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Monograph

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The monograph is devoted to the development of current theoretical foundations and practical recommendations for the formation of a marketing mechanism for managing the development of the innovative potential of the university ecosystem.

The monograph examines and summarizes theoretical approaches, substantiates and clarifies scientific provisions on the essence of innovative potential, develops a model for managing the development of the innovative potential of the university ecosystem, which is based on the interaction of science, business, education and government and its marketing positioning in the context of integration into the European Union. Based on the developed model, an organizational and economic mechanism for managing the development of the innovative potential of the university ecosystem is proposed, which includes a set of methods, principles, functions, organizational support for marketing positioning, in the combination and coordination of which actions it is possible for higher education institutions to achieve the main goal – effective management of the development of existing innovative potential.

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CONTENT

INTRODUCTION

Conceptualization of the phenomenon of social risks and uncertainty during the pandemic and military operations is impossible without determining the new social dispositions of youth both in a separate society and in the global society. Rapid social changes caused by the pandemic lead to uncertainty in society, to situational social anxiety. New social risks and challenges indicate new factors of the potential for uncertainty, which causes the emergence of new social, economic, medical, and cultural threats.

The processes of desocialization and resocialization of student youth during the pandemic, war, and self-isolation acquire new social characteristics. Disorganization of social ties during the pandemic and full-scale war also affects the structural marginality-periphery of student youth.

This work includes a comprehensive analysis of the theoretical foundations and practical recommendations for the formation of a marketing mechanism for managing the development of the innovative potential of the university eco-region, the creation of methodological tools for diagnosing the development of the university ecosystem, and the development of an organizational and economic mechanism for managing the development of innovative potential in order to form new approaches to structuring the university ecosystem.

The study was conducted within the framework of the joint Ukrainian-Turkish research project "Marketing Development of the University's Eco-Territory for Recreation of Post-COVID Individuals" (Contract No. M/43-2024 dated April 30, 2024), supported by the Ministry of Education and Science of Ukraine and the Scientific and Technological Research Council of Turkey (TÜBITAK).

CHAPTER 1
THEORETICAL AND METHODOLOGICAL APPROACHES TO MANAGING INNOVATIVE DEVELOPMENT OF THE UNIVERSITY ECOSYSTEM

Ecosystems, unlike conventional systems, are characterized by a strong internal unity, which is determined by their territorial localization, that is, they are an association of economic entities within a single territory. This condition allows intrasystem communities and individual participants to interact through the interference of inductive behavior, synchronizing the processes taking place in these communities [16]. The integrity and stability of ecosystems is ensured through the close interaction of ecosystem subsystems. The definition of "ecosystem" was introduced by A. Tansley, in a work devoted to ecology. In his study, an ecosystem was defined as a relatively stable system of dynamic equilibrium, which may consist of groups of living organisms, their environment, and a formed system of connections that allows for the exchange of energies between them, expressed in a certain form [110].

The general concept of an ecosystem can be applied at many levels or “units” of analysis, assuming some elasticity. In the economic context, the term “ecosystem” was first used by M. Rothschild [99]. He believes that, similarly to how a living organism can be defined by its genes and position in the food chain, an organization can be defined by its place in a network of customers, competitors, business partners and contractors, as well as by the level of technology development and innovation. Over the past 30 years, since its introduction into scientific circulation, the term “ecosystem” has become widespread, both in scientific and applied economics, which is explained by the growing interest in the issue of interdependence between organizations and their activities. Along with a whole range of ideas such as business models, platforms, cooperations, markets, networks, technological systems, supply chains, the concept of “ecosystem” allowed us to look at the process of value creation and the principle of organizing the management system from a different

perspective. However, the increase in the number of possible organizational constructs has created confusion in the question of the correlation of these ideas in terms of boundaries, redundancy, and even applicability of the elements of analysis.

In the business literature, the term ecosystem was introduced by B. Bansal. He defined it as an economic community supported by a fund of interacting organizations and individuals from the business world [12].

An economic community seeks to produce goods and services that are able to represent a certain value for customers, who are themselves members of this ecosystem. Ecosystem participants can also be suppliers, manufacturers, competitors and other stakeholders. Over time, they undergo a joint change in their capabilities and roles, striving to join the direction set by one or more central organizations. Those companies that occupy leading positions may change over time, but the function of the ecosystem leader in the community continues to be valued. It allows all participants to move towards a common goal, to coordinate their investments and provide mutual support. Considering ecosystems in the context of interorganizational interaction, M. Yansiti and R. Levien, believe that ecosystems are a type of business networks characterized by a large number of loosely interconnected participants who depend on each other for mutual efficiency and survival [62]. Also, an ecosystem is defined as a "network of affiliated organizations" by E. Autio et al. [8]. Based on this, an ecosystem can be understood as a structure for coordinating a multilateral set of partners who must interact.

Due to the fact that the subject structure of ecosystems is quite diverse, one cannot speak of any important universality. According to R. Adner, two fundamental types of ecosystems should be distinguished – this is the "ecosystem as a membership" and the "ecosystem as a structure", where the ecosystem as a membership is understood as a "community of associated subjects, defined by their networks and membership in the platform (healthcare ecosystems, Microsoft ecosystems, Silicon Valley ecosystems or entrepreneurial ecosystems), and the ecosystem as a structure is understood as ecosystems as

configurations of activity, determined by the value proposition (Table 1.1). According to R. Adner, regardless of this, these ecosystems are fundamentally different, they are mutually consistent [1].

Table 1.1

Fundamental differences between ecosystem types

Ecosystem type	**Features**
Ecosystem as a belonging	The development of systems of this type is based on the need to focus on increasing the number of actors connected to the coordinating entity, thereby increasing its role and power. By increasing the number of participants in its ecosystem, the focal entity increases its market power, increases the value of the system due to direct and indirect network externalities, and increases the probability of random interactions between partners that can open up new combinations of interactions, and thereby increase the overall value of the system.
Ecosystem as a structure	This type of ecosystem is defined by a coherent structure of partners who must interact in order for the core value proposition of the system to be materialized. This definition highlights the following important points in understanding an ecosystem as a structure: structural coherence, multi-subjectivity, a specific set of partners, and materialization of the proposition.

Source: author's generalization based on [1].

Thus, the landscape of the socio-economic system can be represented as a set of industry ecosystems, which is a force field that allows to unite localized complexes of organizations, business models, markets, networks, supply chains, innovative projects, infrastructure systems, etc., and is capable of long-term functioning due to the circulation of resources, goods and competencies [1].

Today, the term "ecosystem" is also used in studies of various aspects and conditions of university functioning, as a concept of wider use, which clarifies the concept of "modern university". The shift of emphasis, directly from the university itself, as a certain integral monolithic unit, to its contour, with its organizational logic of existence, caused by the need to determine its place in the socio-economic environment, the peculiarity of combining with other organizations, determining a promising vector of development, etc. So, the question arises – what should be understood by the ecosystem of the university and what are its features? In the study of the term "university ecosystem", "ecosystem of a higher education institution", "ecosystem of a scientific and educational institution" and other variations, we will understand them as synonyms, combining them with the general concept of "university ecosystem". This approach is due to the absence of fundamental differences between them, and even the absence of a research task to separate them.

To answer the question posed, it should be noted that university ecosystems were formed back in the 20th century. in Ukraine. Thus, most educational programs were focused on the needs of the sectors of the national economy served. In fact, complex regional complexes were created, based on a close connection of academic institutions with a practical base. They should be considered the first models of scientific and educational ecosystems, the highest result of development was the creation of academic campuses, where all components were to be concentrated in one place – science, education, as well as the production belt of implementation. The peculiarity of the creation and functioning of this ecosystem is precisely the "complex compactness", which is expressed by the chain of relations – "University – Research Institute – Implementation", and later showed its effectiveness. It was the lack of "complex compactness" that did not allow replicating this model of scientific and educational ecosystem in other territories and for other universities, even with close interaction with research organizations.

Today, this symbiosis has been lost for most industrial and scientific organizations due to the change in the socio-economic formation, while

the modern principles and schemes of interaction between universities and enterprises have undergone significant changes. Therefore, an ecosystem is formed and functions on the basis of universities, which can be characterized by the following systems of relations, for example, "Student – Startup – Project", "Structural unit (department) – MIP – Project", "Project – HEI – Structural unit", "State – HEI", etc. Thus, it should be stated that universities can understand and interpret the definition of an ecosystem in different ways, for example, from the availability of comfortable furniture and teaching tools, to close business ties with manufacturing enterprises of the region and the country, which are formed both within the framework of formal educational institutions and outside them.

The study of the concepts of "university ecosystem" allowed us to highlight a number of its features, in particular: firstly, the ecosystem is flexible and adaptive to external influences on education, consisting of many subjects that occupy their position in the system hierarchy and are able to function without direct managerial influence from the focal subject, and, secondly, the university ecosystem, as a rule, consists of an external and internal contour, where the external contour is a system of relations with subjects of the external environment and authorities that are perceived as potential employers and customers of scientific and research work, and requires methodical building of relationships by creating conditions for solving the problems of subjects of this environment, and the internal contour is the internal environment of the university, represented by the entire set of its organizational elements (Table 1.2).

Both the external contour of the university ecosystem and the internal one have their own fundamental features and logic of functioning, which is inherent in a particular university, a specific organization, a specific interested person, etc. The contour representation of the university ecosystem allows us to judge its boundaries, making it possible to identify a set of metric indicators that reflect the characteristics of the system, and even build an assessment system.

Table 1.2

Features of the contours of the ecosystem
of a higher education institution

Ecosystem outlines	**Features**
External	The formation of the boundaries of the external contour of the university ecosystem involves not just the presence of various contacts, but a clear understanding and understanding of existing and prospective requests from business environment entities, formed by the existing market situation, the vector of technological development, the socio-economic environment, etc. As a rule, the external contour is formed within the framework of partnership interaction between science, business and government, taking into account their mutual interests and the interests of third parties.
Internal	It is formed within the organizational boundaries of the university between structural units. The key feature of this contour is the presence of certain contradictions between interacting units due to the presence of hierarchy and subordination. In HEIs, it is rare to find an organizational and managerial environment that not only forms the development potential of students and teachers, but is also focused on the effective implementation of this potential, both in the labor market and in industry organizations.

Source: author's summary.

Any ecosystem, regardless of the sphere, must have its own foundation or base. According to a number of authors [41], the basis of the university ecosystem should be understood as a platform that is capable of providing multiple horizontal communications. In our opinion, this platform, along with horizontal connections, should also provide the formation of vertical (or corporate) connections. Along with the concept of "university ecosystem", the scientific literature also uses such a concept as "innovative ecosystem of the university". The basic

concept of the term "innovative ecosystem of the university" is the concept of "innovative ecosystem". The concept of an “innovation ecosystem” describes a set of heterogeneous, but complementary organizational entities that work together to create system-level products, similar to the “ecosystem services” provided by natural ecosystems. Innovative ecosystems differ from other organizational systems (for example, supply chains, networks, etc.) in their management scheme, as well as the results of their functioning. Unlike traditional supply chains, innovative ecosystems are not determined only by contractual relations. These and other features lie in the definition of the concept of an “innovation ecosystem” by various authors and researchers. For example, R. Adner, considering an innovation ecosystem through the prism of strategic management, defined it as a coordinated structure of a multilateral set of partners who must interact in order to materialize the main value proposition [56]. By analogy with biological ecosystems, innovation ecosystems are considered at different spatial levels – organizational, urban, suburban, regional, national and global. This aspect is taken into account in the works of G.F. Detter, I.L. Tukkel, H. Chesbro, S. Kim, A. Agogino, P. Chez, M. Claudel, I. Visnych, A. Neely, A. Radziwon, M. Bogers, A. Billberg, D. Campbell, S. Nambisan and others.

In a spatial context, M. Feldman, D.S. Siegel and M. Wright define an innovation ecosystem as an institutional, geographical, economic or industrial context that can be analyzed at different levels of aggregation (e.g. firm, industry, university, region and country) [89]. Innovation researchers have emphasized the knowledge and learning aspects, defining innovation ecosystems as some clusters (physical or virtual) of innovation activity around specific practical areas of activity (e.g. biotechnology, electronics, pharmaceuticals and software) [90].

Innovation ecosystems are also considered at non-spatial levels of analysis. In the non-spatial context, the term “innovation ecosystem” has been used to refer to the target firm, its partners and suppliers, who do not necessarily have to be located in the same space, as long as they belong to the same sector, platform or industry. Different levels also tend

to be associated with different thematic emphases in terms of the key problems addressed. While spatial applications tend to focus on the dynamics of different ecosystem communities (e.g., learning and knowledge creation processes), non-spatial dimensions tend to emphasize issues related to governance and coordination.

The second direction of the concept's spread comes from the nature of collectively generated "ecosystem services" or "ecosystem products" (i.e., "innovations") [98]. Thus, the term "innovation" can be applied both to the outcomes of innovation processes (e.g., products, services, processes, business models, and knowledge) and to the process itself. In the ecosystem context, innovations are conceptualized in the form of products and services, e.g., software, mobile communications, and so on. Innovations have been conceptualized as new enterprises (startups) that implement innovations in business models, as well as new knowledge.

Investigating the concepts of innovation ecosystems, E. Autio and L. Thomas distinguish the following features: first, this is structural heterogeneity, that is, innovation ecosystems consist of heterogeneous participants who have different roles (despite the fact that the heterogeneity of participants is also characterized by other concepts describing collectives of organizations, the heterogeneity of participants demonstrated by innovation ecosystems is often broader and can cover several industries and sectors of the economy); second, an innovation ecosystem is able to organize the production of products at the system level (by analogy with an "ecosystem service"), for example, for supply chains, the results of innovation ecosystems tend to be more diverse and widely replicated; third, the nature of interdependence between participants in an innovation ecosystem is sharply different from the interdependence between networks and supply chains; Fourth, the management of interactions between ecosystem participants is carried out by coordination structures that allow ecosystem participants to specialize in specific roles that are not necessarily defined by formal contracts [113].

Innovation ecosystems can be spatially bounded or unbounded. Spatially bounded innovation ecosystems, such as entrepreneurial

ecosystems and knowledge ecosystems, build on what came before. Thus, the modern incarnation of entrepreneurial ecosystems with an emphasis on innovation in business models enhanced by digital technologies will show different dynamics than "entrepreneurship clusters" or other similar regional associations of entrepreneurial activity without these technologies. For example, the classic entrepreneurial cluster, which was formed back in the 1990s and which underlies many regional innovation systems, emphasized linear, technological innovations. In this case, the entrepreneur acted as an agent converting the results of innovative activity into commercial results. To ensure this knowledge transfer, the support structures of entrepreneurial clusters have been optimized, for example, through the creation of science parks, etc., many science parks have been transformed into new venture accelerators. Therefore, it can be argued that in commercial and scientific ecosystems, the formation processes should not focus on building a new ecosystem from scratch, which was previously characteristic of many classic business clusters. They are consistent – a qualitative change of the existing cluster for a new principle of action through the creation, for example, of new venture capital accelerators in the region. Other types of innovation ecosystems – business ecosystems, platform ecosystems, etc. arise according to a scheme different from the one considered.

While spatially limited innovation ecosystems can emerge as a result of gradual transformation (while preserving the structures and processes that dominated in an earlier era), spatially unconnected ecosystems are most often new formations and therefore require more intensive work to ensure the process of their functioning [113].

Currently, the functioning of state universities in Ukraine is ensured by funds from entrepreneurial activity at the level of 40%. This activity in a market economy is a source of financial resources that allows universities to adequately fulfill their educational and scientific mission in society, expand and strengthen their material and technical base, and maintain human resources. An analysis of university financing trends in the context of the COVID-19 pandemic and the full-scale invasion of the Russian Federation showed a steady decrease in the share of funds

allocated to universities from the budget in the total amount of resources received. This fact makes the study of the problems of managing the innovative development of the entrepreneurial ecosystem of universities relevant to ensuring economic security and academic freedom, which can be implemented using the marketing tools of ecosystem positioning, relevant to the problems of innovation management in universities.

The consequences of the COVID-19 pandemic in Ukraine have radically changed the economic conditions of state universities. These conditions are characterized by increased instability and uncertainty of the external environment, increased competition in the educational services market, a significant reduction in budget financing of higher education [31]. In this context, universities are faced with the problems of ensuring viability, maintaining financial condition at a sufficient level and finding sources of sustainable development [14]. The natural solution to the accumulated problems has become the development of entrepreneurial activity of universities.

One of such entrepreneurial projects of the Kyiv National University of Technologies and Design is the project of creating adaptive and rehabilitation clothing with an expanded range of requirements, which include indicators of comfort and multifunctionality depending on the purpose of the clothing, including protective properties: protection; from hypothermia and hyperthermia and bacterial infection, etc. Rebranding of the range of innovative textile materials with antimicrobial and therapeutic properties with justification of their choice in packaging based on benchmarking of the best world achievements, which can be used not only in products for seriously ill people, but also for low-mobility segments of the population, the elderly, people with disabilities. This approach allows not only to reduce social tension in society, but also to expand their opportunities and improve the quality of life.

Further use of the project results in social practice may include:

- creation of a new range of equipment and rehabilitation tools designed to facilitate movement, dressing and undressing items, grips and many other types of rehabilitation and preventive tools;

- production of garments from textile materials for people with disabilities of various categories, seriously ill and other low-mobility population groups;

- development of basic designs and improvement of production technology and provision of necessary product properties for these categories of consumers, taking into account the peculiarities of their use;

- obtaining initial data for solving issues of mass production of an innovative product.

The presence of a large number of people with disabilities in war conditions necessitates the production of specially adapted clothing and care items from textiles, which will help solve some household problems, self-service, as well as involvement in a full-fledged life in society.

Rebranding adaptive clothing with flexible morphological structure for bedridden critically ill patients with COVID-19 acute respiratory distress syndrome and non-intubated patients receiving oxygen therapy or non-invasive ventilation creates exclusive competence in two application areas: Provision of technical and medical assistance in the care of COVID-19 patients through comparative analysis to create and provide textile fabrics with special antibacterial properties, recognized individual human assets and corporate intangible assets.

Based on scientific recommendations and practice-oriented research results, the project can be successfully implemented by creating and developing an effectively working system for rebranding products from a flexible morphological structure for COVID-19 patients and demobilized people in need. The use of such a new innovative mechanism will allow solving a number of applied tasks: to support medical institutions in the conditions of a new outbreak of the COVID-19 pandemic in the form of timely provision of adaptive, comfortable and ergonomic clothing for bedridden patients; based on rebranding and marketing analysis, to study additional consumption segments taking into account new standards of quality of life and health of humanity.

