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Organizational and Legal Model of Competency-Based Education as a Means of the Transition to Innovative Economy

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Abstract

The purpose of this study is to substantiate theoretical foundations of the development of organizational and legal model of competency-based education as an important means of the transition to innovative economy-knowledge economy, digital intellectual economy. An important problem, as follows from the analysis, is that the current legislation in the field of education, its actual organizational and legal model does not provide necessary reproduction of social capital as a leading factor in the fourth industrial revolution. The main ways to solve this problem is the design of the content (the organizational model) of the sound academic background and its subsequent formalization – development of the organization and legal model of competency-based education. The proposed solutions to the problem, which will be presented to the leadership of education and science of Ukraine, can be useful also to the scientists from other European countries which have similar educational and cultural traditions.

Keywords

Innovative Economy, Legal Support, Quality of Education, Organizational-Legal Model, Competency-Based Education

I. Introduction

In the course of globalization, economic competition between countries has intensified in the past decades both within the European Union and worldwide. National (global) competitiveness became the central issue during the global crisis not only for small open

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economies. Exposure to external shocks made every country of the global network vulnerable and forced to compete for resources, environment, or markets[4].

It is known from numerous press reports that a Presidential University is now planned to be established in Ukraine. It is planned to spend more than 7 billion on its construction (construction of the building). The start of the educational process – the 1st of October, 2023, said the Minister of Education and Science. The Presidential University, he added, must meet all training trends.

At the same time, one can only regret that the creation of the University is associated with the construction of the building, the selection of teachers and applicants, and not with the solution of the most acute problems facing the country. Education can and should become the main means of solving social, socio-technical, and socio- technological problems of society. We also disagree with the fact that to immerse oneself in the world educational space, it is enough to start training "either in the third week of September, or on the 1st of October", "as in the whole world". In our opinion, it should be about educational technologies that immerse students in the latest knowledge achieved by the mankind. At a fundamental level, it is not enough to even comply with "all the trends that exist in the world today".

If we talk about world-class education, which must be recognized by the whole world, then we ourselves must create something that does not yet exist in the world. In other words, we need to set our own trend. We need to stay ahead, not constantly catch up with the West, as we have been trying to do throughout the history of our existence. Developing our own trend of the national education in Ukraine is the main task in creating the University. To connect this task mainly with the building construction is not just yesterday – it is a cave age. It was Aristotle who connected his philosophical school with not the building, but with the direction of education. And the building, the construction of the University, is rather the Dunning-Krueger effect, the effect of the incompetent and the ignorant.

We are very impressed by the approach according to which education is no longer considered as a separate autonomous subsystem of the society's system, but as one of the basic elements of the ecosystem (digital) innovations and digital economy as a whole. Then it is logical to have the funds needed to train, to attract and to retain a sufficient number of professionals who own new technologies. And it is not just a salary for teachers, which, as it is promised, shall start from four thousand euros. And not only students with "non-standard thinking, in-depth knowledge, creativity, the ability to prove that a person is the best". These are mainly educational outcomes needed to achieve a competitive advantage in the digital world.

The development of education in this context is considered as not because of a subjective voluntary decision, but as a reaction to the emergence of new technologies, the increase of the demand for new competencies. Today, and we think, for a very long time to come, the basic need will be to train skilled workers in the field of digital technologies.

It would be expedient to announce a competition to develop a concept of educational activities of the Presidential University – the University of the Future, as it is called.

[4] Fifeková, Nežinský, Nemcová (2018).

Our study, the results of which are partially presented in this article, is an attempt to develop such a concept, which could be considered as one of the possible alternatives to this problem.

The study was conducted based on the analysis of higher education in Ukraine. However, the proposed article will be useful for scholars from other European countries, in particular, Austria, Hungary, Slovakia, Slovenia and the Czech Republic, which have similar educational and cultural traditions.

II. Theory

In developing theoretical provision within the topic of our research, we were guided by the doctrine of works, which based on the latest scientific advances, explore the present and the global future of higher education. In particular, these are works of the group of Meadows[5], Korsak[6,7,8], Rudnitska[9], Ievsieieva[10], and others. Based on these and a number of other studies the authors of this article have formulated definitions of the education relevance, the purpose and problems of the education improvement. As for determining the significance and importance of education.

