

INTELLECTUALIZATION OF HIGHER EDUCATION IN THE KNOWLEDGE ECONOMY PARADIGM AS A DRIVER OF THE DEVELOPMENT OF SOCIETY'S INNOVATIVE RESILIENCE

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Intellectualization of Higher Education in the Knowledge Economy Paradigm as a Driver of the Development of Society's Innovative Resilience

The article examines the essence and characteristics of the intellectualization of higher education in the context of the knowledge economy and substantiates its role in shaping the innovative resilience of society. It is determined that in the current conditions knowledge, information, and human capital are becoming key factors in socioeconomic development, while higher education is acquiring strategic importance as an institution for shaping the intellectual potential of the State. The transformation of the university's role from a traditional educational institution to a center for generating innovation, scientific research, and inter-institutional interaction is revealed. The main conceptual approaches to the study of the knowledge economy, human capital, the research and entrepreneurial university, as well as the conceptions of resilience and innovative sustainability, are analyzed. It is substantiated that the intellectualization of higher education fosters the development of critical thinking, interdisciplinary competencies, digital skills, and adaptive capabilities necessary for society to function in conditions of global instability and technological transformations. The article demonstrates the cyclical nature of the interaction between the knowledge economy, the intellectualization of higher education, and the innovative resilience of society. It has been found that the knowledge economy generates demand for new competencies and innovations, the higher education system creates human capital and scientific and technological outcomes, and innovative resilience ensures society's ability to adapt to crises and use them as a source of development. A comparative analysis of Ukraine with leading countries in innovative development – Finland, Israel, and South Korea – was conducted based on indicators of R&D spending, the number of researchers, and rankings in the Global Innovation Index. Structural problems in the Ukrainian innovation system were identified, in particular insufficient funding for science and a decline in scientific potential. At the same time, it was found that Ukraine retains significant innovation potential thanks to the development of the IT sector, human capital, and scientific and engineering traditions. It is substantiated that investments in higher education, science, and innovation infrastructure should be viewed as a strategic foundation for ensuring long-term competitiveness and the postwar recovery of the State.

Keywords: knowledge economy; intellectualization of higher education; human capital; innovation stability; resilience; research university; entrepreneurial university; innovative development; digital transformation; innovation ecosystem.

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Кагановська Т. Є., Прохорова В. В. Інтелектуалізація вищої освіти в парадигмі економіки знань як рушій розвитку інноваційної стійкості суспільства

У статті досліджено сутність та особливості інтелектуалізації вищої освіти в умовах розвитку економіки знань та обґрунтовано її роль у формуванні інноваційної стійкості суспільства. Визначено, що в сучасних умовах знання, інформація та людський капітал перетворюються на ключові чинники соціально-економічного розвитку, а вища освіта набуває стратегічного значення як інститут формування інтелектуального потенціалу держави. Розкрито трансформацію ролі університету від традиційної освітньої установи до центру генерації інновацій, наукових досліджень і міжінституційної взаємодії. Проаналізовано основні концептуальні підходи до дослідження економіки знань, людського капіталу, дослідницького та підприємницького університету, а також концепції резильєнтності та інноваційної стійкості. Обґрунтовано, що інтелектуалізація вищої освіти забезпечує формування критичного мислення, міждисциплінарних компетентностей, цифрових навичок та адаптивних можливостей, необхідних для функціонування суспільства в умовах глобальної нестабільності та технологічних трансформацій. У статті доведено циклічний характер взаємодії економіки знань, інтелектуалізації вищої освіти та інноваційної стійкості суспільства. Встановлено, що економіка знань формує попит на нові компетентності та інновації, система вищої освіти створює людський капітал і науково-технологічні результати,

-а інноваційна стійкість забезпечує здатність суспільства адаптуватися до кризових явищ і використовувати їх як джерело розвитку. Проведено порівняльний аналіз України з країнами-лідерами інноваційного розвитку – Фінляндією, Ізраїлем та Південною Кореєю – за показниками витрат на R&D, кількості дослідників та позицій у GlobalInnovationIndex. Виявлено структурні проблеми української інноваційної системи, зокрема недостатній рівень фінансування науки та скорочення наукового потенціалу. Водночас встановлено, що Україна зберігає значний інноваційний потенціал завдяки розвитку IT-сектора, людському капіталу та науково-інженерним традиціям. Обґрунтовано, що інвестиції у вищу освіту, науку та інноваційну інфраструктуру мають розглядатися як стратегічна основа забезпечення довгострокової конкурентоспроможності та повоєнного відновлення держави.

