ОБРАЗОВАНИЕ И ОБУЧЕНИЕ: МЕТОДОЛОГИЯ, ТЕОРИЯ, ТЕХНОЛОГИЯ
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ACCUMULATION OF INTELLECTUAL CAPITAL BASED ON QUALITATIVE CHANGES IN THE EDUCATION SYSTEM

Abstract

This article discusses the issues of improving the quality of training specialists in the education system of the Republic of Kazakhstan. The directions of improving the quality of human capital on the basis of qualitative changes in the education system are considered. The purpose of the study was to determine the following: development of recommendations for further improvement of the quality of the personnel training system necessary to ensure the sustainable development of the economy of the country (Kazakhstan). Based on this, the following tasks were performed: the role and functions of the state in the development of interaction between universities and industry/industry were determined; the content of the main state programs aimed at improving the education system of the Republic was studied; a statistical analysis of the implementation of program documents on improving the training system based on the Concept of lifelong learning (continuing education) was carried out; key factors and advantages for the development of a successful partnership with industry/industry were identified.The following methods of economic research were used in the work: observation and collection of facts; historical and logical; systematic. As a result of the analysis of the effectiveness of various models of interaction between infrastructure entities, the most effective method of combining in collaboration in Kazakhstan was determined – territorial integration of scientific infrastructure and intellectual resources. The outdated infrastructure of higher education organizations and the weak connection between science, education and production can be compensated by creating associations, expanding the connection between universities and business.

Key words: education, strategy, national model, collaboration, strategic partnership, economy, development.

Introduction

One of the main factors determining the success of the development of the country's economic system is the improvement of the quality of human capital, which, accordingly, requires qualitative changes in the education system, healthcare, and in the sphere of social security of the population.

As the President said in his Messages to the people of Kazakhstan "The third modernization of Kazakhstan: global competitiveness" and "New opportunities for development in the context of the fourth industrial revolution", "Constructive public dialogue is the basis of stability and prosperity in Kazakhstan" "... We must direct all our efforts to improve the quality of education". And here it should be noted that improving the quality of human capital is expected to be achieved on the basis of the standards of the OECD countries. This is the phased introduction of 12-year education, and the renewal of school standards for the development of functional literacy, and the introduction of per capita funding in high school, and the creation of a system of incentives for successful schools.

This new quality of education presupposes the introduction of IT knowledge, financial literacy, the principle of trilingualism into the educational process, ensuring the availability of the population to receive quality education, increasing the prestige of the profession of teachers and increasing their qualitative composition; ensuring the infrastructural development of secondary education; updating the content of secondary education; ensuring equal access to quality preschool education and training, to quality secondary education; protection of the rights and legitimate interests of children and the formation of an intellectually, physically, spiritually developed, successful citizen; social and economic integration of youth through the creation of conditions for obtaining technical and vocational education.

That is, changes should take place at all levels of education: preschool, secondary and higher.

Main provisions

Today the problems of education are associated mainly with the development of a not impersonal, but national culture. Kazakhstan needs to find its own specific path for the development of the education system. We are talking about the need to change the strategic global goals of education, to shift the emphasis from the knowledge of a specialist to their human, personal qualities, which act as the goals of preparing a person for future professional activities [1].

In 2010, Kazakhstan joined the Bologna Declaration, which is aimed at creating a single European educational space. For graduates of Kazakh universities, this means obtaining competitive diplomas.

In accordance with this process, the system of higher education in Kazakhstan became three-level. In order to improve the quality and level of training of modern specialists, a number of reforms are ongoing in higher education.

Materials and methods

The purpose of the study is to assess the situation and analyze the results of state regulation of changes in the education system in the Republic of Kazakhstan to improve the quality of human capital. The objects of the study were officially approved legal acts regulating the development of education in the Republic of Kazakhstan, including the formation of intellectual capital. Methods of systemic and structural-logical analysis were used, and in addition, general scientific methods were used, including network theory, species classification, comparison method, quantitative analysis methods, and some others.

The theoretical basis of scientific research was the theoretical concepts and methodological developments of domestic and foreign scientists on the problems of improving the education system.

