CONHECIMENTO & DIVERSIDADE
ISSN 2237-8049
UnilaSalle Editora

THE IMPACT OF HIGHER EDUCATION ON INNOVATIVE AND INTELLECTUAL DEVELOPMENT OF TERRITORIES

O IMPACTO DO ENSINO SUPERIOR NO DESENVOLVIMENTO INOVADOR E INTELECTUAL DOS TERRITÓRIOS

Maryna Shashyna
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute
Kyiv, Ukraine
shashyna.marina@gmail.com

Denys Krylov
Zaporizhzhia National University
Zaporizhzhia, Ukraine
krylov.denys2021@gmail.com

Yuliia Hermash
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute
Kyiv, Ukraine
bryl.yuliia@lll.kpi.ua

Ihor Chobitok
V. N. Karazin Kharkiv National University
Kharkiv, Ukraine
igor_chobitok@ukr.net

Svitlana Nazarko
Penitentiary Academy of Ukraine
Chernihiv, Ukraine
s.nazarko@ukr.net

Rostyslav Pashov
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute
Kyiv, Ukraine
pashov.kpi@gmail.com

ABSTRACT

Modern transformations of social development directed to post-industrial development actualize the issue of ensuring intellectual and innovative development of territories, in which higher education plays a dominant role, acting as the basis for formation of intellectual potential and innovations. The purpose of the study is to identify the impact of the higher education system on intellectual and innovative development of territories. Methodological basis of the study is substantiated, which is the systemic and human-centered approach to identifying the impact of the higher education system on the intellectual and innovative development of territories, which do not contradict each other, but complement each other and provide an opportunity to focus on formation of necessary professional social and innovative competencies and intellectual and innovative development of territories at the same time. The nature of the ipact actualization of higher education in formation of professional social and innovatively oriented competencies in students at universities to ensure innovative and intellectual development is determined, which include post-industrial transformation and humanization of socio-economic systems, reforming the institutional and legal field of national economic systems whicle considering current environmental and natural threats, intensification of competitive interactions, acceleration of global change processes. Urgency of using interactive learning methods and project activities as principles of forming socially and innovatively oriented competencies is substantiated. competencies in universities by training future specialists. Urgency of higher education and universities in intellectual and innovative development of territories has been determined.

Keywords: higher education, intellectual potential, intellectual and innovative development, territories, universities, systemic and human-centered approaches, socially and innovatively oriented competencies.

RESUMO

As transformações modernas do desenvolvimento social voltadas para o desenvolvimento pós-industrial tornam atual a questão de garantir o desenvolvimento intelectual e inovador dos territórios, nos quais a educação superior desempenha um papel dominante, atuando como base para a formação do potencial intelectual e das inovações. O objetivo do estudo é identificar o impacto do sistema de ensino superior no desenvolvimento intelectual e inovador dos territórios. A base metodológica do estudo é fundamentada na abordagem sistêmica e centrada no ser humano para identificar o impacto do sistema de ensino superior no desenvolvimento intelectual e inovador dos territórios, as quais não se contradizem, mas se complementam, proporcionando a oportunidade de focar simultaneamente na formação das competências profissionais, sociais e inovadoras necessárias e no desenvolvimento intelectual e inovador dos territórios. Determina-se a natureza da atualização do impacto da educação superior na formação de competências profissionais, sociais e orientadas para a inovação em estudantes universitários, a fim de garantir o desenvolvimento inovador e intelectual, o que inclui a transformação pós-industrial e a humanização dos sistemas socioeconômicos, a reformulação do campo institucional e jurídico dos sistemas econômicos nacionais considerando as atuais ameaças ambientais e naturais, a intensificação das interações competitivas e a aceleração dos processos de mudança global. A urgência do uso de métodos de ensino interativos e atividades baseadas em projetos como princípios para a formação de competências sociais e inovadoras é fundamentada. A importância do ensino superior e das universidades no desenvolvimento intelectual e inovador dos territórios foi determinada.

Palavras-chave: ensino superior, potencial intelectual, desenvolvimento intelectual e inovador, territórios, universidades, abordagens sistêmica e centrada no ser humano, competências sociais e orientadas para a inovação.

Introduction

Rapid social development that replaced industrialization is accompanied by accelerated intellectualization of society in which innovative and intellectual activity has become a determining factor of development. Development of territories directly depends on how actively and productively new knowledge is generated and how quickly it is implemented in various spheres of economic activity. To ensure generation of knowledge, it is necessary to increase intellectual potential, which becomes the basis for intellectual and innovative development of territories and society as a whole. From this point of view, the study of relevence of higher education, which plays a key role in formation of knowledge, understanding of the worldview, critical and analytical thinking, becomes relevant. Higher education is aimed at development of individual, creative, imaginative personality, which forms intellectual potential that lays the basis for innovative development of territories.

Higher education provides the national economy with specialists in required specialties that are in demand on the labor market, while during students' training, in addition to professional knowledge and skills, development of necessary professional qualities, certain qualities regarding perception of innovations and implementation of innovations, an innovative culture and opportunities for self-realization should also be formed. Students should form socially and innovatively oriented competencies, which can be characterized as achieving certain level of personal and professional mastery and their manifestations in intellectual and innovative activity.