Ключові слова: економіка знань; інтелектуалізація вищої освіти; людський капітал; інноваційна стійкість; резильєнтність; дослідницький університет; підприємницький університет; інноваційний розвиток; цифрова трансформація; інноваційна екосистема.

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Introduction. In the context of digitalization, technological transformations, and global instability, knowledge and intellectual capital are becoming key factors in societal development. The knowledge economy is transforming traditional models of economic growth. It is leading to an increased role for higher education as an institution for the formation of human capital and innovative potential. Therefore, in the context of global crises, military challenges, and labor market transformations, the intellectualization of higher education is becoming a priority. It is increasingly viewed as the foundation for building a society's innovative resilience, which entails the ability to adapt to change and use crises as a source of development.

For Ukraine, this issue is particularly relevant in the context of full-scale war and the need for post-war reconstruction. This is because the higher education system is capable of training a new generation of specialists, fostering innovative thinking, and developing the country's research potential. Furthermore, the intellectualization of the educational environment contributes to strengthening society's adaptability and enhancing the competitiveness of the national economy amid global transformations.

Analysis of recent studies and publications. The issue of the intellectualization of higher education within the knowledge economy paradigm is interdisciplinary in nature and draws upon research dedicated to the role of knowledge, human capital, innovation systems, and the sustainability of social development. The theoretical foundations of the knowledge economy were laid in the works of F. Mahleup [1], P. F. Drucker [2], P. M. Romer [3], and G. S. Becker [4].

F. Mahleup [1] was one of the first to substantiate the importance of knowledge as an independent economic resource that influences the structure of production, employment, and social development. P. F. Drucker [2] viewed knowledge as a key factor in the transition to a new type of society, in which intellectual labor, managerial competencies, and the capacity for innovation play a decisive role. P. M. Romer [3], within the framework of endogenous growth theory, demonstrated that technological change, the accumulation of knowledge,

and the development of human potential are internal sources of economic growth. G. S. Becker [4] formulated the conceptual foundations of human capital theory, according to which education, vocational training, and the development of human abilities constitute long-term investments in productivity and social welfare.

Significant contributions to the study of university transformation and the strengthening of their role in innovative development were made by: B. R. Clark [5] (who substantiated the concept of the entrepreneurial university, capable not only of transmitting knowledge but also of producing innovations and interacting with the market, the state, and society); L. Leidesdorf and G. Itskovitz [6] (who developed the "triple helix" model, within which universities, business, and the state form an interconnected innovation ecosystem).

In the context of this topic, these approaches are important because they allow us to view higher education as an active institutional mechanism for the development of the knowledge economy and the innovative resilience of society.

The work of K. S. Holling [7] is of methodological significance for understanding innovative resilience, in which resilience is interpreted as a system's ability to maintain functionality and adapt to change. Within the framework of contemporary educational and socio-economic issues, this idea plays an important role, as the intellectualization of higher education fosters the development of adaptive, critical, and innovative thinking, which is necessary for overcoming crises.

Contemporary aspects of digital transformation, human capital, and innovative development are explored in the works of A. Kolot and O. Gerasymenko [8], A. Ilyina [9; 11], T. Palienko [10], O. V. Pysarchuk [12], O. Dudnik, M. Maiboroda, S. Minenko [13], and D. A. Tereshchenko [14]. A. Kolot and O. Gerasymenko [8] focus on digital transformation and new business models as factors driving changes in social and labor relations and the formation of a non-standard employment economy. A. Ilyina [9; 11] considers human capital as an innovative resource of the economy and an object of investment valuation. T. Palienko [10] defines human capital as an important

component of the innovation ecosystem. O. V. Pysarchuk [12] examines the financing of higher education through the lens of its delayed impact on human capital. O. Dudnik, M. Maiboroda, and S. Minenko [13] emphasize the importance of human capital as the foundation of an innovative organization and the development of a successful enterprise. D. A. Tereshchenko [14] analyzes human capital as a factor in the sustainable development of Ukraine's regions.

Evolutionary and systemic approaches to innovative development are presented in the works of R. R. Nelson and S. J. Winter [15], B.-O. Lundvall [16], K. Freeman and L. Soete [17], and R. R. Nelson [18]. In these studies, innovation is viewed as the result of the interaction of knowledge, institutions, technologies, entrepreneurial activity, and public policy. For the topic of the intellectualization of higher education, these approaches are important because they allow for the justification of the university not only as an educational institution but as an element of the national innovation system that shapes society's intellectual potential.