Periodical, statistical, analytical and translated literature in the field of research was used as information resources.

The research conducted by the authors on the issue of cooperation between higher education organizations of Kazakhstan with industry is based on the study of university approaches to the development of this cooperation, its advantages and best practices, as well as factors that hinder this cooperation.

The following methods of economic research were used: observation and collection of facts; historical and logical methods; system analysis of regulatory documents and information from official sources.

Results

The concept is aimed at creating a system of continuous education that ensures the coverage of the country's population with formal, non-formal and informal education to increase its competitiveness and basic competencies to the level of OECD countries. The main principles of the Concept are:

1) free choice of an individual learning path and acquisition of skills and competencies through continuous education;

2) consistency and complementarity of all forms of receiving formal, non-formal and informal education in accordance with the needs of the individual;

3) mobility of labor resources – the possibility of changing the profile of activity and parallel obtaining professional education in various areas;

4) interaction between various institutions – the state, educational organizations, business and citizens to ensure a system of learning throughout life;

5) equal value of learning outcomes, regardless of the type of educational programs in the framework of formal, non-formal and informal education.

The main approaches to its implementation include:

- development of a system of continuous education, including mechanisms for recognizing the results of formal and non-formal learning;
- formation of a certification model that regulates the procedure for recognition of qualifications and skills based on experience, education, demonstrated knowledge and skills;
- Ensuring the coverage of the population with non-formal education;
- increasing the digital competencies of citizens;
- institutionalization of continuous education.

As a result of the study of various models of interaction between infrastructural formations, the most effective method of unification in collaboration in Kazakhstan was determined – the territorial integration of scientific infrastructure and intellectual resources. Based on the experience studied, key factors are identified and directions are formulated for the development of a successful partnership of educational institutions with an industry.

Discussion

In the process of analyzing the current situation in the Republic of Kazakhstan in the field of education, the authors note the following trends.

One of them is the transition to updated content, which ended in the 2020–2021 academic year. If we talk about the results achieved, then today 96% of schoolchildren (grades 1–10) are trained according to the updated content. Textbooks and educational-methodical complexes for 11 grades passed examination and approbation. This affected not only the updating of the program itself, but also required the cost of retraining teachers. So, since 2016, 317 thousand teachers have taken courses under the updated training program. For teaching on the updated content from January 2018, an additional payment of 30% of the official salary is provided [2]. The work done has brought certain results. Over the past three years, at international intellectual Olympiads and competitions, schoolchildren of the country have won 427 gold, 632 silver and 938 bronze medals [3]. The implementation of the World Bank project "Modernization of secondary education" is scheduled for completion in 2022 [4].

Preparatory work is underway for a phased transition to 12-year secondary education from September 2024. The senior level of the 12-year school will be specialized with a focus on elective subjects for choosing a future profession. For the transition, an update of curricula, textbooks and educational-methodical complexes is required. As early as 2020, an independent assessment of the updated content of education and teaching in three languages was carried out; 30 educational programs (EP) have been developed for universities in pedagogical areas; the model of pedagogical education has been formulated. In 2021, training of teachers continues in the development of EP and the assessment of learning outcomes. The result of the work carried out will ensure the alignment of the assessment system with the updated content.

As a result of the introduction of per capita normative financing, the placement of state orders in private schools has begun. In 2019, 70 new private schools were opened, in 2020 – 22 more. In 2020,

the state order was placed in 153 private schools for 44.1 thousand places [5]. This made it possible to partially relieve overcrowded public schools and reduce the shortage of student places.

Another direction for improving the personnel training system in the Republic of Kazakhstan was associated with the creation of such a tool that would describe changes in the labor market and give targeted recommendations for the education system. In 2019, by decree of the President, the Atlas of New Professions and Competences of the Republic of Kazakhstan was created, which over the past two years has become a real tool and created the conditions for the introduction of a new model of education in the middle level.

The first big task that is implemented on the basis of this tool is the description of new professions, the description of new skills that arise in the labor market, as well as those professions that are "dying" and leaving the labor market, and transforming professions. The second big task for which the atlas is currently being used is a system of career guidance for secondary schools.

