INTERNATIONAL EXPERIENCE OF HUMAN CAPITAL MANAGEMENT IN HIGHER EDUCATIONAL INSTITUTIONS: THE AMERICAN MODEL

Abstract
The issues of training qualified specialists have become especially relevant in recent years, since the requirements imposed on higher educational institutions have increased significantly due to recent trends in the world. Universities today are not just knowledge transfer centers, but they are increasingly involved in social issues. Higher educational institutions have a direct impact on raising the standard of living, improving material well-being, career prospects, and the economic growth and prosperity of the state. Higher educational institutions play a key role in the formation, development of human capital, which is the main basic value of any economy, and especially an innovative economy. The purpose of this article is to study the foreign experience of formation and development of human capital, to identify the main trends, to study statistical data on the example of universities in the United States. The choice of American universities was conditioned by a number of factors, namely by the fact that the majority of American universities occupy leading positions in the world rankings. The main input data were the materials presented in the annual reports of the U.S. Department of Education, scientific journals. The authors provide an overview of statistical data on such indicators as the number of startups launched by students and faculty, their success in the market, and the scope of their activities. The conclusions offered in the article on the peculiarities of human capital management in higher educational institutions based on the analysis of the American higher education system can have a positive impact on the development of other higher education systems.

Key words: human capital, higher education, innovative development, model, management, international experience, education system

Introduction
The importance of higher education in the social, economic development of the country, the way it impacts the competitive advantages of any country in the world is undeniable and has long been recognized. Higher education has served as a kind of marker of the level of development of the country. Nowadays, all the existing independent states have their own system of education as well as a system of higher education. It is known that all these systems have some common characteristics, but the key thing is that they are differently organized. Education is a key component of human capital, which in turn acts like a socio-economic driver of the country’s economic development.

The peculiarity of the education system is that it allows people to realize their potential, develop themselves, and create certain kinds of communities of interest, etc. Education is not just about acquiring certain skills; it is a source of society’s development. It is important to understand that the level of development of the educational system, especially higher education reflects the level of social development of the nation. Education serves as a mirror of society, demonstrating its inner complexity.

Today, the process of human capital formation management in universities takes place in the context of innovative economic development. Post-industrial society does not need diligent performers or doers, it requires creators, innovators, who are capable of self-learning and the continuous production of knowledge. Due to this reason, the role of the educational system and especially higher education is rapidly increasing. Universities and institutes at various levels are becoming more and more involved in this process and are increasingly responsible for training not just qualified specialists, but people who think creatively and analytically. There is an urgent demand to integrate education, to combine academic knowledge and the practical component.
Under the present research the author made an attempt to consider the current model of management of human capital formation and development in American universities. It should be noted that in American higher education institutions the learning process is considered as a service, which is aimed at improving individual human capital. Moreover, the USA has developed a strong structure of education, which is one of the most effective systems in the world by quality and quantitative indicators.

**Materials and methods**

The present article reviews the available literature in this area, which is presented in databases, Russian and foreign articles. The study is aimed at analyzing the current model of human capital formation management in the US higher education institutions. Besides, statistical data from the official website of the US National Science Foundation was used to research the funding peculiarities of the American higher education system. With an aim to learn more about the position of the American universities in global rankings QS World University Ranking was investigated as well.

In writing the article, the authors applied the general method of cognition of reality as well as special research methods such as logical, system-structural and comparative. The research was carried out on the basis of comparativism of estimations of the share of Research and Development expenditure in American universities over certain time periods.

This allowed to see clearly the importance of the input at the governmental level and systemic prerequisites determining the efficiency of human capital development at the tertiary level of education in the USA.

The content analysis shows that the key theoretical approaches and practices implemented in modern universities aimed at managing the process of development of highly-competitive, skilled human capital and in particular the ones widely used at American universities. The models used by these high education institutions set the trends all over the world and have proven their efficiency.

**Main provisions**

Human capital is one of the key factors in the socio-economic development of the United States and in ensuring the country’s economic security. Together with the country’s scientific and technical potential, labor potential determines both the current economic situation and the long-term contours of socio-economic dynamics. The second half of the 21st century was a period of noticeable changes in the characteristics of the human potential of the economy and the mechanisms of its formation and use.

The accumulated qualitative human capital serves as the main factor of the development of the knowledge economy and of the innovative economy.

The modern scientific and technological revolution is an important component of the innovative economy. The development of production stimulates the need for the continuous growth of workers’ qualifications, which makes education the most important factor in the quality of life in all the countries, especially higher education.

