

The Role of Science and Education in the Formation of National Human Capital: Kazakhstani Experience

Saule Koshkenovna Amandykova¹, Marat Kadyrovich Syrlybayev¹, Sholpan Altynbekovna Saimova¹, Bakhyt Omirkhanovich Altynbassov¹, Saule Zhussupbekovna Suleimenova², Zhamilya Serikbayevna Berdiyarova¹, Ardak Meirkhanovna Tassova¹ and Aliya Otarbayevna Askarova²

¹L.N. Gumilyov Eurasian National University, Astana, Kazakhstan; Saule.amandykova@yandex.ru, syrlybayev_mk@enu.kz, saimova85@gmail.com, altynbassov@yandex.ru, berdiyarova85@gmail.com, ardak.tasova@yandex.ru

²Al-Farabi Kazakh National University, Almaty, Kazakhstan; saule.suleimenova@gmail.com, askarova@mail.ru

Abstract

Background/Objectives: This article presents the theoretical analysis and historical development of the concept of human capital. **Methods:** Attempts at a comprehensive study of theoretical and applied aspects of education in the formation of national human capital, including comparative legal aspect or the science of civil procedure and educational law, had not been previously undertaken. **Findings:** The article has illustrated various scientific and philosophical thoughts in relation to the concept and the role of human capital in the formation and development of a national economy. The effective practice of the global leading countries in the formation of national human capital was considered and the state policy of the Republic of Kazakhstan on building human capital was described. Main factors influencing the human capital formation such as higher education were identified and also urgent problems of national higher education and science were highlighted, namely, the issues of national higher education at a time of globalization and integration; issues of formation and development of the staff scientists at universities and research institutes. Additionally, the challenges of engagement of commercial rating organizations to the education institutions, lack of the system for degreed academic staff training were discussed in this article. **Applications/Improvements:** This article provides evidence-based recommendations for the improvement of national science and the development of human capital.

Keywords: Development, Economy, Human Capital, Higher Education, Society, The Republic of Kazakhstan

1. Introduction

National human capital is a substantial part of national wealth of the country. The world science provides substantial information about importance and role of human capital in improving of country economics. As practice shows, time proved that the human capital is more important than other types of the state capital, namely, material possessions. This was observed in the last century, in the developing scientific and technical progress. As a result of the high-quality human capital formation, Western countries became the world's economic powers, while other countries on the continent remained dependent on the economic policies of the West.

During the deep economic crisis that took place in the former Soviet republics Kazakhstan and other republics could not pay attention to the issue of human capital. In the 1990s as a result of the stalemate in the socio-economic crisis the country's most qualified specialists left abroad. In the new economic conditions coaching system for new specialists could not develop still. Human capital has become a key issue on the basis of objective circumstances.

From the theoretical perspective, there are a number of factors influencing human capital. Demographic growth and social and medical assistance, etc. can be attributed here. All the factors of human capital cannot be covered in one work. Therefore, this article deals only

*Author for correspondence

with the human capital formation in the field of education and science as exemplified by Kazakhstan. Speaking more precisely, this article analyzes the issues related to the management in the field of higher education and science¹.

There are no domestic studies conducted by scientists in the field of human capital formation and professional training system, organizational and legal analysis of the state. Even in the CIS countries, there has been conducted little research on this topic. These issues were dealt with mainly in the countries of the former Soviet Union. General conclusions made in the course of the research refer to improving education and science of Kazakhstan. Also, we hope that new research will be the basis for scientific research into the new topic.

2. The Concept of Human Capital

The concept “human capital” was first considered by William Petty (1623 – 1687), the founder of political economics and statistics. In his “Political Arithmetic” the first attempts to estimate human capital were made. Even at that time William Petty proved that human capital was an essential part of the national wealth; that it is estimated higher than the material wealth. He stated in his theory that people were the main treasure².

W. Petty, A. Smith, D. Ricardo were the first who began to consider the human capital in a quantitative data, showed the economic value of knowledge for people and a country on the whole, and considered human productive skills as capital elements. Thus, the establisher of the English classical political economics W. Petty in his “*Verbum Sapienti*” published in 1664 wrote about “the people’s value” in the second chapter of his book. As W. Petty states, the nation’s wealth, property are the results of labor and do not differ from living functional forces, on the contrary, they should be estimated equally³.