In order to systematize the training of personnel, work will continue on the profiling of educational institutions of TVE. The broadcast of educational programs that meet international and professional standards is carried out through basic colleges and centers of excellence, created in conjunction with enterprises. The structure of the state educational order is being revised taking into account the data on the projected need for personnel and projected flows of the number of employees, determined with the participation of business.

Today, qualified personnel are trained in ten leading colleges and 11 basic universities for six key sectors of the economy recorded in the SPIID (metallurgy, petrochemistry, food processing, chemical industry, mechanical engineering, production of building materials), with the subsequent dissemination of experience in other educational institutions of the country. In terms of the composition of the total number of trained specialists, 26.5% are specialists for mechanical engineering, 37.7% for petrochemistry, 15.7% for the production of building materials, 7.6% for the chemical industry, 10.1% for the food industry. Unreasonably few specialists are trained for such an important basic industry as metallurgy – 2.4% (Figure 1). At the same time, more than 100 new EP were introduced (colleges – 53, universities – 48) [6].

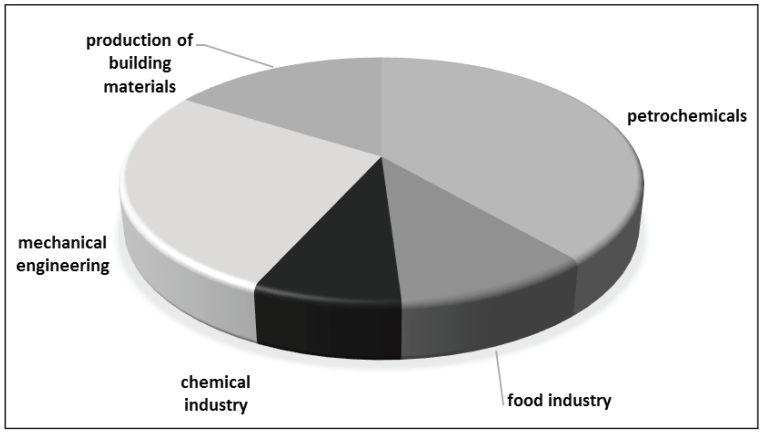

Figure 1 – Structure of trained specialists by state order

The following achievements can be noted: the share of employed graduates – 78.9%, in all basic colleges a system of dual education has been introduced. In 5 basic colleges, personnel are trained in 9 specialties of applied bachelor's degree, cooperation with 369 social partners is carried out. On the basis of 2 basic colleges (Zhambyl Polytechnic College, Almaty State College of Energy and Electronic Technologies), centers of competence in the areas of the chemical industry and energy have been created. In 6 basic colleges there are educational and methodological associations.

Serious changes have been implemented in the system of higher and postgraduate education. The traditional model of education is becoming a thing of the past and is losing its promise. The way out of this situation is in a cardinal renewal of the Higher School, in its ever more profound reforming in accordance with the needs of society, but on the basis of its unconditional autonomization. Movement

in this direction requires a fundamental change in the very essence of the model of the Higher School, ensuring its free, all-round development [7].

Another direction, implemented in the context of the formation of a new quality of education, is the gradual expansion of the academic and managerial independence of universities, taking into account the experience of Nazarbayev University. In 2021, the transformation of private universities into non-profit organizations was carried out in accordance with international practice. In order to attract additional investments for the development of universities, 35 national and state universities, 2 private universities were transformed into non-profit joint-stock companies (NJSC), and 46 private universities function as non-profit organizations [8].

In 2018, the Law of the Republic of Kazakhstan was adopted to expand the academic and managerial independence of universities, in accordance with which 24 competencies of universities were expanded and a new article 43-1 was introduced, which defines the competencies of universities [9].

A new Classifier of Personnel Training Directions was approved. Universities within the framework of directions independently develop educational programs focused on learning outcomes and taking into account the requirements of the relevant professional standards [10]. To account for all EP and evaluate them by the professional community, the Register of educational programs has been launched. 9,018 OPs were entered into the Register, of which 2,515 are new, 266 are innovative ones.