CHAPTER 2
ANALYSIS OF MANAGEMENT OF THE DEVELOPMENT OF YOUTH'S INNOVATIVE POTENTIAL USING THE ECOSYSTEM OF A HIGHER EDUCATIONAL INSTITUTION

The significant contradiction between the need of modern Ukrainian society for an innovatively oriented personality of a specialist, on the one hand, and the level of readiness of university graduates for innovative professional activity, on the other hand, gives rise to the problem of finding ways and means of forming the innovative potential of the individual in the scientific and educational environment of the university on the basis of a holistic dual-educational concept. Problematic questions about how to organize the process of professional training of future specialists, how to promote the development of their innovative potential, what conditions and mechanisms of this process constitute the problem field of this study. Profound changes in the socio-cultural space that occurred during the 20th – early 21st centuries have actualized scientific interest in the problems of innovative activity and human abilities for innovative activity. The innovative vector of the state's development, defined by the Concept and Strategy of Innovative Development of Ukraine for the period until 2030, requires the construction of a scientifically substantiated system of views, principles and priorities for the formation and development of the innovative potential of the individual. In the implementation of the state strategy of innovative development, it is education that acts as a carrier of the ideology of innovative renewal and must create the necessary conditions for innovative processes in the form of a developed environment for knowledge generation, accumulation of intellectual and creative potentials of society. The key innovative qualities of a person are: mobility, desire to learn throughout life, inclination to entrepreneurship, risk, international mobility [74, 109].

The expert report on the implementation of the Strategy for Innovative Development of Ukraine for the period up to 2020 indicates a low level of special training of graduates of higher education institutions, who, having found a job after graduation, undergo a long adaptation period due to the inability to compare their knowledge with practical activities. Young specialists who have recently graduated from university have not developed the skills to participate in projects that require, in addition to professional skills, communication and management skills, as well as planning and self-organization skills. According to expert estimates, tens of thousands of advanced technological developments remain unrealized. For their successful promotion in the Ukrainian and foreign markets, we need about 200 thousand specialists in the field of technological management and innovation activities.

The transformations taking place in society leave an imprint on many spheres of human activity and existence. In the era of the formation of a new technological space, changes in the socio-cultural environment, there is a social demand for a person who is able to live and work productively in conditions of global changes, uncertainty, challenges [48, 49]. In this situation, the issues related to human development corresponding to these transformations are actualized, and the sphere of education is considered as the most important factor in the reproduction of "human capital", which determines the further progressive development of the country [125].

The changes taking place in society, the complication of professional tasks make the need for higher education institutions to train specialists for innovative activity relevant. To develop the innovative potential of students, the modern educational process in higher education institutions must have a personal and professional orientation. An important factor in the development of the innovative potential of students is the educational environment and psychological and pedagogical support of the educational process.

The main contribution to the formation of innovative activity competencies is made by the education system. The main role in the development of the innovation system is assigned to universities not only because they are key institutions for the production and concentration of knowledge, ensuring its generation, updating, dissemination and application in the process of educational and scientific activity, but also because the educational space of higher education institutions lays the innovative potential of the future specialist. The priority role of the education system in creating conditions for innovative development is due to the fact that all its stages should be aimed at the formation and improvement of the skills and competencies of an individual who will be able to successfully solve the tasks of innovative development. Ukraine will easily adapt to rapid social changes in the future.

Analysis of the concepts of the knowledge economy allows us to characterize it as post-industrial, informational, globalization, network, and innovation, in which knowledge allows us to generate a continuous flow of innovations. Innovations do not simply become a response to the dynamically changing needs of society, but also stimulate their further development.

The innovative potential of a person included in socio-economic relations is an important factor in social transformations and innovative progress of Ukraine.

The concept of "potential" includes the possibility of expanding the boundaries of the traditional subject of research of what a person is to what he can become. In a wide range of scientific works, the term "potential" is most often used not in a specifically scientific sense, but metaphorically – a s a synonym for the terms "resources" or "opportunities" (for example, aesthetic potential, economic and production potential, scientific potential, development potential, etc.). The innovative potential of an individual can be considered as a set of personal properties and abilities to “create, perceive, implement

innovations, and also to abandon outdated inadequate methods of activity in a timely manner" [111].

J. Yao, H. Li, D. Shan, L. Ding note that the main characteristic of the subject of innovation is his active self-awareness, that is, the understanding of his personal initiative as a subjectively possible and socially acceptable basis for his own existence [122]. At the same time, a person can have both a desire to develop his own innovative potential and internal resistance. It should be noted that it is within the framework of sociology that the issues of innovative susceptibility and resistance to innovations are considered from the point of view of the human factor. The social characteristics of the carriers of innovative thinking have a significant impact on the course of the innovation process. These objective and subjective properties of the carriers of the innovative way of thinking are embodied in practice in the innovative type of behavior. In connection with the relevance of the above, it should be noted the increased interest of domestic researchers in the problem of the innovative potential of students of higher education institutions, because it is in the youth educational environment that the acquisition of knowledge, skills and abilities in the specialty, the formation of a professional personality takes place. identity and contact with the spectrum of professional problems that university graduates will solve in the future. Student age, due to its psychological and physiological characteristics, allows for better disclosure and individualization of creative abilities, initiative, ingenuity, non-standard approach, as well as the ability to take risks and be responsible for actions taken, which is especially characteristic of the formation and implementation of the innovative potential of the individual.

The introduction of innovative technologies into various spheres of human life leads to sharp changes in the requirements for training young people for future professional activity. One of the main issues being considered today is the effectiveness of the modern educational process in a higher education institution aimed at producing competitive

specialists who are able to work fruitfully in science-intensive industries, participate in innovations, and build a post-industrial society [123].

Today, when society is entering the era of knowledge and high technologies, human creativity, professionalism, and flexible response to changes in the external environment are valued. Given the importance of all levels of education, the process of preparing young people for future professional activity in higher education institutions is of particular importance. A modern specialist must be able to respond to challenges, set tasks and solve them, have a broad outlook, be open to new formats, constantly develop, be a subject of work primarily in the status of a creative personality, respond to innovations, and find solutions to non-standard tasks.

Speaking about the preparation of young men and women for independent professional activity, it is necessary to take into account the tasks that they will have to solve in this age period. This is the time when they think about the future. The main dimension for them becomes the prospect of tomorrow, the independence of the individual is asserted, and social life is complicated. The social situation of youth development is characterized by the fact that society sets before it the task of professional self-determination. This period is significant in terms of the development of value orientations, life positions, the formation of a worldview, a conscious attitude to life, awareness of oneself as a member of the social community, the choice of a social position and ways to achieve it. The leading activity at this time is educational and professional. It is in this activity that the mental processes and personal characteristics of students are maximally developed [75].

An important component of the modern educational process in higher education is the development of students' innovative potential. A. Stolzfus, M. Rosenberg, G. Lapp, analyzing the concept of "innovative potential", first of all, distinguish personal qualities of a person (tolerance for uncertainty, ability to take justified risks, responsibility, need for self-realization, motivation, achievement, reflexivity, creativity (intelligence qualities, intellectual initiative), competence, ability to interact with other

people, features of the value-semantic sphere, working capacity, level of self-regulation [109].

N. Linnell, S. Figueira, N. Chintala identify such personal parameters that indicate a developed innovative potential as a desire for novelty, sensitivity to contradictions, openness to experience, the ability to act in unpredictable, unstructured situations [74].

Competencies and personal characteristics that constitute innovative potential help a person not only to carry out innovative activities, but also to maximize self-realization. The development of innovative potential is closely related to the processes of self-improvement and self-development of the individual.

A person, developing his innovative potential, "expands his own life space, the horizons of his consciousness, his being in the world" [74].

Based on the fact that modern realities determine the need to train a specialist with innovative potential, higher education institutions should create an optimal educational environment for young people to gain competitiveness in the labor market and professional development.

To develop the innovative potential of students, the modern educational process in a higher education institution should have a personal and professional orientation, that is, be focused not only on transferring specific knowledge, skills, and abilities to future specialists, but also on developing the student's personality in the educational process. The need for personal development of a modern specialist is indicated in the competencies of educational programs of higher education institutions. In the context of societal challenges and global changes, this leads us to realize that human resources are fundamental in all transformations. From this point of view, the development of personal competencies can be considered as one of the central characteristics of the educational environment of a modern higher education institution.

Self-development is very important for revealing the innovative potential of the individual. D. Groen, B. Calderhead in their works have repeatedly drawn attention to the fact that for a person, the

transformation of development into self-development is significant. This is manifested in activity. These scientists emphasized that routine work, as a rule, does not serve human development. But solving tasks that require active work of the intellect, motivation and willpower, creating something new, non-standard, ensures the development and self-development of the individual [48]. I. Gryshchenko interpreted such situations as follows: “In creativity, the creator himself is created. A great personality can be created in only one way: through great work on a great creation.” This can also be fully attributed to innovative activity, where a person improves in accordance with the principle of personal development in activity [49].

T. Zhurko emphasized that "the social value of his personality and the socially significant potential that he is able to realize in his affairs, but also the nature of the new frontier he reaches in his development, depends not only on the value of the creative and innovative caliber, actions of a person, but also on the degree and quality of investment in these actions of his mind, feelings, will" [125]. Innovative activity contributes to the transformation of potentials into opportunities, the development of reserves, the search for solutions to increasingly complex problems and at the same time stimulates the transition of a person to higher stages in his development. Participation in innovative projects contributes to a change in the individual-personal and subjective characteristics of students. The scale of the tasks of innovative activity, the mental activity of the person performing it, the degree of motivational involvement and involvement in the activity significantly affect his personal and professional development.

The contradiction between the need of modern Ukrainian society for innovative specialists and the level of readiness of HEI graduates for innovative activity in the professional sphere creates the need to find ways and means of forming the innovative potential of the individual in the scientific and educational environment. university [49]. That is why a sociological study was conducted at the Faculty of Management and Business Design of the KNUTD "Innovative potential of the student's

personality: formation in the scientific and educational space of the university". The method of collecting information was a questionnaire survey. The choice of quantitative methodology corresponded to the nature of the tasks being solved.

The purpose of this stage of the study was to study the innovative potential of students and identify problems of its formation in the scientific and educational space of the university. 196 1st-3rd year students participated in the survey. The sample is representative of the number of students in various areas of training at the Faculty of Management and Business Design of KNUTD. The survey was conducted in January 2022.

The difficulties of studying innovative potential are caused by the lack of a generally accepted understanding of the content and structure of this concept. The main reason for this is the complexity and multifacetedness of the innovative potential of the individual in general and the student in particular.

Currently, the issues under consideration concern various fields of knowledge that offer their own approaches to studying the totality of creative, educational and social aspects of innovative activity. Of course, the leading place in the study of the innovative potential of the individual is occupied by social psychology. Psychological problems of innovative activity are partially reflected in other fields of knowledge, as a result of which related and interdisciplinary approaches to the analyzed phenomenon are formed. The influence of the psychological approach is also evident in sociological research.

We can agree with the previously mentioned authoritative opinion that the innovative potential of a person should be interpreted as a set of properties and qualities of a person that allow "to create, perceive, implement innovations, and also to abandon outdated unreasonable ways of doing things in a timely manner". Based on the concept of personal potential as a set of resources for implementing innovative activities, many authors propose to study the personal qualities and competencies necessary for innovative activities.

The determination of the proportions of the main components of the innovative potential of students surveyed on the basis of the ecosystem is carried out using equation:

$$\mu C_1 = \frac{\sum A(R_1)...A(R_n)}{n}, \quad (2.1)$$

where $A(1...n)$ − student answers; C_1 … C_{10} – evaluation criteria; $\mu C_1 ... C_{10}$ – total numerical score of all surveyed students.

Innovative activity encourages students to go beyond their own limits, contributes to the expansion of the perception system, mobilizes its potential, stimulates the self-development of a person. Therefore, the complication of the implemented activity leads to the development of the personality through its self-transformation, internal self-transformational work, qualitative transformations.

Since modern strategies for preparing young people for professional activity are determined not only by the formation of knowledge, skills and abilities, but also by significant transformations of the personality, its self-realization in the professional space, the desire to convey its point of view to the world, the university should be focused on creating an innovative environment in the formation of students' competencies. That is, to create conditions that create prerequisites for the effective formation and development of innovative activity, where the possibility of implementing new technologies for solving problems is ensured.

The functioning of this environment should be based on a systematic analysis of the object, subject, processes, and conditions of innovative development. In addition, it is important to determine the criteria for the effectiveness of the environment from the standpoint of implementing the principle of continuous development of participants in the educational process. This approach makes it possible to optimize the process of personal and professional development of a future specialist, to develop in students the ability to generate new ideas, generate new technologies, and create new products. To stimulate the development of

students' innovative potential, it is necessary for them to gain personal experience in participating in the development and implementation of innovations, and in the practical implementation of promising innovative projects. In addition, it is important for students to have the opportunity to participate in their studies, choose an individual educational trajectory, demonstrate educational initiatives, and implement them in educational and scientific activities.

When considering the process of preparing students for innovative activities in conditions of high competition and increasing complexity of tasks, the issue of psychological and pedagogical support of the educational process in the formation of students' innovative potential becomes relevant. It is known that one of the main principles of psychological and pedagogical support of the educational process is to take into account the individual characteristics of students, their capabilities, and the development of resources. This process should be aimed, first of all, at updating personal competencies that determine innovative activities. Its main components are diagnostics, which will be aimed at identifying students' resources when solving non-standard tasks in a situation of uncertainty, determining individual trajectories of their entry into innovative activities, supporting participants in innovative projects, developing programs for monitoring the results of psychological and pedagogical support of participants in the educational process.

The relevance of psychological and pedagogical support of the educational process in higher education institutions is also due to the fact that the student age is characterized by a focus on self-knowledge, self-affirmation, personal self-determination, which are the needs of young people to take the internal position of an adult, to realize their place in society, to understand themselves and their capabilities [48]. Psychological and pedagogical support of the educational process should also be focused on the development of young people's reflection, the ability to correlate their abilities, requirements with the requirements of society, and to fully realize social expectations from their work. An

important component of psychological and pedagogical support is helping students organize cognitive activity, develop communicative abilities, and value-content guidelines.

The innovative potential of the individual is realized in direct practical activity. Any human activity requires an active manifestation of the properties of the individual. Activity is a measure of the interaction of the subject with the surrounding reality as a special way of self-expression in society, at which a higher level of development is achieved, which reflects not so much the quantitative characteristics of activity as qualitative ones. The innovative potential of the individual is an integrative characteristic of the individual in the set of personal properties, qualities and abilities, which ensures its readiness to generate new forms of activity in the creation, development and distribution of innovative educational products, as well as self-development. personal growth as a strategic factor of productive innovative activity [123]. The innovative potential of the individual in the scientific and educational environment of higher education institutions implements a target, motivational, creative, prognostic, transformative function, the function of developing and forming innovative experience and a practice-orientation function.

Three components of innovative potential are distinguished. The first is professional competencies that are important in the development of innovations (understanding the strategic goals of the organization and society, the ability to clearly see problems, breadth of knowledge, well-formed skills and professional skills, diverse interests, the ability to generalize specialized knowledge), the ability to objectively analyze problems, the ability to see the possibilities of other people and use them in business, effective feedback skills, high efficiency). The second component is creativity (intuition, flexibility of mind, extensive associations, an unusual view of things, originality, the ability to see the subject from different sides, the ability to recognize only new trends) [97]. The third is entrepreneurship as a resource for promoting innovations (high level of motivation for success and risks, knowledge of

the market, its development trends, initiative, the ability to find new applications for the "object", flexible work style) [109]. In most studies, the innovative potential of a modern specialist's personality is considered in the most generalized form as a set of motives, properties and qualities of the personality that manifest themselves in new, non-standard ways of activity in order to satisfy existing and new needs. emerging material, social and spiritual needs [6].

Based on the analysis and generalization of existing approaches to defining the category of “innovative potential of a person”, the concept of “innovative potential of a student's personality” was formulated: a set of socio-creative qualities of a student's personality (entrepreneurial spirit, competence, creativity) and motives that characterize his readiness for innovative activity [97]. The set of important features of a student's innovative personality looks as follows:

- initiative – the presence of an active life position, initiative, the ability to find a way out in difficult situations, the ability to take responsibility, sociability;

- competence – breadth of knowledge, diverse interests, confidence in professional choice, high work capacity;

- creativity – active creative and intellectual development, which is manifested in scientific and research activities or in extracurricular activities of a higher education institution.

Analysis of sociological research data showed that most students have, to a greater or lesser extent, the qualities of an innovative personality. In particular, about a quarter of respondents do not doubt their active life position (24.5%), the same number of respondents expressed their willingness to take responsibility in a critical situation and demonstrate such qualities as ingenuity.

Using the most common methods for assessing the level of development of the innovative potential of youth (M. Kirton's method; STYLES method;

"Simplex method" by M. Basadur; Rotter's method) allows us to rank the degree of manifestation of the main components of the innovative potential of youth. in students (Table 2.1).

Table 2.1

Assessment of the level of development of the main components of the innovative potential of youth

Methods	Indicators of innovation potential	Minimum	Maximum	Average value	Standard Deviation
Method M. Kirton's	Innovation coefficient	2,1	127,1	112,27	18,12
STYLES method	Aggregate Innovation Index	12,1	121,1	115,22	12,86
	Creativity of thought	9,1	22,1	22,41	4,22
	Purposefulness of decisions	11,1	25,1	26,11	2,91
	Goal-oriented	11,1	28,1	27,96	4,41
	Social partnership	12,1	25,1	27,91	4,19
«Simplex method» M.Basadur	Research involvement	11,1	122,1	41,14	11,87
	Ability to generate ideas	7,1	124,1	28,67	14,62
	Ability to think	11,1	125,1	25,65	12,87
	Ability to assess the situation	12,1	126,1	29,94	14,57
Rotter method	General internalism (tendency to take responsibility for events), points	8,5	57,1	22,81	24,21
	General appearance, (tendency to attribute the causes of events to external factors), points	2,1	8,5	5,2	2,2

Source: authors' calculations.

About a third of students (20.6%) easily establish contacts with people, which indicates a high level of sociability. About half of the respondents do not fully possess these qualities (51.5% doubt their own active life position, 58.7% are not ready to take responsibility in a critical situation, 42.9% have difficulties in communicating with people). The active life position, which in the future will become the main component of innovative activity, was inherent in the respondents while still at school. Only 12.5% of the study participants did not attend additional classes, the rest chose sports sections (49.2%), various types of electives (48.7%), and were engaged in creativity (18.5%). While studying at the university, students gave preference primarily to the scientific field, participation in conferences and projects (55.0%) as additional activities.

At the time of the survey, 20.6% of respondents participated in "extracurricular trajectories". The most popular were: international relations – 22.2%; leadership and initiative – 27.4%; entrepreneurship – 17.7%; culture and creativity – 16.1%. However, only a third of respondents were completely satisfied with the classes.