The purpose of the study is to identify the impact of the higher education system on intellectual and innovative development of territories. To achieve this goal, the authors set and solved the following tasks:

- relevance of the research in modern conditions is proven, taking into account intellectual and innovative social development of territories;

- study of literary sources on this topic was conducted, which made it possible to substantiate timeliness and necessity of this study;

- methodological basis of the research is substantiated, which is the systemic and human-centered approach to identifying the impact of the higher education system on intellectual and innovative development of territories;

- nature of causes of actualization of the impact of higher education in formation of professional socially and innovatively oriented competencies in students at universities for implementation of the concept of activating intellectual and innovative development has been determined;

- urgency of using interactive learning methods and project activities as the basis for formation of socially innovatively oriented competencies in universities when training future specialists is substantiated;

- relevence of higher education and universities in intellectual and innovative development of territories has been determined.

Literature Review

Scientists have devoted a lot of research to development of higher education, including some of them examining its impact on innovative development of various economic entities and territories as a whole.

The study (Toti Luciana et al., 2024) analyzed interaction between acquired academic knowledge and innovative technical services created through digital technologies. The authors proved that research infrastructure embodies symbiotic relationship between scientific, social and material dimensions, providing directions for development of innovation strategies.

Scientists (Hutahaean Berman et al., 2024) analyze features of developing innovative and adapted higher education curriculum to the challenges of Education 5.0. The authors applied the Miles and Huberman model to analyze data, as a result of which they proved the need for curricula that not only take into account technological achievements, but also integrate technology, principles of the student's personalization and stakeholder collaboration in development and curricula, which contributes to development of regions.

Scientific papers (Shevchuk N. et al., 2021; Popelo O. et al., 2024; Kholiavko N. et al., 2023) are devoted to determining the role of eco-industrial parks in innovative development of regions, as well as analyzing modern global trends in development of universities based on implementation of sustainability principles.

The authors (Plietzsch S. et al., 2024) analyzed mindfulness as the innovative approach to shaping attitudes towards sustainable development among future specialists of higher education institutions. The researchers took into account concentration and attention aimed at training internal development, and not only at transferring knowledge about education for sustainable development and innovative strategies.

The aim of the study (Alves-Noreña Alba Catherine et al., 2024) is to develop and implement curricula using educational virtual platform as a vector of innovative development. According to authors, the study should be valuable for decision-makers, managers, scientists, and the community interested in promoting innovative teacher training.

Li Dan (2024) have shown that multicultural integration creates opportunities and challenges for the field of education, and innovations in civic education in universities are becoming increasingly important.

The results of the study (Alaa Eldin Abdel Hamid Ayoub et al., 2023) demonstrate development of the innovative work behavior scale for university teachers and heads of departments. The authors used exploratory and confirmatory factor analysis, which confirmed the five-factor structural model. Scientists are confident that the study makes it clear the urgencu of their developments in innovative development of universities.

However, despite analyzed scientific works, the issue of researching the impact of higher education on innovative and intellectual development of the region requires more in-depth study and analysis.

Methodology

Methodological basis for studying the impact of higher education on intellectual and innovative development of territories is the systemic and human-centered approaches.

The human-centered approach is the basis of the holistically oriented society, it is one of the main conditions for formation of modern system of higher education, which is determined by rlevence of the individual, strengthening the weight of individual and his personal competencies and self-sufficiency, self-realization of the individual throughout the life in society. It is the person under today's development conditions who becomes the center of formation of intellectual potential and innovative development of territories, and higher education contributes to this self-realization. Higher education makes it possible, under conditions of implementing the human-centered approach, to realize the individual's personal abilities, inclinations, creativity, to maximize potential of the person by forming professional socially and innovatively oriented competencies and qualifications. The human-centered approach makes it possible to create space and implement individual educational trajectory that forms systemic scientific thinking, ecological and information culture, creative activity, tolerance, high morality and intellectual potential in general.

Paying tribute to the human-centered approach, which today serves as the basis for the higher education system, one cannot do without applying the systemic approach when studying the impact of higher education on intellectual and innovative development of territories.

The system approach makes it possible to consider intellectual and innovative development of territories as a single integral object of study, and at the same time as certain system with all heterogeneous processes, phenomena, interdependencies and component subsystems. In addition, intellectual and innovative development of territories is a subsystem of the higher order, namely social development as a whole. This approach makes it possible, using heterogeneous methods of scientific knowledge, as follows: analysis, synthesis,

deduction, comparison and others and establishing interaction of subsystems of intellectual and innovative development, to isolate individual features and obtain synergy from aggregate interaction. Relationship between education, intellectual potential, intellectual and innovative resources, innovative developments and their implementation in the spheres of activity of territories provides, using the methodology of the system approach, intellectual and innovative development of territories and society as a whole.

The systemic and human-centered approaches do not contradict each other, but rather complement each other, allowing us to focus on formation of necessary professional social and innovative competencies.

Results

Increasing speed of changes in society, growing volume of information and its rapid updating, changes in the technological base of social production pose new requirements for higher education regarding formation of flexible social and innovative competencies, critical thinking, and the creative approach to solving problems.

