

Managing the innovative educational environment of the university in the context of knowledge economy

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Abstract — The article proposes a model of managing the educational environment of an Institute of higher education as one of the key centers of a knowledge-intensive economy that implements all aspects related to the production of knowledge and human capital. It gives the modern points of view and research data on the directions of formation of knowledge economy. It also considers the structure of the management system of higher educational environment and mark out its components that define various management procedures and ensure its innovative nature. Special attention is paid to the control of each component, its place in the educational environment management system and relations with other components, as well as the external economic environment, which forms the knowledge management infrastructure in the modern economy. The successful experience of the Ural State University of Economics (USUE) in the implementation of a number of aspects of educational environment management is noted.

Keywords — *knowledgeable economy; educational environment; management; educational technology; open education.*

I. INTRODUCTION

In the modern era of widely spreading information and other high-tech technologies, one of the most important factors determining the rate of economic growth and competitiveness of a country in the global economic space is knowledge of its economy - organization of production, reproduction, accumulation, transmission and use of versatile knowledge. All these processes characterize a knowledge-based economy [1-4], based on various economic institutions and information infrastructure, and, above all, on the education and training system. The principles of this economy have been studied by economic scientists for more than half a century [5, 6].

Science and knowledge have long become direct productive forces, and today they are powerful driving forces for the development of the entire economy and the transition to the sixth technological order, determined by the convergence of nano-, bio-, info-, cognitive and socio-humanitarian technologies (the so-called NBICS-convergence) [7, 8]. A necessary condition for the formation of a knowledge-based economy is continuous innovative education, as it is in the field of education (along with the sphere of science, which is closely related to education) that knowledge is produced and transmitted. From this point of view, education is the key sector of a knowledge-based economy, in fact – the knowledge economy itself. This sector includes and forms human capital, and synergistically determines the interaction of all sectors of knowledge-based economy. Modern education is not an autonomous stage in the formation of human resources in the economy and is not a combination of certain stages either. This system of “lifelong education”, with its continuity, creativity and the innovation, provides all the essential characteristics of human capital (investment and production resources, accumulative value, profitability, etc.) and the efficiency of its use. And in this system an important role is played by the educational environment of the university as a hub for the production of knowledge, training and retraining of qualified personnel. The purpose of this study is to identify the most important components of the educational environment of a modern university and build a model for managing this environment.

II. METHODS

The Authors used the methods of structural-functional and program-targeted analysis. The subject of the study is the educational environment of the university. From the chosen

methodological positions, which are based in turn on the principles of system research, the educational environment of the university is regarded as structurally dismembered integrity with the expressed functional purpose of each component. The single final target orientation of all components is ensured by the programmed harmonization of their interaction, in which each component uses its own tools. This helps implement a complex synergistic innovation process of knowledge production and human capital formation.

III. LITERATURE REVIEW

The realities of the development of a knowledge-based economy intensified the need for a radical reform of the educational activities of universities. [9]. The educational environment of the university as one of the centers of knowledge production and innovation development [10] (along with innovative firms, research and production complexes and science cities) has been the subject of numerous studies. Some certain papers [11,12], devoted to studying the experience of various countries in creating environments for successful and sustainable production and dissemination of knowledge (knowledge and innovation spaces - KIS), consider the effective approaches underlying the development of a multidimensional strategy for the formation of such spaces are discussed. They also present factors which determine the optimal conditions for the development of creativity, innovation and the value of knowledge as 4 “dimensions”: management, firm (university), place (economic region), people, which determine the optimal conditions for the development of creativity, innovation and the value of knowledge. From these positions, the educational environment of the university is one of the clusters, which is closely connected with others in a single system of knowledge economy. It seems that this approach is the most relevant to the modern trend of economic development. The formation of an open innovation educational environment in the format of the Knowledge Intensive Business Service (KIBS) and collaborative networks based on close cooperation of firms and universities is discussed in [13]. In this regard, the innovative and entrepreneurial potential of universities becomes very important [14]. The university is one of the key elements in the system of knowledge-based economy, realizing the turnover of knowledge as the most important assets that ensure success in business. The management of the educational environment of a university plays a significant role in building the knowledge infrastructure [15]. All these approaches are reflected in the proposed model of a modern university educational environment and its management.