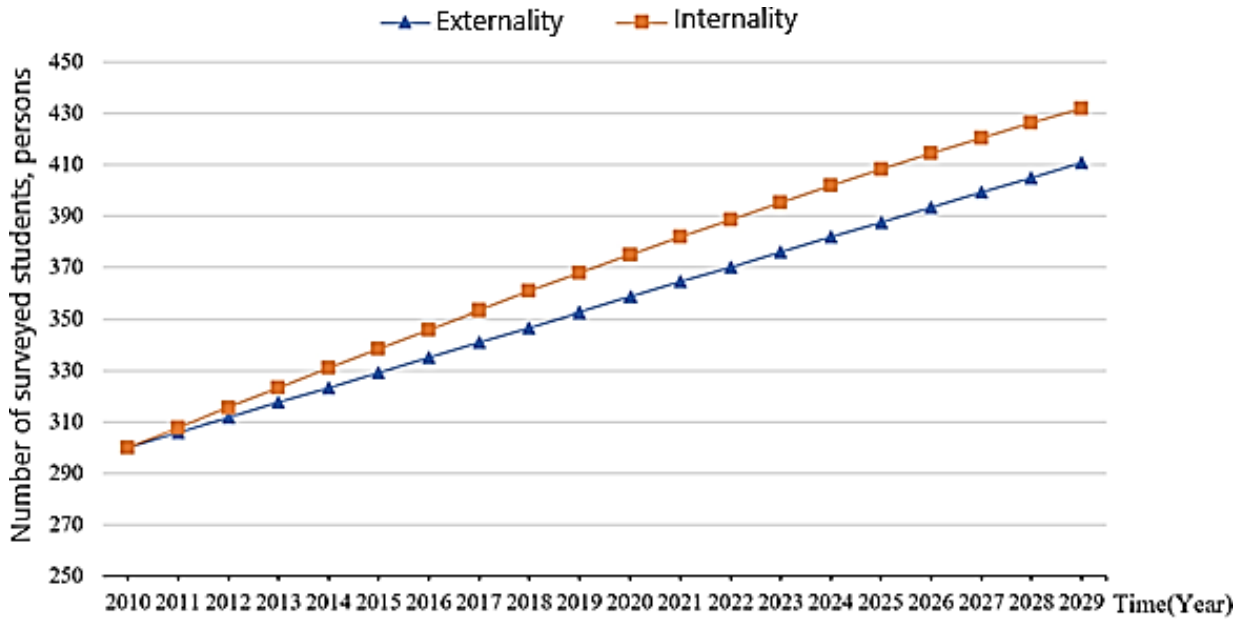
To increase the effectiveness of trajectories and develop motivation, students suggest that organizers invite more interesting people, experts, and speakers to hold events (28.2%), students would also like to update teaching methods (26.7%) and diversify activities in areas and training profiles (25.0%). The main reason for non-participation in extracurricular events is indicated by respondents as lack of interest – 27.4%. A sufficiently high level of satisfaction of respondents with their professional choice (60.2%) creates a basis for the successful formation of professional competencies and indirectly indicates the presence of competence as the most important characteristic of an innovative personality.

A huge role in the professional development of a specialist in an innovative society should be played by research and development activities. This contributes to the manifestation of creativity as the intellectual basis of innovations in any field. The majority of respondents (62.7%) are convinced that a student must necessarily participate in such

work during their studies. However, as the results of the survey showed, only 12.8% of respondents take an active part in it, 28.2% participate sometimes, 24.0% have a desire, but it has not yet been realized. These data indicate the possibility and necessity of further expansion of research activities. The majority of respondents are satisfied with the conditions created in higher education institutions for the creative and intellectual development of students (65.9%). And 48.4% of respondents have ideas for creating a brand or company. For these survey participants, as well as those who still doubt their ideas (27.1%), participation in a Hackathon would help them become more confident and active, because this is where a creative environment should be for the implementation of business projects and emerging business ideas. Nevertheless, the survey showed that only 27.7% of respondents attended Business Hackathon events, and the majority (62.7%) did not participate in it. The main reasons for this were lack of time (29.7%) and lack of interest (24.1%). The main goals of attending the event were considered by respondents to be obtaining information from expert lectures (65.8%), meeting new people (26.0%), translating business ideas into reality (19.8%), and acquiring the necessary knowledge and skills (19.8%).

Cluster analysis of the research results allowed us to identify and characterize three groups of respondents by the level of development of innovative potential: active innovators (48.4%), potential innovators (24.9%) and passive innovators (16.7%). Active innovators demonstrate a high level of participation in research activities and are more often involved in extracurricular trajectories, most of these students are second-year students. The peculiarities of potential innovators are low self-esteem in the field of entrepreneurship, as well as a low level of awareness of the types of activities in extracurricular and educational activities of higher education institutions. However, there are many in this group who have a desire to be active and develop their innovative potential. Such students are the majority in the first year. Passive innovators are characterized by a low level of participation in

extracurricular trajectories and the scientific and educational space of the university, but they are characterized by a high assessment of their own entrepreneurial spirit, which can serve as the basis for the development of innovative potential in the field of business and entrepreneurship. The largest number of such respondents was found in the third year (Fig. 2.1).



Source: compiled by the authors based on a survey of students of the KNUTD.

Figure 2.1 – Forecast of the ratio of internality and externality of the development of the innovative potential of youth

Thus, a survey of students of the Kyiv National University of Technologies and Design allowed us to establish that most of them are aware of the importance of developing personal innovative potential in the scientific and educational space of the university and almost half of them demonstrate a high level of innovative activity already at the university, participation in research activities and interest in various extracurricular trajectories of personal development. Most students are satisfied with their professional choice and the conditions created at the university for the development of a person's innovative potential. At the same time, the following problems were identified: low activity and poor

awareness of various types of activities in extracurricular and scientific research activities of students, who constituted the majority in the cluster of potential innovators; there is a tendency to reduce the level of innovative potential of third-year students compared to second-year students; a significant part of the respondents demonstrates weak motivation and participation in research work and attending business hackathons.

Thus, an important component of the educational process of a higher education institution today is the development of students' innovative potential. For this, in addition to the professional development of future specialists, it is necessary to carry out personal development. An invaluable role here can be played by psychological and pedagogical support for students' entry into innovative activity, significantly contributing to the transition of the process of personal development to self-development. The study of the issue of personal self-development as a significant resource for the formation of students' innovative potential in the educational process has important practical significance, helping to prepare young people for professional activity in modern conditions.

The new stage of social development, the knowledge-intensive economy actualizes the need to develop innovative potential, personal formation of future specialists, since it is the personality that acts as a carrier and an exponent of universal resources of civilizational transformation. This creates the need to study the development of the innovative potential of the individual in the process of studying in higher education.

Thus, based on the generalization of research into the essence and structure of the innovative potential of the individual, we have developed the following definition. The innovative potential of the individual as a subject and participant in the scientific and educational environment of higher education is an integrative characteristic of the individual in the aggregate of personal properties, qualities and abilities that ensure its readiness to generate new forms of activity in the creation,

mastering and dissemination of innovative educational products, as well as self-development and personal growth as a strategic factor of productive activity. It is necessary to create favorable conditions for the development of innovative potential in all types of educational and extracurricular activities, to expand innovative forms of the university's scientific and educational space and to improve the motivational mechanisms of students' intellectual, creative and entrepreneurial activities. In particular, as the results of this stage of the study showed, it is necessary to more actively involve students, starting from the first years of study, in scientific and research work, which significantly develops the innovative potential of the individual. The results of the surveys also allow us to conclude that individuals with high innovative potential may have a subjectively higher assessment of the quality of life. In addition, they are potentially able to make more efforts to change the objective characteristics of the quality of life.

CHAPTER 3
ASSESSING THE IMPACT OF THE COVID-19 PANDEMIC ON THE LABOR MARKET

2020 has brought unprecedented changes to the global economy and the world of work [112]. On 11 March 2020, the World Health Organization declared the outbreak of the novel coronavirus a pandemic, urging governments around the world to prepare for the first wave of a public health emergency with a series of transformative measures, one of which in many countries was a general lockdown [121]. An estimated 2.7 billion people (80% of the world's working-age population) [3] have been affected by the COVID-19 pandemic restrictions. Employers have had to take into account the structural features of demand, determined by the epidemiological situation in the country, to be prepared for possible new waves of the epidemic and their consequences, similar to those recently experienced in Japan, Singapore and South Korea [7]. Most companies that were able to implement new working methods in the shortest possible time were able to not only protect people's lives and health, but also prevent irreversible damage to the economy [10]. Social distancing measures – school closures, airline groundings, bans on gatherings, and workplace closures – were one of the main measures to combat the coronavirus and slow its spread. In recent years, the number of remote workers working part-time and full-time has gradually increased [14, 16]. The pandemic has certainly accelerated the adoption of remote work by employers [23]. In the context of a pandemic, remote work has proven to be an important factor in ensuring business continuity [27]. At the same time, under normal circumstances, its advantages include reduced travel time, the ability to focus on work tasks away from office distractions, and finding an optimal work-life balance [29]. Remote work offers greater freedom in choosing work schedules, as well as alternative work locations outside the employer's premises [32]. Before the pandemic, only a small proportion of workers worked remotely from time to time [39]. In the

European Union (EU), the prevalence of regular or occasional teleworking (combined home and mobile work) ranged from 30 percent or more in Denmark, the Netherlands, and Sweden to 10 percent or less in the Czech Republic, Greece, Italy, and Poland [40]. According to various studies, up to 20 percent of the workforce in the United States worked regularly or occasionally from home or another alternative location, 16 percent in Japan, and only 1.6 percent in Argentina [45]. Indeed, in most countries, the labour market is undergoing structural changes [44]. New forms of work and employment organisation coexist with traditional forms of employment [51]. New forms of employment first emerged in high-income countries but have now spread to developing countries [55]. They are characterised by very short contracts, intermediation through digital platforms and changes in the organisation of work [64]. Some of these changes are also linked to the redefinition of employment relationships, particularly in terms of forms of employment along the lines of employment and self-employment [66]. The COVID-19 pandemic has demonstrated the increasing ability of companies and employees to conduct economic activities remotely [67]. While the global community is counting on the recovery from the COVID-19 pandemic, new questions are emerging about the long-term impact of the pandemic on the quality of employment and the prevalence of different forms of employment [71]. The emergence and growth of new forms of employment are linked to two long-term economic trends: digitalization and globalization of value chains [70]. Both trends have brought benefits to businesses and workers to some extent as a result of the impact of the COVID-19 pandemic [78]. By strategically distributing their operations across jurisdictions, companies can optimize production processes and access local pools of specialized knowledge and skills [81]. Algorithms and digital platforms can also improve companies' ability to forecast demand and optimize the suitability of workers for tasks across time and space [91].

Some companies that invest in digital technologies pay higher wages, and digital platforms create opportunities for employment abroad [85]. In addition, many new forms of employment are

implemented remotely and can create opportunities for groups that have limited mobility due to health conditions or care responsibilities [87]. New forms of employment, especially the ability to work on digital platforms, offer better opportunities for specific types of work, such as intellectual work, where individual schedules can significantly improve the quality of results [94, 124]. The aim of this phase of the study is to determine to what extent the COVID-19 pandemic is affecting the level of digitalization of the intellectual labor market in Ukraine.

The mechanism of supply and demand in the intellectual labor market is based on competition between employees for the right to most profitably apply their abilities to employers; for the right to attract and use the most qualified employees capable of creative, innovative activity. The product in this market is intellectual labor, the carrier of which is personally each employee engaged in intellectual activity. The structure of the intellectual labor market is more complex compared to the structure of the labor market. The owner of human capital gets the opportunity to realize his creative and innovative skills and abilities in the process of investing in one or another business of a particular company (Fig. 3.1).

Construction of multifactor correlation-regression models of the dependence of demand and supply in the intellectual labor market of a separate industry on a group of independent factors makes it possible to predict demand and supply in the industry market of intellectual labor. As a dependent indicator reflecting the volume of demand for intellectual labor, we chose the number of hours spent on creating intellectual property objects for a certain period.

Calculations were made on the example of the Ukrainian economy. At the initial stage of the study, 35 factors were selected. The volume of the need for intellectual labor is defined as the total amount of time actually spent by industry employees on scientific and inventive activities:

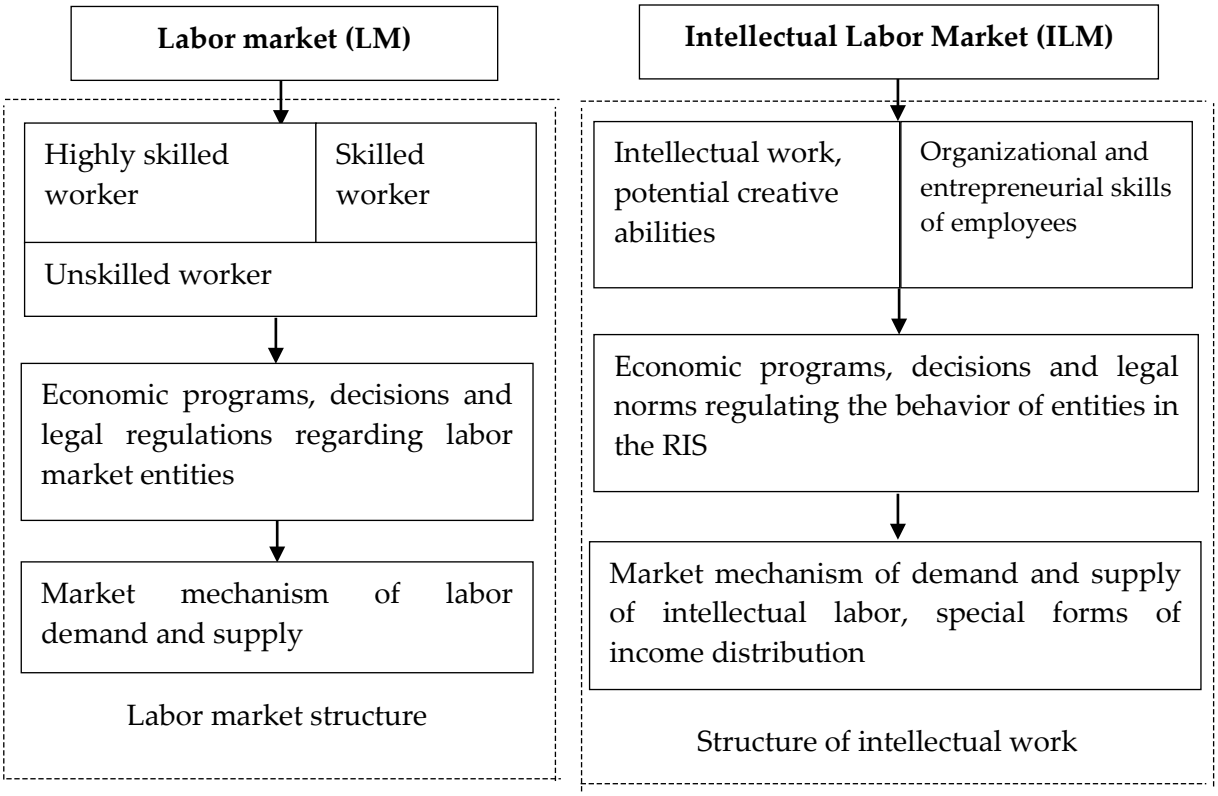
$$Y_{dem} = Num_1 \bullet Uw_1/100 \bullet Uw_2/100 \bullet F_{int}, \quad (3.1)$$

where Num_1 – Number of employees in the industry, thousand people;

Uw_1 – the share of engineering and technical workers and scientists, %;

Uw_2 – share of enterprises in the industry where innovations have been implemented, %;

F_{int} – average time spent on intellectual work by one industry employee.



Source: compiled by the authors.

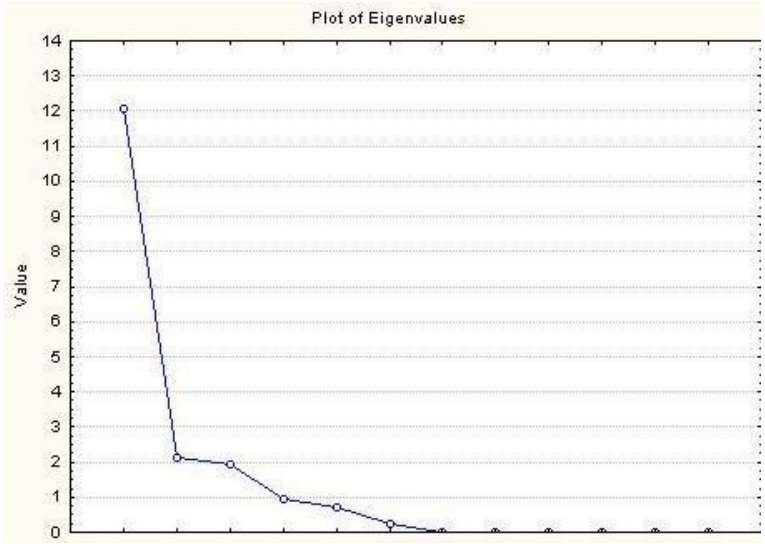
Figure 3.1 – Transformation of labor markets

The supply of intellectual labor is defined as the total amount of time that industry workers can engage in intellectual labor:

$$Y_{sup} = Num_1 \bullet Uw_1/100 \bullet Uw_2/100 \bullet F, \quad (3.2)$$

where F – average working hours of one employee in the industry.

The number of factors for building a model of demand for intellectual labor was determined using the "loosened rock" method (Fig. 3.2).



Source: compiled by the authors.

Figure 3.2 – A "loosened rock" graph for determining the number of factors for building a model of demand for intellectual labor

As shown in Fig. 3.2, the number of factors is three. For a more detailed analysis of the degree of influence of individual indicators on the level of demand for intellectual labor, a factor analysis was conducted (Table 3.1).

Table 3.1

The degree of influence of individual indicators on the level of demand for intellectual labor (STATISTICA 10 listing)

Variable	Factor loadings (without rotation) (data) Extraction: Principal Components (Labeled loadings >.700000)		
	Factor1	*Factor2*	*Factor3*
1	2	3	4
Dem 1	*0,96601*	*-0,49501*	*0,16167*
Dem 2	*0,91365*	*-0,27254*	*-0,35287*

Continuation of Table 3.1

1	2	3	4
Dem 3	*0,94506*	*-0,33878*	*-0,33878*
Dem 4	*-0,36833*	*-0,67658*	*0,70989*
Dem 5	*-0,02865*	*-0,35785*	*0,84192*
Dem 6	*-0,60454*	*0,01664*	*0,77219*
Dem 7	*0,96645*	*0,01364*	*0,04119*
Dem 8	*0,85630*	*0,30984*	*0,34685*
Dem 9	*0,86259*	*-0,16357*	*-0,34534*
Dem 10	*0,96748*	*0,25810*	*0,05206*
Dem 11	*0,82435*	*0,36357*	*0,44345*
Dem 12	*0,90963*	*0,21680*	*0,09712*
Dem 13	*-0,53681*	*0,77512*	*0,15419*
Dem 14	*0,49966*	*0,15343*	*0,06878*
Dem 15	*0,96807*	*0,15773*	*0,15508*
Dem 16	*0,35123*	*0,88171*	*0,35123*
Dem 17	*-0,44745*	*0,78243*	*0,13308*
Dem 18	*0,35343*	*0,71555*	*0,35343*
Expl.Var	*12,05827*	*2,133475*	*1,956259*
Prp.Totl	*0,66990*	*0,118526*	*0,108681*

Source: calculated by the authors.