It is important to determine causal nature of actualizing the impact of higher education in formation of professional socially and innovatively oriented competencies to activate innovative and intellectual development of territories. Relevant determining factors include the following:

- dynamic processes of post-industrial transformation of socio-economic systems, which involve expanding target horizons of strategic planning of activities of business entities, covering the needs assessing and further taking into account prospective impacts on economic, social and environmental components of activity, which are necessary to ensure intellectual and innovative development of economic systems of any level, factors of exhaustion of natural resources and destructive processes of global changes in climate parameters in planetary dimension;

- progressive humanization of socio-economic systems, accompanied by increase in the level of education of the population, standard of living, socio - cultural development, improvement of working conditions and active promotion of the policy of socially responsible business, which in turn forms demand of civil society for development of expanded forms of state socio-ecological policy, increase of intellectual and innovative potential, responsible attitude of economic entities and individual aspects of interaction with surrounding natural and ecological environment;

- active reforming institutional and legal field of national economic systems by considering current environmental and natural threats, their impact on the quality of life indicators of the population, which manifests itself in implementation of many both stimulating measures, preferential conditions and support programs, and sanction provisions aimed at directly restricting negative, from environmental point of view, economic practices, which should be based on intellectual and innovative basis;

- intensification of competitive interactions, which forms objective incentives for business entities to search for new intellectual and innovative ways of cost optimization and increasing profitability of their core activities, one of which is implementation of principles of sustainable development economics, which, together with positive environmental effects, allows for the economy of resource costs and release of reserves for increasing profitability;

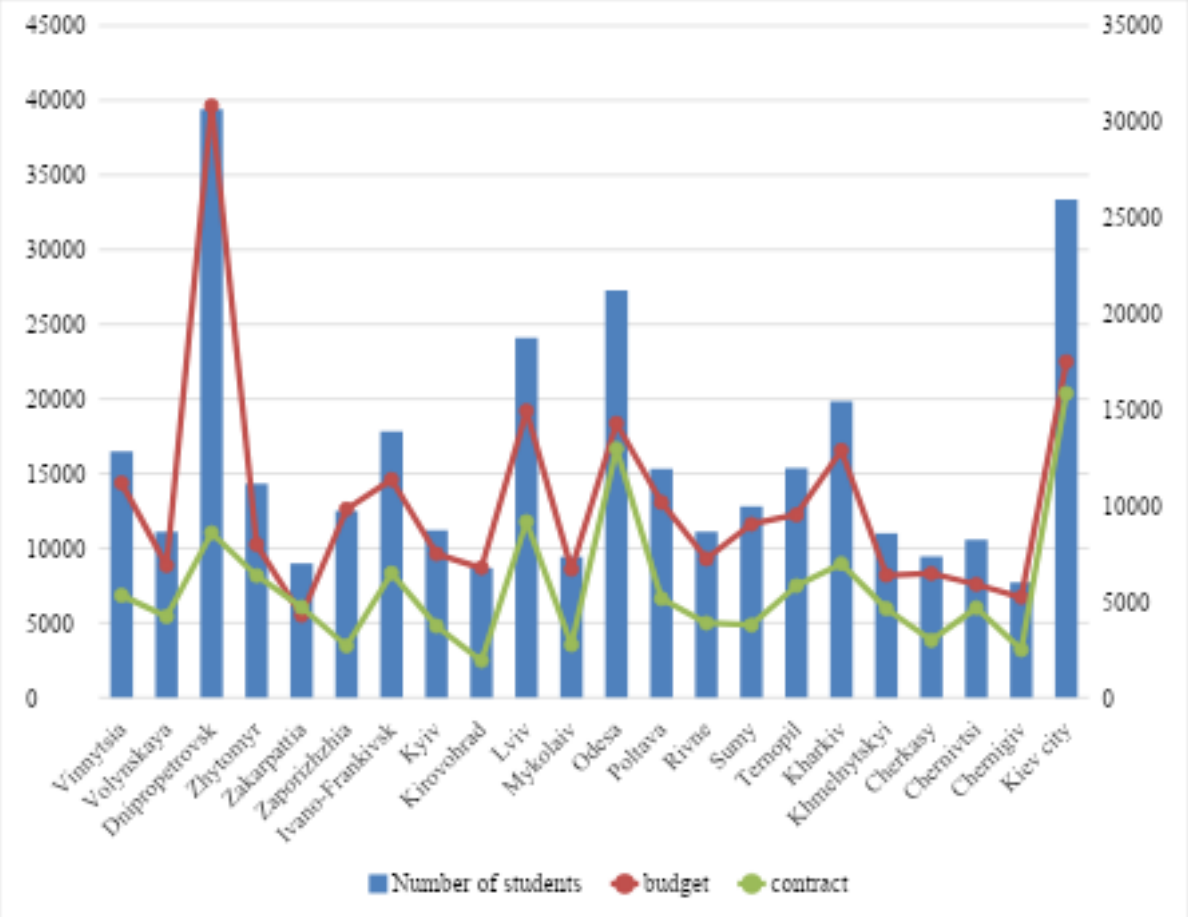
- acceleration of global climate change processes, which is expressed in expansion of geography of natural disasters, negative natural and climatic phenomena caused by the irrational approach to the use of natural resources, excessive release of greenhouse gases and pollution of the natural and ecological environment, which in turn affects stability of existing biocenoses and unique ecological systems that are subjected to excessive influence of anthropogenic and technogenic factors, leading to global climatic shifts.