Issues related to the development of higher education, the research capacity of universities, open science, and the evaluation of educational quality in the context of European integration are explored in the works of V. I. Lugovoy, I. I. Drach, O. M. Petrov, and I. Yu. Regeilo [19], as well as in the methodological recommendations of O. Vorobyova, M. Debych, V. Lugovoy, O. Orzhel, O. Slyusarenko, Zh. Talanova, and K. Tryma [20]. These works are valuable for substantiating the role of universities in shaping research potential.

Identification of previously unresolved aspects of the general problem. Despite a significant number of scientific works devoted to the knowledge economy, human capital, digital transformation, and innovative development, the relationship between the intellectualization of higher education and the formation of a society's innovative resilience remains under-researched. Most scientific approaches focus primarily on the economic aspects of knowledge, the development of human capital, or the transformation of the labor market, whereas the role of higher education as a systemic driver of adaptability, societal resilience, and innovative renewal requires further theoretical justification.

Formulation of the article's objective (statement of the problem). The objective of the article is to examine the essence and characteristics of the intellectualization of higher education within the knowledge economy paradigm, as well as to substantiate its role as a driver of the development of society's innovative resilience.

Description of the methodology (structure, sequence) of the research. The methodological basis of the study consists of systemic, interdisciplinary, and structural-logical approaches, which enabled a comprehensive investigation of the processes of knowledge economy development, the intellectualization of higher education, and the formation of society's innovative resilience. The study employs general scientific and specialized methods of scientific inquiry, including methods of analysis and synthesis, scientific abstraction, logical generalization, comparison, systematization, and structural-functional analysis.

To study the transformation of the role of higher education in the context of the knowledge economy, systemic and structural-functional approaches were applied, which made it

possible to identify current trends in the development of universities and their role in shaping society's human and innovative potential. A conceptual analysis of the relationship between the intellectualization of higher education and the innovative resilience of society was conducted based on a comprehensive approach to considering education, science, and innovation as interrelated elements of a unified development system.

The analytical part of the study was based on methods of statistical, comparative, and graphical analysis. International indicators of innovative development were used to assess current trends, and the results of the study are summarized in the form of tables, figures, and analytical characteristics.

Presentation of the main material and scientific results obtained. In the second half of the 20th century, there was a gradual transition from an industrial to a post-industrial model of development, within which knowledge began to be viewed as its key resource. The term "knowledge economy" gained widespread use thanks to the works of F. Machlup [1], who was one of the first to study the role of knowledge in the structure of the national economy, as well as P. Drucker [2], who substantiated the concept of the "knowledge worker" as a new type of human capital.

Unlike the classical economic system, where land, labor, and capital were the dominant factors of production, the knowledge economy is based on society's intellectual potential. In such conditions, knowledge acquires the status of a strategic resource characterized by inexhaustibility and the ability to self-replicate. The use of knowledge does not diminish its volume; on the contrary, it fosters the emergence of new ideas, technologies, and management decisions. In the cost structure of modern companies, intangible assets – patents, software, brands, databases, and intellectual property – play an increasingly significant role.

The further development of the knowledge economy concept is linked to Paul Romer's theory of endogenous economic growth [3], according to which technological progress is the result of targeted investments in research, innovation, and human capital, rather than an external factor in economic development. According to this concept, the accumulation and dissemination of knowledge determine a country's long-term economic growth rates.

G. Becker's theory of human capital [4] demonstrates that investments in education, professional development, and skill enhancement yield a higher economic return compared to investments in physical capital.

Thus, the knowledge economy shapes a new logic of social development, in which a country's competitiveness is determined not so much by the volume of its natural resources or production capacity as by its ability to generate, accumulate, and commercialize new knowledge. However, realizing the potential of the knowledge economy is impossible without an appropriate institutional system – the higher education sector, which ensures the reproduction of intellectual capital.

In the context of the knowledge economy, the role of higher education is undergoing a transformation. While the traditional model of higher education was primarily focused on the transmission of accumulated knowledge and the preservation of cultural heritage, the modern university increasingly serves as a generator of innovation and new knowledge. Accordingly, the nature of the educational process is changing,

shifting from reproductive learning to the development of an individual's creative and research potential.

