

## Formation Features of Higher School Innovation Model in Modern Conditions

<sup>1</sup>Ivan S. Sandu, <sup>2</sup>Sergey N. Glagolev, <sup>1</sup>Alma I. Doshanova,

<sup>2</sup>Aleksandr S. Troshin and <sup>2</sup>Svetlana N. Lomachenko

<sup>1</sup>FGBSI All-Russian Scientific Research Institute for the Rural Economy,  
Choroshovskoe Highway bld. 35/2, 123007 Moscow, Russia

<sup>2</sup>Belgorod State Technological University Named after V.G. Shukhov,  
Kostuykova Str. 46, 308012 Belgorod, Russia

---

**Abstract:** The study considers the features of the higher school innovation model based on integration of science, education and production. The Tempus Programme creates integration of universities and scientific thought into the world-wide education, encourages modernization of higher education. The study reflects innovation potential significance of the university's science development that should support new quality of specialists training for an innovation economics.

**Key words:** Modernization, the higher education, integration, international cooperation, innovation model, Tempus programme

---

### INTRODUCTION

Globalization of the economy, modern business, the forthcoming accession to the WTO all this makes it relevant to the need for highly qualified specialists in the first place in the field of economics, finance, management and technology (Veselovsky and Semenyak, 2007a, b). An innovational economy is impossible without a relevant field of study. Market requires practitioners which can think independently and economically correctly can take responsibility and make effective decisions (Semenyak and Veselovsky, 2007).

Today industrial innovative development is on the agenda of many countries, both developed and developing. At this university, a special role is allocated in the creation and development of the intellectual capital of the nation.

An integrated policy in the field of higher education has been developing and implementing in the European Union for several decades. These processes are naturally led to the creation of the EU politicians' idea of the Bologna Declaration and the initiation of the Bologna process. The essence of the declaration accurately reflects the specific objectives of transformations formulated for the member countries of the process in the coming years. The declaration includes the following tasks (Baranova *et al.*, 2011):

- The adoption of generally understandable and easily comparable documents on higher education which will be an important part of one of the diploma supplement
- The transition to a multi-level system of higher education which is based on three levels: Bachelor, Master and Doctorate
- The introduction of a common system of educational credit loans. Was adopted by a well-established European System of Transfer of Credits (ESTC). The credit system should also apply to additional forms of postgraduate education
- The development of European cooperation in the field of quality assurance in higher education within the framework of comparable criteria and methods, the introduction of decentralized mechanisms for accreditation of educational institutions and programs

Performing these tasks will allow for the initial phase of the formation of the European area of higher education and to ensure the expansion of educational services export of European universities, proclaimed the main objectives of the Bologna process.

### MATERIALS AND METHODS

It is considered that the universities traditionally have two functions: educational and research. However,

experience shows that many universities add to these features the third function to complete a transfer of knowledge (Trippel *et al.*, 2012) which is an integral component of the innovation system. A new approach to understanding the role of the university promoting “economic development and the transfer of technological innovation” has been gradually producing in a society (Fassin, 2000).

In fact, the role of universities is much broader than it is considered to be. This is evident from the research of Kosh and Hugh in which they presented an extensive analysis of the role of universities in the development of the innovation system:

- Ensuring economy with skilled workforce (Bachelor, Master, Doctorate)
- Creation and distribution of codified knowledge through scientific publications, patenting, prototyping, etc.
- Assist enterprises in finding solutions through contract research, consulting, incubation services, etc.
- Provision of public space, i.e., create a platform where people can meet and exchange ideas (e.g., networking, socializing interactions) (Cosh and Hughes, 2010)

British scientists claim that higher education institutions are the most important mechanism for the generation, distribution and storage of knowledge in our society (Abreu *et al.*, 2008). In addition, universities have a positive effect on the economy, increasing the level of education of the population and disseminating innovative ideas in society (Lester, 2007). As the Etskovich points out, “universities mostly serve as a basis for economic development through the creation of social, intellectual and human capital” and thus “they become major institutions in society” (Etskowitz, 2007). Obviously in addition to the two traditional functions educational and research universities make a significant contribution not only to the intellectual development but also to the economic development of the country (Lawton-Smith, 2007).