Education, from a social standpoint, is a huge social value, being the main means of developing the humanistic essence of a person. This is, first. Second, the society, the state provides social protection for the population from unemployment by providing educational services, increasing its competitiveness in the labour market. Third, society's needs for productive power are being met. And, fourth, the goal of education should be to solve social, socio-technical, and socio-technological problems of society. It should be noted that the last task, as the goal of education, has not been yet set before. In any case, explicitly. We were always limited, at best, to the first three tasks. And that, often formally, in a bureaucratic way. Human resource education can be understood as a system of linked strategies, methodologies and decision-making, the purpose of which consists in the management and development of the human potential for organisations and whole economies to achieve their strategic objectives; however, it is also necessary to respect educational requirements and aspirations, and it is important for every state or economy, regardless of its size[11].

Naturally, for education to really gain its potential value, it is necessary to create in society sufficiently competitive conditions for its development, as well as for the real use of this power of education in our society. The availability of these conditions is necessary to combat migration, the loss of "working hands" "brain drain". It is interesting that Americans have come to view broad access to higher education as a necessary component to maintain the nation's stature as a "land of opportunity"[12].

[5] Meadows, Meadows, Renders (2007).
[6] Korsak (2014).
[7] Korsak (2013).
[8] Korsak (2010).
[9] Rudnitska (2016).
[10] Ievsieieva (2016).
[11] Vnoučková, Urbancová, Smolová (2018).
[12] Smith (2013).

And now about one important aspect of the state and public value of education. It, as already mentioned, should be a means for solving social, socio-technical and sociotechnological problems of society. At the present stage, such problems are to ensure the development of economy, the information of society, as well as to ensure its sustainable development. In order that education corresponds to the above criteria, it is necessary not just to modernize and/or to integrate it into the European, global educational space. New approaches are needed, the transition from traditional to competency-based, innovative education, ensuring the development of creative abilities, the focus on the search and use of innovations in the content of curricular and teaching aids.

Speaking of the latter, we mean the rejection of the so-called "knowledge approach" – a traditional system of the knowledge transfer in a particular subject area. From the standpoint of the process, the knowledge approach can be represented by a well-known scheme: study – consolidation – control – result. This scheme is used almost everywhere at high school.

The traditional "knowledge" approach, in which a teacher and a textbook were the only sources of knowledge, was convenient for the Soviet bureaucratic education system, as it ensured its unification, politicization and, as a result, the programming of the individual through education. On the other hand, the traditional education system corresponded to the time – the industrial epoch of social development. In the 70s and the 80s, a university graduate could be and was sure that the acquired knowledge would be enough for him for 30 years, if not forever. Now, the conditions are different. Everything is changing rapidly.

III. Methodology and Methods of Research

Within the framework of the basic methodology of the present study, the general theory of the system (GTS), the system analysis (SA), the problem-oriented approach are defined and actually used. The main provisions of the systems analysis, a problem-oriented approach are set out in the works of foreign specialists in the systems theory (Bertalanfi[13], Optner[14], Young[15]), representatives of the Ukrainian scientific school GTS Uemov[16] and his students Blauberg, Yudin; in the works of Nikanorov[17], Korsak[18], and others. According to the basic definition of the system, a system is a set of elements on which a relation, which possesses certain properties, is implemented. Considering education as a system, it should be noted that we can deal with two systems (models), namely: the actual system of education, and the desired (normative), which we want to create. The normative system (model) of education is determined through its desirable features. These should include the novelty of the educational materials, development of students' creative abilities, skills to identify, analyse and solve actual problems in the relevant subject area.

[13] Von Bertanalffy (1969).
[14] Optner (1969).
[15] Young (1972).
[16] Uemov (1978).
[17] Nikanorov (1969).
[18] Korsak (2013).

In developing the author's concept, we proceeded from the need to identify problems of education, which in turn should be based on the problems of society social problems (the technique of the SA was used – building a "goal tree"). Methods of analysing and forecasting, modelling and structuring, the method of expert assessments, sociological methods, the method of sociological surveys were also used.

