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Formation of Pedagogy of Higher Project Education in The Period of The New 18th-Century Technological Order

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A B S T R A C T

This article examines the functions, roles, and characteristics of pedagogy within higher project-based education, aiming to enhance educational quality through the advancement and socialization of this pedagogical approach. The study explores factors influencing the development of higher project-based education amid the emerging 18th-century technological order and examines the differentiation and didactic features within its pedagogy. It also investigates the psychological and pedagogical mechanisms, organizational culture, and analytical methods for assessing educational quality in this context. Additionally, the article addresses risk analysis in implementing project-based education at the higher education level. Methodologically, the study employs historical and logical analysis, systematic and comparative analysis, pedagogical and didactic theories, forecasting, expert assessment, risk theory, and efficiency theory. The work's scientific contribution lies in establishing higher project-based education pedagogy as an independent field within higher education, clarifying its unique essence and content as a distinct theoretical and practical direction.

A R T I C L E I N F O

1. INTRODUCTION

The importance of this study is rooted in the emerging need for a scientifically grounded pedagogy of higher project-based education, prompted by ongoing differentiation in pedagogical approaches and the formation of the 18th-century technological order. The preceding technological era, defined by microprocessors from 1970 to 2010, brought rapid advances in information technology, influencing educational methods and strategies. In the coming 18th-century technological order, which centers around "nanotechnology" as reported elsewhere (Kumar, 2021; Nandiyanto *et al.,* 2018), growth is expected not only in nanotechnology but also in digitalization, neurotechnologies, resource-saving, and other advanced fields.

This shift in technology patterns aligns with a global systemic crisis that began in 2008, reshaping international labor divisions and expanding the range of professional fields. These changes also influence student behavior, with a significant portion displaying "clip thinking" (known as a fragmented, non-linear cognitive approach), which educational institutions must increasingly address. As a consequence, education systems worldwide are reassessing and integrating new strategies. Experts emphasize the need to consider the diverse interests of educational stakeholders in shaping the future of higher education. Key stakeholders include government agencies, enterprises, local authorities, students, parents, university administrators, and faculty.

Analysis of the 18th-century technological order highlights expected features like economic clustering, technological platforms, ecosystem-based organizational approaches, continuous innovation through project-based initiatives, and an increased focus on organizational culture and personnel social development. These transformations are mirrored in higher education, where trends such as "specific", "measurable", "achievable", "relevant", and "time-bound" (SMART) education, lean approaches, customization, and a shift toward project-based and system-activity education are gaining traction, as reported elsewhere (Glushchenko, 2023). To improve the quality of project-based higher education and mitigate potential risks, establishing a rigorous scientific foundation for this pedagogy is essential.

While interest in project-based higher education has grown, with research emerging from approximately 50 Russian universities, prominent institutions are leading the way in advancing and applying project-based methodologies. Yet, a comprehensive scientific pedagogy for project-based higher education remains undeveloped at the start of the 21st century.

This study hypothesizes that creating a scientific pedagogy specific to project-based higher education is critical for ensuring quality and promoting dynamic growth. The core problem addressed is the development of scientific support tailored to this pedagogical model in the context of the 18th-century technological era. The study aims to establish the methodological foundation for differentiated project-based pedagogy, addressing the following tasks:

(i) Analyzing factors driving the growth of project-based higher education in the new technological era.
(ii) Investigating the mechanisms of project differentiation in this pedagogical model.
(iii) Formulating pedagogical and didactic models specific to project-based education.
(iv) Describing the structure and components of the psychological and pedagogical mechanisms at play.
(v) Defining the roles and unique characteristics of the organizational culture within project-based higher education.

(vi) Developing methods for analytical pedagogy and quality assessment.
(vii) Evaluating the risks associated with implementing project-based methodologies in universities.

The object of this study is the pedagogy of project-based higher education, while the subject focuses on the methods and tools within this educational approach.

