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DEVELOPMENT OF ENTREPRENEURIAL INNOVATION ECOSYSTEM IN KAZAKHSTANI UNIVERSITIES

To analyze innovations in the field of education, ecology and technology, identify successful practices and make recommendations for the further development of innovative university models that contribute to sustainable development.

The method of analytical analysis is applied. The methods of object classification were used as a research method.

This article is devoted to the implementation of innovative disciplines in university education. In the modern world, the relevance of this topic is due to the need to prepare students for the rapidly changing demands of the labor market, where not only traditional knowledge is in demand, but also skills in working with the latest technologies and methods.

The article examines various aspects of the introduction of innovative disciplines, including the choice of course content, teaching methods and evaluation of results. Special attention is paid to the practical significance of such education for future specialists and the development of their creativity, analytical and problem-oriented skills.

Keywords: *Green University, innovative infrastructure, sustainable development, entrepreneurship, startup, business incubator, innovations.*

Кілт сөздер: *Жасыл университет, инновациялық инфрақұрылым, тұрақты даму, кәсіпкерлік, стартап, бизнес-инкубатор, жасыл инновация.*

Ключевые слова: *Зеленый университет, инновационная инфраструктура, устойчивое развитие, предпринимательство, стартап, бизнес-инкубатор, зеленая инновация.*

Introduction. Innovation infrastructure is a complex and multifaceted system that brings together various elements to promote the development and implementation of innovation in society. This concept is based on the integrated interaction of institutions, enterprises, education and the state, creating a favorable environment to stimulate innovation and sustainable development.

Infrastructure development and sustainable industrialization are key drivers of growth. Industrialized countries benefit from diversified economic bases and lower costs of doing business. Emerging economies, including in Asia, are experiencing fast growth rates that are strongly correlated with industrialization and manufacturing.

Innovations, encompassing technological advancements and more, are playing an ever-growing role in driving economies. They are progressively emerging as effective solutions to real-world problems, evolving from the grassroots level at an accelerated rate. Consequently, it is imperative for governments and the global community to establish and strengthen conducive environments that foster innovation, particularly in the realms of skill development and collaborative partnerships.

This will bolster innovation and create new jobs in infrastructure and industrialization. For instance, every job in manufacturing creates 2.2 jobs in other sectors. Innovation, infrastructure development and industrialization will therefore support all other areas of the economy. Sustainable industrialization is also a response to many global crises so this represents an opportunity to strengthen regional integration as well as international cooperation.

The introduction of innovative disciplines is not only a matter of updating the content of education, but also a strategic approach to the formation of competencies necessary for success in the modern economy.

The purpose of this article is to study the relevant aspects of the introduction of innovative disciplines into university education. Using the example of Buketov University, we will consider successful practices, as well as obstacles faced by universities. Our work is aimed at identifying the importance of innovative

disciplines for future specialists and their impact on the quality and competitiveness of university education in the modern world.

Materials and methods. The following methods were used to write the article: comparative method, analytical, synthetic, problem-oriented, method of strategic planning and forecasting.

Literature review. Innovation is a key element of modern economic development and social progress. The word «innovation» comes from the Latin word «innovation». It means to make a new thing or a change. However, according to Schumpeter, in a scientific context, the concept of innovation covers a much broader range of aspects, including technological, social, economic and organizational change [1].

From the early stages of economic thought, Adam Smith, in his «An Inquiry into the Nature and Causes of the Wealth of Nations» (1776), laid the foundation for the study of innovation by emphasizing the role of technological innovation in economic growth. With the advent of the Industrial Revolution, the study of innovation expanded to focus on the changes in social relations under the influence of technological progress [2].

According to Lundvall, innovation is «the use of existing sources in new ways». Innovations are new products, new technologies, new organization of industrial production, opening of new markets. The source of development is internal processes, new combinations of production factors based on innovation [3].

In the 20th century, with the development of technology and new challenges to society, such as the digital revolution and biotechnology, innovation research has become more interdisciplinary. Friedrich von Hayek's writings on the role of knowledge in a market economy, Michael T. Miller's research on organizational innovation, and Everett Rogers' concept of «Diffusion of Innovations» (1962) have made a significant contribution to understanding the processes of innovation diffusion and innovation infrastructure in society.