Thus, development of territories requires growth of intellectual and innovative component, which ensures development of territories and other socio-economic systems in modern conditions, which comply with principles of the

sustainable development concept and take into account social, economic and environmental aspects. The basis for formation of intellectual and innovative development potential is higher education.

Analyzing current trends in students' enrollment in professional pre-higher education institutions in Ukraine, we can state that the largest number of students in 2023/2024 were enrolled in Kyiv (33,342 people), Dnipropetrovsk (39,409 people), Odessa (27,254 people), Lviv (24,099 people) and Kharkiv (189,863 people) regions. The smallest number of students were enrolled in Cherkasy (9,450 people), Mykolaiv (9,429 people), Zakarpattia (8,984 people), Kirovohrad (8,675 people) and Chernihiv (7,712 people) regions (Fig. 1).

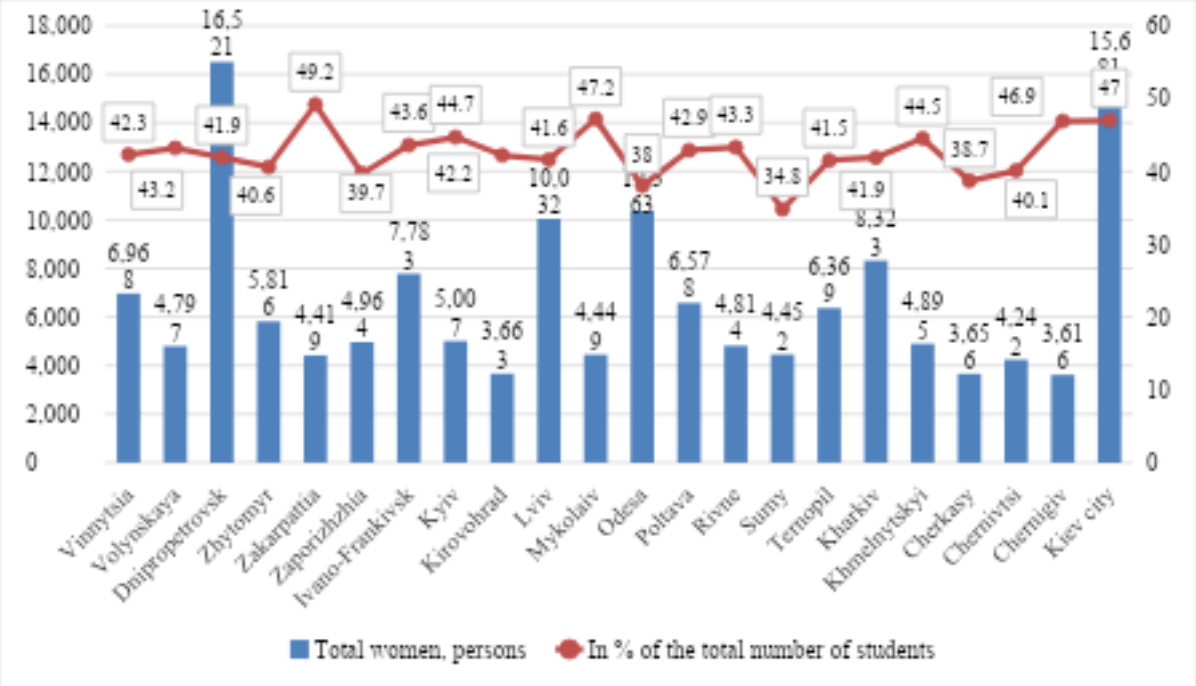
Figure 1 – Number of institutions of professional pre-higher education and students by region, 2023/2024



Source: ukrstat.gov.ua

In total, 350,013 students studied in Ukrainian institutions of professional pre-higher education in 2023/2024, of which 321,946 people studied full-time, 1,085 people studied evening, and 26,964 people studied part-time. Among students, 148,715 were women, which is 42.5% of the total number (Fig. 2). The largest share of female students was in Zakarpattia (49.2%), Mykolaiv (47.2%), Chernihiv (46.9%) and Kyiv (47.0%).