Further A. Smith made a profound study of the issue concerning developing and increasing human working skills. A. Smith⁴ proved that humans’ productive forces play a primary role in economics of any country and came to the conclusion that the increase of the productivity of the effective labor depends, mainly, on worker’s skills and performance, then only on machines and instruments which are used by workers. He regards labor, mainly worker’s skills, his competence, and his formed and developed abilities as the fundamental source of the nation’s wealth. Along with machines and instruments labor skills formed by studies and learning, knowledge and master-

ship were included into the basic category of the capital³. Therefore, the scientist gives the following arguments: firstly, men’s abilities to beneficial work did not appear by itself; on the contrary, like manufacturing tools their progress needs some economical expenses. Secondly, men’s knowledge and skills like any other form of the capital can bring profit and benefit without turning into marketing and changing ownership^{5,6}.

In examining the problem D. Ricardo⁷ developed A. Smith’s views. Ricardo also highly estimated the role of education. He stated that along with other reasons of poor economy in a country there was a lack of education among all the groups of people.

There are a great number of economists and scientists who conducted scientific investigations and made their own theoretical conclusions. Among them there are Theodore Schultz (1902 – 1998) and Gary Becker (1930), the holders of the Nobel Prize. Theodore Schultz wrote such scientific monographs on this issue as “Transforming Traditional Agriculture”⁸, “Investment in Human Capital: The Role of Education and of Research”⁹, “Human Capital: Policy Issues and Research Opportunities, National Bureau of Economic Research”. In⁸ Theodore Schultz emphasized the importance of the agricultural technologies and estimated their effective and profitable results depending directly on how well informed the farmer is. In other words, he proved that the effective and profitable results of technologies depend on a man’s knowledge and skills. Moreover, T. Schultz developed the idea of educational capital as one of the branches of the human capital, relating specifically to the investments made in education. Trying to support his ideas he researched into post-World War II Great Britain, Germany and Japan. Although Germany and Japan suffered greatly after the war, they recovered their economies at almost miraculous speed from the significant social and economic devastation. His conclusion was that the speed of the recovery was due to a healthy and highly educated population. His research inspired a lot of work in international development, motivating investments in vocational and technical education by International Financial Institutions such as the International Monetary Fund and the World Bank⁹.

Today the theory of human capital is well developed in Gary Becker’s “Human Capital”¹⁰ which was widely spread among his scientific surroundings. He was awarded the Nobel Prize in Economic Sciences in 1992 for this work¹¹. Owing to his calculations, in the USA the investments put into the human capital gave considerably higher results than the investments put into securities¹⁰.

On the basis of such research and due to governmental support, now the USA is leading in financing educational and scientific spheres, the quality of the education and its organization, exporting education to other countries. At the end all of these factors brought the USA to the top in human capital issues in the world.

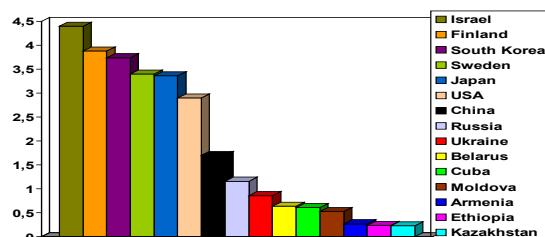


Figure 1. List of countries of the world ranked by the level of national R&D expenditure

Figure 1 shows a periodically updated list of countries of the world, ranked by the level of national R & D expenditure, expressed as a percentage of GDP. Data are presented as of 2010 (published in 2012)¹².

As shown in Figure 1 in order to develop the education and science countries have to spend huge amount of funds with respect to their GDP. Without the state funding to implement the developing in the sphere of science is impossible. Especially at this time when there is fierce competition among the various levels of countries in the global space.