Speaking about the system approach, the system analysis, we assume that it is at the conceptual, systematic, model level that the (conceptual) provisions of the implementation of the certain activity (in this case – educational) should be linked. These provisions should contain responses to current challenges from the external environment (in relation to the system to be built). Based on these answers, a model of the state educational policy should be formed, which can be defined as a form, and its very conceptual provisions should be interpreted as content of transformations in the activity organization. It is in the symbiosis of this content and the form and could be a "combination of the form and the content of the educational policy", the implementation of an "effective redistribution of functions and powers between central government and educational institutions". And these are the tasks, which solutions are required by the approved National Doctrine of the Education Development of Ukraine in the 21st Century.

IV. Results

The result of research is the development (at the conceptual level) of a competency-based model. Improving the quality of education and science can be interpreted as one of the conditions for solving the most important state problem – the progressing economic and technological lag of the country in the field of innovation from highly developed countries. The existence and exacerbation of this problem leads to severe economic and political consequences. The first ones (consequences of the economic nature) include the low standard of living of the population, the migration of its able-bodied part to work in other countries, the "brain drain". The second ones (consequences of the political nature) lead to threats to the country's sovereignty, national security, and the territorial integrity of Ukraine.

No less important result of improving the quality of education, its efficiency, should be to ensure sustainable development of the country.

It is known that according to the criterion of the innovative development the states can be (of course, to some extent, conditionally) divided into two groups. The first group will include the countries that sell innovative high-tech products with high-added value. The source of their economic growth is mainly the added value, new technologies, knowledge production (the countries of the so-called "golden billion").

Let's call them the full-fledged states. Full-fledged states will receive flows of investment, able-bodies migrants arriving in the country for employment, etc.

The ultimate goal of efforts in this direction is the transition to innovative economy-knowledge economy, digital intellectual economy. It is a post-industrial transformation, which is based on the flow of innovations, digitalization, continuous technological improvement, production and export of high-tech products with very high added value and the technologies themselves.

The transition to knowledge economy, digital economy is called the Industrial Revolution (Industry 4.0). This is the transition to fully automated digital production, which is controlled by intelligent systems in real time in constant interaction with the external environment. Industry 4.0 goes beyond a single enterprise, with a prospect of merging into a global industrial network of things and services. The concept of Industry 4.0 originally came from Germany in 2011. Industry 4.0 defines a methodology to generate a transformation from machine dominant manufacturing to digital manufacturing. The promotion of the industrial change and the acquisition of a leadership position in manufacturing sector in the world were the main objectives of the country[19].

We are speaking about the development of social capital as a leading factor in the fourth industrial revolution. That is why we consider the accumulation of creative, high-quality human capital to be the main driver of establishing the production of innovations, their mass generation. Moreover, some scholars believe that the main reason for the collapse of the country's economy and even its statehood is the problem of lacking highly qualified, professional staff [20,21].

The accumulation of high quality human capital is carried out by ensuring the operation of the educational system. It is it that must lay the necessary foundation for moving forward. And for this, in order to prepare the high quality human capital, it is necessary to build and ensure the functioning of the effective, sound academic education.

The competency-based approach is quite common in the education modernization. There is a lot of research in this sphere[22,23,24]. Educational structures characterized as competency- or outcome-based can be identified by various manifestations of functioning end points: educational objectives, outcomes statements, competency frameworks, task analyses, employability skills lists, performance and grading checklists. What is common across these tactics is the focus on endpoint behavioural competence and therefore on assessing direct indications of attained competence throughout the educational experience. This focus contrasts with the still common assumption that competence is related to time in courses or service. Similarly, the competency-based approach removes the emphasis on institutional reputation as a proxy for graduate quality. In CBA both assumptions are replaced with documentation of classroom, simulation, and work execution indicators chosen to reflect demands of the next placement or workplace performance[25].

The competency-based approach is a priority orientation on the goals – vectors of education: learnability, self-determination, self-actualization, socialization and individual development. Fundamentally new educational constructs act as the tools for achieving these goals: competency, competencies and meta-professional qualities. The last three constructs are combined by us into a meta-educational concept – the key qualifications[26].

[19] Bartodziej (2017).
[20] Zadorskiy (2020).
[21] Khomyachenko, Yuldashev (2020).
[22] Lilleväli, Täks (2017).
[23] Bezanilla et al. (2019).
[24] Khutorskoy (2017).
[25] Curry and Docherty (2017).
[26] Zeer, Symanyuk (2005).