Indicators fall under the factor where they are highlighted in red. As can be seen from the listing, the indicators of the first factor can be characterized as the number of implemented scientific and innovative developments in a qualitative context and by sources of financing. The indicators of the second factor characterize the amount of financing of scientific and innovative developments from own and internal sources. The indicators of the third factor reflect one of the essential components of the successful application of intellectual work – the level of their legal protection. The results of the factor analysis showed that the features of the demand for intellectual work are almost completely characterized by the obtained three factors, which is sufficient to justify the general trends

in its use. The most significant influence on the level of use of intellectual labor has the first factor, the value of its dispersion is 65.93%, the second – 12.19%, the third – 11.13%. Thus, the model of demand for intellectual labor according to formula 3.3 looks as follows:

$$Y_{dem} = {}^{1}\!/_{12,05827} \times \begin{pmatrix} 0,966Dem_1 + 0,91365Dem_2 + \\ 0,94506Dem_3 + 0,96645Dem_7 + 0,85630Dem_8 + \\ 0,86259Dem_9 + 0,96748Dem_{10} + 0,82435Dem_{11} + \\ 0,90963Dem_{12} + 0,96807Dem_{15} \end{pmatrix} + {}^{1}\!/_{2,133475} \times \begin{pmatrix} 0,77512Dem_{13} + 0,88171Dem_{16} + 0,78243Dem_{17} + \\ 0,71555Dem_{18} \end{pmatrix} + {}^{1}\!/_{1,956259} \times (0,70989Dem_4 + 0,84192Dem_5 + 0,77219Dem_6) \quad (3.3)$$

A preliminary analysis of the number of factors into which it is necessary to divide all indicators affecting the level of intellectual labor provision using the "loosened rock" method showed that their number is also equal to three (Fig. 3.3).

Table 3.2. presents the results of the factor analysis of the supply on the intellectual labor market in Ukraine.

The first factor characterizes the potential volume of scientific developments in the economy of Ukraine: the number of enterprises, organizations and potential performers of scientific research. The magnitude of its dispersion is 48.61%, which indicates a significant impact on the achieved level of intellectual labor provision.

If the first factor reflects the potential supply of intellectual labor, then the second factor should be treated as an actual supply. The value of its variance is 24.79%. The third factor, in terms of its load, ranks third among the factors that significantly affect the value of the supply of intellectual labor. It characterizes the achieved level of quality support of scientific and innovative developments by performers. This factor should be considered as an assessment of the compliance of the actual level of qualification of different groups of performers with the successful implementation of innovative developments. The value of its variance is 14.23%.

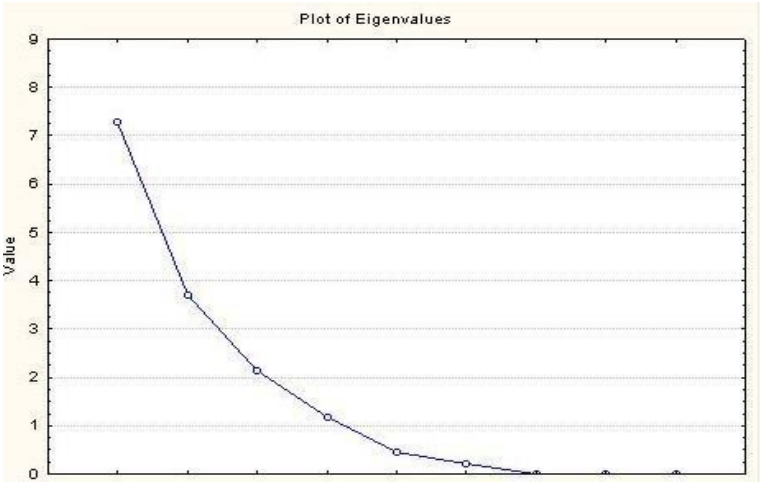


Figure 3.3 – "Loosened rock" graph for determining the number of factors for building a model of intellectual labor supply in the Ukrainian economy

Thus, the model of the supply of intellectual labor according to equation 3.4 looks as follows:

$$Y_{sup} = {}^{1}\!/_{7,291981} \times \left(0,74669Sup_1 + 0,85336Sup_2 + 0,87238Sup_4 + 0,95609Sup_5 + 0,96079Sup_6\right) + \quad (6)$$
$${}^{1}\!/_{3,718119} \times \left(0,89587Sup_3 + 0,79131Sup_{12} + 0,75716Sup_{13} + 0,81397Sup_{14}\right) + \quad (3.4)$$
$${}^{1}\!/_{2,134396} \times \left(0,86159Sup_7 + 0,76974Sup_8 + 0,67171Sup_9 + 0,79729Sup_{10} + 0,77038Sup_{11}\right)$$

Table 3.2

Factor analysis results. Determining the level of supply of intellectual labor (STATISTICA 10 listing)

Variable	Factor loadings (without rotation) (data) Extraction: Principal Components (Labeled loadings >.700000)		
	Factor1	*Factor2*	*Factor3*
1	2	3	4
Sup 1	*0,74669*	*0,65501*	*-0,03102*

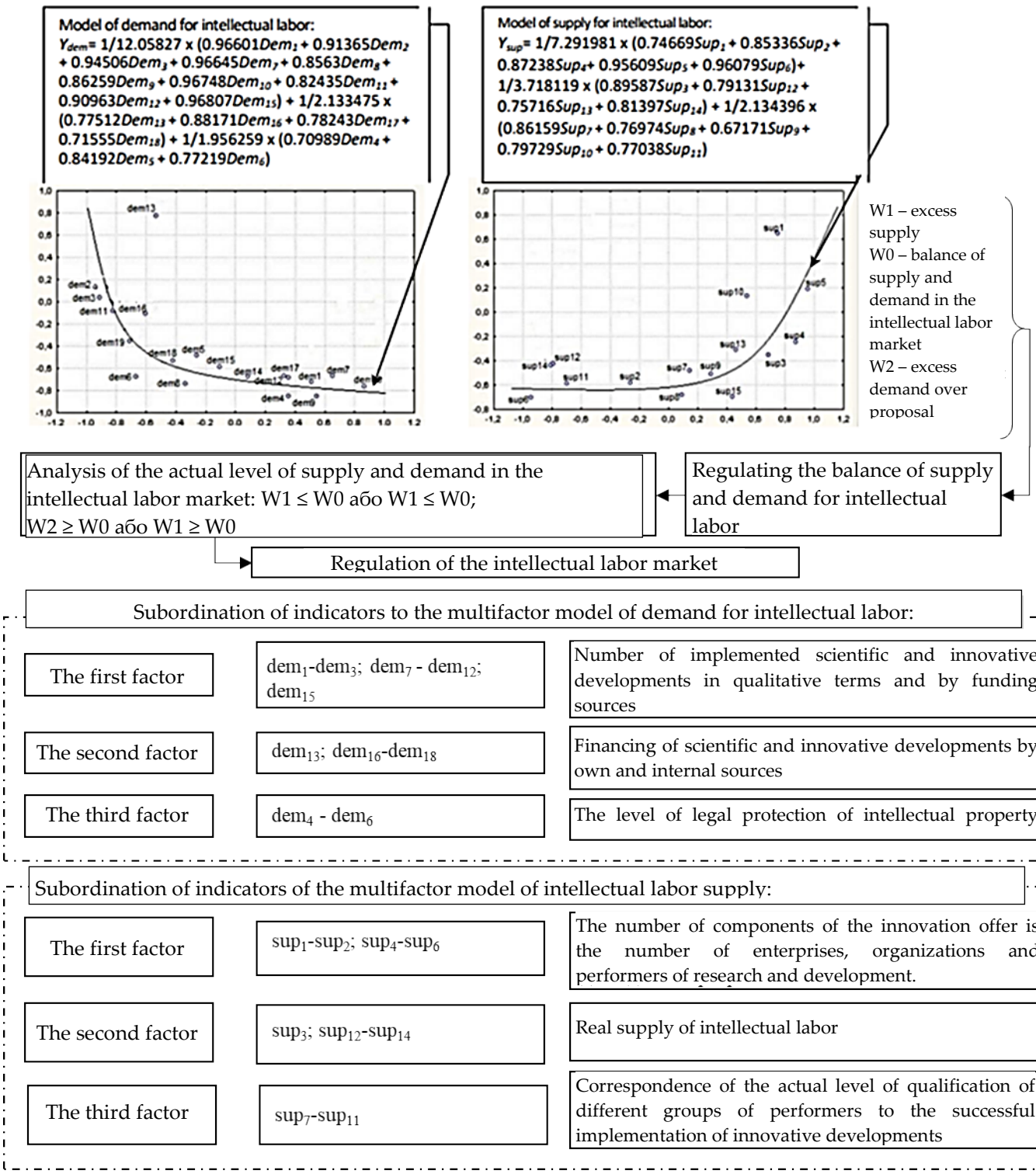
Continuation of Table 3.2

1	2	3	4
Sup 2	*0,85336*	*-0,02721*	*-0,30345*
Sup 3	*-0,32981*	*0,89587*	*-0,02001*
Sup 4	*0,87238*	*-0,24118*	*-0,40314*
Sup 5	*0,95609*	*0,19341*	*-0,01943*
Sup 6	*0,96079*	*-0,12794*	*0,04119*
Sup 7	*-0,16133*	*0,48819*	*0,86159*
Sup 8	*-0,23466*	*0,39093*	*0,76974*
Sup 9	*-0,57542*	*0,46837*	*0,67171*
Sup 10	*0,53381*	*0,13251*	*0,79729*
Sup 11	*-0,29862*	*-0,58548*	*0,77038*
Sup 12	*-0,42396*	*0,79131*	*0,21613*
Sup 13	*-0,26925*	*0,75716*	*-0,18631*
Sup 14	*-0,43378*	*0,81397*	*0,20833*
Sup 15	*-0,43045*	*0,69741*	*-0,01963*
Sup 16	*7,291981*	*3,718119*	*2,134396*
Sup 17	*0,486132*	*0,247875*	*0,142293*
Sup 18	*0,74669*	*0,65501*	*-0,03102*
Expl.Var	*0,85336*	*-0,02721*	*-0,30345*
Prp.Totl	*-0,32981*	*0,89587*	*-0,02001*

Source: calculated by the authors

The third stage involves building a model for monitoring supply and demand in the intellectual labor market (Fig. 3.4).

Monitoring made it possible to: 1) determine the current ratio of demand and supply in the intellectual labor market; 2) develop appropriate measures to eliminate the identified imbalance. Calculations in 2019 and 2021 showed that before the COVID-19 pandemic, there was an excess of supply over demand (by 13%), then there was an excess of demand (by 20%). This situation is explained by the fact that most intellectual workers have the opportunity to optimally organize their workplace and algorithmize intellectual processes in view of forced



Source: author's development.

Figure 3.4 – Modeling of monitoring supply and demand in the intellectual labor market

remote work. The current situation in the intellectual labor market shows that before the pandemic, the excess of supply over demand was justified and confirmed by research [101, 104, 106, 110]. This is due to the first two supply factors: the number of companies, organizations and R&D performers who constantly worked in a business environment (offices) [112]. Indeed, before the pandemic, only a small part of employees worked remotely from time to time [115]. After the pandemic (2021), most intellectual work is performed remotely (in remote mode) [118, 120]. This, at a fundamental level, affects the level of demand for this type of work and makes it possible to turn the economy around. This situation makes it possible to carry out effective differentiation of labor, optimizing transaction costs. Digital platforms "facilitate the distribution of tasks" through "efficient allocation of resources and a consistent reduction in transaction costs.

Thus, the current situation forces organizations of all forms of ownership to conduct an active personnel policy, that is, the accumulated intellectual capital becomes one of the main factors of business competitiveness.

Analysis of the development of the situation in the field of application of scientific and technological achievements before and after the pandemic allowed us to conclude that at the moment the situation on the intellectual labor market is influenced by several key factors:

- imbalance between the demand and supply of intellectual labor and the use of funds for an active policy of attracting creative and innovative employees;
- preservation of low competitiveness of certain categories of citizens in the intellectual labor market due to limited implementation opportunities;
- their individual intellectual abilities: young people without work experience; women with minor children; able-bodied persons with disabilities; difficulties with employment for graduates of vocational educational institutions of all levels;
- inter-sectoral redistribution of labor force due to the sale of organizational and entrepreneurial capital, the complexity of small

business development, the complexity of solving employment problems and, as a result, increasing the efficiency of using intellectual capital;

- insufficient adaptation of the education system, structures of the socio-cultural sphere to the current situation in the intellectual labor market: low level of retraining, advanced training of personnel;

- insufficient cultural and moral level of employees of the enterprise, increased psychological stress in society due to the COVID-19 pandemic, degradation of the social sphere as a result of insufficient funding of education and science.

Therefore, the main areas of action in this market in the medium term are:

- maintaining at the national and regional levels funding for measures to promote the development of vocational education; developing an in-house system of training for the personnel of the enterprise, organization, improving the qualifications of employees, increasing their competitiveness and professional mobility in the intellectual labor market;

- leveling the general educational level of the labor collective, developing its intellectual and creative and innovative abilities, developing mechanisms to meet the needs of organizations in graduates of all levels of vocational education;

- encouraging citizens to open their own business through the active use of digital forms of employment, expanding measures and ways to support venture business.

CHAPTER 4
MODELING MANAGEMENT OF INNOVATIVE DEVELOPMENT OF THE UNIVERSITY TECHNOLOGY TRANSFER ECOSYSTEM

The strategy for innovation development in Ukraine involves the creation of an innovation ecosystem of higher education institutions. An analysis of the current state of interaction between science, business and the state in Ukraine shows that most technologies and developments created as a result of scientific and technical activities of higher education institutions have not yet been implemented in the real sector of the economy.

Communication interaction between representatives of higher education and enterprises involves the initiation of the creation of an innovation ecosystem. The practical implementation of the technology transfer ecosystem model in higher education institutions will allow them to move to a new level of their innovative development.

There are many factors that influence the level of social development and perception of changes, among which culture is significant, the main elements of which are emphasized in the scientific works of both domestic and foreign scientists [5]. Ukrainian culture as a whole does not contribute to socio-economic development. This means that the state must make a lot of efforts, orienting its policy towards changing the perception of society of these cultural factors [2]. Innovation culture, like civil society in general, is only being formed in Ukraine. The analysis showed that the issues of creating a project management system are not reflected in international project management standards, and are also insufficiently studied by domestic and foreign scientists. Existing research by scientists [9] on the creation of an ecosystem model of technology transfer relate to the business sphere and do not take into account the specifics of higher education institutions. However, organizational projects for creating a unit in the form of a technology

transfer ecosystem (ETT) in a higher education institution have their own specifics [59, 61, 119]. In view of the above, the construction of a conceptual management model for creating a technology transfer ecosystem at a university is an important current task, and given the vector of state policy, it is simultaneously a necessity.

In public higher education institutions, the biggest obstacles to development are bureaucracy, risk avoidance and a high level of responsibility, which leads to resistance to the implementation of changes [69]. For the perception of changes, the following rules or conditions are proposed, which the initiator must adhere to. The most important thing is to communicate to employees the specific reasons for the need to implement changes and the expected positive results. To do this, it is necessary to first study the needs and problems that arise in connection with the transfer of technologies among university employees.

The diffusion of innovations is proposed to be considered through the model of diffusion of innovations proposed by E. Rogers (a process in which innovations are transmitted through certain channels over time between members of a social system).

Thus, the most effective channel for the implementation of innovations is informal (interpersonal relationships) with the help of influencers who have already adopted the innovation and are similar to other employees, because they face the same problems and work in the same department. Paul Dolan proposed a model of mental space using factors that provide “non-violent” but self-motivated change. Managing the mental space of projects and programs is the main use of ETT. The proposed models can be taken into account when implementing projects in HEIs. Some sources suggest determining the level of maturity of the organization in terms of project management before implementing ETT. Others [68, 126] define the characteristics of competence levels according to the following criteria: subject area, project management area, IT technologies and tools. The experience of creating ETT in a higher education institution is new for our country. The creation of ETT has not been studied with approaches to

project management. University technology transfer activities are just beginning in our country. The level of university competence in ETT creation projects is "embryonic". Therefore, there is a need to increase the level of knowledge in project management, primarily among functional managers of the university. The project initiation stage also includes identifying stakeholders and their interests.

The project stakeholders, their roles and interests in establishing an ETT at the university are presented in Table 4.1.

Table 4.1

ETT project stakeholders at the university

№	Stakeholders	Roles	Interest
1	2	3	4
1	Project initiator	The person who initiated the project to create an ETT in a higher education institution prepared an application for consideration of the initiative (an employee of a higher education institution who professionally carries out scientific, scientific-technical or scientific-pedagogical activities)	High-quality and timely implementation of projects, gaining experience and skills in the field of project management
2	Project Manager	Higher education employee responsible for project planning and implementation, risk response (head of department, professor or associate professor of the department)	High-quality and timely implementation of the project in accordance with established requirements, gaining experience and skills in the field of design management, receiving material incentives

Continuation of Table 4.1

1	2	3	4
3	Project team	A group of freelancers who, on the instructions of the project manager, plan and implement a project to create an ETT on a freelance basis (freelancers who professionally carry out scientific, scientific-technical or scientific-pedagogical activities)	High-quality and timely implementation of the project in accordance with established requirements, gaining experience and skills in the field of design and management, receiving financial incentives
4	Project curator	A senior management employee of the HEI who will monitor and control the activities of the team and the project manager (vice-rector)	High-quality and timely implementation of the project in accordance with the established requirements, increasing the rating of the HEI, attracting extra-budgetary funding and additional funding from the Ministry of Education and Science of Ukraine
5	Customer	Rector of the HEI that finances and supervises the implementation of the project	High-quality and timely implementation of the project in accordance with established requirements, increasing the rating of the higher education institution, attracting extra-

Continuation of Table 4.1

1	2	3	4
			budgetary funding and additional funding from the Ministry of Education and Science, achieving the strategic goal
6	Owners	Higher education institution – has rights to the project results	Achieving the strategic goal of the HEI, increasing the HEI rating, attracting extra-budgetary funding and additional funding from the Ministry of Education and Science of Ukraine
7	Investors	The project is co-financed by the Rector of the Higher Education Institution and the Ministry of Education and Science of Ukraine. It is also possible to involve local authorities and business representatives.	High-quality and timely implementation of the project, increasing the rating of the higher education institution, region, and state
8	Competitors of the main participants of the project	Other HEIs in which ETTs are being created or planned and which are interested in increasing the rating of their own HEIs.	Poor and/or untimely project implementation
9	Governing bodies	The Ministry of Education, Science and Technology, the Ministry of Economy, local	High-quality and timely implementation of the project, increasing the

Continuation of Table 4.1

1	2	3	4
		governments, as well as international organizations are interested in developing cooperation between science and business	rating of the region and the state, attracting investment into the state
10	Public groups and organizations, population	Freelancers	Establishing cooperation with business representatives
11	Suppliers/contractors	Persons who supply computer equipment, furniture for organizing premises for ETT, and also provide IT services for creating software products	High-quality and timely fulfillment of the terms of supply/contract agreements
12	Consumers	Freelancers, representatives of business, region, state, community of scientists and inventors, international organizations	Obtaining a high-quality project product

Source: suggested by the author.