The development of universities, transforming existing and creating new forms of higher educational institutions, always reflects the needs of society. At the same time, adopting new forms and integrating them into the established educational system is a complex and long-term process.

The period and the result of transformation should not distort the main function of education – to build human capital, which qualitatively meets the current needs of the society and is able to ensure the achievement of strategic goals of social development.

The fulfillment of the task of forming competences necessary for innovative activity requires from universities harmonious development of general cultural and professional competences of students, which form general and specific human capital.

**Results and discussion**

The competitive advantages of the country’s economy today are achievable not at the expense of natural resources, but primarily through knowledge, competence, skills and abilities. This, according
to the authors, can explain the rapidly increasing interest in the development and formation of human capital. Many scientists-economists throughout the last century have been dealing with the issues of the human capital theory. The very concept of “human capital” can be considered from different aspects. Thus, the human capital of the university is characterized by a number of features, conditioned, on the one hand, by properties of the human capital itself, and on the other hand – by its branch affiliation. The specific features of the human capital of higher educational institution are as follows:

- Firstly, the education system is the same system in which human capital is formed, accumulated and reproduced.
- Secondly, a large share of the intellectual component causes imbalance and asymmetry in the development of human capital.

- Thirdly, the peculiarities are characterized by tendencies of reduction of human capital in the system of higher education. This reduction is explained by the targeted state policy towards higher educational institutions, which is concretized in their restructuring.
- Fourthly, innovations in the sphere of higher education management are characterized by a long innovation lag, i.e. the time from the emergence of an idea to the moment of its implementation is a process that takes much time.

In connection with the inclusion of a number of American universities in the world rankings, the authors of the article made an attempt to analyze the model of human capital management in the system of higher education in the USA.

The current American system of higher education was formed as a result of a number of factors: The trends of the scope and development of the scientific and technological revolution, The Cold War, which constantly posed the challenge of improving the areas of training professionals.

The law that passed in 1964. According to which all US citizens had equal rights, including the field of education. As a result of these actions, it is evident that the American model of training is one of the most effective ones in the world.

Consequently, the US has developed a sustainable and one of the most efficient systems for training, science and the regional economy and the federal economy. The twentieth century contributed much to the development of the whole schools of science, studying economics of education, as a separate branch of economic knowledge, which is based on studying and improving the efficiency of forms and methods of economic management in education. The US has become a leader in this field.

Many of American universities are presented in the various world rankings. One of such rankings is QS World University Ranking. It assesses high educational institutions based on the following criteria: the reputation of the academics (40%), the reputation among the employers (10%), faculty/student ratio (20%), citations per faculty (20%), international faculty ratio (5%), international student ratio (5%). In the year 2021, five American Universities were placed among 10 leading universities in the ranking.

Table 1 – QS World University Rankings 2021 (American Universities)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>University</th>
<th>Country</th>
<th>Overall Score</th>
<th>International Students Ratio</th>
<th>International Faculty Ratio</th>
<th>Faculty Student Ratio</th>
<th>Citations per Faculty</th>
<th>Reputation of the academics</th>
<th>Reputation among the employers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Massachusetts Institute of Technology</td>
<td>USA</td>
<td>100</td>
<td>91.9</td>
<td>100</td>
<td>100</td>
<td>99.1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Stanford University</td>
<td>USA</td>
<td>98.4</td>
<td>63.6</td>
<td>99.7</td>
<td>100</td>
<td>98.1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Harvard University</td>
<td>USA</td>
<td>97.9</td>
<td>69.9</td>
<td>85.2</td>
<td>98.6</td>
<td>99.1</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>California Institute of Technology</td>
<td>USA</td>
<td>97</td>
<td>88.2</td>
<td>100</td>
<td>100</td>
<td>99.9</td>
<td>97</td>
<td>82.8</td>
</tr>
<tr>
<td>9</td>
<td>University of Chicago</td>
<td>USA</td>
<td>93.1</td>
<td>82.6</td>
<td>67.1</td>
<td>94.4</td>
<td>86.3</td>
<td>99.4</td>
<td>91.3</td>
</tr>
</tbody>
</table>

Note – Completed by the author based on the sources [7].
According to the available data, the positions of the universities presented in the above table did not change from 2019 to 2021. The leading universities are the ones, which have a strong network with government and business and aim at training the specialists in accordance with the requirements of the labor market.