One of the important aspects of innovation is its impact on economic growth. Research conducted by R. Romer emphasize that innovation is a key factor in the long-term growth of the economy, contributing to increased productivity and the creation of new market opportunities [4].

According to the concept of 'innovation systems' (Lundvall, 1992), innovation is not only limited to technical aspects, it also includes social, institutional and cultural factors. This emphasizes the importance of considering the context in which the innovation process takes place [5].

According to M. Porter, innovation infrastructure includes such components as innovation clusters, educational and scientific institutions, enterprises, science parks, technology incubators, financing systems, as well as innovation networks and partnerships. This complex system of interactions creates conditions for the effective implementation of scientific and technological developments in the real sectors of the economy [7].

According to the concept of innovation infrastructure, the development and implementation of innovative technologies extend beyond technical aspects. It also underscores the importance of educational research institutions, which play a crucial role in the innovation infrastructure by contributing to the training of skilled personnel and the dissemination of new knowledge [9].

Various definitions of innovation infrastructure exist, with some scholars viewing it as a collection of entities that support innovation development across all stages of the process, while others focus on specific stages. For instance, A.A. Soldatov defines innovation infrastructure as the comprehensive set of public and private structures necessary for the development and sustainability of all stages of innovation. N.Z. Mazur and M.P. Levina's definition also encompasses the entire innovation process, stating that «Innovation infrastructure consists of information, organizational, marketing, educational, and other networks that facilitate the practical implementation of new ideas and their adoption by consumers» [10].

The main part. Innovation infrastructure is a complex system of organizational, technological, educational, and financial resources designed to support and enhance innovation processes within society. The term «innovation infrastructure» encompasses a broad array of components that work together to create an environment conducive to research, development, the introduction of new technologies, and the promotion of entrepreneurial activities [6].

Thus, innovation is a complex and multifaceted phenomenon that includes various aspects of technical, economic and socio-cultural nature (Figure 1). Innovation research is an integral part of understanding current trends. Contemporary challenges such as artificial intelligence research, environmental innovation and socio-cultural aspects of change are becoming fundamental areas of contemporary innovation research [8].

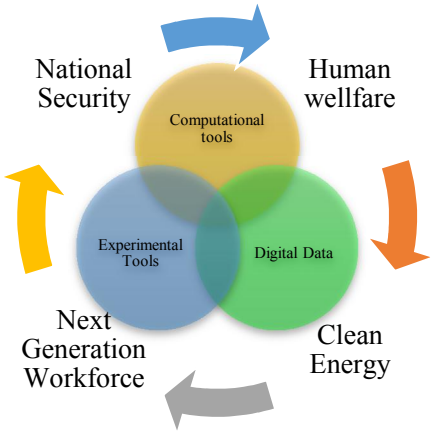

Figure 1. **Materials Innovation Infrastructure***
** Compiled by the authors based on the source [15]*

Research on innovation infrastructure also emphasizes the importance of government support and the creation of conditions for interaction between business, science and education (Figure 2).