2. LITERATURE REVIEW

At the beginning of the 21st century, scientists are actively developing scientific professional and general pedagogy [1, p. 2]. Researchers are also forming such a direction as a systematic approach in pedagogy (Pisarenko, 2017; 3, p.2]. Experts are forming design methods in pedagogy [3, p.2]. Some researchers summarized the opinions of experts on the content of technologies of this Industrial Revolution [4, p. 2-7]. The theory of technological structures was formulated in (Glushcenko, 2022a). At the same time, it is noted that the development of a new technological order is accompanied by a global systemic crisis (Glushcenko, 2022b). The changes that are taking place in the field of higher education give experts reason to talk about the "decline" of traditional universities, in particular, due to the development of SMART education (Nesterov, 2015). At the same time, there is a revival of interest in differentiation in higher education. Due to the increasing complexity of the higher education system, there is an increasing need for a systematic approach and systematic analysis in this area, as well as the need to develop analytical pedagogy. The researchers develop the theoretical foundations of the differentiation of curricula in higher project professional education (Glushcenko, 2023b). To study the pedagogical and psychological mechanism in higher project-based professional education, a system analysis is used (Glushcenko, 2023a). Scientists pay great attention to the further development of didactics. Teachers develop the methodology of project activities of organizations and higher project education. At the beginning of the 21st century, the effectiveness of project activities is associated with the development of emotional intelligence and Gestalt psychology (Zakaryan, 2018; Glushcenko, 2023c). Experts note the penetration of the project approach into all new areas of all levels of education. Scientists are exploring the possibilities of creating a mechanism to improve the efficiency of project teams. Teachers study the motivation structure of students in higher project education (Glushcenko, 2022c). Experts note that among the educational projects there may be projects aimed at improving the international rating of the University. An educational project aimed at creating a student ecosystem of the University was proposed (Vladimirovich, 2023). Scientists consider it possible to develop an educational ecosystem (Glushcenko, 2022c). The researchers note the need to develop higher professional education to ensure the transition of the national economy to a new technological order (Tukhtarova, 2023). Scientists believe that project education is developing as an independent segment of education, and the franchise method can be used to accelerate the expansion of areas of application of project education (Vladimirovich, 2021; Glushcenko, 2021a; Glushcenko, 20221b). Experts consider it useful to form a paradigm of curriculum differentiation in higher project education. Experts note the great role of the development of emotional intelligence in the framework of educational projects. To determine the direction of development of a new technological order, a model of a new technological order and a strategy for the transition of an organization (university to a new technological order) may be important (Glushcenko, 2022c; Glushcenko, 2022b).

The analysis of literary sources on the topic of the article showed the relevance of the development of pedagogy of higher project education, taking into account the tendency of its differentiation.

3. METHODS

This study gathers data from a variety of online sources, including international journals and research papers, to ensure a comprehensive and current analysis of relevant literature. This study carefully collected, calculated, and synthesized this data, using it to support our findings and construct a well-informed paper. Detailed information on how to collect data from internet sources is reported elsewhere (Al Husaeni & Nandiyanto, 2022; Azizah *et al.,* 2021).

4. RESULTS AND DISCUSSION

First of all, it is necessary to analyze the factors of the development of higher project education in the period of the 18th-century technological order. At the same time, it should be borne in mind that education and pedagogy are important elements of the post-industrial world. At the same time, IT technologies are important transformation tools not only in education but also affect the person himself. Under the influence of IT technologies, new generations of people develop "clip-on" thinking, dependence on gadgets, and more.

In the widely known book "The Fourth Industrial Revolution", we need to have a comprehensive and unified understanding of how technologies are changing our lives and the lives of future generations, and how they transform the economic, social, cultural, and humanitarian environment of our habitat. The nature of the changes taking place is so fundamental that world history has not yet known such an epoch, a time of both great opportunities and potential dangers.

Next, the independence of the fourth industrial revolution can be justified by the following influencing factors.

(i) The pace of development: the industrial revolution in question is not developing linearly, but rather exponentially. Such a pace of development is a product of the multifaceted, deeply interdependent world that surrounds us, as well as the fact that new technology is beginning to synthesize more and more advanced and effective technologies on its own.