62 universities are implementing the experience of Nazarbayev University. In 11 universities with a special status, 168 doctoral students were awarded PhD degrees and they received their own corresponding diplomas.

Since 2016, more than 100 foreign top managers and 861 foreign scientists have been involved. This practice made it possible to revise the development strategies of universities, modernize the structure, increase the number of educational programs in English, and expand the participation of the teaching staff of universities in international grant programs.

The number of Kazakhstani universities, noted in the QS WUR rating, increased from 5 to 10 (for 2011, 2020, respectively). For the first time, two universities were included in the Times Higher Education WUR (KazNU, ENU) [11]. Of the universities presented in the QS WUR 2021 ranking by country, 10 are from Kazakhstan, including 6 basic universities included in the QS–2021 ranking [12].

Basic universities in the profile magistracy prepared 7,511 people, including metallurgy – 12.8%, petrochemistry – 5.7%, food industry – 14.8%, chemical industry – 19.8%, mechanical engineering – 37.7%, production of building materials – 9.2% (Figure 2). Of these, 91% of graduates are assigned to enterprises. 98.5% of the interviewed employers noted that graduates of the SPIID work at their enterprises and positively assessed the compliance of the EP with the production requirements [13].

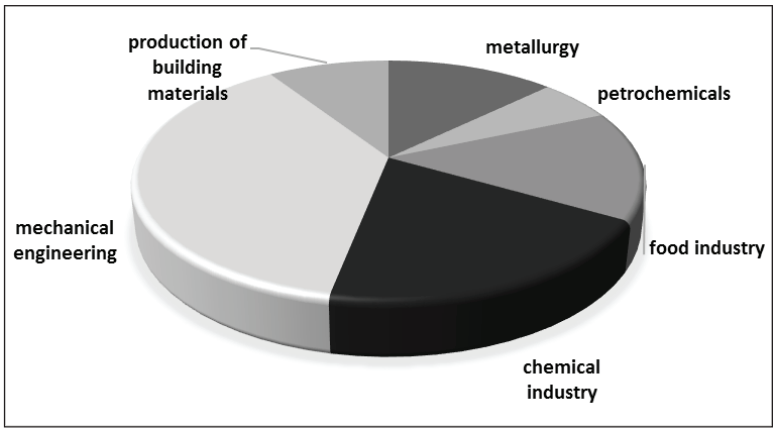

Figure 2 – Distribution of graduates of the Master's degree by economic sectors

Despite the fact that universities have received academic freedom and can themselves form scientific and educational programs, determine the model of their development, the degree of their competitiveness remains a big question, and this is evidenced by the outflow of students to foreign universities, including neighboring countries, which exceeded 90 thousand people. It is necessary to

further improve the quality of training of specialists by introducing mechanisms for the responsibility of universities for the quality of student training. To this end, Kazakhstan has developed a classification model for higher education institutions, according to which the country's higher education institutions will be divided into four groups. The first group will include universities of the international and national levels, the second – the regional level, the third – the higher educational institutions of the sectoral level. The rest will be included in the fourth group. The university being created for the first time will also belong to the last, fourth group. The assignment of an organization to a particular group will be based on the results of its educational, scientific activities, internationalization, as well as its contribution to the economy of the country, region and industry. For universities included in the first three groups, it is necessary to have accreditation of educational programs, their compliance with professional standards. In order to make such distribution by groups transparent, it will be carried out through a specialized information platform where universities will place their applications. The division of universities into groups will encourage them to improve the quality of educational services, the competitiveness of the higher education system in the country.

It should be noted that the quality of education directly depends on modern technological support. Basic universities are equipped with 47 laboratories, on the basis of which 368 diploma, 874 master's and 41 doctoral theses have been completed [14]. More than 800 specialists were recruited from production to teach at universities.

Taking into account this experience of personnel training by universities, since 2016, 40 EP in English have been developed and implemented in the specialties of the Natural Science Cycle (SSC) and SPIID.