The first level of the bachelor’s degree can be taken at the community college and then it is followed by four years of study at the university. During the first two years, students usually have to take general education courses. This is done to gain general knowledge before focusing on a specific area of study. Students who choose to study at a community college get their “bachelor’s degree”.

Another feature of the US higher education system is that students have the opportunity to change their major several times. The US education system is very flexible, but changing majors can involve taking a large number of courses, which means that it can be more time-consuming and financially demanding. A bachelor’s degree in a particular field is awarded after a certain number of courses are taken in order for the graduate to meet the requirements for that qualification. In most cases the choice of major is made in the third year of study.

The principles on the basis of which US higher educational institutions function are the following: focus on practical training and total career orientation of the graduate; building learning paths in full accordance with the requirements of the labor market and student’s preferences; high requirements for the professional skills of the faculty; great opportunities to participate in the launch and promotion of startups, small and medium enterprises while studying, in the fifth, opportunities to change the volume and sequence of learning with the use of new technologies.

Another strength of the American higher education system is the expansion of funding sources, the tradition of philanthropy, backed by federal fiscal policy, and the ability to create new disciplines/ courses aimed at learning the basics of entrepreneurship, the development of so-called “soft” skills. These characteristics have allowed the field of entrepreneurship among undergraduate and graduate students to develop rapidly and independently compared to other countries in Europe or Asia.

The table presented below (Figure 1) depicts the dynamics in funding sources in the US higher education since 2010 to 2018. Main sources of funding are federal, state or local, own sources of the universities, companies, which are often represented by venture- capitalists and other sources. As it is seen the biggest part of it is made up by federal resources and universities themselves, while other resources such as companies and others made less than eight million in 2010 and reached their peak in 2018 of almost 12 million dollars. Universities tend to use their own resources aimed at the development of R&D as well. For instance, in 2010 this direction cost high educational institutions about 12 million dollars, whereas in 2018 almost 21 million was allocated for this purpose. Still, the USA is one of the countries, where this pattern of network between state, business and universities is strong and productive enough.

![Figure 1 – Higher education R&D expenditure by funding source](8)
Such various sources of funding make the whole system of higher education in the USA efficient and boosts further development. Besides, annual and stable increase in the amount of funding allocated for R&D prove and state the importance of this field not only for the university itself, but for the whole country.

According to the latest National Science Foundation Higher Education Research development ranking, in 2019 US high educational institutions spent nearly 84 billion on R&D. The main academic fields for funding are health, biology and biomedicine, engineering and agriculture.

Funding of university education by private individuals or companies is another American specificity worth noting. Research centers have always been funded by generous donations from private organizations interested in developing a particular field of research. Due to their size and extended geographic reach, large corporations with multiple locations and multiple products are not in a position to fund centers or establish departments at a particular university.

Therefore, the bulk of private donations to colleges and universities for this purpose come from fast-growing small and medium-sized companies. Successful entrepreneurs tend to be more willing to thank their own university, donating large sums of money to see centers or departments created and named in their honor. This generous financial support from entrepreneurs has led to the creation of numerous entrepreneurship centers and chairs, which has ultimately strengthened small business-oriented research.

Many multinational corporations have their offices close to campuses. Their goal is to maintain close ties with scientists who, in turn, are engaged in technological research and development. Companies located in the Research Triangle area, for example, include Sony Ericsson Mobile Communications, Lenovo, Cisco Systems, etc.

The forms of interaction between business and science can be different: sponsored research, gift contracts, joint programs, technology licensing, etc. Universities act as active participants in the education and development of startup companies. For example, the Boston area is home to 25 major firms, 14 of which were founded or are run by university graduates.

It can be stated that US universities today are fully focused on their third function. Thus, in addition to the main function – to provide higher education, American universities are actively developing an innovative and entrepreneurial function by establishing partnerships and alliances with industry and business representatives. For example, in the five academic years from 2014 to 2019 in Illinois alone, 1,064 startups were created by students and professors. Three out of every five startups (59.4%) are successful to this day, while less than half, namely 39.3% are no longer active and 1.3% have been acquired by larger companies [5].

One in five startups set up on Illinois campuses are in the field of biotechnology (21%). Healthcare-related startups (in biotechnology, health care and social services) account for more than one-third of all startups founded at Illinois universities [5].

Every second startup set up in the past five years got funding through venture capital or angel investments, contest prizes, Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR). Startups that appeared in the past five years raised $1.42 billion in funding, which makes the biggest amount ever stated in a five-year period as of 2019 [5].

Almost two-thirds of the startups (68.5%) that have raised funding continue their work in the same place, but most of them that have earned more than $5 million are originated from other states [5].