The theoretical rationale for such changes is presented in a number of conceptual models of university development. First and foremost, this refers to the research university model, which is based on the unity of scientific activity and the educational process. In modern conditions, this model is implemented through project-based learning, research laboratories, startup centers, and the integration of students into real scientific research.

The further development of this idea is reflected in the concept of the entrepreneurial university proposed by B. Clark [5]. According to this concept, the university ceases to be merely a supplier of personnel for the economy and transforms into an active participant in innovation processes, creating its own startups, commercializing research results, and developing partnerships with business.

An important extension of these approaches was the "triple helix" concept by G. Itskovitz and L. Leidesdorf [6], which views innovative development as the result of the interaction between three key actors – the university, business, and the state. In this model, the university acts not as a supporting structure but as an equal participant in the formation of an innovation ecosystem.

As a result of these transformations, a process of intellectualization of higher education is taking place, which involves not only improving the content of curricula but also changing the university's mission. The educational process is focused on developing metacognitive skills, critical thinking, interdisciplinary collaboration, digital literacy, and the ability to work under conditions of uncertainty. In effect, the university is transforming into an institution that does not merely pass on accumulated experience but shapes the future trajectories of societal development.

At this stage, a logical connection emerges between the intellectualization of education and the innovative resilience of society. If the knowledge economy creates demand for new competencies and the university meets that demand, the result of this process is an increase in the socio-economic system's ability to effectively respond to external challenges.

The concept of resilience, introduced by K. Holling for the analysis of ecosystems, was later adapted to socio-econom-

ic research and began to be viewed as a system's ability to maintain functionality while simultaneously transforming under the influence of external changes. Innovative resilience represents a higher level of development of this concept, as it involves not only adapting to change but also actively using crisis situations as a source of development.

An innovation-resilient society is characterized by the presence of three interrelated capabilities: absorptive, adaptive, and transformational. Absorptive capacity ensures the rapid assimilation of new knowledge and technologies; adaptive capacity – the restructuring of institutional mechanisms and management models; and transformational capacity – the creation of new structures and practices in response to long-term challenges. As a result, society not only reacts to changes but also anticipates them by constantly generating innovative solutions.

Thus, the knowledge economy, the intellectualization of higher education, and the innovative resilience of society form a single cyclical system of development. The knowledge economy generates demand for new competencies and innovations; the intellectualization of higher education creates human capital, scientific results, and technologies; and society's innovative resilience ensures the effective use of these resources for its development. At the same time, successful innovations generate new knowledge and incentives for the further development of education, forming a self-reinforcing cycle of social progress.

For a more thorough understanding of the interrelationship between the knowledge economy, the intellectualization of higher education, and society's innovative resilience, it is advisable to consider these concepts not in isolation but as complementary elements of a unified development system. Each of the paradigms presented reflects a distinct aspect of the transformation of modern society: the knowledge economy defines a new logic of economic growth, the intellectualization of higher education shapes the mechanism for creating human capital and innovation, and the concept of innovation resilience characterizes society's ability to adapt and transform in response to global challenges.

A summary of the key characteristics of these concepts, their theoretical foundations, and practical manifestations is presented in Table 1.

Table 1

Comparative characteristics of the knowledge economy paradigm, models of intellectualization of higher education, and the concept of innovative sustainability

Concepts/Models	Essence	Characteristics	Representatives	Practical implementation
1	2	3	4	5
Knowledge Economy	Knowledge and intellectual activity are becoming the main driver of economic development	The dominance of intangible assets; innovation-driven growth; the strategic role of human capital; the inexhaustibility of knowledge	F. Mahleup, P. Drucker, P. Romer, G. Becker	Development of high-tech industries, the digital economy, and innovative entrepreneurship
Human capital theory	Investments in education and competencies shape economic productivity	Education as a form of investment; growth in labor productivity; accumulation of competencies	G. Becker	Building a competitive workforce