200 double-degree and 619 joint educational programs are being implemented. The share of foreign students in the higher education system increased from 2.7% in 2016 to 5.7% in 2021 [13].

Today, our country and our universities have an opportunity not only to improve the level of the state system of advanced training for engineers, but also to connect to the European and international system of continuing education. The Government of Kazakhstan, by its decree of July 8, 2021, approved the Concept of Lifelong Learning (Continuing Education) [15]. The main goal of the strategy is the development of a national education model aimed at the formation of a creative personality, the accumulation of intellectual capital as the most important factors of the economic and social progress of society on the basis of the priority of education proclaimed by the government, the transition from the 'Education for All' model to a lifelong learning model (continuous education). The implementation of the project of continued engineering education will allow to join the system of distance education, the content of which is to provide video courses and computer-based courses to most effectively meet the needs of the state in the field of education in management, technology and ecology. This educational model was born with the aim of bringing our economy to Western standards for product quality, labor productivity, and environmental protection. The purpose of the continuing engineering education model is not only to provide video and computer-based courses, but also to create the necessary infrastructure (which is in its early stages of formation) to support continuing education in the field. The issuance of the certificate will officially testify to the equivalence of the education of domestic universities and European universities of this profile. The owner of such a certificate in terms of the level of professional training is recognized as adequate to foreign colleagues.

Another tendency that has now manifested itself in the higher education system is that the reproduction of the nation's most important asset – its intellectual potential – ceases to be the exclusive monopoly of the state and becomes a matter of society itself. The combination of basic engineering education with modern knowledge in the field of economics and market relations creates excellent prospects for the targeted training of highly qualified specialists for work in various investment companies, implementation and other firms engaged in innovative activities.

When training highly qualified personnel for sectors of the economy, it is impossible to do it without collaboration. As a concept, "collaboration" is used more often in relation to large international programs and much less often in the educational sphere. This kind of cooperation is mutually beneficial for everyone – it creates an opportunity to exchange experience, improve skills and learn new things. It is especially good when there is interaction between scientific institutions and the university. Students delve into the field of scientific research, are determined with their areas of thesis, take a direct part in development and experimental work, gain interaction skills in a team.

Effective cooperation between academic institutions and higher educational institutions on the one hand, and universities and industrial enterprises on the other hand, is possible with centralized regulation using government support instruments. The main part of collaborations is formed through the interaction of scientific and technical departments of scientific and educational institutions and employers' enterprises based on territorial proximity.

According to the Ministry of Labor, there is a low involvement of the adult population in lifelong education in Kazakhstan. At the same time, today the relevance of skills in many specialties remains only for 2 years [13]. There is a growing need to resolve the problem of narrowing the gap between the requirements of employers and the qualifications of workers. Today, the labor market is undergoing changes under the influence of such global trends as the acceleration of technological progress, the digitalization of the economy, resulting in a gap between the requirements of employers and the qualifications of employees, especially graduates of educational organizations. In this regard, there is a need to constantly update the professional knowledge, skills and competencies of Kazakhstanis. To address these issues at the level of ministries, systematic work is being carried out to develop the National Qualifications System (NQS). The NSC provides answers to three main questions: "What should modern specialists know and be able to do? What and how to teach them for this? How to recognize and assign their qualifications? Within the framework of the NQS, the foundation is laid in the form of the National Qualifications Framework, which contains 8 levels of qualification and determines at what level, what general professional competencies and level of education a specialist should have. In 2021, 36 industry-specific qualifications frameworks were updated, which classify the qualification requirements for a specialist in a particular industry by levels depending on the complexity of the work performed and the nature of the competencies used, 589 professional standards were approved, which make it possible to understand what skills and knowledge are needed to engage in a particular profession . The continuation of this work consists in the fact that educational institutions, taking into account the requirements indicated in professional standards, develop educational programs. This ensures the training of personnel corresponding to the requirements of employers.