Kazakhstan has begun the transformation of leading universities to research universities with the aim to create a national innovation system and the development of market-based competitive market knowledge. The presence of such universities allows concentrating financial, material and human resources for the solution of major scientific-technical problems. Therefore, under the new law “On Science” and amendments to the law “On Education”, the country began to develop such types of higher educational institutions as a national research university, a national institution of higher education,

research university, university, academy, institute. These research universities are intended to implement the 5 years program for the development approved by the Government of the Republic of Kazakhstan and have the opportunity to develop educational programs based on the results of basic and applied research to the generation and transfer of new knowledge.

The sample of such universities in the Republic of Kazakhstan is the Nazarbayev University created on the initiative of the President of the Republic of Kazakhstan, Nursultan Nazarbayev became the first Kazakhstan research university in the international level. Its activities concern the implementation of the main priorities of the country, including intensive research capacity, industrial and innovative development of the country, enabling the transition to education that meets the requirements of a changing and globally integrated economy.

## **RESULTS AND DISCUSSION**

Each university in Kazakhstan is considered as a functional part of the innovation system which contributes to the development of world science and its institutional integration into the innovation system. It should be noted that the involvement of universities in innovation meets two global challenges: first of all, it is the development of intellectual potential of the nation through the mass representation of higher education and then, the generation and transfer of knowledge to the rapid introduction of innovative technologies in various fields (Esengel'din and Sitenko, 2011).

In the last two decades, Kazakhstan has stepped up international cooperation in the field of higher education. One of the areas of cooperation is academic mobility. It provides rotation of students, teachers and other stakeholders with the aim to exchange experiences, to overcome national isolation and to achieve pan-European perspective (Hubbard, 2000). This approach can not be overstated, especially in the context of globalization. In the area of mobility, a number of countries have achieved significant results. For example in Finland, mobility programs cover about 30% of the students and this figure will increase to 50-60%.

One of the areas of cooperation is the implementation of joint educational programs, including Tempus. The Tempus program was initiated by the European Union after the fall of the Berlin Wall to promote international cooperation University of Central-European countries. The Tempus program is aimed at promoting the modernization of higher education in countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean through the allocation of funds to stimulate interaction and cooperation between Higher Education Institutions (HEIs) countries-partners and the

European Union. Within the framework of the Tempus program, the project “Strategic Integration International Management SME” (SME) is realized at the University of Kazakhstan at the Faculty of Economics and Finance. The main objective of this project is the development and implementation of an interdisciplinary program to train masters. This program is designed for students of economics and provides a combination of a scientific approach to decision purely practical matters; priority business projects that are meaningful to the region's economy as well as the characteristics of a single society. (Armstrong *et al.*, 1996).

In the economy based on knowledge, universities play an active role in the promotion of technological innovation (Bramwell and Wolfe, 2008). The results of research, conducted at universities are transformed into new technologies and these technologies are in turn can be used for the benefit of society (Dalmarco *et al.*, 2012) and the country's economy. This can only be achieved through the integration of education, science and innovation in the “knowledge triangle” which was presented by the European Commission in 2000 as part of the Lisbon agenda of economic development of the European Union.

The integration of the knowledge triangle is a prerequisite for building an innovative economy. Innovations in such an economy, tend to develop at the expense of innovative business as for the ideas and sources, they are the knowledge created and accumulated at universities (Al'zhanova, 2010). Figure 1 shows the relationship of education development and innovation potential of the country.