1	2	3	4	5
The research university model	Integration of research and the educational process	Project-based learning; research laboratories; engaging students in science	W. von Humboldt	Research and educational centers and university laboratories
The entrepreneurial university model	The university becomes an active participant in economic processes	Commercialization of knowledge; startups; patenting; collaboration with business	B. Clark	Spin-offs, technology parks, innovation hubs
The "triple helix" model	Innovation arises from the interaction between the university, business, and the state	Institutional interaction; joint innovation; integration of science and the economy	G. Itskovitz, L. Leidesdorf	Innovation ecosystems and partnership clusters
Intellectualization of higher education	The university is shifting from knowledge transfer to shaping the future	Interdisciplinarity; critical thinking; digital and entrepreneurial competencies; metacognitive skills	A. Kolot, V. Lugovyi, Zh. Talanova	Next-generation educational platforms, adaptive learning
The concept of resilience	A system capable of maintaining functionality under the influence of crises	Adaptability; flexibility; recovery from disturbances	K. Holling	Crisis management and adaptive systems
Innovative resilience	Society uses crisis as a source of renewal	Absorptive, adaptive, and transformational capacity; generation of new solutions	R. Nelson, S. Winter, B.O. Lundvall, K. Freeman, L. Suele, and others	Technological modernization, institutional transformations, development of innovation ecosystems
Integrated outcome	Formation of a self-reinforcing cycle of "knowledge – education – innovation – development"	Continuous reproduction of knowledge, competencies, and innovations	Comprehensive interdisciplinary approach	Enhancing competitiveness and long-term sustainability of society

Source: summarized by the authors based on [1–8; 15–20]

The knowledge economy, the intellectualization of higher education, and the innovative resilience of society do not constitute isolated areas of development, but rather an interconnected system within which each element serves simultaneously as both a result and a prerequisite for further transformations. Their interaction is cyclical rather than linear, as changes in one sphere trigger structural shifts in others, forming a self-reinforcing mechanism of social development. The starting point of this process is the knowledge economy, which creates demand for a new type of human capital and a new model of education. In today's environment, the labor market requires professionals who possess critical thinking, creative abilities, skills in interdisciplinary collaboration, and the ability to adapt quickly to technological changes.

As a result, the traditional higher education system, focused primarily on the transmission of ready-made knowledge, is gradually transforming into an intellectualized model centered on the development of individuals' innovative and research potential.

The intellectualization of higher education serves as a response to the challenges of the knowledge economy and ensures the formation of a new quality of human capital. Universities are increasingly functioning not only as educational institutions but also as centers of science and innovation that generate new knowledge, technologies, and management so-

lutions. Within this approach, the educational process is integrated with research activities, the development of a startup culture, the commercialization of research outcomes, and active engagement with business and the state. Consequently, the university becomes a key institution for shaping society's intellectual potential and a catalyst for innovative processes.

The flow of knowledge, competencies, and technologies formed within the system of intellectualized education creates the foundation for the development of a society's innovative resilience. Unlike the traditional understanding of resilience as the ability to maintain stability, innovative resilience implies the capacity of a socio-economic system not only to adapt to change but also to use crises as a source of renewal and development. It is precisely the constant creation of new knowledge, solutions, and competencies that ensures society's ability to respond quickly to challenges, restructure institutional mechanisms, and form new models of economic and social development.

Innovative resilience does not conclude this process but returns it to its starting point, deepening the knowledge economy. Successful innovations stimulate growth in demand for highly qualified personnel, increase the importance of scientific research, and contribute to increased investment in education and science. Thus, a cyclical development mechanism is formed, within which the knowledge economy generates de-

mand for intellectualized education, education creates innovation and human capital, and innovative resilience ensures the long-term adaptability and competitiveness of society.

A distinctive feature of this system is its high interdependence. A disruption in any of its links weakens the functioning of the entire model. In particular, if the education system remains predominantly transmissive and fails to meet the needs of the knowledge economy, society loses the ability to develop the necessary level of innovative potential. Similarly, if knowledge is generated but not integrated into economic practice and not commercialized, innovative development slows down, and investments in education lose their strategic effectiveness.

Thus, the intellectualization of higher education is not merely a direction for modernizing the educational system, but a comprehensive societal project that determines the potential for the development of the knowledge economy and the formation of the state's innovative resilience. It is the interaction of knowledge, education, and innovation that creates the foundation for society's long-term competitiveness amid global instability and technological transformations. The cyclical nature of

the interaction between the knowledge economy, the intellectualization of higher education, and the innovative resilience of society is illustrated in Fig. 1.

Practical confirmation of the interconnection between the development of the knowledge economy, the intellectualization of higher education, and the innovative resilience of society requires an assessment of key indicators of a country's innovative development.

Assessing a country's innovation resilience requires analyzing not only the overall level of innovation development but also the country's ability to build, sustain, and transform innovation potential over the long term.

