essence of this phenomenon [21], its foundations [22] and role in the history of culture [23]; the need for a combination of innovative and traditional approaches in improving the quality of education [24; 25]; and the needs to assess the mission of the educator [26].

Studying the paradigmatic approach to developing the content of teacher’s competence undertaken by E. Bondarevskaya and S. Kulnevich [27] helped us to point to cultural, cognitive-informational, personal, competency-based paradigms described in the works of I. Veretenko [28: p. 249-257]. We think that their theoretical positions make it possible to form in students a wide range of necessary skills, the basis of key subject competencies. Such poly-paradigmality that assumes the coherence of various areas, where each of them corresponds to a specific role of the teacher, allows us to consider the process of forming these skills from a different perspective in the context of the requirements of the modern labor market.

The formation of competitiveness and mobility, as major qualities of modern students, is carried out by teachers on the basis of systemic, activity-based, personal, competence-based approaches. These approaches are the basic for all above mentioned educational paradigms. They are also fundamental for establishing
educational standards and curricula of academic disciplines for higher education students in Ukraine.

The basis of teacher’s activity in forming soft and hard skills in the context of these paradigms is understanding such concepts as «personality», «uniqueness», «development», «vital necessity», «means» on the basis of which the model of professional behavior of a student will become geared towards further development of their personal and professional qualities by all possible pedagogical means.

Conclusions.

Thus, in conditions of student-centered learning (as a new educational paradigm), the main idea of which is the possibility for young people to achieve success in obtaining prestigious jobs in the labor market, the main objective of the teacher is to harmonize training programs and bring them in line with the demands of the market and employers.

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