European investors in Kazakhstan are experiencing a great deficiency of smaller suppliers on the market which often leads to the success of a large company. Even when

the region has suitable domestic suppliers for Foreign companies, it is very difficult to establish and maintain contact with them. This is because local entrepreneurs have lack of knowledge in international business, cross-cultural knowledge and business communication. Economic reforms in the country, aimed at creating a business environment for Small Medium Enterprises (SMEs) are more flexible. However, the main problem is in the enterprises themselves. Large businesses use not only the old technology and equipment but also outdated management style of economy planning, inherited from the Soviet era; in addition, private investments are only enough to improve equipment. Rejection of innovations in the trading process, conservatism, the pursuit of rapid enrichment all these factors hinder improvement of quality, creation of competitive products and provision of services in the global market.

Regional studies show that 32% of businesses are not aware of the business opportunities that exist in the field of electronics; only 40% of businesses use the services of the market and only 37% have web-sites. Currently, access to the international internet is necessary because the host contract and communications are carried through the internet. In fact, the existing training program focused on techniques and possibilities of electronic trading platforms and services on the internet do not have much in demand by companies (Armstrong *et al.*, 1996). Innovation situation on the market is dramatic. Traditional and bureaucratic ways of commercializing innovative ideas destroy any initiative. Administrative barriers keeps from experimenting. Many managers of small companies do not have the necessary economic education and do not own the business development culture (Veselovskiy and Semenyak, 2007).

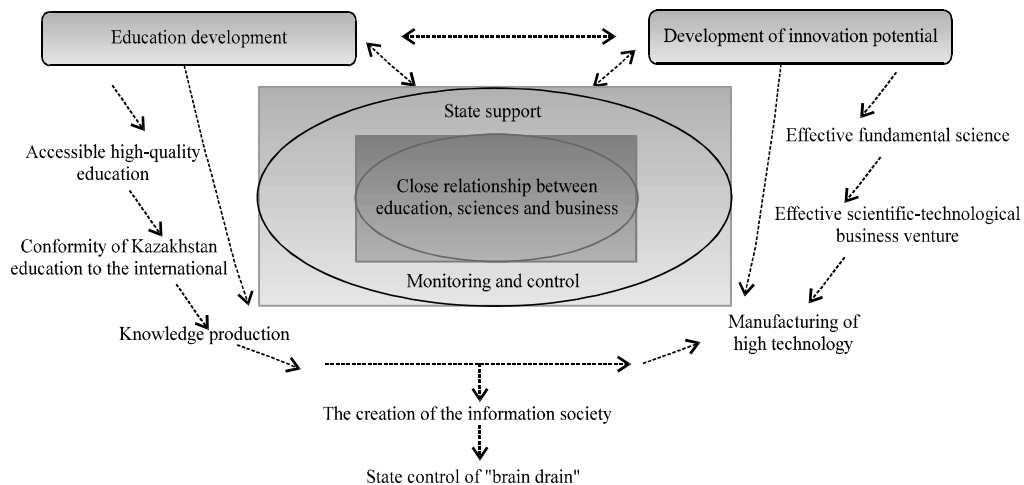


Fig. 1: Relationship between education development and innovation potential

According to estimates of the statistics agency of 01.01.2012, the share of innovative enterprises in the Republic of Kazakhstan amounted to 4% of the total number of respondents (10,100 units). For comparison, the share of innovative enterprises in Russia is 13% (2008) in Eastern Europe 40% (Romania 28%, Slovenia 32%, Poland 38%) in the OECD countries 50%.

In the Republic of Kazakhstan in the innovative development lead: Almaty 6.7% of innovative activity, Karaganda region 6.2, East-Kazakhstan 5.9%. Among the laggards are distinguished: Akmola region 1.2%, Almaty region 1.4-1.4% Mangistau region, Kostanai region 1.5%, Kyzylorda region 1.5%. If in 2008 among enterprises engaged in innovative activities, the maximum volume of production accounted for metallurgy (84.4% of all produced innovative products RK) at 01.01.2012 manufacturing industry was leading >70%.