To this end, it is advisable to use a set of indicators that characterize the resource base of the research sector, human capital, the level of innovation activity, and the effectiveness of transforming knowledge into practical results.

A comparative analysis of Ukraine with leading countries in innovation development – Finland, Israel, and South Korea – reveals both the structural weaknesses of Ukraine's innovation system and its hidden potential.

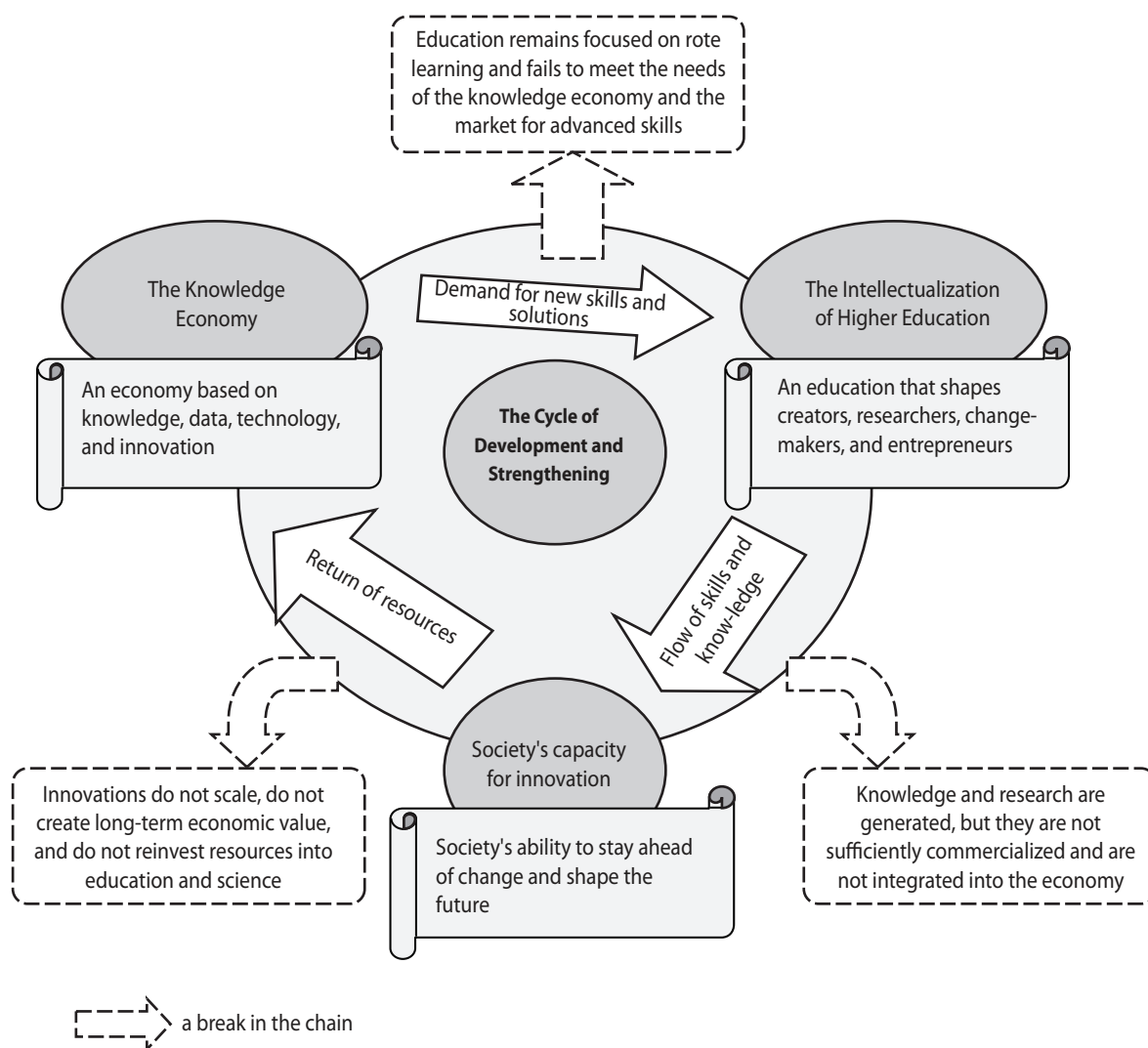


Fig. 1. A cyclical model of the interrelationship between the knowledge economy, the intellectualization of higher education, and the innovative resilience of society

Source: authors' own work

One of the key indicators of innovation resilience is the share of expenditures on research and development (R&D) in GDP (Fig. 2).