The Republican tripartite commission on social partnership and regulation of social and labor relations approved a list of regulated professions, consisting of 72 professions in the areas of healthcare and finance, requiring mandatory confirmation of qualifications. The approved occupational standards cover 2,689 professions and 27% of subclasses of types of economic activity throughout the country; in terms of industries, the greatest coverage of occupational standards is noted in the areas of construction (94.4%), agriculture (78%), information and communications (57.9%).

It is assumed that the Associations of Employers will intensify work on updating and developing new professional standards by 2025 with an increase in coverage to 70% of subclasses of economic activities.

Collaboration between universities and business is a track that is gaining momentum – it is also project-based learning (when a project is proposed and its decision is accepted by business representatives), internships, master classes, corporate programs, etc. And at the core is mutually beneficial cooperation that allows graduates to gain experience and the necessary competencies, the predicted result of graduate training for business, and for universities the compliance of educational programs with the requirements of the labor market and, as a result, the quality of education.

Based on the lessons learned in other countries, it is possible to identify the key factors for the development of successful partnerships with an industry.

1. The opportunity for students to visit the enterprise during the period of study at the university, to get acquainted with the real state of affairs, the work environment, to study the documentation and to have the opportunity to express themselves.

2. Close relationship of the university and its departments with the personnel services of enterprises and the employment fund for the purpose of employing students.

3. Providing the student with the opportunity to work during the period of study with his transfer to an individual training plan, if necessary.

4. Fulfillment of scientific works during training and participation of students together with the teaching staff in various events, both scientific and organizational, which further motivates them to continue their studies in magistracy and postgraduate studies.

5. Opportunity to improve qualifications and broaden the horizons of students through a system of continuing education and obtaining a certificate, which will create great opportunities for them in the event of employment

6. Conclusion of contracts for the performance of research and development work or other contractual work.

Today, there is a system of state grants, and the costs of training highly qualified personnel are borne by the budget. What can universities, an industry, employers, and governments do to develop more successful partnerships that benefit both universities and an industry?

1. Develop long-term training programs for specialists in promising areas of activity.

2. To form closer contractual relations between large enterprises of the region for the training of personnel on the basis of the order. Within the framework of this study, the authors have identified the main directions for the development of collaborations in the Higher School of Kazakhstan and the mechanisms for combining highly qualified scientific personnel and the production infrastructure of industrial enterprises:

- attraction of research institutes to teaching activities, involvement of students in the work of research teams, which involves expanding motivational mechanisms in regulatory documents and tools in the form of indicators of state and local target programs;
- the creation of new organizational forms based on the formation of a regulatory and instructive base for the regulation of relations formed in collaborations, which will create conditions for maintaining and strengthening such associations;
- creation of large centers with an extensive infrastructure (in the form of design bureaus, research laboratories) for the implementation of long-term targeted government programs through the interaction of various research teams and temporarily created structures in the form of cross-functional teams based on various forms of financing, including PPP.

Conclusion

The concept of lifelong learning, aimed at integrating formal, non-formal and informal education, expanding access to the profession through flexible tools for recognizing learning outcomes and qualifications, creates conditions for creating a competitive labor market and forming high-quality intellectual capital. Professional staff is the key to the success of the organization. Therefore, maintaining the compliance of the professional level of employees with changing qualification requirements becomes one of the tasks of the employer.

Thus, the continuous process of improving technologies and creating new methods of production, in the face of an ever-growing financial and economic crisis caused by the coronavirus pandemic and budget deficits at different levels, requires solving the infrastructure problem not only at the expense of public funds. The outdated infrastructure of higher education organizations and the weak link between science, education and production can be compensated to a certain extent by creating associations, expanding links between universities and business.

The advantages of developing partnerships between universities and an industry are expressed, first of all, in ensuring its image. The more students are employed at the enterprises of the region, the higher the level of training in this university. The competitiveness of the university will grow. Ultimately, this will contribute to an increase in the number of contracts for training personnel at the university.

For the region, this is an opportunity to form high intellectual capital, reduce the outflow of highly qualified personnel, and intensify activities in small and medium-sized businesses.