Funding usually comes from companies operating in the biotech industry, the field that made more money than all other industries combined ($749 million vs. $646 million). Startups dealing with real estate and retail or wholesale also earned more than $100 million in funding [5].

Almost a quarter of the startups (23.2%) created in the past five years from 2014 to 2019 have obtained direct financial support from their university totaling $14.1 million. Startups that received direct funding from universities attracted $204 million in follow-on funding.

Startups set up in universities in Illinois directly benefit the state economically by creating new jobs. Startup companies employed about 3,300 people in 2019. About 2,700 of those jobs are still active and 1,500 are directly in Illinois [5].

In addition to creating startups, Illinois higher educational institutions made 707 inventions, issued 255 patents and entered into 166 licensing and option agreements for commercializing new technologies in 2018. University activities in the field of licensing in Illinois generated $1.37 billion from 2014 to 2018 [5].
Conclusion

The analysis of the current model of human capital management in US higher educational institutions has led to the following conclusions. These conclusions applied and followed in Kazakhstani universities at a full scale can contribute to the efficient development of human capital.

Firstly, higher education should be focused on the development of practical skills that reflect the needs and requirements of the labor market. A detailed analysis has to be carried out when designing university curriculum to ensure that the skills and competences acquired by graduates fully correspond to those needed by employers, business sector and industry. Effective interaction between higher educational institutions and employers is a necessary condition for full development of the higher education system and labor relations in the Republic of Kazakhstan. Stimulation of this interaction implies coordination of actions of all interested parties, hence, presence of mutual understanding between them and aspiration to develop a common vision of the situation.

Secondly, an extensive and strong network between business representatives, government and higher educational institutions usually tends to boost entrepreneurship development among both lecturers and students. Here the trend set by American universities serves as a sample to follow. As cases suggested above depict the proves of close link between three parties in the universities of the USA – higher educational institutions, government and business sector. Even some improvements in this field can be traced, yet they still seem to be vague and inherent only for some big universities of big cities.

Thirdly, proper and developed infrastructure can be maintained due to the availability of constant funding. For Kazakh universities today there are two main sources of funding – state and students. The list of these sources needs to be enlarged and complemented by the representatives of business organizations and industries. At the present stage of development of higher educational institutions there is a tendency to consider the educational institution as an enterprise that creates and sells on the market the product of intellectual labor of its employees – educational and scientific services.

To conclude, it should be noted that not one single factor can improve or positively contribute to the development of the whole system of higher education in the Republic of Kazakhstan, but a set of complex and interrelated measures aimed at changing the existing way of university development into a more efficient one.

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ЖОГАРЫ ОҚУ ОРЫНДАРЫНДАҒЫ АДАМИ КАПИТАЛДЫ БАСҚАРУДАҒЫ ШЕТЕЛДІК ТӘЖІРИБЕ: АМЕРИКАНДЫҚ УЛГІ

Аннотация

Вопросы подготовки квалифицированных специалистов приобрели особую актуальность в последние годы, поскольку требования, предъявляемые к высшим учебным заведениям, значительно возросли в связи с последними тенденциями в мире. Университеты сегодня являются не просто центрами по передаче знаний, они все больше вовлечены в решение социальных задач. Высшие учебные заведения имеют прямое влияние на повышение стандарта жизни, улучшение материального благосостояния, перспективы карьерных возможностей, а также на экономический рост и процветание государства. Вузы играют ключевую роль в формировании, развитии человеческого капитала, который представляет собой главную основную ценность любой экономики, а особенно инновационной. Цель данной статьи заключается в изучении зарубежного опыта формирования и развития ЧК, выявления основных тенденций, изучении статистических данных на примере вузов Соединенных Штатов Америки. Выбор американских вузов был обусловлен рядом факторов, а именно тем, что большинство вузов Америки занимают лидирующие позиции в мировых рейтингах. В качестве основных исходных данных выступали материалы, представленные в годовых отчетах Министерства образования США, в научных журналах. Автором приведен обзор статистических данных по таким показателям, как количество запущенных студентами и профессорско-преподавательским составом стартапов, их успешность на рынке и сфера деятельности. Предложенные в статье выводы по особенностям управления человеческим капиталом в высших учебных заведениях на основе анализа американской системы высшего образования могут иметь положительное влияние на развитие других систем высшего образования.

Ключевые слова: человеческий капитал, высшее образование, инновационное развитие, модель, управление, международный опыт, система образования.