

The Educational and Research Centres in Universities

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Abstract: To develop and strengthen the educational and research base of higher educational institutions of the republic of Uzbekistan, which is based on the principle of the unity of scientific and educational processes aimed at improving the efficiency of the economy, defining social and spiritual development of society. The creation of educational and scientific industrial complexes is required today taking into account existing and future needs of the economy, the priorities of science, technology and innovation policy in the interests of science organizations and their effective interaction with the organization. The innovative component is main factor determining the socio-economic development of any country in the XXI century. The innovative way of development allows mastering such a niche in the socio-economic environment, which can contribute to solve the pressing problems of society and economies with the high complexity, learn new modern industry, realize human potential, expand the market for intellectual products, improve the effectiveness of innovation activity, i.e. educational, technological, cultural and moral as well.

Keywords: Innovative Activity, Research, Technology, Innovation Policy, Innovation System

1. Introduction

The current stage of research and technological development (RTD) as a breakthrough process is a new economy, which means the beginning of a new period for the development of socio-economic system, with its global nature and characteristics related to the single or group of countries. Therefore, the initial stage of the STR - development of science and education in general is the basis for the emergence of new socio-economic characteristics of the system.

It can be distinguishing two important parameters initial stage of the RTD. First, parameter is the explosive nature of information and communication technologies. The other one is the creation of conditions for the development of high technologies through training in higher education on new platforms, i.e. on a platform of “learning-research-application”.

In particular, the innovative way of development of the economy of Uzbekistan, responsible to global trends, requires the preparation of a new generation of researchers and highly qualified professionals who are ready to run innovative activities in the development of the economy.

These tasks are mentioned in the National Program for specialists training, in decrees, resolutions and decisions of the President and the Cabinet of Ministers of the Republic of Uzbekistan [1-6, 9].

The system of higher education and higher education institutions at the current moment of the country's development has the following tasks:

1. To educate talented young generation of the country as a competitive specialist, with independent thought and own views;
2. To improve the quality of education and training of young professionals;
3. To deepen the integration of educational process with scientific research and production activities;
4. To implement applied researches, which have practical significance for industrial manufacturers;
5. To develop science – i.e. to carry out and support applied and fundamental researches to address current and future challenges of the modern national economy, education, medicine and culture;
6. To contribute to the development of modern industry, the rural and urban economy of the country through the creation and development of scientific, engineering and innovation potential of higher education institutions and

regions of the country, as a basic point of growth and development of the economy, society and culture.

2. The Ways of Developing the Educational and Research Cells

With the development of modern production, absorbing the foreign investment and the creation of new enterprises, new economic zones, the creation and development of high technologies, including information technologies become an important link for a scientific breakthrough and enter the international level of modern new technologies.

Creation of economic zones and techno parks in Uzbekistan has a strategic importance. At the same time, there is a demand particularly for effective industrial parks, specializing in the production of software products. The analysis Uzbekistan's software market shows that currently in this area operate approximately hundred companies and firms, including foreign ones, and their subsidiaries. According to expert estimates, the market development of software products in Uzbekistan is estimated several million US dollars per year. Profitability in the field of software products is estimated around 5-15%. It is noted that about 80% of total costs associated with the introduction of products. The enhanced investment attractiveness of the domestic market impacts in increasing number of representative offices of foreign companies in Uzbekistan, mostly the world's leaders in the development of software products. At the same time the development and strengthening of educational and research foundations of higher education institutions is quite important. The close attention is paid to these tasks in the Decree of the President of the Republic of Uzbekistan No. PP-1533 "On measures to strengthen the material-technical base of higher educational institutions and radical improvement of the quality of training highly qualified specialists" dated on 20.05.2011 [10-11].

Persistent need for the further development of the market for the innovative industry became the idea to concentrate the intellectual potential around innovative ideas, secured by the preferential treatment of economy. Formations of economic zones, where complex technology projects, exchange of experience and ideas among professionals will be implemented freely, will allow qualitatively improve the dynamics of the industry. The specificity of this activity depends on the availability of highly qualified personnel and established system to attract orders. It is obvious that these free zones are formed in close conglomerate with technical universities, where some experiences in the field of research and constant inflow of qualified specialists, as result of student training, are already exists. For example, the most appropriate way for Uzbekistan might be the formation of scientific and technical zone, in cooperation with leading universities specialized for IT industry: Tashkent University of Information Technologies, University of Inha in Tashkent (South Korea), Tashkent State Technical University, etc. In this regard, The National Center of Programming could

become the organizational structure (techno polis) form of this zone. However, it is necessary to mention that the technologies for concentrated and integrated solutions of complex IT projects in republic are widely used nowadays. The Centre for training and support of young programmers opened in previous years is a good example in this area. Students of this Centre based on the deep theoretical knowledge in the field of programming have the ability to use and demonstrate in real situations.

Hence, the state initially can support industrial techno parks, techno policies and then socio policies, which reproduce the intellectual products that combine production, education and science, i.e. the prototypes of the new economy and the future model of the society.