Initiating a project to create an ETT at a university also has its own characteristics, because it is, as a rule, a state structure, and therefore the coordination and approval of documents is lengthy, includes more steps than in a private company, where the speed of decision-making and the elimination of bureaucratic procedures are extremely important. The initialization of the project will be successful only if it corresponds to the strategy of the university, the Ministry of Education and Science of Ukraine and the support of the

university management. After the approval of the project, the planning stage begins, the basis of which is the development of a basic project plan, determining the type and place of the ETT in the organizational structure of the HEI management. Also at this stage, planning is carried out:

- Documentary support of the project, which includes a set of works on creating a new organizational structure at the university – preparation and approval of the decision of the Academic Council of the university on the creation of the ETT, amendments to the university charter, preparation and approval of the regulation on the structural unit, job descriptions, approval of staffing, etc.

- Project schedule, according to which the project deadline, the deadline for each project task, the sequence of their implementation are established, while the schedule planning is carried out simultaneously with the definition of the project content (goals and objectives).

- Project groups – the criteria for selecting the team, the conditions for involving specialists from other structural units, the functions, powers and responsibilities of each team member are determined. Formation of a highly effective project team, the resulting conceptual model can be adapted for managing the project of creating an ETT at the university.

- Communications – determines the most convenient virtual communication channel between available messengers for the project team, analyzes the compatibility of cloud storage technology with the necessary ETT software, plans the implementation of cloud storage technology and remote work – a virtual office to be able to work in quarantine, plans to develop a section of the site for communication with business representatives or other interested parties. The developed models can be adapted for the implementation of the necessary software for ETT in HEIs.

The project budget, which includes costs related to the project team (salary, tuition, training), and unrelated costs for equipping the premises for the project team and holding joint meetings with heads

or employees of the university's functional units, the cost of software and creating a section of the site.

The next stage is the implementation of the project, which should be carried out in accordance with the basic project plan. It should also be noted that at any stage of project implementation, the creation of an ETT at the university can be risky. The monitoring and control stage is carried out by the curator (vice-rector) and the project customer (rector), as well as the Ministry of Education and Science of Ukraine based on the project results to assess the effectiveness of its implementation. In addition, monitoring and control is carried out by the project manager at each stage. Based on the results of monitoring and control, an assessment of the project's effectiveness is given and the organizational structure at the university – ETT – actually begins to work again.

Thus, at this stage of the study, it was established that the implementation of the project approach will allow creating an effective innovation infrastructure, the main element of which is the ETT at the university. It is proposed to highlight projects and portfolios of technology transfer projects, and their main differences from other types of projects implemented at the university are determined. Modeling the management of innovative development of the technology transfer ecosystem in higher education institutions takes into account the specifics of the functioning of the university and includes seven stages, including adaptation of the psychological climate, initiation, launch, planning, implementation, monitoring and control, the completion stage – the creation of ETT at the university. Within the framework of the specified model, a flowchart for the initialization of the ETT creation project at the university was developed. The stakeholders of the project were also identified, indicating the role and interests of each party. An organizational model of ETT in higher education institutions was developed, which includes a template for creating an ETT project in a higher education institution, a template for the organizational structure of ETT in a higher education institution.

CHAPTER 5
DETERMINING THE CORRESPONDENCE OF THE PROTOTYPE OF THE TECHNOLOGY TRANSFER ECOSYSTEM IN A HIGHER EDUCATION INSTITUTION TO THE NEEDS OF STAKEHOLDERS

Ukraine has a powerful scientific potential, every year innovative technologies and developments are created in higher education institutions (HEIs), technology transfer offices are registered [6, 126]. However, most of them remain unrealized in the real sector of the economy. The modern vector of state policy is aimed at the development of an innovation ecosystem, the main element of which are universities. The use of the Ecosystem of Technology Transfer (ETT) [21] can serve as a prototype for using the results of innovation activities of higher education institutions for the needs of stakeholders. The development of an innovation ecosystem is one of the main vectors of development of the Ukrainian economy. Higher education institutions are one of the main elements of such a policy [5]. An effective transition to a project approach to technology transfer management is an organizational approach. Using an organizational approach involves the creation of a new organizational structure in a higher education institution [2, 9]. Such a structure may be the creation of an organizational unit – a technology transfer ecosystem, the main task of which will be the management of technology transfer projects.

The application of the project approach will allow the creation of effective organizational units – technology transfer ecosystems (ETT) on the basis of HEIs, the main task of which will be the management of projects and portfolios of technology transfer projects. The presence of ETT will allow for cooperation with business representatives, which, in turn, will increase the level of implementation of scientific and technical developments and attract extra-budgetary funding to the university [59]. The creation of such an ETT is essentially a project, therefore there is an

objective need to apply the project management methodology. The problem of interaction between HEIs, government and business is the subject of research by many scientists, including [49, 68, 69, 95], some of whose provisions were used as the basis for this study. Some of the mentioned scientists [68, 69] proposed the creation of organizational units – technology transfer ecosystems in HEIs to manage technology transfer processes. However, these studies were conducted without taking into account project approaches. At the same time, ETT is essentially a mechanism for operational project management, and therefore the use of a project approach in the creation and functioning of ETT is necessary. The issue of creating and organizing such project offices in HEIs has its own characteristics. Managing projects and project portfolios in HEIs and scientific institutions by creating a separate structural unit in a HEI or scientific institution to manage innovation activities is the most effective solution to the problem. However, the issue of creating a new organizational structure for the purpose of managing technology transfer projects and portfolios still remains unresolved. Therefore, today there is a need to establish ties between representatives of HEIs and business, which will increase the level of implementation of scientific and technical research results in the real economy and attract extra-budgetary funding to HEIs. The solution to this problem is proposed by creating an organizational structure on the basis of HEIs that will be responsible for managing technology transfer projects and portfolios – a technology transfer ecosystem. However, for the successful creation and further functioning of such an organizational structure, there is an objective need to apply a project approach.

The methodology for determining the compliance of the ETT prototype in the HEI with the needs of stakeholders will allow a decision to be made regarding the future fate of the new organizational structure – whether to start full-fledged functioning of the ETT in the HEI or to close the project. This method will also allow for the identification of areas for improving the new organizational structure. However, in order to obtain an objective opportunity to evaluate the results of this ETT

prototype, some time must pass (about 3–12 months). The main task is to obtain feedback on the functioning of the ETT in the HEI. The methodology for determining the compliance of the ETT prototype in the HEI with the needs of stakeholders includes a stakeholder questionnaire using closed questions, the answers to which are efficiency scores on a 5-point scale. 10 criteria, the total score of which will assess the level of satisfaction with the work of the ETT. In order to determine the compliance of the ETT prototype in the KNUTD with the needs of stakeholders, a survey was conducted among respondents who had already participated in surveys at the stage of the initialization of the ETT creation project in the KNUTD, as well as among other stakeholders. The questionnaire was formulated using both closed and open-ended questions. The formulation of closed questions should meet clearly defined criteria for assessing whether the ETT prototype in HEIs meets the needs of stakeholders. To formulate the closed questions, criteria for determining whether the ETT prototype in HEIs meets the needs of stakeholders were created and are listed in Table 5.1.

Table 5.1

Criteria for determining whether an ETT prototype meets the needs of university stakeholders

Criteria designation	Criterion name	Criterion description
1	2	3
C1	Timeliness	Project completion within the set deadline or with minimal deviation from the set deadline
C2	Efficiency	ETT team effectiveness; management decision effectiveness; technology development effectiveness
C3	Flexibility	Establishing connections between different functional units of HEIs for the joint creation of innovative technologies; adjusting to market requirements

Continuation of Table 5.1

1	2	3
C4	Optimality	Creation and maintenance of technology databases, setting up and maximum simplification of the document flow system in HEIs regarding technology transfer; creation of a section of the website dedicated to HEI technologies to enable access to this information by the maximum number of potential consumers
C5	Reliability	Providing advice and assistance to technological innovators
C6	Stimulation	Creating a psychological climate in higher education institutions to stimulate innovation; preparing and implementing an intellectual property policy that will determine the distribution of funds received as a result of the transfer of intellectual property rights or licensing, and will promote the creation of innovative technologies
C7	Economy	Maximum cost reduction: instead of involving third-party specialists (for software development, marketing research, etc.), use your own personnel and resources
C8	Progressiveness	Participation in national and international projects, continuous development and training
C9	Communication	Establishing relationships with business and government representatives; establishing communication channels
C10	Efficiency	Involvement of the Ministry of Education and Science in co-financing the project; attraction of additional funding for the purchase of modern equipment for HEIs; attraction of extra-budgetary funding

The criteria given in the table take into account the specifics of the functioning of the HEI and make it possible to carry out an objective assessment of the activities of the new organizational structure. When assessing the criteria specified in table 5.1, we propose to use a 5-point scale, according to which:

«1» – the ETT prototype does not meet the needs of stakeholders at all according to this criterion;

«2» – the ETT prototype does not meet the needs of stakeholders according to this criterion;

«3» – the ETT prototype generally meets the needs of stakeholders according to this criterion, but it is desirable to improve it;

«4» – the ETT prototype meets the needs of stakeholders according to this criterion, but not fully;

«5» – the ETT prototype fully meets the needs of stakeholders according to this criterion.

Thus, based on the criteria defined in Table 5.1, closed questions have been formulated, to which the respondent must answer, scoring from 1 to 5 points for each criterion. The total number of points from one respondent can be from 10 (absolute dissatisfaction with the ETT at the university) to 50 (complete satisfaction). Taking into account certain criteria for the compliance of the ETT prototype with the needs of stakeholders, as well as a 5-point evaluation scale, we propose to formulate closed questions with the proposed answer options as follows:

Question No. 1: “Was the ETT project implemented on time?” Answer options: “The project was implemented on time” – 5 points; “The project was implemented with minimal delay” – 4 points; “The project was implemented with a delay” – 3 points; “The project was implemented with a significant delay” – 2 points; “The project was not implemented” – 1 point.

Question #2: “How effective was the work of the ETT?” Answer options: “The work of the ETT team was coordinated, management decisions on technology transfer issues were prompt and effective, the technologies have effectively entered the market and there are already

successful examples of their implementation" – 5 points; "The work of the ETT team was coordinated, management decisions on technology transfer issues were prompt and effective, but the technologies have just started to enter the market" – 4 points; "The work of the ETT team was coordinated, but management decisions on technology transfer issues were inoperative and ineffective" – 1 point.

Question #3: "To what extent has ETT managed to establish connections between the functional units of the HEI for joint work on creating innovative technologies and adapting work to market requirements?" Answer options: "Functional units of the HEI work together on creating innovative technologies taking into account market requirements" – 5 points;

"Functional units of the HEI are beginning to cooperate on creating innovative technologies taking into account market requirements" – 4 points; "Functional units of the HEI are beginning to cooperate on creating technologies" – 3 points; "Functional units of the HEI have not started joint work on creating innovative technologies taking into account market requirements, but there is an understanding of the need to create innovative technologies" – 4 points.

Question No. 4: "How convenient is the document flow and data storage of technologies created at the university?" Answer options: "The document flow system for the created technologies is simplified and understandable (there are all the necessary document forms, document flow schemes), the work of the databases is well-established, ETT employees help in filling out all documents and databases if necessary" – 5 points; "The document flow system is simplified and understandable (there are all the necessary document forms, document flow schemes), the work of the database is being adjusted, ETT employees help in the work of the database if necessary".

Question No. 5: "How do you assess the provision of consultations by HETT employees on technology transfer issues? Answer options: "HETT employees provide comprehensive consultations on all issues of technology transfer at a time convenient for HEI employees" – 5 points;

"ETT employees provide comprehensive consultations on all issues related to technology transfer, but only at the time established by such employees" – 4 points; "ETT employees consult on all issues related to technology transfer, but it is very difficult to get to such a consultation" – 3 points. Question No. 6: "How do you assess the incentives for activities in the field of creating innovative technologies?" Answer options: "Intellectual property policy clearly defines the distribution of funds, provided that the distribution encourages innovators to create technologies, the psychological climate also contributes to the creation of innovative technologies" – 5 points; "Intellectual property policy clearly defines the distribution of funds, provided that the distribution encourages innovators to create technologies, the psychological climate promotes the creation of innovative technologies" – 4 points; "Intellectual property policy clearly defines the distribution of funds, provided that the distribution encourages innovators to create technologies, the psychological climate also promotes the creation of innovative technologies" – 3 points.

Question No. 7: "Was the project implemented within the planned budget? Answer options: "The project was implemented within the planned budget, thanks to co-financing, we even managed to save money" – 5 points; "The project was implemented within the planned budget." planned budget" – 4 points; "The project was implemented slightly above the planned budget" – 3 points; "The project was implemented significantly above the planned budget, but the project was implemented" – 2 points; "The project was implemented significantly above the planned budget, which is why the project could not be implemented" – 1 point.

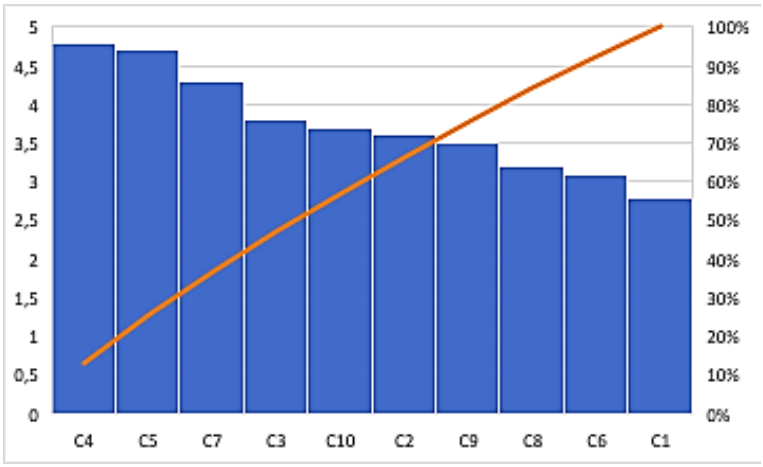
Question #8: "Do HEI representatives participate in national and international projects in the field of technology transfer thanks to the work of ETT?" Answer options: "HEI representatives have already taken an active part in national and international projects and continue to apply for participation thanks to the information received from ETT employees" – 5 points; "HEI representatives apply for participation in

national and international projects thanks to the information received from ETT employees" – 4 points; "ETT employees disseminate information about international or national projects, but HEI representatives perceive this information rather passively" – 3 points; "ETT staff is not involved in national projects" – 2 points.

Question #9: "To what extent are the communication channels established between HEI representatives and business?" Answer options: "Communication channels, including the Internet, are configured and meet market requirements, namely: a section of the site with a user-friendly interface dedicated to HEI technologies, active promotion of technologies, there is a database of business representatives who may be potential consumers of equipment, there is communication with them" – 5 points; "Communication channels are configured, including on the Internet: in the section of the site dedicated to HEI technologies, only a database of business representatives has been formed" – 4 points; "Communication channels are configured, including on the Internet: a section of the site on HEI technologies has been formed" – 2 points; "Communication channels are not configured" – 1 point.

Question No. 10: "Has extra-budgetary funding been attracted to the university due to the work of the ETT?" Answer options: "Extra-budgetary funding has been attracted in a significant amount" – 5 points; "Extra-budgetary funding has been attracted in a small amount" – 4 points; "Extra-budgetary funding is being attracted" – 3 points; "Extra-budgetary funding is planned to be attracted" – 2 points; "Extra-budgetary funds are not planned to be attracted" – 1 point.

Based on the total scores obtained according to equation (5.1), we propose to construct a Pareto diagram that will determine which of the criteria do not meet, do not quite meet, or do not meet the needs of stakeholders at all. This will allow us to determine the direction of improving the work of the ETT in HEIs (Fig. 5.2).



Source: generated by the author.

Figure – 5.2 Pareto diagram for identifying areas for improving ETT in a higher education institution

Open-ended questions were formulated by supplementing the questionnaire with the feedback grid shown in Table 5.2.

Table 5.2

Feedback grid

What did I like about working at ETT at the university?	What did you not like about the ETT work at the university?
What questions do you have about the work of ETT?	What are your ideas for improving the ETT experience?

Source: author's development.

It is very important that respondents who gave a low assessment of the ETT activity in HEIs express their thoughts and ideas in the proposed table. The combination of closed and open questions in the questionnaire process will allow us to draw objective conclusions about the need to make changes to the activities of the created ETT. If the questionnaire reveals that the ETT prototype at the university does not meet the needs of stakeholders, it is necessary to return to the idea generation stage and, taking into account the information received, select ideas. with further iteration. If the questionnaire establishes that the ETT prototype meets the needs of stakeholders, the ETT will continue to

function. However, the ideas identified in the questionnaire to improve its functioning should not be rejected, but can be gradually implemented if appropriate resources are available. To determine the relevance of the prototype section of the site dedicated to ETT technologies and development, we propose to use A / B testing and usability testing. During A/B testing, we suggest showing respondents screenshots of the current version of the HEI section of the site dedicated to technologies and development for comparison, as well as screenshots of the site section that is proposed for implementation. Based on the respondents' answers, it will be possible to clearly determine which version of the site is more acceptable. We suggest conducting usability testing of the prototype of the site section dedicated to technologies and development of the university by involving respondents in searching for specific information in this section in order to assess the convenience and intuitive interface, the possibility of identifying shortcomings with the aim of their further elimination. The information obtained in the results of testing on the prototype section of the site will help to make a decision on the need for its refinement or the start of full-fledged functioning.

During the observation and survey, it turned out that modern communication channels between university representatives and business are absent, primarily on the Internet. Therefore, during the generation of ideas, it was proposed to create an additional product of the project – a section of the site that would be dedicated to technologies and the development of HEIs.