At the same time, key competencies mean the training of specialists of a broad profile able to adapt to modern production technologies, to easily move from one type of work to another, having knowledge, skills and abilities necessary for a wide range of professions. So, in solving the problem of technological backwardness of the country, the primary role belongs to science and education, the organization of data management, which are (important) areas of life. At the same time, the above-mentioned organization must ensure high quality of education, high efficiency of scientific research, as well as high synergetic effect from the joint functioning of science and education as the components of a single system "science-education". This effect, ensuring the unity of science and education, is that science, scientific results – discoveries, inventions, new technologies – must determine and shape the curricula in the higher education sphere. This is a cardinal way to improve the quality of higher education and, at the same time, science. It is the mechanism of the most complete (industrial) implementation of new knowledge that will increase the requirements for the quality and the responsibility of developers of new knowledge. And all this are not declarations. We actually offer corresponding concrete mechanisms of the implementation in the curricula of higher education institutions scientific results, new knowledge. Out of Hegel's "a thing in itself", scientific results must become "a thing for all". It is necessary to implement new knowledge in the curricula of universities not only in the country where these results were obtained, but also in other countries, to establish the feedback between users of scientific information (that can be students from around the world). This will lead to a sharp increase in social responsibility of the latter, incomparable with the authority and rigour of any certification commissions, bureaucratic in nature. And this alone cannot but lead to the increase in the quality of scientific research. We have developed a number of measures of a technological and organizational nature, which should ensure a high level of the quality of scientific research. One of the main ideas is to identify a scientist not by the presence (or absence) of a diploma on awarding a scientific degree, but by scientific results obtained.

At the same time, the same new scientific results must be brought to the business environment. Thus, scientific results – the flow of innovations – can become goals, objectives of improving production, and its development – can become innovative.

At the same time, moral and spiritual values and knowledge of a person living in harmony with the surrounding social and natural environment are brought to the fore.

That is why the goals of ensuring innovative and ecological development of the individual become the main ones in education, and it is itself, from a social standpoint, quite rightly considered as a means of developing the humanistic essence of a person.

Based on the foregoing, one of the main goals of education should be the upbringing of a new personality, focused not only on the values of the consumer society, but on the system of environmental restrictions. An essential component of a new personality should be the ability to self-restraint, moderate consumption of resources and products of human labour. It is necessary to form spiritual and moral values that focus on the survival of all mankind. Only a society consisting of people with this kind of new world-view will be able to develop sustainability. Similar ideas have long been discussed in the world. Modern philosophers speak of a scientific and world-view paradigm, within

which "human economy on the Earth is viewed as a moment of noospheric and cosmic harmony considering the restrictions that homeostatic mechanisms, laws of the biosphere, the Earth and space impose on the free will of an economic entity on the Earth…"[27]
The global trend "Green Economy" is increasingly becoming a goal-setting benchmark for the development of economies of advanced European countries, in particular, Sweden, Norway, Denmark, Finland. China has set up a research centre with a mission to achieve carbon neutrality by 2060[28].
As far as Ukraine is concerned, the existence of many environmental problems stems from the use of outdated technologies. For example, such technologies exist for the most part in the activities of the imperfect and outdated coal industry. After coal mining, waste heaps are formed, which leads to failures of the upper layers of the earth and the deterioration of the quality of underground waters.
The best opportunities for upbringing of the personality intolerant of environmental violations open up within the framework of competency-based education. The main advantage of this education lies in the fact that its main result is not individual knowledge, skills and abilities, but a person's ability and readiness for effective and productive activity.
An important role in solving environmental problems belongs to the creation of nootechnologies that are harmless to the biosphere. It is on their development, in our opinion, that the existing potential of education and science should be directed to.
So, in order to survive in the world and to live with dignity, states must ensure their innovative, or, more precisely, as we found out, innovative and ecological development. No doubt, the leading role in ensuring innovative and ecological development in each country belongs to the national education (higher and school), as well as science. It is about the organization of the science and education management. At the same time, it should be emphasized that the bureaucrats that now manage education have correctly formulated the task of its improvement – to improve the quality of education. However, neither legislation on education, nor numerous program documents, strategies, missions today give a clear constructive answer about the quality of education.
In Ukraine, according to the current Law on Higher Education, one more prescriptive and auditing body in this area – The National Agency for Quality Assurance in Higher Education – has been created. As follows from the analysis of the relevant legislation, the Agency is a "permanent collegial body authorized to implement the state policy in the field of quality assurance in higher education". As conceived, it is the most powerful bureaucratic control body that takes over all control functions of the Ministry of Education and Science. Among the main tasks of the National Agency are the formation of requirements for the quality assurance system of higher education, criteria for assessing the quality of educational activities, including scientific achievements, according to which the ratings of higher educational institutions in Ukraine should be determined; accreditation of educational programs, development of the requirements for the level of scientific qualification of persons receiving scientific degrees, and the like. As provided by the