Based on the above, it can be concluded that the implementation of the huge task addressed for the preparation highly qualified specialists, who meet the modern requirements and be able to contribute to the development of the country in all major sectors of the economy is a nationwide task.

To meet new challenges, universities and institutes should become a new type of research universities following the example of the best international research universities. - Universities and institutes can act as centers for the preparation of national competitive specialists under the globalized world economy to become an engine for the high quality education.

The main objectives of strengthening the scientific and technical base of higher educational institutions are:

1. To provide high-quality education based on modern educational programs in accordance with state educational standards;
2. To improve training from the perspective of economic and social development of the country, the needs of society, modern science, engineering, technology, economics, and culture;
3. To introduce new teaching and information technologies, methods and means of self-education and individualization of instruction;
4. To introduce effective mechanisms for the integration of higher education with science and industry;
5. To create research capacity, as a condition for the integration of science and higher education with production, scientific and research work in the development of industrial enterprises, including the development of innovations developed on the basis of its fundamental and applied research;
6. To improve the quality and efficiency of scientific research in fundamental and applied research, development and implementation of innovative projects.

These priorities can only be performed when creating the necessary conditions for the development of training and research, further development of the material base.

Therefore, it is required to optimize the structure of the science sector, taking into account existing and future needs of the economy, the priorities of science, and technology and

innovation policy of the republic in order to ensure the effective functioning of the organizations of the profile of science and their effective interaction with manufacturing industry.

It is assumed that it will integrate science and education, to solve the problem with the staff, and will also contribute to closer contact with industry, facilitating time to market.

To solve these problems, the Ministry of Higher and secondary specialized education of the Republic of Uzbekistan is already implementing a system of measures aimed at both the development of fundamental science in universities, and acceleration the development of applied research base of universities and their integration into applied research in the interests of innovative development sectors of the real economy.

3. Integration of Academic and University Science

Today much attention is paid to the problems of integration of science, education and production.

Conducted researches analyze and solve problems of complex formation and development of science and education in the context of their interaction, without usage of the appropriate unit of systemic exposure (through the creation of integrated educational and scientific complex) on the internationalization of education.

Hence one of the principles of the approach of research institutes and universities - is the creation of educational and scientific complex (ESC) on the basis of universities, which follows along with the scientific and educational components of the university, and becomes an important scientific-innovative activity. The specificity of scientific and innovative activity is its integrative character and market orientated results. Therefore, we turn to scientific research and make a conceptual clarification of the concept of "educational - scientific complex", noting that in the modern education system this association is mainly determined by the concept of university complex. The scheme of integrated educational - research complex, uniting objectively folding structure, provides scientific and methodological support of the educational process, the development of scientific research and implementation of innovation. It can be implemented on the cutting-edge areas of regional development.

It should be mentioned that university complex is an open system, scientific and educational enterprise system consisting of complementary scientific, educational, industrial and other modules, the basic principle of operation of which is the continuous updating of the educational and research processes.

We single out the essence of scientific and educational model - "university complex", expressing it in the following areas:

1. institutional specificity of the research university and complex of its functions;

2. types of studies, most adequately meeting the status of a research institution;
3. characteristics of national model of research institution;
4. approaches to defining the basic parameters of the national model of research institution

From this perspective, teaching and research in higher education establishments should be treated as equal-and-legislative function.

ESC differs from scientific research organizations (involved in research only) or an educational institution (where the only training), in the fact that it performs these two functions in integration, i.e. simultaneously produces and knowledge (in the form of theories, principles, facts), and personnel who are able to develop and exploit. If we consider that industry demand for new knowledge depends not only on "purely economic" factors, but also on the presence in the industrial sector specialists capable of this knowledge to identify, evaluate and implement, it must be admitted that the role played by the ESC in the innovation process is unique: at each new stage of development of science and technology simultaneously it provides both offer of knowledge and the demand for it.

Should be said that the ESC is an independent object and subject of scientific and industrial policy, actively participating in the creation, transference of knowledge and technology in a different form, performing as significant cultural and regulatory functions, participating in the formation of social valuable orientation and with a unique intellectual potential is able to participate in many not only scientific and technological, but also social projects. ESC, as indicated by our study in a modern, multicultural educational environment is the leading generators of social transformation actively participate in the formation of a new political culture and contribute to the stability of social relations.

ESC organization and transmission of the results of science and technology trainees include them in the scientific and creative process of ESC. It comes to a powerful and high-quality scientific and educational system of the transfer, requiring special attention to the protection of the procedure of dissertation research and new learning technologies.

ESC relying on its highly competent scientific staff carries out technological, economic and social innovation, and in terms of today's information base creates the product that complies with the global science and make it competitive.