IV. RESULTS

When considering the educational environment of a university as an object of management, it seems appropriate to select some of its components, which have a specific functional purpose (Fig. 1).

Administrative management which is responsible for the following:

- liaison with government education authorities and the entire economy;

- tracking public policy and the regulatory environment that it determines;
- consideration of trends in the global and domestic markets for the production of knowledge and educational services;

- providing a base of regulatory documentation for all components of the educational environment, the functioning of which it directly determines.

Management forecasting and risk assessment. Their functions include:

- marketing; and analysis of the labor market, knowledge production and educational services;

- to determine the potential of the university, as well as short-term and long-term forecasting of the conditions of its economic and educational activities;

- to identify areas for expanding the range of activities;
- to make an assessment of possible risks and find out the ways to reduce their levels.

This component is directly connected with the staff responsible for regulatory support on the one hand, and on the other, with the departments of communication with employers and material and financial support.

External Relations Management:

- comes into direct contact with the management of organizations and enterprises, determines and assesses the need for specialists and requirements to them, the conditions and prospects for the enterprise development, the employment prospects of graduates and their professional growth, the reasonability and possibility of using the personnel potential of the enterprise in the scientific and educational activities of the university, the expediency and the possibility of improving the organization of students' practice and the chances to raise the level of the higher education institution's personnel skills of exercises in-house; as well as the opportunities of getting research orders and introducing scientific and design developments;

- forms international relations with scientific, educational and economic structures, organizes the exchange of students, teachers, specialists, and experience; monitors global economic trends, including scientific and educational sphere;

- carries out marketing activities, contributes to the promotion of scientific and educational products of the university in the domestic and global markets [16];

- organizes public relations, with professional associations.

Intellectual Property Management accomplishes the following functions:

- monitoring the policy and the related regulatory framework concerning copyright and intellectual property protection;

- providing information and analytical support for the creation of copyright and intellectual property objects;

- processing documents for the acquisition of copyright and ownership of intellectual property;

- examination of scientific, methodological and technical developments of the university in order to determine the possibility of processing them as objects of intellectual property;

- commercialization of intellectual property of the university.

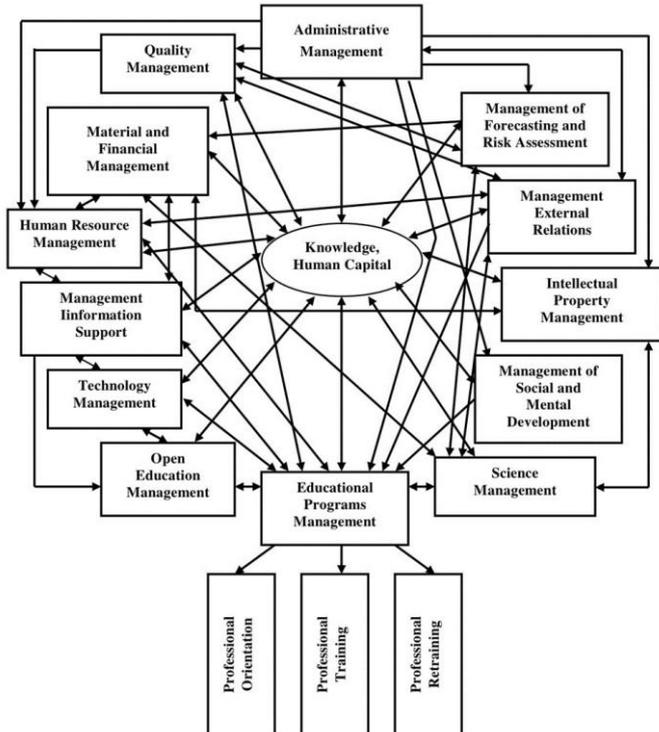


Fig.1. The structure of management model for education area of university

This component is directly related to the *management of science*, which is the most important sector of knowledge production, responsible for:

- organizing and carrying scientific research, design development, inventive activity;
- implementation of scientific and methodological work;
- integration of scientific and educational activity, and business;
- providing financial support for research, organization of relations with potential customers, participation in competitions for grants;
- implementation of significant results in the educational process in various sectors of the economy; training and retraining of scientific staff, the development of scientific schools.