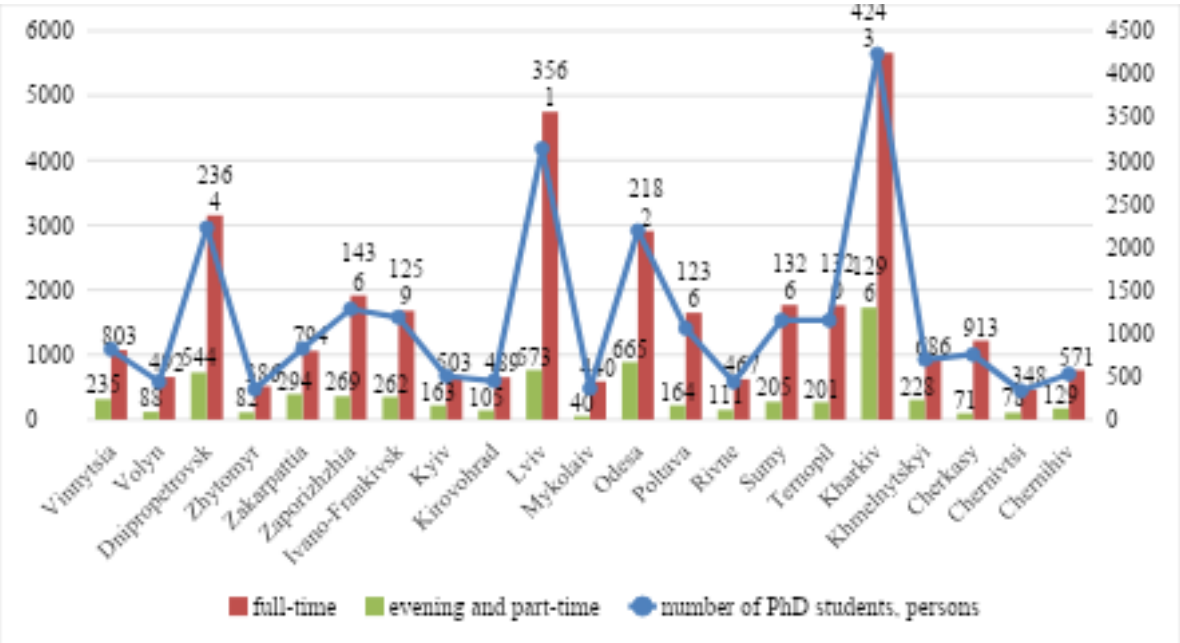
Figure 2 – Number of women among students of professional pre-higher education institutions by region, 2023/2024



Source: ukrstat.gov.ua

Analyzing trends in development of higher education institutions and recruitment of postgraduate students, the following trend is observed. The number of scientific institutions and higher education institutions with postgraduate studies in Ukraine as of January 1, 2024 was 399, where 46,523 postgraduate students studied, of which 36,744 were full-time students, 9,073 were evening students, and 706 were part-time students (Fig. 3). The largest number of postgraduate students was observed at the universities of Lviv (4,182 people), Kharkiv (5,639 people), Dnipropetrovsk (2,956 people) and Kiev regions (14,464 people).

Figure 3 – Number of PhD student by region, 2023



Source: ukrstat.gov.ua

Intellectual potential is considered from different points of view and most often it is understood as certain opportunities, latent abilities, knowledge of the individual and socio-economic systems of different levels as a whole. Intellectual potential ensures implementation of creative organizational and managerial, economic, technological, informational, scientific and innovative, socio-cultural, environmental and other types of activity and thereby ensures development of territories on the innovative basis.

In turn, intellectual potential is developing into intellectual and innovative resource that ensures intellectual and innovative development of territories.

To ensure intellectual development of regions, it is necessary not only for students to acquire socially and innovatively oriented competencies in the form of forming readiness of future specialists for innovative activity, but also to form understanding and desire for lifelong self-education, research of scientific schools in various fields of science, participation in grant programs, and formation of their own educational trajectory of study. Students who then become specialists in their field of activity after graduating from universities due to socially and innovatively oriented competencies become people with broad horizon, competences of

innovative culture, high intellectual level, ready for professional communication, generation and implementation of innovations.