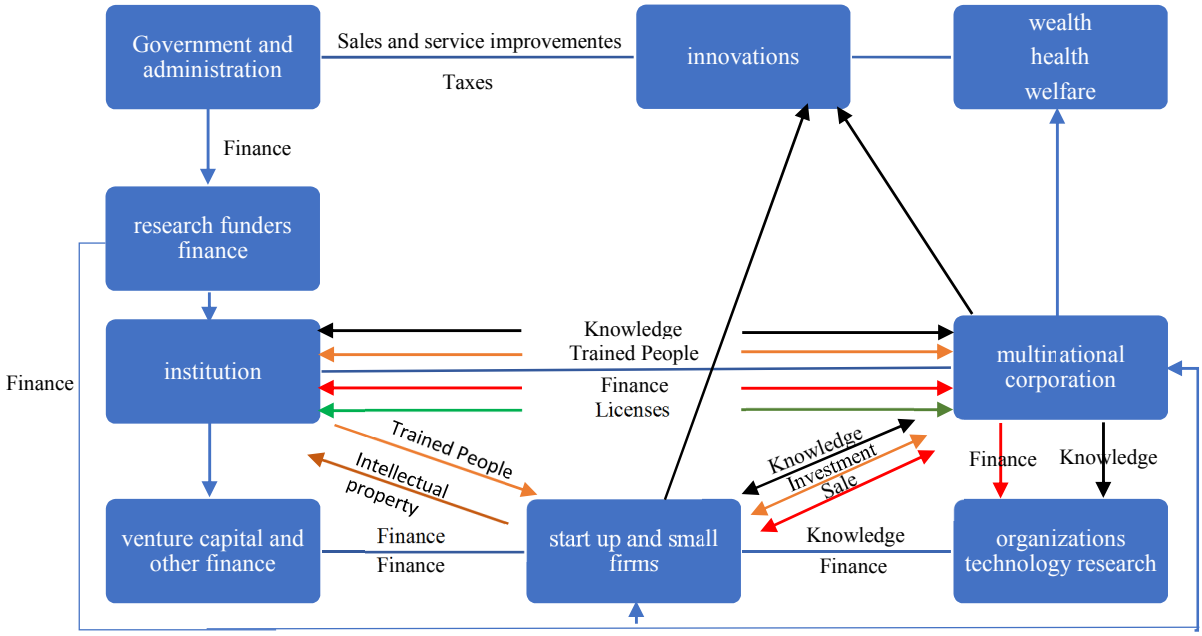

Figure 2. **Innovation Ecosystem with Regulatory Standarts***
** Compiled by the authors based on the source [15]*

Government strategies aimed at promoting innovation include creating tax incentives, stimulating research, and creating legal and infrastructural conditions for entrepreneurial activity.

Such definitions significantly narrow the purpose of innovation infrastructure and do not reveal its economic essence [11].

Innovation infrastructure comprises a collection of entities that enable the execution of either the complete innovation process (innovation cycle) within specific regions or the entire country, or a specific phase of it - the commercialization of advancements. This interpretation enables us to highlight different facets of innovation endeavors in comparison to a more comprehensive perspective, which defines innovation infrastructure as a collection of establishments that foster the growth of innovation activities within a particular region. [12].

The following functions of the innovation infrastructure can be distinguished:

- Facilitating research and development: Innovation infrastructure provides organizations and scientific institutions with access to state-of-the-art laboratories, technology platforms and engineering

resources to facilitate research and development. This enables the creation of new technologies, products and services [13].

- Supporting startups and innovative enterprises: The infrastructure provides startups and small innovative companies with access to investments, training programs, incubators and gas pedals, facilitating their successful start-up and growth. This stimulates the formation of a dynamic innovation ecosystem.

- Technology transfer: innovation infrastructure facilitates the transfer of technology from academia to industry. Such processes help to bridge the gap between research and the actual application of technologies in production [14].

- Providing education and training: education centers, laboratories and training programs provide highly qualified personnel capable of working effectively in an innovative environment.

- Formation of innovation clusters: companies, research institutions and educational organizations share knowledge, experience and resources, promoting synergies and accelerating innovation processes.

- Enhancing regional competitiveness: regions with a developed innovation infrastructure tend to be more attractive to investors and talent. This contributes to increased economic activity, improved competitiveness and the creation of highly developed societies.

Karaganda Buketov University implements a variety of initiatives aligned with its core objectives, adhering to legal regulations and strategic program documents, while also taking into account contemporary trends in innovative advancement. These initiatives encompass entrepreneurial education, with a particular emphasis on enhancing innovation infrastructure, commercializing the results of scientific and scientific-technical projects, and fostering entrepreneurial mindset and business ventures within the academic and scientific community. The university has established and approved the «Concept of development of entrepreneurial education in Karaganda Buketov University», which includes segments dedicated to knowledge generation and competency development in practical entrepreneurship among students, updating teaching methodologies for courses emphasizing entrepreneurial skills, application of acquired entrepreneurial knowledge in real-world scenarios, and a roadmap for enhancing entrepreneurial education at Buketov University. Each segment of the Concept involves an analysis of the current situation, examination of international practices, projection of future opportunities, identification of risks, and assessment of positive outcomes.