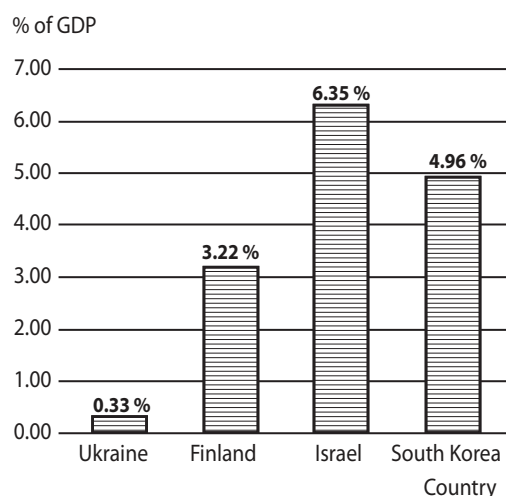


Fig. 2. Comparison of R&D Expenditures (% of GDP)

Source: constructed by the authors based on data from [22]

As shown in Fig. 2, the level of R&D funding in Ukraine remains critically low compared to the world's leading innovative economies. In 2023, Ukraine allocated only 0.33% of GDP to R&D, while Israel invested 6.35% of GDP, South Korea 4.96%, and Finland 3.22% of GDP. Thus, Ukraine spends nearly 10 times less on research than Finland and nearly 20 times less than Israel, which indicates systemic underfunding of the science and innovation sector.

Another equally important indicator is the staffing of research and development activities.

The number of researchers per 1 million people reveals a significant gap between Ukraine and the leading countries in innovation development (Fig. 3).

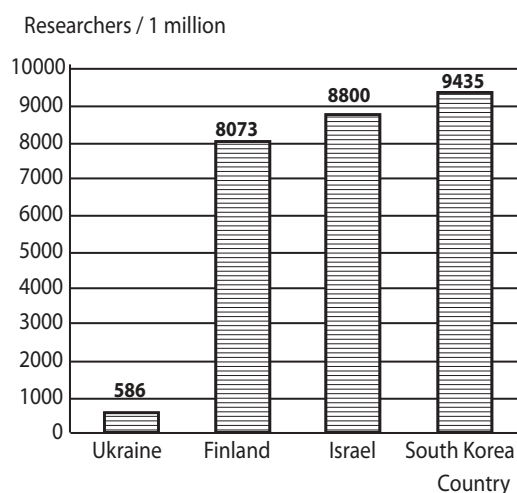


Fig. 3. Number of R&D researchers per 1 million population

Source: constructed by the authors based on data from [22]

Thus, in 2022, Ukraine had only 586 researchers per 1 million population, while in Finland this figure stood at 8,073,

and in South Korea—9,435 (for Ukraine, complete official data on R&D expenditures as a percentage of GDP for 2025 are currently unavailable). Even in international databases (World Bank, UNESCO UIS, OECD), the latest fully verified data for most countries are available only for 2023–2024. Therefore, 2022 was used for comparative analysis). The relevant data indicate a massive loss of scientific potential caused by chronic underfunding of science, labor migration, and the negative consequences of a full-scale war.

At the same time, an analysis of the Global Innovation Index (GII) reveals the ambiguity of Ukraine's position within the global innovation system. The dynamics of changes in the rankings of Ukraine, Finland, Israel, and South Korea in the Global Innovation Index for 2020–2025 are presented in Fig. 4.

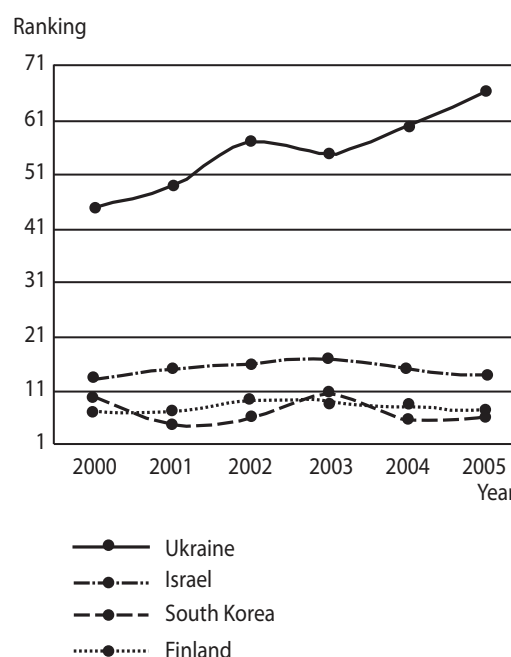


Fig. 4. Changes in the rankings of Ukraine, Finland, Israel, and South Korea in the Global Innovation Index from 2020 to 2025 (lower ranking = higher position)