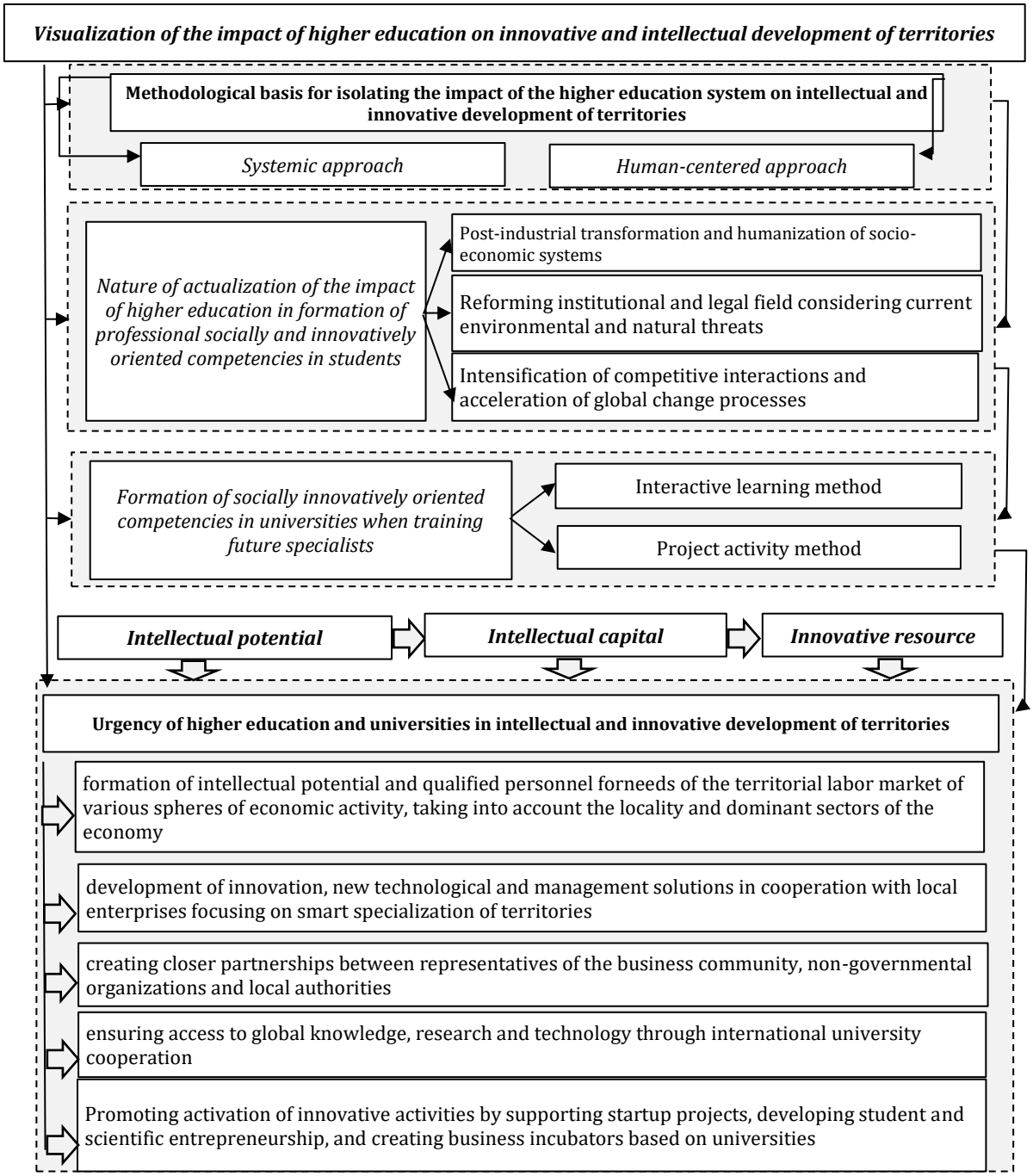
Human-centered and systemic approaches, which were defined as the methodological basis of the study, make it possible to highlight the need to form certain internal potentials of university students within formation of socially innovatively oriented competencies, which can be achieved through formation of internal motivation, personal qualities, skills based on knowledge of strategies, methods, tools for implementing innovative activities and reflection as the ability of an individual to assess their position, capabilities to requirements and interests of territorial intellectual and innovative development. For formation of socially innovatively oriented competencies in universities when training future specialists, it is necessary to implement:

- first, methods of interactive learning and density of student interaction. Interactive learning involves involvement of each student in active search for the solution to the problem, exchange of ideas about innovations, impetus for making non-standard, creative decisions, exchange of information. Interactive learning increases self-organization, contributes to acquisition of skills for independent planning of innovative activities, perception of information about innovations, regularly process new information, analyze it and accumulate new knowledge;
- second, the method of project activity, which forms socially innovatively oriented competencies in solving problems from a real project. Project activity contributes to formation of intellectual, special and general cultural knowledge and skills of students of various specialties, logical thinking that contributes to decision-making and independent planning.

Methods of interactive learning and project activities, forming socially and innovatively oriented competencies, develop in students the ability to creative, scientific and innovative activities, perception of innovations and innovative culture, readiness for self-development, purposefulness and making innovative decisions. Therefore, higher education increases intellectual capital, awareness among future

specialists of the need to form and apply components of socially and innovatively oriented competencies (Fig. 4).

Figure 3 – Visualization of the impact of higher education on innovative and intellectual development of territories



Source: developed by the authors.

Universities also activate innovative activities, technology transfer, and dissemination of innovations by stimulating partnerships with other scientific institutions and manufacturing enterprises, which is especially important for intellectual and innovative development of territories, laying foundation for generating knowledge and creating innovations.

Higher education plays an important role in innovative development of territories, as it has great influence both on formation of intellectual potential, and on innovative development of territories, taking into account their needs and characteristics. Among these features of intellectual and innovative development of territories, it should be noted:

- formation of intellectual potential and qualified personnel, including by formation of socially and innovatively oriented competencies in students, for needs of the territorial labor market of various spheres of economic activity, taking into account the area and dominant sectors of the economy, which have the greatest impact on formation of added value, thereby increasing competitiveness of territories. As well as creating conditions for continuous training, retraining and advanced training of personnel. At the same time, it is important to take into account territorial characteristics and needs of the local labor market when forming the educational component and directly socially and innovatively oriented competencies in students, this contributes to training of qualified personnel ready to work in the conditions of a specific territory;
- universities develop innovations, new technological and management solutions in cooperation with local enterprises, focusing on smart specialization of territories, which increases the level of efficiency of innovation activities, technology transfer and contributes to faster distribution of innovative products and services in both local and international markets;
- at the local level, universities are initiators of creating closer partnerships between representatives of the business community, non-governmental organizations and local authorities, which contributes to attracting investment resources to educational and scientific activities, including based on

public-private partnerships, which has positive impact both on creation of new knowledge and technologies, effective fundamental and applied research, and also on innovative activity of territories as a whole. It also makes it possible to intensify development and implementation of innovative and social projects taking into account territorial specific needs and increase socio-economic territorial development and standard of living of communities;