The university's entrepreneurial education development action plan encompasses approximately 20 measures that are presently undergoing active implementation. It is important to highlight that these measures align with the recommendations provided by the ERG Project experts following the university's diagnostic assessment. Let us take a closer look at the main directions of the concept in the context of the implemented activities.

The first direction - Development and introduction of the discipline «Applied Business» into the curricula of all undergraduate specialties.

One of the main obstacles encountered by students who lack motivation towards entrepreneurship is their skepticism about entrepreneurship as a feasible career choice, inadequate knowledge and absence of mentors, and a restricted comprehension of the core essence of entrepreneurial activities.

Consequently, there exists a genuine necessity to design dedicated elective courses for students, funded through the elective component, with the specific aim of enhancing their business competencies.

In this regard, the discipline «Applied Business» was developed and introduced in the curricula of all 78 undergraduate majors in the amount of 2 credits, starting with the admission 2016 in 5/6 semesters (in the third year).

The discipline «Applied Business» consists of 3 blocks:

Block 1 - basic economic and legal fundamentals of business and business planning.

Block 2 - gaining practical skills to start a new business.

Block 3 - developing their own startup and its business plan.

The Concept's second focus is to incorporate the discipline «Commercialization of the results of scientific and scientific-technical activity» into the curriculum of 49 Master's degree programs. This inclusion will be worth 3 credits and will commence from the 2016 admission onwards.

This course is distinctive because it is taught by three different departments: the Department of Economics and International Business, which covers the economic side of RSTA commercialization, the Department of Civil Law, which provides legal support for this process, and the specialized graduate department, which focuses on the organizational and technological aspects of project work, taking into account the specialtys unique requirements. The second part of the training seminar, which was part of the

ERG project, had mostly faculty members from the graduate departments that were in charge of creating the specialized part of the subject.

The goal of this field is to teach students how to apply their knowledge and abilities to create and sell products or services based on scientific or technical research.

This course delves into the legal and regulatory issues involved in turning RSTA into a business, such as its different types and ways of doing so, and how the state helps with this process.

The Concept aims to create a group of instructors for the fields of «Applied Business» and «Commercialization of RSTA» and enhance their teaching methods. The training seminars organized as part of the ERG project made it possible to accomplish this task.

The fourth part of the Concept is to work closely with businesses and business groups, involve well-known experts in teaching courses that develop entrepreneurial abilities, supervise thesis projects and internships, and collaborate on the development of educational resources for business topics.

Students of the Department of Economics and International Business undergo practical training on the basis of the branches, and at the request of enterprises perform theses and master's theses. In addition, it is widely practiced to hold visiting meetings of the attestation commission for the defense of custom-made diploma works on the basis of the department's branch.

Cooperation with successful entrepreneurs of the region and the country has been actively established, in particular, with the Chairman of association of legal entities and individual entrepreneurs «Eurasian Association of Entrepreneurs» Aldangarov Zhomart Toleshovich, member of the Youth Council under the Senate of the Parliament of the Republic of Kazakhstan, Deputy Director of the charitable foundation «Meirim», bronze medalist of the Youth Paralympic Games in 2013, captain of the national team of Kazakhstan in sitting volleyball and winner of the project «100 new faces of Kazakhstan» Serik Esmatov, Director of Sales and Reinsurance Department of the insurance company «Kazakhstan 100».

Trainings for students and teachers on developing entrepreneurial skills were also conducted by Talgat Turumbaev, co-founder and member of the Board of Directors of Kusto Group (Singapore), member of the Board of Directors of Coteccons (Vietnam).

University students actively participate in the Enactus International Social Entrepreneurship Program. As part of this program, they receive 48 hours of training at the «School of Young Entrepreneur» and credit brokers' courses through the «Business Advisor» Project of the Regional Chamber of Entrepreneurs. A crucial aspect of the program is the incorporation of scientific and educational advancements in business-oriented subjects into the curriculum. These advancements have been developed in collaboration with experienced professionals. The Chamber of Entrepreneurs in the Karaganda region provides support and direct involvement in the program. They have created educational and methodological guides, such as the «Practical Guide to drafting and analyzing a business plan», which are available in both state and Russian languages, including electronic textbook formats.