Source: constructed by the authors based on data from [21]

As shown in Fig. 4, Ukraine exhibits a negative trend in its GII rankings during 2020–2025, largely due to the consequences of full-scale war, structural underfunding of science, and the reduction of innovation infrastructure. At the same time, Finland, Israel, and South Korea maintain consistently high positions in the ranking, which indicates the systematic nature of their innovation policies and a high level of support for the R&D sector.

A summary of the key indicators of innovation resilience for Ukraine and leading countries is presented in Table 2.

As shown in Table 2, in 2025 Ukraine ranked 66th among 139 economies worldwide, having fallen in the rankings compared to 2020.

The gap between the GII Inputs Rank and GII Outputs Rank sub-indices is particularly striking: in terms of resource provision for innovation, Ukraine ranks only 80th, while in terms of innovation outcomes, it ranks 54th. By comparison,

Table 2

Comparative indicators of innovation resilience

Indicator	Ukraine	Finland	Israel	South Korea
GII ranking 2025	66	7	14	6
R&D / GDP	0.33%	3.22%	6.35%	4.96%
Researchers / 1 million population	586	8,073	~8,800	9,435
GII Inputs Rank	80	4	14	5
GII Outputs Rank	54	11	14	7
IT exports	\$6.7 billion	–	~\$25 billion	~\$100 billion

Source: compiled by authors based on [21; 22; 23]

Finland consistently ranks in the top ten, while Israel and South Korea hold positions among the global innovation leaders.

This imbalance suggests the existence of a phenomenon of “effective poverty” in Ukraine’s innovation system. Its essence lies in the fact that Ukraine demonstrates relatively high innovation performance even with minimal financial and institutional support. This is largely explained by the preservation of a strong tradition in mathematics and engineering, established in previous decades, as well as the development of the IT sector, which has become one of the key drivers of the country’s digital economy.

Despite general structural problems, certain process indicators point to the adaptive potential of Ukraine’s innovation system. In particular, in 2023, Ukraine demonstrated the highest growth in utility model applications among the top 10 countries—+46.2% compared to the previous year. This indicates that innovation activity has persisted even amid military instability. Further evidence of this innovative resilience is the development of the IT sector, which employs approximately 307,000 specialists and generates roughly \$6.7 billion in export revenue. At the same time, Ukraine holds a leading position in Europe in terms of the number of R&D centers in the field of information technology, and most IT companies were able to retain international contracts even after the start of the full-scale invasion.

The data reveal a strategic paradox in Ukraine’s development. Despite limited financial resources and the negative impact of the war, the country maintains a relatively high level of innovation performance thanks to the quality of its human capital and the development of the IT sector. However, the continued functioning of this model without systematic investments in science, higher education, and R&D infrastructure is unsustainable in the long term. In this regard, reinvestment in higher education, research, and innovation infrastructure should be viewed not as an expense but as a strategic foundation for post-war recovery and ensuring the country’s innovation resilience.

Conclusions. The study found that the intellectualization of higher education is a key prerequisite for the development of a knowledge economy and the formation of a society’s innovative resilience. It is demonstrated that, under current conditions, the role of universities is undergoing a significant transformation – they are becoming not only educational institutions but also centers for scientific research, innovation, and the development of human capital. It has been demonstrated that the interaction between education, science, business, and

the state contributes to the development of an innovation ecosystem and enhances society’s adaptability to global challenges and technological changes.

The analysis conducted showed that a country’s innovative resilience depends to a significant extent on the level of development of higher education, the research sector, and the innovation infrastructure. It was found that Ukraine, despite existing structural problems and the impact of military challenges, retains its potential for development thanks to human capital, the IT sector, and scientific and technical resources. It has been established that investments in higher education, science, and innovation should be viewed as a strategic foundation for ensuring long-term competitiveness, technological modernization, and the country’s post-war recovery.

Prospects for further research lie in developing mechanisms for integrating higher education, science, and business to strengthen Ukraine’s innovative resilience amid global transformations.

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