In determining the level of funding for science and education researchers and experts take the proportion of GDP as a basis. As we can see in Figure 1, Kazakhstan takes the 69th place by this indicator, allocating 0.23 per cent of GDP. It is almost ten times less than in the developed countries such as Israel, Finland, the USA. The experts concluded that currently this Figure should be not less than 1.0 percent. Without enough funding it is not impossible to develop the education and research in the developing countries.

We believe that the development of education and science is a key factor for the development of the human capital.

Human capital is a fund of knowledge, skills and motivations pertaining to each person. Education, increase of professional experience, saving health and searching for information can be referred to the investment into human capital. From the global point of view, human capital is an important social factor which is directly connected with

human thought and mind. It is developed depending on putting an investment in a nation's training, education, health, professional skills, informative supportability, its safety and economic liberty as well as investments into science, culture and arts.

3. Human Capital in Kazakhstan

It is well known that people's activity and creativity play a great role in the realization of strategic purposes and tasks which the Republic of Kazakhstan faces in the XXI century. At this point human capital is the nation's wealth and it is estimated taking into account persons' education, competence and their intellectual ability gained throughout all their life. Therefore, human capital within capital relations is a productive and intensive factor of economic development and it should be taken as one of the extra powers which joins and activates with a family to a society. Consequently, human capital is a power along with personal relations activated in industry and, the main source of the dynamic profit¹³.

Human capital is not only a particular person's standard of living, but it is also a society's standard. It is known that there are some characteristics of human capital. There are demographic, social, legal and family situations. Thus, a demographic feature is population and life quality in a country. This is, undoubtedly, a great capital. For example, whereas in China the increase in population affects negatively the Chinese economy, in Kazakhstan the increase in population is taken only positively. Hence, undoubtedly, the demographic capital situation is considered differently in different countries. Human capital should be taken as an image of a person's education, experience, wisdom and values¹⁴.

Human capital takes more than 75 per cents of all the capitals in the developed countries; in our country it makes 10-12 per cent. That is why we are to increase human capital share by 5-6 times more¹⁵.

The Republic of Kazakhstan is a strong state which has achieved certain success in social development of its citizens and gained leading positions in the world's economic relations. Kazakhstan develops its economy based on the competitive innovational education. It can be firmly said that we have the basics of the market economy in our country. In the new stage of our development the main attention is paid to the development of the national human capital.

National human capital is a constituent part of human capital which is a component of a state's national wealth. Whereas human capital takes more than a half of the national wealth in the developing countries, in the developed countries it amounts to 70-80 per cent. From the theoretical point of view the peculiarity of the national human capital depends on the historical development of a particular country and the world civilization. Now human capital has become the main driving force of society and economy.

In addition it contributes to the state regulation of economy. The experience shows that in the country where the degree of human capital is very low or its quality is poor it is useless and profitless to invest into high technological spheres. As for the rapid development in the countries such as Japan, China, Korea, West Europe, such factors effectively influence the high juridical culture of most population in these countries and by these means the highly graded human capital was formed there. Obviously, human capital plays a great role in the innovational economic development. The holder of the Nobel Prize Simon Kuznetz states that to have a scientific and technical progress it is necessary to have enough human capital fund in a country. Without that there is no chance to achieve the next technological stage. Nowadays among the developing countries only such countries as Singapore, Hong-Kong, Taiwan and Northern Korea are able to reach the level of the developed countries. According to experts, in the perspective only five per cent of the developing countries can become developed¹⁶. The rest of them do not have such possibilities.

After the breakup of the Soviet Union there were no investments into Kazakhstan's national human capital. Its education, medicine and science started to decay and the role of human capital lost its value. It is obvious that due to twenty years of economic crisis the finances invested into education, science and other spheres were not sufficient. According to the data submitted by the developed countries, it can be seen that we still invest 10-20 times less finance into this sphere.

On the whole, the importance of human capital as one of the key directions of the state policy was stressed in President N. Nazarbayev's address to Kazakhstani people concerning "Socio-Economic Modernization as Main Vector of Development of Kazakhstan", on January 27, 2012¹⁷. Previously state programs were worked out oriented at the development of educational, scientific and

healthcare spheres. However, only now attempts are made to form the national human capital.

Education and science play a significant role in the formation of human capital. The aim of this research is to examine to what extent education and science affect the national human capital.