The fifth element of the program focuses on encouraging the participation of students, postgraduates, and young researchers in competitions related to startups, business projects, and the commercialization of RSTA projects.

On April 27-28, 2023 in Astana, the National Competition of student entrepreneurship, innovation and startups Enactus Kazakhstan National EXPO 2023 was held, where the team of Enactus Buketov University took the 1st prize among the teams of 50 universities of Kazakhstan and received the title of national champions! Having become the winner of the National competition, the team of Enactus Buketov University represented Kazakhstan at the Enactus World Cup 2023 in Utrecht, the Netherlands.

The aspect emphasizes the importance of entrepreneurial education and dissemination to society. Since entrepreneurship has the potential to change the world, this strength seeks to collaborate with a local high school to introduce students in grades 10-11 to the fundamentals of practical entrepreneurship. Entrepreneurial education is essential for developing the next generation and preparing its members to cope with the challenges and opportunities of today’s world. Entrepreneurship education provides students with knowledge, skills, and attitudes enabling them to think differently, take risks, and create a personal and professional life worth living. A partnership with a local high school is required to disseminate entrepreneurial education broadly. By introducing practical entrepreneurship during this period, students have the opportunity to explore their interests, develop their entrepreneurial skills, and gain a deeper understanding of the entrepreneurial mindset.

The cultivation of a foundational understanding of practical entrepreneurship among students in grades 10-11 involves various initiatives and activities. These may include workshops, seminars, guest lectures,

and hands-on projects that allow students to apply their knowledge in real-world scenarios. By engaging students in practical experiences, they can develop their problem-solving abilities, critical thinking skills, and creativity, all of which are essential for entrepreneurial success.

The seventh component of the Concept entails creating a wide range of training courses and workshops that emphasize the development of entrepreneurial skills through advanced programs provided by the Faculty of Further Education. Furthermore, coordinating training seminars with development organizations, businesses, and trade associations for individuals who are interested in pursuing entrepreneurship.

This direction of work is implemented through the involvement of teachers as lecturers of the «School of Young Entrepreneur», organized by the Chamber of Entrepreneurs for university students and college students of Karaganda.

In addition, a number of teachers are business trainers under the Business Advisor project, as well as lecturers of Kazagromarketing JSC's training courses on the basics of entrepreneurship for residents of rural areas.

The University's Youth Entrepreneurship Center hosted the FinTechStars Republican Hackathon, which focused on startup projects in the field of financial IT technologies using blockchain, «smart contracts», electronic money and cryptocurrencies. The University co-organized this specific Startup-IT-Marathon along with such business leaders as Astana International Financial Center, UNICEF, MOST Business Incubator and other leading financial and credit institutions of the country. More than 200 applications from participants from different regions of Kazakhstan were submitted for this Hackathon. At the same time, of the 9 projects that reached the finals, 3 projects were developed by students of the university, including the project «AdCoin», which received an invitation for cooperation from the International Financial Center «Astana» and the project «MyCreditkz», which interested the Microfinance Company «Credit24», which began the implementation of this startup.

The successful work of the university in popularization of entrepreneurial education and promotion of student startups has not gone unnoticed. Karaganda University named after Academician E.A. Buketov was determined by the Ministry of Education and Science of the Republic of Kazakhstan as a regional co-organizer and the base university of the Republican Contest of startup projects «StartupBolashak: Menin Armanim» in the format of a reality show. The Contest aims to provide assistance to young entrepreneurs in their socially impactful business endeavors, with the objective of enhancing the standards of living, facilitating the exchange of advanced knowledge and technologies, and contributing to the socio-economic development of the nation. The project is a collaborative effort involving Joint Stock Company «National Center for Advanced Training «Orleu», «Enactus Kazakhstan» Foundation, Association of Friends of Tel Aviv University, and Association for Entrepreneurial Education.