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НАКОПЛЕНИЕ ИНТЕЛЛЕКТУАЛЬНОГО КАПИТАЛА НА ОСНОВЕ КАЧЕСТВЕННЫХ ИЗМЕНЕНИЙ В СИСТЕМЕ ОБРАЗОВАНИЯ

Аннотация

В данной статье рассмотрены вопросы повышения качества подготовки специалистов в системе образования РК. Рассматриваются направления улучшения качества человеческого капитала на основе качественных изменений в системе образования. Целью проведенного исследования является выработка рекомендаций по дальнейшему повышению качества системы подготовки кадров, необходимых для обеспечения устойчивого развития экономики страны (Казахстана). Исходя из этого были выполнены следующие задачи: определе-

ны роль и функции государства в развитии взаимодействия университетов с промышленностью/индустрией; изучены содержание основных государственных программ, направленных на совершенствование системы образования Республики; проведен статистический анализ выполнения программных документов по совершенствованию системы подготовки кадров на основе Концепции обучения в течение всей жизни (непрерывное образование); выявлены ключевые факторы и преимущества для развития успешного партнерства с промышленностью/индустрией. В работе были использованы следующие методы экономических исследований: наблюдение и сбор фактов; исторический и логический; системный. В результате анализа эффективности различных моделей взаимодействия инфраструктурных образований был определен наиболее результативный метод объединения в коллаборации в Казахстане – территориальная интеграция научной инфраструктуры и интеллектуальных ресурсов. Устаревшая инфраструктура организаций высшего образования и слабая связь науки, образования и производства могут быть компенсированы за счет создания объединений, расширения связи между университетами и бизнесом.

Ключевые слова: образование, стратегия, национальная модель, коллаборация, стратегическое партнерство, экономика, развитие.

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БІЛІМ БЕРУ ЖҮЙЕСІНДЕГІ САПАЛЫ ӨЗГЕРІСТЕР НЕГІЗІНДЕ ЗИЯТКЕРЛІК КАПИТАЛДЫ ЖИНАҚТАУ

Аңдатпа

Бұл мақалада ҚР Білім беру жүйесінде мамандарды даярлау сапасын арттыру мәселелері қаралды. Білім беру жүйесіндегі сапалы өзгерістер негізінде адами капитал сапасын жақсарту бағыттары қарастырылуда. Жүргізілген зерттеудің мақсаты мыналар болып айқындалады: ел (Қазақстан) экономикасының тұрақты дамуын қамтамасыз ету үшін қажетті кадрларды даярлау жүйесінің сапасын одан әрі арттыру бойынша ұсынымдар әзірлеу. Осыны негізге ала отырып, мынадай міндеттер орындалды: университеттердің өнеркәсіппен/индустриямен өзара іс-қимылын дамытудағы мемлекеттің рөлі мен функциялары айқындалды; республиканың білім беру жүйесін жетілдіруге бағытталған негізгі мемлекеттік бағдарламалардың мазмұны зерделенді; өмір бойы оқыту тұжырымдамасы (үздіксіз білім беру) негізінде кадрлар даярлау жүйесін жетілдіру жөніндегі бағдарламалық құжаттардың орындалуына статистикалық талдау жүргізілді; өнеркәсіппен/индустриямен табысты әріптестікті дамыту үшін түйінді факторлар мен артықшылықтар анықталды. Жұмыста экономикалық зерттеулердің келесі әдістері қолданылды: фактілерді бақылау және жинау; тарихи және логикалық; жүйелік. Инфрақұрылымдық құрылымдардың өзара іс – қимылының әртүрлі модельдерінің тиімділігін талдау нәтижесінде Қазақстандағы коллаборацияда бірігудің неғұрлым нәтижелі әдісі-ғылыми инфрақұрылым мен зияткерлік ресурстардың аумақтық интеграциясы айқындалды. Жоғары білім беру ұйымдарының ескірген инфрақұрылымы және ғылым, білім және өндіріс байланысының әлсіздігі бірлестіктерді құру, университеттер мен бизнес арасындағы байланысты кеңейту есебінен өтелуі мүмкін.

Тірек сөздер: білім, стратегия, ұлттық модель, ынтымақтастық, стратегиялық серіктестік, экономика, даму.