In the address of the President of the Republic of Kazakhstan N. Nazarbayev to Kazakhstani people "Kazakhstan – 2050" of December 14, 2012 the new political directions of the state development concerning human capital were given. This document defined further tasks for authorized educational agencies to develop competitive and effective educational system. Speaking about the educational sphere, the President stated: "We need to attract the best leading specialists and invite them to work in our country. The involvement of highly skilled specialists possessing the international experience will give a binary result: we modernize not only the management of our industry, but also educate our workers. This is a new experience for us... To become a competitive and developed country we need to turn into a highly educated state"¹⁸.

Historically it can be proved that the investment made into education and science was one of the ways to form the state's active human capital. The educational and scientific development of West European countries and the USA was the main basis for achieving their leading roles as compared to the Oriental countries. For instance, in the Middle Ages Oriental countries were highly developed, but the Western countries could not develop for theological reasons. In the second half of the XII century the Renaissance Period started in the West and the role of education and science began to increase in those countries. Consequently, in the XVI – XVII centuries education and science in the Western countries reached its height and they became famous for their distinguished scientists and philosophers all over the world.

As experts state, in the 1990s more than 70 percent of the whole financial fund was invested to form human capital in the developed countries. Foremost, a greater part of those financial means came from the state budget. Even today the USA, Great Britain, France and Germany, the countries that export their services in the sphere of education and science and consequently gain large income into their budget, do not stop to invest into this sphere from the state budget. The above-mentioned states know that the main factor of forming human capital is the educational and scientific sphere and its role is great.

There are several issues in higher education system of Kazakhstan. Particularly, impermanent governing in educational system has influenced the high education negatively. To look deeper at the first problem, we notice that reforms in educational system are made irregularly. Developmental direction of reforms is based on the subjective factors, on the state agencies, because every new assigned minister presents his own ideas, rules educational system in his own way. If we take last 10 years, these features are noticeable. In the period from 2007 to 2010 intensive efforts were made to introduce educational system into worldwide knowledge area. As a result, Kazakhstan became the 47th member of Bologna process in 2010. In those days educational system started to take into account autonomic and liberate ideas and credit system of teaching was introduced. In general, introduction of the Western system was completed and it officially started to operate.

During 2010-2013 after the appointment of a new education minister autonomy and independence of universities was delayed. Relations within educational system and improving government's authority were in focus. Higher education organizations were governed by central system. The role of ministries in governing much improved. Major reforms were made. Statuses of candidates and doctors in education lasting from the period of the Soviet Union were abandoned and dissertation council stopped its work from January 01, 2011. The old system of training science personnel was completely destroyed and new system worked in training bachelor-magister-doctor PhD. According to the new system, candidates of sciences were equalized to the PhD level. From this moment former candidates of sciences were not allowed to earn a doctoral degree. As a result, thousands of candidates of sciences lost their activity and the most important stimulus of doing research works. The doctoral degree status was not determined clearly by the law. At the same time former candidates also obtained same status with PhD doctors. Nowadays because of this duality high educational system is suffering the complicated problems. Moreover, total rejection of the old system is one of the greatest mistakes of the Government.

Most countries take into account the principle "in order to create a new system there is no need to breach the old one" while implementing the new reforms. This principle did not work in Kazakhstan when educational reforms were implemented after the independence. Lots of challenges appeared while educating the masters and

PhD and refusing the old system regarding candidates' training.

Because of the difference of the European and Kazakhstani education system copying the European education system caused numerous problems currently. According to the new education reforms training of the PhD doctors is strongly limited by the government. As a result, thousands of talented young academicians could not obtain the academic degree with current higher education system and could not obtain the opportunity to carry out their research.

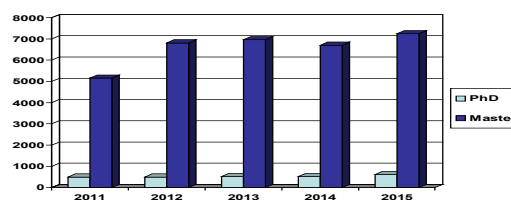


Figure 2. The statistics of orders of ministry education and science of kazakhstan for undergraduates' and postgraduates' education between 2011-2015 years¹⁹.