Management of integration processes and organizational forms in the system of "science - higher education," primarily bases on a set of incentives for the establishment and operation of research institutions. The integration of academic research institutes and universities in the republic meets all interests of society and the state, as well as their own rationally understood interests of science and higher education. Therefore, this corporate union has the right to choose the forms and rates of specific integration partners, and within mutual agreements creates necessary background for the realization of this right. Corporate activities between universities and research institutes should be based on the

following lines:

1. goals, achievement of which is desirable from the standpoint of national interests;
2. criteria for prioritization of state support;
3. principles of regulation of state exposure adequate to the new conditions of functioning science and industry
4. The objectives of the integration process from the point of view of the state can be:
5. restructuring of the national research capacity;
6. improving the efficiency of public investment in the sphere of science and education;
7. ensuring the national economy with new ideas and innovative-thinking staff.

Increasing the research capacity, as well as the desire of many academic researches to educational activities is equal. However, for various reasons, various universities and research institutes are located at different distances from their possible integration status. This implies three conclusions:

- Recognition of the need for a phased implementation process of convergence of universities and academic research institutions - to the extent that they are ready to transformations

- Encouraging universities and research institutes should be sufficiently mobile and not only consider the "statistical" (reached previously), but also "dynamic" (resulting in a new environment benefits of various universities);

- The need to choose a joint strategy. In accordance with this the main task of university and research institutes is to determine their competitive advantage and begin to develop them, or, if none of these advantages existed, they promptly should be created and increased. If the university and research institutes jointly under at least one of their chosen areas will achieve the best results in the region or the country as a whole, it's probably already guarantees their survival in a competitive environment.

The matter of finding facilities for integration process encouragement should probably be solved with a view of Research Centers' role in reaching the aims of structural and regional policies.

One of allocation sources could be, for instance, programs oriented on structural reorganization of science, education and industry as well as programs on critical technologies development. For example, while issuing research grants, the preference might be given to collective projects fulfilled by Universities and Research Institutes jointly. Within the framework of the program Universities could be granted with funds for inviting small productive teams in order to elaborate new curricula and conduct research at Universities. Basically, there are two possible options: either second job employment or (after a certain probation period) guaranteed full time employment.

Presently existing funds should also consider the possibility of joint project encouragement.

Likewise, it would be relevant to include specialized programs encouraging:

Personnel mobility (e.g. internship programs of "outer" candidate for a degree in academic RI, etc.);

Creation of new structural divisions on the basis of Universities and RI which would solve research problems for the benefit of industry.

It is important for a RI to consider not only University Professors but also students as an object of analysis.

One of indicators could be the number of joint publications of scientific adviser and his students.

Research parks play a fundamental role in the organization of ASC. They transfer the results of fundamental Research into the phase of applied Research and Development. The main objects of the parks are innovative vanguard scientific ideas and consequent projects which may be of applied significance in the long term. Due to the exceptional complexity of the set goals it is appropriate to involve the research elite from all sectors of science: university, academic and industrial.

The next variety of scientific cooperation is so called collective research. In principle the same model is applied here though modified, as collective research involves not only 'academic' science organizations but industry as well. The managing influence is a bit tougher here though it does not contradict University interests [11-15].

The advantage of the given forms from governmental prospect is an opportunity to focus the attention of various research parties on governmentally important problems which makes collective Research an effective instrument of conducting structural policy.

Research Higher Education establishments exist like models of academic-scientific complexes. The choice of the most adequate for the local conditions model should be preceded by their detailed analysis.

Stationary research centers on University basis like American Science and Technology Centers (STC). The centers are targeted on forming the basis for the development of brand new technologies by means of conducting oriented fundamental research. There are many similarities between the centers. Both types of centers exist on University basis though preserve research and financial autonomy. On the initial stage STCs are financed (on various conditions) by the government. Although on the expiration of the defined period they become self-financing. The center involves into its activities (in the form of combined financing, specialists' delegation and others) the industry which subsequently is to become their principal partner. The researchers' proficiency requirements in the centers are very high. Along with research goals the centers may undertake educational functions such as elaboration of new curricula [12].

For University complex techno park hosts four realism of activity [13-14]:

Management. Research Institutes take part as co-founders of the park, co-authors of concepts and general development plan, co-owners of technical infrastructure, managers and experts.

Research. Academic RI locate on the territory of the techno park branches or separate divisions.

Innovations. Participants of park activities are companies created by Academy scientists.

Scientific and educational services. RI scientists by themselves or in cooperation with University colleagues coordinate the commercial service which can provide clients with qualified consulting, informative and other services as well as prepare educational programs.

Thus, having analyzed the local construction of innovative projects as well as foreign experience in this direction we can conclude that such a mobile structural reorganization of innovative scientific potential in Higher Education both meets the demands of economy and the goal of self-preserving University and Academic science in present day conditions.

4. Conclusion

It should be noted that further long-term development in the country scientific and educational institutions, industrial and agricultural enterprises may have a paramount influence of the union of their intellectual potential and production capacity. One of the ways of the national scientific and educational space, in our opinion, is the creation of inter-regional scientific and educational organizations.

Thus, it can be argued that all the above are focused on the key objectives of economic development - more efficient use and development of scientific and technological potential of the country, meeting the human resources needs of a modern economy and the creation of new structures in the post-industrial society based on the integration of intellectual and material resources sphere science and Higher Education.

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