CHAPTER 6
MARKETING DIAGNOSTICS OF THE DEVELOPMENT OF THE INNOVATIVE POTENTIAL OF YOUTH IN THE UNIVERSITY ECOSYSTEM

Modern society places high demands on the training of a specialist. A future specialist should not only have the competencies necessary for the future profession, but also sufficiently developed cognitive skills, independence, initiative, and creative thinking. Research competence is an integral quality of a person, expressed in the ability and readiness to independently solve research problems, mastery of research technology, recognition of the value of research skills and readiness to use them in the professional sphere.

The modern competency paradigm of the development of higher education is objectively focused on forming the readiness of future specialists for professional activity in conditions of a high degree of uncertainty and dynamism of phenomena and processes. A person in society must be ready to quickly solve complex problems qualitatively, be able to see and solve the problem, offering creative options. Research in a rapidly changing world is considered not only as a highly specialized activity of scientists, but also as an integral part of any activity, as a style of activity of a modern person. This means that one of the attributive characteristics of a specialist today is research competence.

The formation of research competence of students, like any other property of a person, requires, first of all, solving the question of what is the concept that determines its content and essence. In this regard, we will consider below the question of what is the essence and content of the concept of "research competence" in relation to higher education applicants.

Following A. Stolzfus, M. Rosenberg, H. Lapp, we understand diagnostics as “the process and methods of determining the degree of development of personal qualities, difficulties in learning, development,

communication, mastering a profession, and also the effectiveness of functioning". and the development of psychological systems, technologies, methods, pedagogical projects" [38].

Most of the works that describe and reveal various aspects of students' scientific and research activities are based on the competency approach and the theory of activity of N. Linnell, S. Figueira, N. Chintal [95].

It is assumed that experiential competence is both a system of research competencies and the ability and willingness to apply them in practice. A detailed analysis of the literature on the set and content of research competencies can be found in the publications of D. Groen, B. Calderhead and others [18, 19, 61].

Based on the conclusions drawn, it is advisable to distinguish the following components of students' research competence:

- orientational, which includes goal-setting, planning, forecasting and mastery of the methodology of scientific research;
- motivational, which involves determining the importance of research activity for the individual;
- technological, which consists directly of research competencies;
- reflective-behavioral.

These components are the main ones in the structure of research competence. However, other, equally important components can be added that determine the quality of students' research activity [73]:

- cognitive – a set of knowledge necessary for setting and solving research tasks in professional activities, erudition, the ability to obtain and assimilate new knowledge;
- informational and instrumental – mastery of modern information technologies, the ability to collect and critically analyze information, the ability to effectively apply knowledge in practice;
- social and communicative – communicative competencies, in particular academic writing and presentation of scientific text, foreign language competence, as well as the ability to work in a team, find a common language with the scientific supervisor and colleagues [105].

In addition, the scientific activities of undergraduates, postgraduates and scientists may include [72]:

- innovative and implementation component – implementation and commercialization of developments, knowledge of the laws of economics, etc.

- creative and heuristic component – imagination, ingenuity, freedom and independence of judgments [108].

The mathematical model for diagnosing the degree of readiness of HEI students for scientific and research activities is presented in the form of a linear equation:

$$L = 5{,}66x_1 + 5{,}05x_2 + 2{,}05x_2 + 2{,}51x_5 + 2{,}88x_5 + 2{,}11x_6 + \\ + 2{,}68x_7 + 5{,}55x_8 + 2{,}88x_9 + 5{,}65x_{10}, \quad (6.1)$$

where xi = {1; 2; 2…} – the meaning of the competence levels (each of the ten competences is divided into three levels):

$= \sum_{i=1}^{1} i = \sum_{i=1}^{1} i$ – threshold value of the diagnostic assessment of a student's readiness for research activities;

γi – "weight" values of the competencies (components) given in Table 6.1; coefficient 2 – average level of components;

$= \sum_{i=1}^{1} i$ – maximum value of the diagnostic score;

i$n = \sum_{i=1}^{1} i$ – minimum diagnostic assessment value.

The following indicators of assessing a student's readiness for research activities are acceptable:

L < 70 – below the average value of the student's readiness for research activities;

70 ≤ L ≤ 80 – the average value of the student's readiness for research activities;

L > 80 – above the average value of the student's readiness score for research activities.

The presented mathematical model is a tool for determining the readiness of students of higher educational institutions for research activities. It is assumed that a software product will be developed based on the results of the study, the implementation of which will allow

determining the value of a linear function through testing. Then, based on the threshold values and testing results, it will be possible to diagnose the readiness of students for research activities.

The structure of readiness for research activities is directly dependent on the structure of research competence, which completely or partially duplicates individual components, or may include all of them with varying degrees of severity. M. Riesener, K. Dlle, M. Kun interpret the readiness of students for scientific and research activities as "a personal formation that determines the state of the subject's personality and includes a motivational and value attitude to this activity, a system of methodological knowledge that allows research skills to form research activities" and to use them productively when solving professional and research tasks" [117]. The structure of students' readiness for research activity is presented, the components of which coincide with the main components of research competence (Table 6.1).

Table 6.1

Structure of students' readiness for research activities

Component	Characteristic
Motivational	Characterizes cognitive interest, motivation for research activities
Orientation	Includes an understanding of scientific research methodology and research methods
Activitsky	Defines research skills and abilities
Reflex	Includes self-assessment and self-analysis of one's own research activities, identification of ways of self-development in scientific knowledge

Source: proposed by the authors.

The most significant competencies of postgraduate students were identified and ranked on a 5-point scale. During the experiment, 50 respondents from Ukrainian higher education institutions were interviewed. The methodology for selecting relevant qualities is

described in detail. The most significant qualities identified by the researchers are presented in Table 6.2.

Table 6.2

The most important qualities of a graduate student

No. s/n	Qualities (competences)	Percentage of responses with a score of 5
1	High level of academic training, erudition	98
2	Knowledge of foreign languages	90
3	Experience working in an experienced group (team)	72
4	Experience presenting research and development results	65
5	"Recognition" in the scientific environment, contacts in the scientific environment	65
6	Skills in writing competitive applications, grant applications	60
7	Familiarity with the basics of the economics of science, methods of commercialization	51

As can be seen from the contents of Table 6.2, in addition to the research competencies themselves, a young scientist must possess some communicative and economic competencies (items 2, 5, 6, 7), which determines the set of qualities necessary for a student's research activity before entering graduate school or at the very beginning of a scientific career.

Based on the survey data and the structure of research competence, taking into account the difference between the level of training and experience of research activities of graduate students and students, a list of qualities necessary for assessing the readiness of graduate students and students to form research activities has been compiled. This list is somewhat expanded compared to the contents of Table 6.1, as it includes some additional competencies in addition to the main components of research activities.

The structure of students' readiness for research activities is represented by the following components:

- motivational;
- orientational;
- activist;
- reflexive;
- cognitive;
- informational;
- social-communicative;
- creative-heuristic.

This structure of readiness for research activity corresponds to the "extended" structure of research competence.

To determine the final set of qualities, as well as the weight of each of them in assessing the readiness of HEI students for research activity, we conducted a questionnaire. 56 respondents were candidates and doctors of science and had significant experience in scientific management. Among them were teachers familiar with the specifics of students' scientific work and the features of preparing final qualification theses.

Respondents were asked to answer two questions:

1. Assess how necessary these qualities are for a student-researcher. Rate on a five-point scale from 1 (not necessary) to 5 (absolutely necessary).

List of qualities necessary for a student-researcher:

1) high level of academic training, erudition;

2) comprehensive approach to solving scientific and technical problems;

3) experience working in a research group;

4) academic writing skills (including writing competitive applications, grant applications);

5) experience in presenting research and development results;

6) knowledge of the basics of science economics, methods of commercialization of research and development results;

7) proficiency in foreign languages;

8) knowledge of computer technologies, software products;

9) skills of professional reflection;

10) motivation for research activities.

In your opinion, what other qualities, in addition to the competencies listed above, are necessary?

In our opinion, it would be logical to begin the analysis of the survey results with the second question, since the experts in their comments confirmed the feasibility of enriching the structure of research competence and readiness for research activities. In particular, they suggested supplementing the points indicated in the first question:

Specify 1 – erudition:

- "high level of secondary education in exact sciences";
- "knowledge of the fundamental laws of the exact sciences";
- "knowledge of the basic laws of philosophy".

Specify 2 – a comprehensive approach to solving scientific and technical problems:

- "desire to learn and explore new things";
- "skills for planning research work";
- "ability to see the result of one's activities";
- "ability to systematically (comprehensively) consider the objects under study";
- "diligence";
- "ability to solve not only current problems, but also to work systematically, for the future";
- "quick response to changes in scientific knowledge on the subject under study and the ability to adapt in a new situation";

specify 6 – knowledge of the basics of the economics of science, methods of commercialization of research and development results:

- "fundamentals of project management";

Specify 9 –skills of professional reflection:

- "analytical thinking (analytical abilities)";
- "propensity for criticism and self-criticism, critical reflection of the results of one's activities";
- "ability for professional mobility";

- "knowledge of the current situation in a certain research field";
- "ability to navigate in related subject areas and be focused on interdisciplinary synthesis".

Based on the expert assessment, the list of competencies given in Table 6.2 was clarified:

- "activity, independence": general activity, efficiency, diligence, purposefulness, initiative, independence, ability to defend one's point of view, independence from the opinions of "recognized authorities";
- "creativity": scientific imagination, passion for creativity, curiosity, desire to understand the "zest" of the process, ability to non-standard solutions, ability to generate ideas and formulate a problem;
- "self-control, time management": ability to organize one's time, self-organization to perform work, self-control, stress resistance, ability to quickly adapt to changing conditions, punctuality, diligence, responsibility;
- "general communication skills": interpersonal communication, ability to use technical literature and other sources, navigate in modern information flows, select the necessary information and work with it.

These competencies can be considered as meta-competences, which are basic competencies and ensure the quality of basic research competencies. Taking into account these comments and the results of testing the proposed technology, it is possible to further clarify and improve the proposed list of qualities.

Analysis of the ratings provided by respondents when answering the first question made it possible to calculate the arithmetic mean of each item, that is, by statistical analysis to determine the weight coefficients (weight values of competencies) γi for building a linear mathematical model of diagnostics. readiness of university students for research activities.

The obtained evaluation values indicate that the list of components (competences) is correct, there are no insignificant ones among them. Component ratings are in the range [2.05; 4.67]: minimum value – $2.05 > 1$, maximum – $4.67 < 5$. The mathematical expectation (average value) was 2.88. The weight of the components was: (2.88/5.0) – 100% = 57.6%.

Table 6.3 shows the expected values, as well as the probability density distribution for each quality – the proportion of all respondents' ratings for each component.

Table 6.3

Statistical analysis of respondents' answers

No. s/n	*Qualities (competences)*	*Mathematical expectation, γ_i*	*N*	*Probability density of estimates, n/N*				
				1	*2*	*3*	*4*	*5*
1	High level of academic training	5,66	56	–	0,05	0,09	0,09	0,79
2	A comprehensive approach to solving scientific and technical problems	5,05	56	0,05	0,05	0,18	0,29	0,55
3	Experience working in a scientific team	2,05	56	0,11	0,15	0,26	0,25	0,11
4	Academic writing skills	2,51	56	0,11	0,07	0,27	0,28	0,18
5	Experience in presenting research and development results	2,88	56	0,05	0,02	0,22	0,26	0,25
6	Introduction to the basics of the economics of science	2,11	56	0,18	0,07	0,26	0,25	0,15
7	Knowledge of foreign languages	2,68	56	0,02	0,16	0,21	0,2	0,2
8	Knowledge of computer technologies, software products	5,55	56	–	0,02	0,07	0,26	0,55
9	Professional reflection skills	2,88	52	0,06	0,08	0,1	0,56	0,21
10	Research motivation	5,65	55	–	0,05	0,05	0,12	0,78

The probability density of the distribution is expressed by the ratio n/N, where n is the number of requests, the frequency of ratings from 1 to 5 for individual competence; N is the number of answers to the first question of the questionnaire (in items 1–8 – 56, in the last two items – 55 and 52, respectively).

In table 6.2, the competencies are arranged in the same order in which they were presented to the expert community.

When comparing the data in tables 6.2 and 6.3, it turns out that if for postgraduate students the most important competencies in R&D are a high level of academic training, erudition and knowledge of foreign languages, then for university student researchers the priorities are somewhat different. In the list of necessary NICs formed for them, the highest score was given to a high level of educational training (4.67) and motivation for research activity (4.66).

During the experiment, the following indicators of student readiness for research activity were confirmed:

$L < 70$ – below the average value of the student's readiness for research activity;

$70 \leq L \leq 80$ –the average value of the student's readiness for research activity;

$L > 80$ – above the average value of the student's readiness for research activity.

Thus, the developed mathematical model fully describes the readiness of students of higher education institutions for research activity.

This model can be used as the basis for creating a test software product that can be used in practice both by students to measure their inclination to research activity, and by scientific supervisors to correct the activities of students and postgraduates.

The described diagnostic model is useful "at the entrance" of students of higher education institutions for their orientation to further research activity.

CHAPTER 7
DIRECTIONS FOR EFFECTIVE USE OF THE UNIVERSITY ECOSYSTEM FOR THE SOCIO-PROFESSIONAL INTEGRATION OF YOUTH

The problems of employment of the population remain one of the most important problems of today. The constantly changing state of the labor market is an objective reality of modern social relations. However, the current situation in the sphere of labor and employment leads to the fact that young people find themselves in the most difficult situation. Transformations in various spheres – social, economic and political – have led to the fact that the consequence of the decrease in the social value of labor for a significant part of young people has been not only moral degradation, but also social pessimism – disbelief that they can ever get an interesting job paid in accordance with the measure of their labor; polarization of the efforts expended and wages, which in practice often diverge.

For a sufficient level of professional maturity, the use of traditional forms of labor socialization is not enough. This is due to the fact that some young people are engaged in non-professional work, some are engaged in professional activities, but do not strive to achieve professional skills, and some young people are discriminated against by the older generation in terms of professional development. An experiment conducted on the basis of the university Hackathon ecosystem proved that professional socialization of an individual is the process of an individual entering a professional environment, assimilation of professional experience, assimilation of standards and values of the professional community, the process of active implementation of one's own accumulated professional experience.

Changes in the spheres of social life in Ukraine in the period 2019–2024 had ambiguous consequences [22]. From the point of view of A. Stolzfus, M. Rosenberg, H. Lapp, on the one hand, the world underwent a renewal of social institutions, a transformation of value

orientations, the imperfection of the functioning system became clearly evident, and new promising directions of development appeared [60]. On the other hand, crisis phenomena associated with the conditions of the pandemic deepened a number of problems in the economy, politics, and the socio-cultural environment [4]. Youth in this situation was in a vulnerable position [11]. According to many scientists (I. Gryshchenko, T. Zhurko), any changes in the external environment exacerbate the problems of youth integration into society, as they pose a threat to both the reproduction of individual personalities and the reproduction of existing social structures [22, 25].

The global increase in the volatility of the global financial system in 2019–2020 has significantly affected Ukraine. This is a time of economic upheaval and change, which entails the same phenomena in the political and social spheres. During this period, according to W. Taylor, long-standing problems that were often discussed at the highest level have become more acute in most countries, but no specific actions have been taken to resolve them [17].

2019–2020 cannot be called stable for both Ukraine and the international community. The deterioration of the economic situation in Ukraine began in 2014 with the beginning of the military invasion, worsened with the emergence of the Covid-19 pandemic and full-scale military operations in 2022. All this led to: a significant increase in the price of imports, a reduction in exports to most countries, a large percentage of the inflation rate, a drop in GDP and overall economic growth, an increase in the share of poor and low-income citizens [20]. According to the monitoring of the socio-economic situation and well-being of the population in 2021, 50% of Ukrainian citizens noted a decrease in their standard of living. A significant increase in the cost of consumer goods, utilities, as well as treatment and recreation (including abroad) has led to a decrease in the quality of life, complicating the situation of the weakest social strata [26]. One of them is youth, an age category that is a receiver of accumulated experience and a potential bearer of the image of the future society. The transition from one age position to another entails both physical and spiritual and mental

changes [63]. During this period, a person begins to integrate and fit into the existing social structure. Entering society, according to many scientists, forces young people to sympathize with dynamic social movements, which does not always have a positive effect on both young people and society as a whole [15, 33, 34, 58]. This group is motivationally detached from the political process, they do not yet have fixed interests and views on the economy, values available to adults, they can be easily changed by external influence.

Social integration is the act of including a person in the social environment with the subsequent unification, linking and harmonization of structural components. It lies at the heart of the creation and development of society, in the absence of this process, the transfer of social experience of society will be stopped and will lead to chaos [35]. Youth is a kind of reserve, the activation of which directly depends on the successful integration into society, because the hidden forces of the nation can be mobilized only if they are united. This is a group that is going through a period of social maturity, the position of which is determined by the socio-economic state of society [34]. In the process of social integration, which takes place in conditions of crisis phenomena in the economic sphere of the country, youth faces a number of problems.

In the period from 2019 to 2022, the main direction of state policy was a stabilizing influence on the economic sphere, while other, no less important components, in particular, the youth policy of Ukraine, were given relatively less attention. A trend of erosion and further loss of the national idea has taken shape. The problems of youth have merged with the general difficulties of each individual person and the problems of the state as a whole [63]. The difficult situation has put the new generation in a dead end, the list of priority specialties for youth has changed, and employment opportunities have decreased. For example, in the IT sector, previously recognized as very promising, there is a serious oversaturation; it is also difficult for qualified doctors, economists and lawyers to find work. At the same time, there is a shortage of engineers, production workers, technologists, real consumer opportunities have

decreased, and the inaccessibility of some services, in particular educational ones, has increased.

In the process, the integration of a person into society becomes more difficult. Changes in any system are a factor in the social integration of this age group. Changes in the economy have not only affected the state of the national economy, but also significantly complicated the role systems that accompany the integration of young people into society. These changes have become more widespread and large-scale, requiring different and often contradictory roles. Often leads to social inadequacy among young people. Social inadequacy is understood as a violation of the ability to perform the so-called "social roles". Access to development resources is limited, which leads to a contradictory situation in which the desire for self-realization comes into conflict with existing opportunities.

This process hinders the growth of status in all areas, and most of all in education and the system of labor relations.

Education is a mechanism that promotes the development of young people. This helps them move up the social ladder and integrate into society. However, economic hardships have also affected education in Ukraine, creating significant difficulties for the implementation of the educational process. The reduction in funding for educational institutions, low wages for employees in the sector leads to the gradual destruction of the public education system, and the introduction of commercial relations, in conditions of sharp impoverishment of the population, significantly limited the social advancement of the population. number of groups of the young generation [34].