Management of Social and Mental Development performs the following organizational and managing functions:

- organizes extra-curricular activities, cultural and sport events;
- supports students with physical, mental or psychological problems, organizes activities which could help them to participate in the educational process;
- organizes activities aiming to develop tolerance as one of the factors showing the high cultural and educational level [17];
- organizes events on legal and moral education;
- provides social support for teachers and students.

Educational programs Management (career orientation, training and retraining) is the central component of the educational environment which is responsible for:

- drawing and implementing educational programs and curricula in accordance with the requirements of educational standards and employers;
- forming the methodological support for educational programs;
- creating a system of dispatching support of the educational process;
- identification of student's individual educational paths, including those with physical, mental or psychological challenges;
- integrating innovative educational technologies into the educational process, including the open education technologies.
- to be in the picture of modern approaches to the organization of the educational process and taking them into account in the formation and implementation of educational programs. (The academic and methodological administration and departments of the USUE, including the Department of Physics and Chemistry has gained extensive experience [18, 19]).

Open Education Management does the following:

- finding out good-quality open resources to use in the education process;
- integrating these resources into the university educational programs;
- developing the scheme of transforming the academic results of open education into the university academic results;
- providing the development of open education resources for the university experts.

Technology Management in its turn:

- implements effective educational technologies, including information and communication, and particularly computer-based training systems that are intelligent learning environments [20,21];
- develops authentic electronic learning resources, creates a digital research and academic environment of the university, provides its integration into the external information environment and the digital economy;
- provides all educational programs with the necessary modern technologies;
- creates the system of online education;
- provides the access to the online education resources;
- helps the university teaching staff exchange their experience in using the modern educational technologies.

(One of the examples of a successful functioning of this component is the USUE Electronic Educational Environment),

The functions of *Information Support Management* include:

- forming the library fund and organizing of its use;
- enabling the use of electronic libraries;
- forming the banks of information resources, and organizing its use;
- providing the technological support for the publishing activities of university employees.

Human Resources Management is responsible for personnel management directly:

- it provides the scientific and educational process at the university with qualified personnel,

- it controls the rational use of human resources in accordance with the needs of the scientific and educational process at the university and the requirements of labor legislation;

- organizes regular staff retraining and professional development activities.

Material and Financial Management performs the functions of:

- creating and providing regular modernization of the entire material base and equipment;
- providing the academic process with material and non-material resources;
- taking the responsibility for all financial activities of the university;
- finding out the ways to obtain and increase economic efficiency;
- ensuring the conditions of functioning of the university are in accordance with the requirements of the legislation.

Quality Management. This component, in accordance with global requirements, is a part of in any production. Its functions are:

- monitoring and analyzing the state of production (scientific and educational process) to forecast its quality (planning) and the quality of the product (knowledge);
- developing methods and tools for measuring quality in accordance with the required standards;
- ensuring the high quality of knowledge at all stages of the scientific and educational process;
- giving assessment for each stage of the educational process and its subjects (students, teachers, support staff);
- providing assessment for process conditions, methods and equipment used;
- developing methods for improving the quality and stimulating the subjects of the process in order to improve the quality.

All these components are connected with each other by direct and feedback links and form a complex open self-organizing system in the open space of a market knowledge economy.

Practically all the components of the management of the educational environment have both internal functions that ensure their interaction and external ones, which define links with other centers of the knowledge economy.

V. CONCLUSION

The development of the educational environment of the university is carried out as a result of the competition of two polar tendencies inherent in any open self-organizing systems: the desire for stability and change. These trends are manifested in the implementation of management functions of all components of this environment, and is embodied in the nonlinear dynamics of knowledge production and human capital.

The model of managing the educational environment of a higher educational institution suggested in the article, is considered as a major center in the knowledge-based economy system takes into account various links with other centers, it is

organically integrated into its structure and contributes to the development of knowledge management infrastructure. The model corresponds to the modern development strategy of the educational sphere, and at the same time, it is quite variable, adaptive to possible changes and modifications of the educational paradigm while maintaining the expressed imperative: the formation of knowledge as the most important asset in the knowledge economy and human capital as a substrate.

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