Figure 2 shows the statistics of orders of Ministry Education and Science of Kazakhstan for training undergraduates and PhD doctors between 2011-2015 years¹⁹.

As shown in the diagram above, state grants for undergraduates and postgraduates are restricted by the government. Therefore, post-graduate education suffers from a lack of current state grants for education of undergraduates, especially PhD. Due to the limited training of the degreed scholars the percentage of degreed postgraduates, degreed faculty members is declining every year. Additionally, needs in higher education system for postgraduates are increasing dramatically. This situation has affected the entire education system negatively. All these problems of high education system have arisen due to joining of Kazakhstan to the Bologna process. Surely, in general Kazakhstan's joining to European higher education system is beneficial for the whole Kazakhstani educational system, but issues of training degreed scholars are suffering huge difficulties now.

This diagram illustrates the statistics of changes in the number of undergraduates and postgraduates in the country over the past 5 years¹⁹.

Figure 3 shows the statistics regarding to the changes in the number of undergraduates and postgraduates in the country over the past 5 years in the sphere of post-

graduate education. Comparing these two diagrams we can determine how Kazakhstani postgraduate education sphere is suffering the strong deficit of degreed faculty members nowadays.

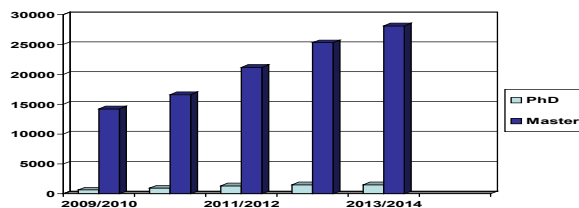


Figure 3. The state grants for undergraduates and postgraduates education restricted by the government.

The analysis of the Bologna process development in the CIS countries including Kazakhstan brings to the following ideas:

- As practice shows, in the developing and especially in the post-Soviet countries the reform for entering the European area of higher education, being somewhat contradictory to the traditional system, makes certain problems. Here it would be more expedient to keep such basic principles of the Bologna process, as “respect for the interests of national education systems” adopted in the Bologna Declaration
- The Bologna process is the result of the consistent educational policy of European countries. It is necessary to take into consideration that Kazakhstan and other CIS countries were in the system closed for integration for a long time, and the legislative system was and is now somewhat different than the European one. In this context initiators of this process would better keep flexible policy in relation to the post-Soviet countries. Such a step could affect positively the political authority and economy of European countries as a large exporter of educational services.¹

4. Conclusion

In general, this research analyzed the history of the concept of human capital in Kazakhstan. We discussed the leading studies and evaluated points of experts on this issue. We focused on the importance of human capital, and the influence of human capital to the development of entire state and society.

Taking into account that science and education are the main objective of the study we evaluated the impact of science on the development of the national human capital. In particular, topical issues of organizational and legal aspects in the field of higher education and science were discussed, and the issues hindering the development of national human capital were identified.

This research pointed out and analyzed the challenges of the state policy in the field of the national high education area. The conclusion is drawn that subjective factors are more important than objective factors while implementing the state policy in this area. All reforms periodically changed education system of Kazakhstan totally.

Based on the lack of the current legislation, shortage of the degreed scientific staff is observed at the universities and research centers. In contrast, the developed countries create the available conditions in terms of the academic career. However, Kazakhstan has limited academic grants for the PhD doctorate by the law. We cannot find similar regulations in any other countries of the world.

There are lots of problems in terms of managing and financing education and research in Kazakhstan, in particular, with regard to the evaluation of higher education institutions and their accreditation rating measures by the private organizations. International and national commercial organizations using a variety of legal and administrative mechanisms have been influencing the entire education system negatively. In order to meet the requirements of the rating companies much attention is paid by the universities to the organizational activities to the detriment of education. The formality and bureaucratic obstacles have been increasing among the universities and research institutions in order to improve their ratings. Additionally, all these formal activities affected negatively the poor financial condition and poor budget of the educational institutions, as well as the quality of the entire education system and development of the human capital in Kazakhstan.

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