According to the latest data, the level of officially registered unemployment among the economically active population increased by 0.1% to 1.4%, while in 2019 it was 1.3%. This trend also affects the level of unemployment among youth [35, 58]. The crisis in the financial market, the bankruptcy of many enterprises, the destruction of many industries and the general decline in their volumes (due to the cessation of financing of a number of industries in which young people are mainly employed), increased requirements for employees led to a natural increase in the number of unemployed, including among young people.

Low wages, the presence of more qualified representatives of other age groups in the labor market, inadequate employer requirements for experience, qualifications and qualifications – reduce employment opportunities and negatively affect the professional orientation of young citizens who have not yet worked. As a result, this leads to a regression of labor opportunities, a change in the direction of the integration movement towards the criminal sphere. It should be noted that the student environment is being criminalized faster than any other youth groups.

It is also noteworthy that in Ukraine in 2022 the number of young citizens who are looking for not their main job, but an additional one has increased. The reason is dissatisfaction with salaries among employees. Of course, part-time work makes it possible to get more financial opportunities, but this negatively affects the rhythm of life, health. The need to spend most of the time on part-time work affects the quality of education of young people studying in a higher education institution or other institution. This can be seen in the constant increase from year to year in the number of expelled education seekers.

In 2019–2022, young people also had fewer opportunities to improve their qualifications, which means fewer chances of getting a higher salary and career growth in the future. Due to military operations, dissatisfaction with the lack of prospects, a decrease in employment opportunities in their specialty, and due to the imperfection of the higher education system, large-scale staff reductions, there is a redistribution of personnel from production to distribution and sales.

The opportunities of young people in the field of entrepreneurship are even more limited. After all, in order to open a business and achieve success in it, you need start-up capital, which young people do not have for many reasons. Loans are not an option, since many young people do not meet the criteria for an agreement with a credit organization, and for others, the bank's terms seem unprofitable.

Entrepreneurship is considered the best occupation, but many do not have the opportunity to do business. Many young people who have managed to open a business are also having a hard time. The developing

entrepreneurial activity of Ukrainian youth faces taxation difficulties, corruption and other problems that are the main obstacles to legal entrepreneurship.

Social integration processes introduce young people to modern society, but the correspondence between expectations and realities of achievable status positions in transitional moments is sharply opposite and contrasting. The need to consolidate a status-role position and reduce the possibility of its implementation is one of the problems that is most clearly manifested in moments of instability [60].

The undervalued cost of labor, the lack of decent wages, weak social guarantees contribute to the outflow of young specialists abroad, reduce interest in education, and lead to the development of shadow business. The consequence of this is the worsening of the criminal situation in the country: the number of economic and other types of crimes is increasing, alcoholism and drug addiction are spreading, life expectancy is decreasing, mortality is increasing – this contributes to the degeneration of the nation.

The housing problem of youth is particularly relevant and directly affects many social indicators. Most young families face the problem of acquiring housing, but in the period 2019–2020 it has become significantly more acute. This is due to the reduction in construction volumes, the abandonment of the practice of providing housing free of charge by the state and its unavailability due to its high cost on the free market. The dependence of the demographic situation on the housing conditions of young families is obvious. Since the social integration of young people in socio-economic conditions significantly affects the demographic situation and planning of marriage and family relations. The lack of demand for young people, material problems force them to postpone issues related to the family and future children for the future [4]. This leads to a decrease in the birth rate. There is not just a decrease in population reproduction, but a movement towards negative indicators of the demographic balance.

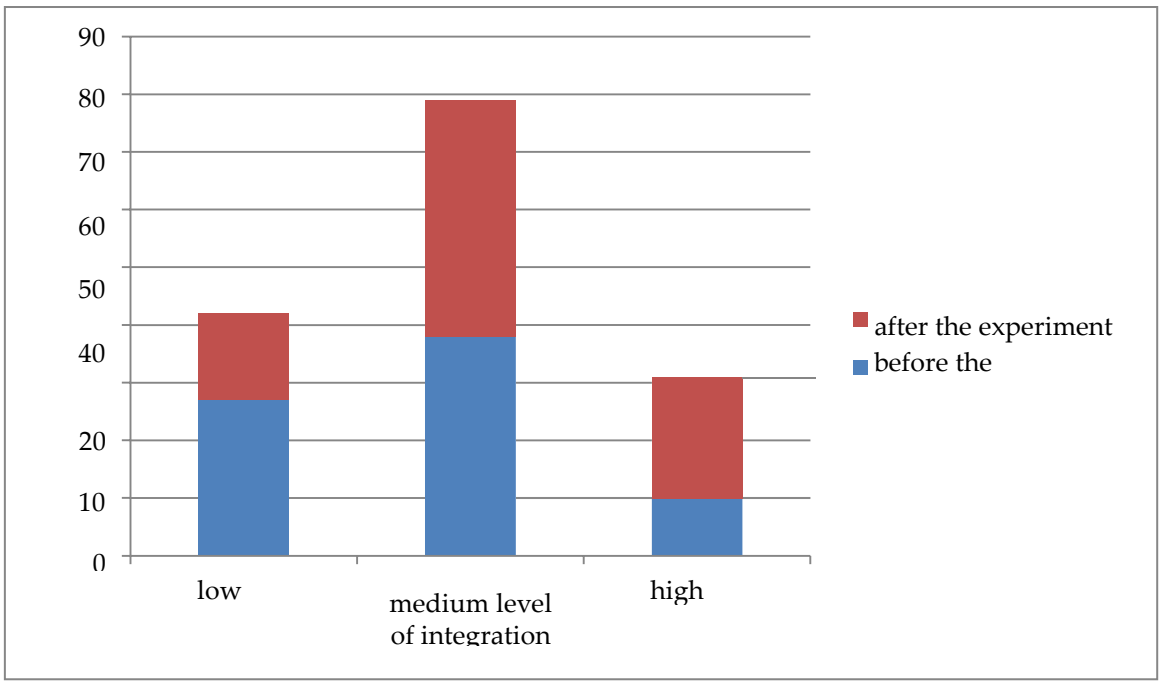
In 2019–2022, youth became the most vulnerable category of the population. After all, the "starting" conditions for entering society are

significantly deteriorating. It is obvious that in the absence of stability and the impossibility of realizing one's own potential, the biological principle of a person begins to actively manifest itself. According to sociological studies, the transformation of the spiritual state leads young people to selfish activity and such forms as "ethicism" (in this case, moral values are perceived pragmatically), as well as "praxis" (human existence is subordinated to worldly things). The basis of selfish activity is a destructive attitude: "the end justifies the means", which involves the rejection of any principles, norms, social laws for the sake of approaching and further achieving the set task. This paradigm allows us to assert the destructive effect of selfish activity. But young people who are exposed to such a state, in the future, being in the leadership ranks, will lead to destructive phenomena up to the destruction of any organization, society, and accordingly, in the state. Such states can be overcome only at the personal level, and a meaningful, independently formed active life position can serve as a solution to the problem.

A survey of graduates conducted on the basis of the KNUTD ecosystem revealed quantitative and qualitative characteristics of future specialists and their ability to integrate into the social environment of society. Processing using the apparatus of mathematical statistics in order to obtain values with accessibility and reliability showed the validity of the developed organizational and pedagogical conditions in higher education institutions both separately and in the complex, while the comprehensive implementation of organizational and pedagogical conditions ensures the greatest effectiveness of adaptation to professional activity on the basis of value-oriented education, readiness for integration into society (Fig. 7.1).

As evidenced by the data of the experiment conducted on the basis of the KNUTD ecosystem, today the problems of youth arise and worsen, which threatens to further intensify the social, political and economic crisis of society. Funding for educational institutions is being reduced, support for non-educational organizations is being discontinued. All this exacerbates the mature crisis of educational and

recreational activity models. Young people are losing the skills of self-organization, self-organization, self-education and self-development.



Source: according to a survey conducted.

Figure 7.1 – Students' readiness for integration into society before and after the experiment based on the KNUTD ecosystem

Society is interested in the effective use of youth leisure. Because leisure is a huge area of their life activity, in which the creative, spiritual, labor and intellectual potential of youth is realized. Unfortunately, young people spend most of their time on the Internet, losing the skills of direct social communication and being influenced by the media with their cultivated consumer attitude to reality. The culture of physically active leisure is being lost. The desire for self-improvement, cultural, moral enrichment, deep all-round self-development, at the stage of crisis moments in the country, cannot be called a trend among modern Ukrainian youth. The influence of the environment often stops the movement of youth in this direction, and the capabilities of the media and Internet resources are actively used by destructive structures and

contribute to the inhibition of general spiritual and intellectual development.

The younger generation, finding themselves in difficult life situations, reacts sensitively to all adversities and often makes radical decisions. In recent years, the number of suicides among young people has increased. Many are characterized by low self-esteem and a sense of undesirability. There is a direct relationship between suicide and loss of social status; during the crisis of 2019–2020, some young people faced this process. According to the World Health Organization, in the first nine months of 2020, the suicide rate was 17.7 per 100,000 people. A sense of tension, risk, and instability due to the political and economic situation in the country accompanies young people. Awareness of one's own helplessness and unrealization causes a feeling of despair and indifference to life. As a result, young people seek to escape from reality with the help of alcohol and drugs, various forms of deviant and protest behavior are spreading, and the youth environment is being criminalized. Dissatisfaction with the state of affairs in the country and general social tension are also a breeding ground for the spread of extremist and terrorist ideology. Fear and tension arising from the assumption of possible economic and social catastrophes reduce the adaptive capabilities of young people, reducing the level of mental and physical health. Young people waste their own potential, trying to distract themselves from what is happening around them, and the country loses future specialists capable of developing it and maintaining internal order.

It is necessary to monitor the state of social integration of youth, defining it as the most important element and one of the conditions for social reproduction. For its successful implementation, a high level of integration is necessary. The state should closely monitor this process, promoting positive changes, identifying social problems of citizens as the main ones and carefully working out their solutions [13]. The views, interests and priorities of young people that have not yet been fully formed are strongly influenced by the environment, especially in times of crisis. Deformation, destruction and lack of interest in individual,

often necessary, internal components of a worthy member of society (values of developing moral and ethical qualities, general self-development and self-improvement) can lead the country to further decline. Being the heirs of modern leaders, innovators, scientists, without support and assistance from the outside, will not be able to form a developed, promising, social state in the future. Thus, we can say that the state of instability in many areas of public life emphasizes the need to create effective measures aimed at finding and implementing a mechanism for stabilizing systems and developing the country, not only in the economic direction. It is important to understand the main problem: failures in the Ukrainian economy at the moment are evidence of insufficient development of human capital. All opportunities for resolving the current situation will be implemented provided that the state supports and is interested in developing the potential of modern youth. The model of promoting professional adaptation of student youth in the context of partnership between the university and social institutions and organizations characterizes the pre-production period of educational and professional adaptation. Increasing the level of adaptation of student youth to professional activity will help young specialists gain confidence in their abilities and become competitive in the labor market, affirming new values of professional self-development and professional improvement. The analysis and results of the sociological study allow us to formulate the following conclusions. Professional self-determination of youth is of great importance in the process of socialization of the individual and is considered as an integral part of the development of the individual. Labor activity is one of the most important spheres of human life. Professional self-determination of youth is a process that covers the entire period of professional activity of the individual: from the emergence of professional intentions to leaving work. As the process of self-determination develops, social roles and intentions regarding the desired social status expand. Due to changes in socio-economic conditions, it is necessary to adopt new economic norms and values, to master new areas and types of professional activity. Thus, the foresight of social and labor mobility of youth is formed under the

influence of a number of different vector socio-economic factors that act spontaneously and purposefully. All these factors affect the individual not directly and automatically, but indirectly, through consciousness and the formation of the internal activity of the individual [33]. Any choice, including the choice of the "channel" of professional training, is associated with limitations. The first group of limitations is related to the personal characteristics of a young person: temperament, character, interests, inclinations, needs. In addition, knowledge, skills, abilities, gender and age criteria, and marital status play an important role in the process of professional choice [15].

Thus, the foresight of the social and labor mobility of youth in the Kyiv region, implemented on the basis of the KNUTD ecosystem, has several characteristic features:

- approximation of professional choice to the needs of the regional economy in personnel, which is associated with the formation in the public consciousness of a certain prestigious "range" of professions and a developed structure of educational institutions;
- coordination of professional self-determination of youth and information about types of professional work, classification of professions, characteristics of specialties according to various parameters; state of the labor market, demand for specialists and workers and employment opportunities for graduates of schools, colleges and universities;
- graduates of peripheral schools are more realistic in choosing a profession, highlighting professions of a prestigious circle, but choosing for themselves more necessary in the industry and infrastructure of their own settlement;
- regardless of success, students prefer the same educational institutions and professions, focusing on new socio-economic living conditions and the labor market;
- students of vocational schools reproduce the educational and professional status of their parents and have little chance of demonstrating vertical upward mobility in the level of education and achieving the desired professional role.

Therefore, it is necessary to highlight the mechanisms for regulating the social and labor attitudes of young people on the basis of the university ecosystem:

- institutional (development and implementation of the regulatory framework, state personnel policy),
- organizational (analysis of conditions within the educational environment: social and domestic, psychological),
- economic (in particular, optimality, efficiency, structure),
- personal and motivational (educational needs, value orientations, interests and motives) mechanisms.

CHAPTER 8
ADAPTATION OF STUDENTS TO SCIENTIFIC AND PROFESSIONAL ACTIVITIES BASED ON THE USE OF THE UNIVERSITY ECOSYSTEM

For young students, the process of entering the profession and harmonizing interaction with the professional environment and future professional activities is a key moment in life. This process, according to most modern researchers, is a certain complexity and contradiction for both students and higher education institutions, as well as social institutions and organizations that act as social customers. The process of modernization of higher education in Ukraine is due to intensive changes taking place in all spheres of socio-economic life. Universities are called upon to provide training of highly qualified specialists capable of professional growth and professional mobility in constantly changing living conditions. In this regard, the problem of adaptation of students in the educational environment of higher education institutions does not lose its relevance. For every professionally active person, mobility, competitiveness, ability to self-development and self-education acquire a professional and moral character [74]. The modern market of professions is filled with young specialists who do not have the necessary professional education. Many have unformed social and professional-moral qualities, professional culture, and often they do not need it [48]. Practice shows that most of the products they create are in demand in a short time, which does not allow improving the quality of professional training. A similar phenomenon was observed among young people during the formation of industrial society. When they began to use the labor of adolescents, they did not think about the social and personal consequences of the lack of professional and moral qualities of young people involved in the labor process.

Modern post-industrial society actualizes the problems of personal socialization and professional socialization. The process of professional socialization can be considered in the context of "lifelong learning",

which complicates the allocation of the subject of education [122]. The subject of education should be related to the surrounding activity, regardless of where in the surrounding society it takes place. Answers to the questions of early professionalization of the individual can be found in the system of higher education. The era of post-industrialism puts forward new requirements for the professional personality. However, the balance, measure in the combination and mutual enrichment of traditional and new, innovative means of socialization are very important. Some scientists often look not for new ideas and strategies, but for ready-made solutions or algorithms [54, 75, 102]. The search for new non-standard solutions requires a growing person to have a different way of thinking, the formation of integrated knowledge, and the ability to construct ideal images of a socially oriented orientation. The professionalization of youth is focused on the development of personality, the formation of socio-moral qualities, the formation of an understanding of a new society, the formation of human capital, the preservation and strengthening of human health [47]. The adoption of a competency-based model of education in an uncertain and unstable economy implied that its implementation would allow solving various socio-economic problems. For higher education, this meant bringing the quality of specialist training into line with the achievements of scientific and technological progress.

We often do not think about the fact that professional training in a higher education institution is accompanied by high intellectual loads, irrational intensification of educational activities, unfavorable socio-pedagogical environment, negative environmental loads associated with professional activities, hypodynamia, emotional stress, non-compliance with the rules and requirements for a healthy lifestyle, insufficient awareness of maintaining professional hygiene and safety. At the same time, the complexity and intensity of the educational process, insufficient awareness of the value of the profession, inability to rationally allocate time for independent work complicate the successful adaptation of a higher education institution graduate to new socio-professional environmental conditions. The presence of emotional, environmental

and industrial stressors affects the health and working capacity, that is, the competitiveness of the graduate. It is impossible to solve these problems without the formation of a professional and value attitude to professional activity based on the integration of professional, humanitarian and health-preserving knowledge, which allows the graduate to develop universal human and professionally important qualities and successfully implement the adaptive capabilities of the body without harm to their own health. It is known that the adaptation process occurs throughout the entire period of study in higher education institutions, but the initial period of study in higher education institutions is sensational for the development of adaptive personality properties and behavior [97]. In the process of adaptation of recent schoolchildren to student life, psychophysiological, psychological and social levels are distinguished. Adaptation requires the involvement of psychophysiological reserves of an organism that is not yet fully formed and is associated with the crisis of adolescence – an important stage of personality formation. Typical difficulties of students are caused by both external (objective) and internal (subjective) factors, among which there are factors that reflect the level of pre-university training; factors that characterize the individual characteristics of the student as a subject of the adaptation process; factors related to the conditions of study; factors related to the conditions of family life [111]. The process of university adaptation is not a passive adaptation of the student to the conditions and influences of the educational environment, adaptation involves the active interaction of the student with the educational environment, during which the development and transformation of the student's personality occurs.

The problem of a person's adaptation to future professional activity begins long before entering a higher education institution and is associated with personal and professional development, that is, with his professional socialization. Professional training is one of the stages of formation. The process and results of professional training affect the graduate's readiness to accept a future profession and future professional activity. In this regard, it is necessary to significantly modify

the educational process itself, the process of professional training, giving it a subject-oriented orientation. The organization of a purposeful pedagogical process, in which students solve professional tasks and have the opportunity to model future professional activity, significantly affects their professional socialization in real practice. Therefore, the specifics of a higher education institution, the features of the organization of professional training significantly affect the professional development of a university graduate [74]. Improving the quality of professional training and the formation of various competencies in a higher education graduate is determined by the effectiveness of his adaptation to professional training [47, 109].

Let us consider the adaptation of students to professional training from the position of their value orientations to education and profession. We consider this process as an element of a single process of social, professional, psychophysiological entry of a student into the educational environment of a higher education institution and into future professional activity. At the same time, the professional training of students of a higher education institution is aimed at the formation of not only knowledge and skills, but also readiness for interaction and cooperation, the desire for sustainable professional growth, and a culture of professional labor protection. The process of adaptation of students to future professional activity is considered taking into account the analysis of socio-psychological, professional-pedagogical, medical-physiological aspects and is a complex psychological-pedagogical task. The medical-physiological interpretation of the studied concept gives grounds for the conclusion that adaptation is a functional indicator of the health status of a graduate, affects the result of educational activity and successful entry into future professional activity.