- Through international cooperation, universities provide access to global knowledge, research and technology, which contributes not only to meeting the needs of territories in specific innovations, implementing international research projects, attracting international investments, but also to integration of regions into the global economy and the exchange of experience;
- universities contribute to activation of innovative activity by supporting startup projects, developing student and scientific entrepreneurship, creating business incubators based on universities, which promotes development of innovative entrepreneurship, small and medium-sized businesses, provides new jobs, reducing unemployment. In turn, this contributes to increasing tax revenues to local budgets and self-development of territories on the intellectual and innovative basis;
- universities form open intellectual environment by creating platforms for exchange of ideas, experience and knowledge, which activates civic position of the population in intellectual and innovative development of territories,

The above emphasizes the impact of higher education on innovative and intellectual development of territories.

Discussion

Supporting the research (Ji Ming et al., 2023), it is appropriate to pay attention to justification of the urgency of adhering to innovative leadership and educating students according to their abilities through innovative and sustainable development of higher education. The authors are convinced. that promoting high-quality development of local universities is in demand and necessary. Scientists

explore how high-quality higher education can provide innovative approaches for making rational and effective decisions on economic development in the digital economy era.

The study (Popova L. et al., 2023) is well-founded and interesting, proving urgency of inclusiveness in higher education for sustainable and innovative development of the knowledge economy. The authors identified manifestations of inclusiveness in higher education that are most significant for sustainable and innovative development of the knowledge economy at moderate and high levels of higher education development.

Important are the results of scientific papers (Zhavoronok A. et al., 2021; Tulchynska S. et al., 2021; Butko M. et al., 2020), where authors consider the integrated model of financing higher education, investigate the role of higher education in formation of eco-industrial parks and features of formation of the regional industrial cluster as the innovative factor in development of the region.

Pedro Eugénia de Matos et al. (2020) analyze peculiarities of stakeholders' perception of the impact associated with various components of intellectual capital on the practice of sustainable development of higher education institutions and innovative development. Scientists believe that based on results of empirical research, it is necessary to provide more detailed information on the policy and practice of university development based on sustainability and innovative development of regions. It is also appropriate to note relevance of the study (Tulchynska S., et al., (2021), within the framework of which the authors carried out modeling and forecasting of innovative activity of regions.

Agreeing with the authors (Kashyap Ankur et al., 2019), it is appropriate to emphasize that at present contribution of universities to development of the economy and society as a whole is under constant assessment. Indeed, one of the important parameters that is taken into account in their effectiveness is generation of intellectual capital. The results of the authors' analysis demonstrate significant positive relationship between policy, incentives, research center, universities, which certainly affects intellectual development of theories.

The analysis of existing scientific works and the research conducted within the framework of this article substantiate the need for further analysis and identification of opportunities, problems, and challenges for higher education in modern realities.

Conclusions

Higher education not only provides increase in intellectual potential, laying foundation for formation of new ideas, technologies and business models, management decisions, but also forms changes that stimulate innovative development of territories, contributing to economic growth, increasing competitiveness of territories, social stability and improving quality of life of the population. Universities, providing training of qualified personnel taking into account needs of territories, form knowledge, determine development of science, technology and innovative entrepreneurship, which is facilitated by the socially and innovatively oriented competencies of young specialists.

The scientific novelty of the study lies in proving impact of the higher education system on intellectual and innovative development of territories using the methodology of systemic and human-centered approaches, which made it possible, based on identifying the nature of causes of actualization of the impact of higher education in formation of professional socially and innovatively oriented competencies in students, to substantiate the use of interactive learning methods and project activities as principles of formation of socially and innovatively oriented competencies. competencies in universities when training future specialists, which will contribute to activation of intellectual and innovative development of territories.

Substantiation of methodological basis of the study using systemic and human-centered approaches made it possible to focus on formation of necessary professional social and innovative competencies in students at universities using interactive learning methods and project activities, which ensures formation of students' ability to creative, scientific and innovative activities, perception of

innovations and innovative culture, readiness for self-development, purposefulness and making innovative decisions. This contributes to the growth of intellectual potential, latent abilities of individuals and transition of intellectual potential into capital, which ensures intellectual and innovative development of territories.

Relevence of higher education in intellectual and innovative development of territories has been proven, taking into account the fact that higher education has great impact both on formation of intellectual potential of territories, and on innovative development of territories, taking into account their needs and characteristics.

Further research is required on issues related to development of mechanisms and tools for establishing closer relationships between universities and local authorities, stakeholders, and the public to activate innovative developments and their implementation in production, taking into account needs and capabilities of territories.

REFERENCES

Alaa Eldin Abdel Hamid Ayoub, Soud Mohammad Almahamid, Luma F. Al Salah. (2023). Innovative work behavior scale: development and validation of psychometric properties in higher education in the GCC countries. *European Journal of Innovation Management, 26*(1), 119-133. DOI: 10.1108/EJIM-04-2021-0176.

Alves-Noreña, Alba Catherine, Rodríguez-Conde, María José, Hernández-Ramos, Juan Pablo. (2024). Empowering the Development of Higher Education Counselors Teacher: Innovative Training Strategies to Strengthen Competency in Student Mentoring. *Proceedings of TEEM 2023: The Eleventh International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 1497-1506). https://doi.org/10.1007/978-981-97-1814-6_149.