However, it should be noted that the Kazakhstan enterprises in the field of innovation mostly chose to “catch up” strategy which indicates their innovative immunity. “Catching up” strategy involves imitation of foreign technologies, products copy and their mass production. So, from all sales of innovative products in Kazakhstan on 01.01.2012 in the amount of 82,597,400,000 tenge, products, newly introduced or exposed to significant technological change was 88.9% while the share of really fundamentally new products remains unknown.

Using innovation enables businesses to effectively compete on the market and attract new customers, improve financial performance. The competitiveness of enterprises depends on the most significant technological enterprise. In addition, it is necessary to take into account the depth of innovation processes in the enterprise because not all innovations but only those that are focused on new markets and accompanied by original designs, lead to an increase in competitiveness.

There is a lack of educational programs promoting new approaches to the implementation of the innovation process in a modern economy and a strong demand for measures to facilitate the introduction of innovations. Compared with large companies, SMEs have a structural flaw exists in the form of limited human and financial resources.

Many businesses are not familiar with the peculiarities of the fiscal policy of Kazakhstan, they do not respond quickly to any changes in the existing legislation do not have information about the benefits and preferences and as a result they have losses. The level of awareness in the field of small and medium businesses is low. Some business persons also believe that the study of standards and rules of international business is a waste of

time and money. At the same time, the introduction of international standards is quite expensive measure which requires not only financial resources but also the reorganization of the management structure of the company and often involves changing the traditional stereotypes.

Conclusions given above were made on the basis of the results of the program Business-Sovetnik (Business Advisor) at the initiative of the Entrepreneurship Development Fund “Damu” (Burkov, 2012).

In addition to the above listed, there is a need to train managers able to join the innovation market and work with foreign partners.

Doing business with foreign companies suggests that business partners speak the same language using common terminology, standards. The success of the partnership largely depends on the understanding of market-based business from financing conditions, the availability of professional experience, business culture, etc. A large number of transactions and agreements are canceled due to lack of elementary relevant information and disregard the rules of the market. If companies understand all these arguments, they may suffer from a lack of qualified personnel. Demand for innovative training programs according to the standards of international business is growing.

However, there is an acute shortage of know-how to conduct such special courses. Domestic universities have not enough experience in the structuring and execution of this work. There is almost no development in cooperation between universities not only internationally but also at the national and regional levels.

Thus, the universities do not have access to international education. There is an understanding but there is no possibility of implementing such innovative educational programs in international business and key issues in establishing partnerships, business relations with foreign firms, requiring skills in the use of information technology and moreover, there is a lack of the necessary books and teaching material on the subjects. Existing training materials are not up to date and are not a guide in doing business. Many translated publications require adaptation and explanation of the basic concepts. There are no practical recommendations, precise calculations on the specifics of establishing business relations, development and maintaining Foreign partnership. There is no free access to manuals on business issues in entering the Foreign market and gaining benefits.

One of the solutions of the above problems is the possibility of creating innovative educational consortium which is an important mechanism for the formation of innovation infrastructure in Kazakhstan. This is voluntary

peer associations acting on the basis of joint activity agreement in which higher education institutions, research organizations and other entities engaged in the production, combined intellectual, financial and other resources to prepare highly qualified specialists on the basis of fundamental and applied research and technological innovation.

In order to integrate education, science and industry to improve the quality of training on the basis of KSTU (Karaganda State Technical University), the first innovative-educational consortium “Corporate University” in Kazakhstan was created which brings together 48 organizations, including universities, research institutions of Kazakhstan and Russia and large industrial enterprises, such as JSC “ArcelorMittal”, “Sokolov-Sarbaiskoye ore-dressing production association”, “ShubarkolKomir”, “Kazpromgeofizika”, “Kazakhmys Corporation”, “Bogatyr” and others. The consortium gave a powerful impetus to the development of scientific technical activities: since its inception, the volume of contractual research work of the University increased almost 8 times (from 77-650 million tenge in 2010). The experience of sustainable interaction with backbone enterprises showed that the corporate model could be effectively used as a basis for innovative development of universities and enterprises.