[27] Subetto (2011).
[28] Metallurgprom. (2020).

mentioned Law, the Strategy for the National Agency for Quality Assurance in Higher Education until 2022 was developed and presented.

Other acts, for example, the Law "On Amendments to Certain Laws of Ukraine Concerning Improving Educational Activities in the Field of Higher Education" No. 392, adopted by Verkhovna Rada of Ukraine on December 18, 2019 also provides for various additional forms of control. This is the improvement of the procedure for licensing educational activities, admission to training, expanding the scope of using external independent assessing, etc.

A number of methodological documents on reforming education, improving its quality, reducing corruption risks were developed by the forces of the nongovernmental sector, public organizations, mainly international. These documents include the Roadmap for reforming higher education in Ukraine (published in March 2018). The central idea of the document is "the quality of the Ukrainian higher education depends on the implementation of the concept of the university's autonomy". This document was produced within the framework of the ElibUkr project "Assistance to reforms in higher education in Ukraine from the point of view on the development of academic integrity", supported by the International Charitable Foundation "Renaissance".

At the same time, the analysis of the above and many other developed and adopted documents shows that a number of their provisions are of a general, declarative nature, and therefore, are also, in fact, bureaucratic. Indeed, if in non-bureaucratic management systems, when a problem arises, they seek to find mechanisms for solving it, then in bureaucratic systems they simply transfer the solution of the problem "to the bottom", to the localities, and at the same time create structures to control its solutions.

In our case, exactly the same bureaucratic methods were applied. In addition to the operative State Service for the Quality of Education, the aforementioned National Agency for Quality Assurance in Higher Education has been created. And all this is presented as almost a panacea for all illnesses, a breakthrough in the field of education. The regulations of the National Agency refer to the "mission to ensure the quality of higher education", "strategic objectives", etc. However, as follows from the analysis, neither the authors of the Law "On Higher Education", nor the named bureaucratic structures have even formulated a clear definition of the quality of education. Moreover, there are no clear indicators of its (quality of education) assessment, approaches to measurement.

V. Conclusion

The main conclusions regarding the ideas for improving learning are primarily that continuous updates of the teaching materials are required. The information on innovations in the relevant subject area should be used in full extent. This information can be provided by advanced science and education of high quality. Moreover, the greatest effect can be achieved under the condition of the functioning (development) of these spheres as interrelated components of a single system. The new educational paradigm, the concept of improving the quality of education, which we propose, is aimed at building such a system. Within the framework of this concept, the definition of sound academic (innovative) education has been formulated. Constructive tools are proposed for assessing its quality

and development. A mechanism is offered for constructing of appropriate management (and not purely controlling) system that allows to increase the quality of education and science, providing a synergetic effect.

The essence of the above results lies in the design of the content part (the organizational model) of sound academic education for its subsequent formalization the development of a legal, organizational and legal model of competency-based education. In the process of designing the substantive part of the organizational model of sound academic education, criteria for assessing and improving the quality of education at the present stage of the development of the society informatization, the country's transition to innovative economy are determined.

As for the organizational and legal model of competency-based education, it should, first, legally fix not the actual, but the desired, designed organization, and, second, it should be complete, i.e., sufficient for its implementation in practice.

It is also presumed that the material and energy reification of this model will ensure its functioning, a breakthrough in improving the quality of education, bringing the country closer to innovative economy society, a knowledge society.

The above concept can be interpreted as a possible alternative to solving the most important state problem – the progressive economic and technological lag of Ukraine in the field of innovations from highly developed states with all the ensuing consequences. This refers to the already occurring negative processes of an economic (non-receipt of possible investments, migration of a part of the working-age population leaving for other countries for employment, including "brain drain") and political (threats to sovereignty, national security, territorial integrity of Ukraine) nature.

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