Butko, M., Ivanova, N., Popelo, O., Samiilenko, G. (2020). Conceptual foundations of the regional industrial cluster formation based on European experience and leading world tendencies. *Financial and credit activity: Problems of theory and practice, 1*(32), 319-329. https://doi.org/10.18371/fcaptp.v1i32.200528.

Hutahaean, Berman, Telaumbanua, Sadieli, Tamba, Losten, Hutabarat, Renato Gema Nugraha. (2024). Analysis of Innovative and Adaptive Higher Education Curriculum Development to Education 5.0 Based Challenges in Indonesia. International Journal of Learning, Teaching and Educational Research, *23*(4), 76-98.

Ji, Ming, Jiao, Yiwen, Cheng, Na. (2023). An Innovative decision-making scheme for the high-quality economy development driven by higher education. *Journal of Innovation & Knowledge, 8*(2), 100345. https://doi.org/10.1016/j.jik.2023.100345.

Kashyap, Ankur, Agrawal, Rajat. (2019). Scale development and modeling of intellectual property creation capability in higher education. *Journal of Intellectual Capital, 21*(1), 115-138. https://doi.org/10.1108/JIC-09-2018-0168.

Kholiavko, N., Popelo, O., Hryhorkiv, M., Kosmii, O., Oleksiienko, O., Zhavoronok, A. (2023). EU higher education institution toward the sustainable development. *Management Theory and Studies for Rural Business and Infrastructure Developmente, 46*(2), 124-132. https://ejournals.vdu.lt/index.php/mtsrbid/article/view/4739/2760

Li, Dan. (2024). Innovative Development of Civic and Political Education in Higher Vocational Colleges and Universities in the Context of Multiculturalism. *Applied Mathematics and Nonlinear Sciences, 9* (1), https://doi.org/10.2478/amns-2024-0481.

Pedro, Eugénia de Matos, Leitão, João, Alves, Helena. (2020). Stakeholders' perceptions of sustainable development of higher education institutions: an intellectual capital approach. *International Journal of Sustainability in Higher Education, 21*(5), 911-942. https://ui.adsabs.harvard.edu/link_gateway/2020IJSHE..21..911P/doi:10.1108/IJSHE-01-2020-0030.

Plietzsch, S., Brunmayr, S., Brunner, S. and Lehmann, C. (2024). Increasing the attitudes toward sustainable development through mindfulness: an innovative approach for higher education institutions. *International Journal of Sustainability in Higher Education*, ahead-of-print, No. ahead-of-print. https://doi.org/10.1108/IJSHE-06-2024-0418.

Popelo, O., Kholiavko, N., Safonov, Y., Shaposhnykov, K., Babukh, I., Yamniuk, B. (2024). GLOBAL TRENDS OF UNIVERSITIES DIGITALIZATION UNDER THE SUSTAINABLE DEVELOPMENT CONCEPT. *Management Theory and Studies for Rural Business and Infrastructure Development*, *46*(4), 473–481. https://doi.org/10.15544/mts.2024.44

Popova, L., Dugina, T., Shaldohina, S., Nemkina, E. (2023). The Value of Higher Education Inclusiveness for Sustainable and Innovative Development of the

Knowledge Economy. *Studies in Critical Social Sciences, 254,* 120-124. https://doi.org/10.1163/9789004540019_011.

Shevchuk, N., Tulchynska, S., Severyn-Mrachkovska, L., Pidlisna, O., & Kryshtopa, I. (2021). Conceptual Principles of the Transformation of Industrial Parks into Eco-Industrial Ones in the Conditions of Sustainable Development. *IJCSNS International Journal of Computer Science and Network Security, 21*(12), 349-355. https://doi.org/10.22937/IJCSNS.2021.21.12.49.

Toti, Luciana, Cina, Elda. (2024). Sustainable development of scientific research infrastructure for quality and innovative higher education in the field of information technology. *Journal of Theoretical and Applied Information Technology, 102*(17), 6396-6415.

Tulchynska, S., Popelo, O., Tulchynckiy, R., Khanin, S., Hrechko, A. (2021). Modeling and forecasting of the integrated index of innovation activity of regions. *Management Theory and Studies for Rural Business and Infrastructure Development, 43*(2), 307-315. https://doi.org/10.15544/mts.2021.27.

Tulchynska, S., Shevchuk, N., Kleshchov, A., Kryshtopa, I., Zaburmekha, Ye. (2021). The Role of Higher Education Institutions in the Development of EcoIndustrial Parks in Terms of Sustainable Development. *IJCSNS International Journal of Computer Science and Network Security, 21*(10), 317-323. https://doi.org/10.22937/IJCSNS.2021.21.10.45.

Zhavoronok, A., Kholiavko, N., Shaposhnykov, K., Krylov, D., Morozova, L., Babiak, N. (2021). Integrated Model of the Higher Education Financing Under the Quadruple Helix Concept. *International Journal of Computer Science and Network Security*, 21(7), 125-132. https://doi.org/10.22937/IJCSNS.2021.21.7.16.