The main path of social adaptation is the adoption of the norms and values of the new social environment (group, team, organization), established forms of social interaction (formal and informal ties, leadership style, family relations, etc.), as well as forms of subject activity (ways of professional performance of labor or family duties). The psychological aspect of this problem is associated with the peculiarities

of mental processes, the properties of the student's personality. The process of learning, the student's assimilation of professional values, norms and behavioral attitudes leaves an imprint on his attitude to education as a value and on future professional activity.

At the first stage of the experimental work, a survey was conducted. More than 50 teachers and 500 students of the Kyiv National University of Technologies and Design took part in the survey. 94% of the surveyed teachers understand the need to solve the problem of adapting students to professional training in higher education institutions. At the same time, they note that they do not have enough knowledge, methods and technologies for this. In addition, it was found that 90% of expert teachers believe that professional training requires professional knowledge and skills, 92% – humanitarian knowledge and 94% – knowledge of the opportunity to participate in research work.

According to 46% of students, adaptation to professional training begins directly at the enterprise, and 14% consider adaptation to professional training "as an opportunity to join the team, to student life". 29% of students associate adaptation to professional training with "getting used to" educational activities and future profession, and 12% of students had difficulty defining the concept of "adaptation to professional training". A study was conducted at the Kyiv National University of Technologies and Design to study the process of students' adaptation to the educational environment of the university. On the first day of classes, a written survey of first-year students was conducted, who revealed students' expectations regarding studying at KNUTD, a total of 50 people (out of 69) were surveyed.

The following table presents the reasons for choosing a higher education institution and profession in order of decreasing importance. It should be noted that respondents could choose several of the proposed answer options (Table 8.1).

According to the data obtained, almost half of the students who enter this university expect, first of all, to receive a quality education. Also, on the first day of classes, students were asked whether they had any idea about their future professional activity. To this question, 59% of

first-year students answered that they were confident in their choice and knew their future professional activity well; 39% had a very vague idea of the chosen profession; 2% chose the options: "I have not yet thought about professional activity, the main thing for me is to graduate from university" and "It is more important for me to get a higher education in general than to evaluate the field of professional activity". Thus, we can state that career guidance work with applicants is not effective enough and needs to be improved. In our opinion, for further professional adaptation in higher education institutions it is necessary to conduct career guidance work in such forms as specialty weeks, meetings with graduates and practitioners, career planning trainings, etc. This will reduce the likelihood of professional maladjustment and the number of students leaving for other higher education institutions and areas of professional activity.

Table 8.1

Results of a student survey on motivation for choosing a future profession and place of study

Motives for choosing a higher education institution and profession	Number of elections (%)
They provide quality education	49
On the advice of friends and relatives	38
I want to dedicate myself to work in this field	30
Low entrance competition, it was easier to enter higher education institutions	12
Closer to home than other universities	6
Moderate tuition fees	2

At the end of the first month of study at the university, a survey of students was conducted to identify the difficulties they encounter in the first month of study (the sample consisted of 65 people). According to the data obtained, the most difficult for students are three groups of problems: lack of free time (48% of respondents), inconvenient schedule (34%) and overload with classes (26%). Thus, the most relevant for first-year students is the problem of rational time planning. In our opinion,

this explains the appearance of fatigue, overwork in the first days of study at the university, which was indicated by 30% of the surveyed students.

In total, 95% of the surveyed students attend classes with interest, 19% note cheerfulness, 9% indicate a constant need to fight laziness, 6% experience boredom in academic activities, and 4% of respondents who study at the university associate it with anxiety and worry.

Only 2% of respondents said that it was difficult for them to establish contact with the group, 82% said that they liked to communicate with their classmates, 51% of students said that they had several friends in the group, and 49% of students considered themselves members of the group. In the middle of the first semester of study, using the "Methodology of express diagnostics of the level of adaptation of students to scientific, research and professional activities", data on the level of adaptation of KNUTD students were obtained (Table 8.2).

Table 8.2

The level of adaptation of KNUTD students
to scientific research and professional activities

Types of adaptation	Adaptation level (%)		
	high	medium	low
Social adaptation	15	59	26
Research adaptation	15	44	41
Professional adaptation	4	41	55

As can be seen from Table 8.2, low indicators on the scale "Professional Adaptation" in more than half of the students (55%) indicate that the process of professional adaptation in higher education institutions is not given due attention. Also, a fairly high percentage of low indicators is noted on the scale "Research Adaptation" (41%). This indicates that many students find it quite difficult to take additional part in research activities during their studies; such students may need specially organized pedagogical support. At this stage, the relationship between the obtained adaptation indicators and the individual-

typological personality properties of students, which were assessed using the "Individual-typological questionnaire" method, was studied. To establish a statistical relationship between adaptation indicators and individual-typological properties, the Paison correlation coefficient was used. Table 8.3 shows the obtained correlation coefficients (statistically significant ones are highlighted in bold).

Table 8.3

The relationship between adaptation indicators and individual typological characteristics of KNUTD students

Indicators	Social adaptation	Research adaptation	Professional adaptation
Extraversion	**0,815***	-0,159	-0,293
Spontaneity	0,448	0,155	0,143
Innovation	0,056	**-0,892****	-0,464
Creativity	0,305	-0,489	0,249
Insularity	-0,425	-0,069	0,025
Sensitivity	0,552	0,391	-0,291
Anxiety	0,438	-0,094	0,095
Lability	0,493	0,199	0,490

*Professional adaptation *p≤0,05; **p≤0,01.*

Thus, statistically significant correlations were found in the following cases:

- a positive correlation between the indicators of extraversion and the level of social adaptation (at the significance level of 0.05);

- a high negative correlation between the indices of innovation and creativity (at the significance level of 0.01).

No correlations were found between the indicators of professional adaptation and individual typological qualities. The obtained data can be interpreted as follows: students with an extroverted personality type adapt faster and easier to a new social environment, as they tend to show initiative in communication, like to communicate with different people, and generally have social courage; The lack of creativity negatively affects the indicators of research adaptation due to the fact that teachers

often negatively perceive students' aspirations for self-affirmation and independence.

The absence of statistically significant correlation indicators of individual typological traits and professional adaptation can be explained by the fact that this type of adaptation is more related to the motivational structure of the personality, its orientation, the presence of certain interests and inclinations, and not to individual typological features. At the beginning of the 2024 academic year, we conducted a study of the process of student adaptation according to the "Methodology of studying the adaptability of students of higher education institutions to dual training" [111]. The methodology includes two scales: adaptability to professional activity and adaptability to research activity. The data obtained using the methodology are presented in Table 8.4.

Table 8.4

Level of adaptation of students of higher education institutions to dual education

Adaptability criteria	Adaptability levels, %				
	high	above average	average	below average	low
To professional activity	4	54	18	25	0
To scientific and research activities	13	29	25	25	9

According to the data obtained, no students with a low level of adaptation to professional activity were identified. This indicates that students in general do not experience serious difficulties in employment and study, but a quarter of students (25%) still have a level of adaptation to professional activity below average. This indicates that professional activity is currently still in the formation stage, and some students have not yet fully mastered the norms and rules of conducting interviews and internships.

The following results were obtained on the scale of adaptability to research activity: 9% of students have a low level of adaptation, 25% have a level below average. The data obtained indicate that more than

30% of students experience difficulties in mastering the basics of scientific and research work, need additional consultation; it is difficult for them to express their thoughts, cannot show their individuality and abilities.

The results obtained allow us to distinguish the following areas of training: professional, social and research, as well as stages of adaptation to professional training: educational identification, educational and professional activation, professional and value reflection. The integration of these areas allows us to organize activities that ensure the formation of necessary professionally important qualities (competences) in students (graduates), agreed with potential employers and in demand in the relevant profession.

In professional training in higher education institutions, we propose to implement the following measures:

- value (social and moral) orientation of education, aimed at self-development and self-improvement in professional activity;
- organization, management and pedagogical support of students' adaptation to professional activity;
- orientation of students to a value-based attitude to research activity.

As part of this activity, during professional training, a graduate (student) is formed with a readiness to work in new socio-economic conditions, which allows him to self-determine himself in the labor market and profession, to be ready to change professional functions, roles. and even professions.

The experiment conducted on the basis of the university ecosystem was carried out taking into account the areas of training and the corresponding adaptation criteria: professional direction – activity-result and motivational-value criteria; humanitarian – communication-professional criterion; research – personal and creative criterion.

Diagnostics included: questionnaires, testing, observation, interviews, computer diagnostic methods for each criterion. During diagnostics, three assessment levels were used to assess the level of adaptation – low, medium, high. The quantitative composition of the

experimental and control groups was determined by the existing composition of the specific study groups. Representativeness was achieved by randomly selecting four experimental groups and a control group. Each of the selected areas was implemented in one of the experimental groups, and in the fourth group a complex of all areas was implemented. This made it possible to assess the impact of each of the selected areas on the adaptation of students of different courses to professional and scientific training. To compare the results of the adaptation of different experimental groups, the $\chi 2$ statistical criterion was used.

Professional orientation correlates with activity-result and motivational-value criteria, its indicators are the formation of the system of educational and professional knowledge, instrumental and analytical skills and the presence of professional motivation. The results of the first criterion, obtained during the introductory diagnostics, indicate a low level of formation of students' educational and professional knowledge, instrumental and analytical skills and the presence of professional motivation. This is manifested in the fact that more than half of the students have a weak interest in the chosen profession and, as a result, low success, which does not contribute to the development of their adaptive needs in professional training.

The implementation of the first activity direction allows you to form motivational and value orientations of students for self-development in intellectual, professional and creative activities. The low level of formation of the system of educational and professional knowledge, instrumental and analytical skills of students decreased from 38% to 19%, and the high level increased from 15% to 35%. This reflects the positive impact of this direction on the adaptation of students to professional training and the formation of a base of professional knowledge as a value of professional activity. The socially responsible direction corresponds to the communicative and professional criterion, its indicator is the formation of professional behavior and professional stability. This is manifested in the inclusion of students in the system of social relations, during which the necessary professional qualities of the

personality are formed, communicative and organizational skills are acquired in a professional environment. The results showed that in fact the majority of students have a low level of perception of professional behavior and professional stability. The implementation of the second direction of activity allowed students to form communicative skills, professional motivation, taking into account professional traditions and value attitudes towards the future profession. Diagnostics conducted at the end of the experiment revealed a positive impact of this direction on students' adaptation to professional training, the presence of professional motivation (low level changed from 33% to 18%, high from 14% to 31%, average almost unchanged).

The direction of research corresponds to the personal-creative criterion, its indicator is the formation of students' value attitude to scientific knowledge and professional innovations. This is manifested in the ability of the future specialist to independently plan his lifestyle, organize the research process, take into account innovative factors of the production environment. The implementation of the third direction allows students to form a value attitude to professional labor protection. This was manifested in an increase in the number of students who realize the importance of scientific knowledge, the ability to rationally plan the research process. The diagnostic results are as follows: the low level changed from 33% to 20%; average from 52% to 56%; high from 15% to 24%, which indicates the presence of positive dynamics of students' adaptation to research activities.

The results obtained indicate that the greatest positive dynamics of adaptation to professional training were experienced by students of the experimental group, where a set of educational areas was introduced (the low level decreased from 29% to 11%, and the high level increased from 11% to 11% among students of the experimental group). % to 24%) compared to the three experimental groups. This is explained by the fact that the majority of students were included in cognitive, creative and research activities, as well as in the socio-professional environment. The control group, formed on the principle of random selection of the same number of students from the three experimental groups, confirmed the

reliability of the results obtained (the low level decreased from 28% to 16%, and the high level increased from 10% to 20%).

Based on the results of the study, we made the following conclusions:

- university adaptation is a process of active interaction between a student and the educational environment, the result of which is the change and development of the personality, the formation of new adaptive behavioral strategiesUniversity adaptation includes three interrelated components: socially responsible, research and professional;
- most students are oriented towards quality education and have vague ideas about the content of future professional activities;
- in the first month of study at a higher education institution, students face difficulties in rationally organizing their own time, which is subjectively accompanied by a feeling of fatigue and states of fatigue and overwork;
- in the initial period of study, most students do not experience serious difficulties in communicating with classmates. However, from the beginning of the second semester, a quarter of students note misunderstanding on the part of classmates, which may indicate a crisis stage in the formation of a student group. Social adaptation is generally easier for students with pronounced extraversion traits.

A significant part of students experience difficulties in adapting to research activities (research adaptation) throughout the entire period of study, as evidenced by the data of testing conducted in the first and second semesters. Moreover, the greatest difficulties in research adaptation are experienced by students with independent personalities who show excessive activity and a desire for self-assertion, in particular, they resist the rules and do not complete the proposed tasks, which is perceived by teachers as aggressiveness, which must be eliminated by lowering grades and increasing requirements. The conclusions obtained during the study can be used in the development of comprehensive programs of professional and scientific support for the adaptation of students of higher education institutions.

Diagnostic sections for tracking the results showed: at the beginning of the experiment, students had a low level of professional and research adaptation, at the end of the experiment the number of students with a low level decreased by an average of 1.4 times, and with a high level increased by an average of 1.9 times.

Thus, as a result of the study it was established that:

- organization, management and pedagogical support of students' adaptation to professional training is a system of interaction between the management of the higher education institution, the teaching staff and students, aimed at developing a single concept of organizational and pedagogical support for the process of adapting students to professional training at the university, taking into account the socio-moral orientations of society;

- research adaptation includes the formation of a value-based attitude towards science in students as a form of participation in intellectual and creative development. A specialist's comprehensive readiness for professional training and future professional activity includes physical, mental, psychophysiological well-being, sufficient professional working capacity and skills for safe interaction in a rapidly changing socio-professional sphere. Adaptation of a higher education institution graduate to future professional activity is the process of forming a holistic, mature personality of a future specialist-professional. The adaptation process includes the formation of scientific and professional knowledge, the development of communication skills and methods of interaction in a professional environment, the formation of a social and moral attitude to professional safety and labor protection. The results of adaptation are manifested in the graduate's value orientation towards self-realization and self-development, which ensures his competitiveness and mobility in the labor market.

CONCLUSIONS

The key to solving the problems of activating innovative activity is scientifically substantiated and developed questions regarding the ability of university ecosystems to effectively manage the development of innovative potential. In this regard, the authors have investigated the essence of innovative potential as a set of organizational and managerial, resource block and innovative culture of the university ecosystem, which can, under certain existing internal and external factors of the innovative climate, be directed to the implementation of innovative activity, the purpose of which is to meet the new needs of society in challenging conditions.

In the process of conducting research, a search was made for fundamentally new methods for solving the problem of differentiating youth groups by size and degree of use of the human potential of consciousness and awareness of youth in order to assess the possibility of using the university ecosystem – new network forms of organizing educational activity: from labor to distance-intellectual in the conditions of preventing a new outbreak of the Covid-19 pandemic and wartime.

The conceptual principles of implementing marketing management for the development of the innovative potential of the university ecosystem are:

- development of conceptual provisions for the functioning mechanism of the university ecosystem to activate counter information and knowledge flows through effective regulation of the organized environment of the 3HE;
- creation of conditions for personal, professional and psycho-physical development and self-realization, social activity and employment of young people, active life position in the field of environmental safety, degree of mobility, improvement of the level of qualification, acquisition of unique life and professional competencies, development of new types and areas of activity.

Within the framework of this study, the following was investigated:

— mathematical and model description of the process of marketing management of the development of the innovative potential of the university ecosystem;

— an analysis of the management of the development of the innovative potential of youth using the ecosystem of a higher educational institution was conducted;

—an assessment of the impact of the covid-19 pandemic on the labor market was carried out;

—management of innovative development of the university's technology transfer ecosystem was developed;

—the conformity of the prototype of the technology transfer ecosystem at the university to the needs of stakeholders was determined;

—a marketing diagnostics of the development of the innovative potential of youth in the university ecosystem was conducted;

—directions for effective use of the university ecosystem for the socio-professional integration of young people have been formed;

—adaptation of students to scientific and professional activities based on the use of the university ecosystem has been determined.

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Research applications:

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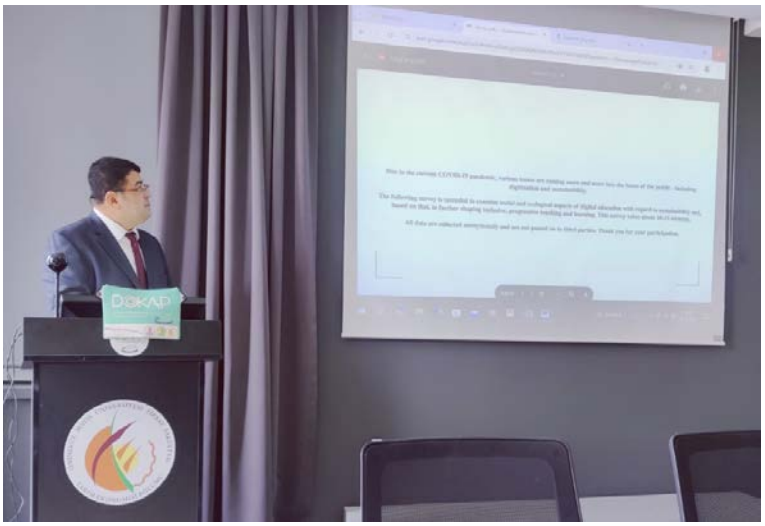
RESULTS OF THE PROJECT MARKETING
DEVELOPMENT OF THE UNIVERSITY
ECOTERRITORY FOR POST-COVID
RECREATION OF PERSONS



Монографія присвячена розробці актуальних теоретичних засад та практичних рекомендацій щодо формування маркетингового механізму управління розвитком інноваційного потенціалу екосистеми ВНЗ.

У монографії розглянуто та узагальнено теоретичні підходи, обґрунтовано та уточнено наукові положення щодо сутності інноваційного потенціалу, розроблено модель управління розвитком інноваційного потенціалу університетської екосистеми, яка ґрунтується на взаємодії науки, бізнесу, освіти та влади та її маркетинговому позиціонуванні в контексті інтеграції до Європейського Союзу. На основі розробленої моделі запропоновано організаційно-економічний механізм управління розвитком інноваційного потенціалу університетської екосистеми, що включає комплекс методів, принципів, функцій, організаційного забезпечення маркетингового позиціонування, у поєднанні та координації дій яких можливе досягнення вищими навчальними закладами основної мети – ефективного управління розвитком наявного інноваційного потенціалу.

Наукове видання

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Під редакцією Людмилт ГАНУЩАК-ЄФІМЕНКО,
Алі КАХРАМАНОГЛУ, Кюршат ДЕМІРЮРЕК

МАРКЕТИНГОВИЙ МЕНЕДЖМЕНТ ІННОВАЦІЙНОГО РОЗВИТКУ ЕКОСИСТЕМИ УНІВЕРСИТЕТУ

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