The university is currently engaged in the ERG («Eurasian Group») initiative aimed at cultivating entrepreneurial skills within the student community. This project emphasizes the development and implementation of a university strategy for entrepreneurship, the creation of innovative educational programs and facilities, and the enhancement of entrepreneurial abilities among young people.

Conclusions. Innovation-oriented infrastructure entities, on the other hand, play a crucial role in providing resources and a range of services to innovative businesses. This involves establishing specialized zones for scientific research, technology parks for startups, and business incubators for the growth of new ventures. These establishments are designed to cultivate additional competitive advantages for economic entities and foster a conducive environment for innovation.

Successful examples of the introduction of innovative disciplines presented in our article indicate the importance of such education for the training of qualified specialists. However, we have also identified the obstacles that universities face in implementing these courses, such as insufficient funding, lack of support from the administration and technical difficulties.

To overcome these obstacles, it is necessary to improve strategies for the introduction of innovative disciplines, including improving teaching methods, cooperation with industry and government agencies, as well as raising awareness of their benefits and necessity among students and teachers.

In general, our analysis confirms the importance of innovative disciplines in university education and the need to continue their implementation in order to ensure high-quality training of future specialists to modern challenges and requirements of the labor market.

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ҚАЗАҚСТАН УНИВЕРСИТЕТТЕРІНДЕ КӘСІПКЕРЛІК ИННОВАЦИЯЛЫҚ ЭКОЖҮЙЕНІ ДАМЫТУ

Аңдатпа

Зерттеу мақсаты білім беру, экология және технологиялар саласындағы инновацияларға талдау жүргізу, табысты тәжірибелерді анықтау және тұрақты дамуға ықпал ететін инновациялық университеттік модельдерді одан әрі дамыту үшін ұсыныстар жасау.

Зерттеу барысында аналитикалық талдау әдісі қолданылды. Зерттеу әдісіретінде объектіні жіктеу әдістері қолданылды.

Бұл мақала университеттік білім беруде инновациялық пәндерді енгізу мәселелеріне арналған. Қазіргі әлемде бұл тақырыптың өзектілігі студенттерді дәстүрлі білім ғана емес, сонымен қатар жаңа технологиялар мен әдістермен жұмыс істеу дағдылары талап етілетін еңбек нарығының тез өзгеретін талаптарына дайындау қажеттілігімен байланысты.

Мақалада инновациялық пәндерді енгізудің әртүрлі аспектілері, соның ішінде курстардың мазмұнын таңдау, оқыту әдістері және нәтижелерді бағалау қарастырылады. Мұндай білімнің болашақ мамандар үшін практикалық маңыздылығына және олардың шығармашылығын, аналитикалық және проблемалық-бағдарланған дағдыларын дамытуға ерекше назар аударылады.

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РАЗВИТИЕ ПРЕДПРИНИМАТЕЛЬСКОЙ ИННОВАЦИОННОЙ ЭКОСИСТЕМЫ В УНИВЕРСИТЕТАХ КАЗАХСТАНА

Аннотация

Цель исследования заключается в проведении анализа формирования и развития предпринимательской инновационной инфраструктуры в академической среде, выявить успешные практики и составить рекомендации для дальнейшего развития инновационных университетских моделей, способствующих устойчивому развитию.

В качестве методов исследования использовались метод экспертных оценок и инструментарий моделирования и прогнозирования. Применен метод наблюдения, т.е. оценка текущих практик внедрения элементов предпринимательской инновационной инфраструктуры в академической среде.

Данная статья посвящена вопросам внедрения инновационных дисциплин в университетское образование. В современном мире актуальность этой темы обусловлена необходимостью подготовки студентов к быстро меняющимся требованиям рынка труда, где востребованы не только традиционные знания, но и навыки работы с новейшими технологиями и методами.

В статье рассматриваются различные аспекты внедрения инновационных дисциплин, включая выбор содержания курсов, методы обучения и оценки результатов. Особое внимание уделяется практической значимости такого образования для будущих специалистов и развитию их креативности, аналитических и проблемно-ориентированных навыков.