The innovative educational consortia will help to integrate education, science and industry by creating around the university area of scientific research organizations providing educational process with new knowledge in the future.

Strong interaction between universities and enterprises contribute not only to the effective transfer of knowledge but also to the increase in the growth of the innovation economy. “The transfer of knowledge between universities and enterprises” is the exchange of knowledge and technology between universities and companies, occurring at different levels and including a variety of activities (Rossi, 2010). Thus, the teaching staff can provide advice to enterprises, analyze the data, or even carry out joint experiments and tests (Fassin, 2000). Knowledge can also be spread through cooperation with companies in the field of scientific research works, scientific publications, seminars, workshops and informal relationships (Mueller, 2006). One of the most important tools of knowledge transfer between universities and enterprises is a continuing learning. Cooperation in the field of postgraduate education and training of personnel of enterprises increases the intellectual capital of the nation (Debackere, 2004).

However, without a two-sides interest in the interaction it will be difficult to achieve significant

results in the field of innovation. Now, predominantly government may create incentive for cooperation between universities and enterprises in Kazakhstan.

The government actively involves universities in the country's innovation as it is evident from the creation of a series of government programs, strategies and other normative legal documents aimed at promoting innovation and modernization of Education of the Republic of Kazakhstan. One of the recent government initiatives is the creation of industrial clusters which will serve as a platform for the development of cooperation between universities and enterprises through the integration of education, science and industry. According to the State Program for Development of Education of the Republic of Kazakhstan for 2011-2020 years, it is expected that universities will actively participate in scientific-technical modernization of the country by 2020.

**Summary:** A key feature of higher education is to motivate students to acquire the skills and knowledge that they will need in later life, both personal and professional. Students as competent, active and constructive partners should be involved in the development of new educational approaches. Such cooperation should be based unanimously on European education.

European Higher Education Area, promoting improvement and cooperation, requires physical mobility of students, teaching staff and researchers.

All changes in the system of higher education is a real contribution to the speedy implementation of the president's strategy becoming one of the most competitive countries in the world.

Kazakhstan's joining the European educational area is not only the next step of the integration processes but it also meets the needs of the internal Kazakhstan market of educational services.

## CONCLUSION

International integration and globalization of the economy determine the need to solve the problems of innovative activities development and the formation of scientific and technical capacity of country which allows transition to an innovative type of economic development.

The results showed that with increasing the level of development of the country, understanding of the role and function of universities is changing. The higher the level of development of the country, the more complex and wider role of universities in the process of knowledge transfer and in accelerating growth of innovative component of the economy. In recent years, Kazakhstan

has been building quite an active policy for the development of an innovative economy based on knowledge transfer between universities and enterprises. Now universities are considered not only as educational and research centers but also as an integral part of the national innovation system which is active interaction with the business sector.

Macroeconomic policy of Kazakhstan is focused on implementation of the state program of forced industrial and innovative development which should provide a technological breakthrough in the modernization of the country through the creation of innovative industries, businesses and industries that produce high-tech export-oriented products.

The program of accelerated industrial and innovative development was the core of modern innovation policy and laid the foundations for a new vision of the place of science and university education in Kazakhstan society.

Innovative model of higher education institution that meets the requirements of macroeconomic development is "Nazarbayev University" which is a "polygon" for the testing of innovative educational and research projects. Accumulating the qualities of the best higher education institutions in the world, the university will facilitate other universities of the country the tasks of transformation in research universities.

#### REFERENCES

- Abreu, M., V. Grinevich, A. Hughes, M. Kriston and P. Ternouth, 2008. Universities, business and knowledge exchange. London: Council for Industry and Higher Education, pp: 64.
- Al'zhanova, N., 2010. Sh. Obrazovatel'naja dejatel'nost' v sfere innovacionnogo biznesa i predprinimatel'stva. Delovoj Kazahstan, 14 (211): 16.
- Armstrong, S., G. Thompson and S. Brown, 1996. Facing up to Radical Challenges in Universities and Colleges. London.
- Baranova, N.A., N.A. Trubitsina, T.M. Bannikova, A.V. Glazkova, 2011. Modernizatsiya matematicheskogo obrazovaniya v kontekste idey Bolonskogo protsessa. Izhevsk: UdGU, pp: 209.
- Bramwell, A. and D.A. Wolfe, 2008. University and regional economic development: The entrepreneurial University of Waterloo. Res. Policy, 37 (8): 1175-1187.
- Burkov, A., 2012. Scientific enquiry in the contemporary world: theoretical basins and innovative approach. L&L Publishing, pp: 342.
- Cosh, A. and A. Hughes, 2010. Never mind the quality feel the width: University-industry links and government financial support for innovation in small high-technology businesses in the UK and the USA. The J. Technol. Transfer, 35 (1): 66-91.
- Dalmarco, G., P. Zawislak, W. Hulsink and F. Brambilla, 2012. Knowledge flow in industry-university relations: a comparison between the Netherlands and Brazil. Paper presented at the 38th EIBA Annual Conference, Brighton.
- Debackere, K., 2004. Introduction. R&D Management, 34: 1-2.
- Esengel'din, B.S. and D.A. Sitenko, 2011. Razvitie universiteta v ramkah formirovaniya innovacionnoj ekonomiki. Sajasat Policy, No. 2, pp: 4-7.
- Etzkowitz, H., 2007. Incubation of incubators: innovation as a triple helix of university-industry-government networks. Sci. Public Policy, 29 (2): 155-128.
- Fassin, Y., 2000. The strategic role of university-industry liaison offices. J. Res. Administration, 1 (2): 31-42.
- Hubbard, D., 2000. Thriving in a Global Education Marketplace. Perspectives in Higher Education Reform. University of Tennessee, pp: 19.
- Lawton-Smith H., 2007. Universities, innovation and territorial development: a review of the evidence. Environment and Planning, 25: 98-114.
- Lester, R.K., 2007. Universities, innovation and the competitiveness of local economies: An overview. Innovation, Universities and the Competitiveness of Regions, 214: 9-30.
- Mueller, P., 2006. Exploring the knowledge filter: How entrepreneurship and university industry relationship drive economic growth. Res. Policy, 35 (10): 1499-1508.
- Rossi, F., 2010. The governance of university-industry knowledge transfer. Eur. J. Innovation Manag., 1 (2): 155-171.
- Semenyak, O.V. and M.Y. Veselovsky, 2007. Prioritetnyie napravleniya sovershenstvovaniya regulirovaniya ryinka obrazovatelnyih uslug vysshey shkoly v Rossiyskoy Federatsii. Regionalnaya ekonomika: teoriya i praktika, 4: 100-107.
- Tripl M., T. Sinozic and S.H. Lawton, 2012. The "third mission" of universities and the region: comparing the UK, Sweden and Austria. Paper presented at the 52nd European Congress of the RSAI. Bratislava: Slovakia, 21-25th August.
- Veselovsky, M.Y. and O.V. Semenyak, 2007a. Razvitie ryinka obrazovatelnyih uslug vysshey shkoly v usloviyah formirovaniya edinogo obrazovatel'nogo prostranstva. Vestnik SGSEU, 3: 5-9.
- Veselovsky, M.Y. and O.V. Semenyak, 2007b. Metodicheskie podhody k regulirovaniyu rinka obrazovatelnyih uslug vishey shkoly kak ekonomicheskoy systemy. Vestnik SGSEU, 16: 18-22.