(ii) The depth and breadth of the transformations taking place within the framework of this industrial revolution has its source not only in digitalization technologies (digital revolution) but also involves other diverse technologies in this process. Together, this generates fundamental and unprecedented paradigm shifts in business, economics, society, and in each individual. The industrial revolution under study changes not only "what" and "how" are produced and implemented but also "who" the actors (subjects) of these global processes themselves become.

(iii) The impact of the industrial revolution is systemic. This means that such an impact takes place on all aspects of society. The observed industrial revolution generates interconnected external and internal transformations of all systems and their subsystems across all: countries, industries, companies, and the whole society.

At the same time, it should be borne in mind that the very fact of the new industrial revolution is a manifestation of the law of turning the number of innovations into the quality of life of society. This is because global scientific and technological progress is characterized by rapid development. It is precisely such leaps in the technological development of the economy and society that are called "industrial revolutions".

When studying industrial revolutions, it should be borne in mind that the process of forming new technologies requires the synchronous development of social and professional institutions adequate (to these technologies) in their essence and organizational culture, forms of doing business, types of money and forms of settlements and other changes (Glushcenko, 2022a).

Reducing the uncertainty of the image of the future can play an important role in reducing risks during the industrial revolution. Such an image of the future can be formed in the process of development, in particular, of crisis management, as part of the theory of technological structures and the theory of complex systems (Glushcenko, 2022b). The system analysis within the framework of the theory of technological structures allows us to say that the image of the future new technological structure will have the following form.

It can be predicted that in the fields of science, education and innovation, the 18th-century technological order will differ in the following features: the advanced development of the service sector; the separation of fundamental and applied science will be increasingly conditional; science, innovation and education appear as key resources for the progress of the economy and society; such forms of integration of science-practice-education will develop as technology platforms and clusters; an ecosystem approach will be practiced in the activities of universities; an additional impetus will be given to the development of natural-like technologies; The "center of gravity" in conducting research will move to small research laboratories; the process of decentralization in science and management of this area will continue; the main organizational form of development of science and education may become a project approach (method); new forms and tools of integration of science-practice-education and more will develop.

In the period of the 18th-century technological order, the further development of science and technology can be aimed at:

(i) an increasingly in-depth study of the structure and nature of the material world (the results obtained will form the basis of nanotechnology, environmentally friendly and resource-saving technologies, and digitalization technologies);

(ii) an increasingly comprehensive and in-depth study of brain activity and the characteristics of the human psyche (the scientific results obtained will be used in the creation of neurotechnologies, information technology, and digital technologies), and others.

Because innovations will become almost permanent, innovatively active organizations will switch to the project model of organizations' activities. Such a transition will be because the main organizational form of innovation activity is an innovative project.

As part of active innovations and the project model of organizations, there will be an increased demand for personnel trained and psychologically adapted to work within the framework of the project approach in the real economy and the implementation of socially significant projects.

Such development of project activities in the real economy and the social sphere creates a demand for the development of the design form of higher engineering design education.

At the same time, in the process of further development of IT technologies, a significant part of students will have:

(i) "Clip thinking" associated with the weakening of the logical component of thinking processes;

(ii) Dependence on gadgets (gadget addiction, Internet addiction), which negatively affects the involvement of students in the educational process and has a chance to become the main addiction of the 21st century.

In the interests of adapting the higher education system to changes in the external environment determined by the formation of a new technological order, a mechanism for adapting higher education can be formed. Under the mechanism of ensuring the sustainability of the development of the higher education system during the formation of a new technological order, we will understand a system of methods and tools for maintaining the state of sustainability of the development of this system.

The process of forming a new technological basis for the economy and society creates additional risks for the sustainability of the development of the higher education system. At the same time, before studying the structure and elements of the mechanism of sustainable development of the higher education system, it is useful to clarify the very definition of the sustainability of this system. From the point of view of economic theory, such development of an organization is recognized as sustainable, in which there is no decrease in any of the types of assets of this organization. In a situation of structural adjustment, the disadvantage of such a definition of the concept of "university sustainability" can be considered that, in the context of a change in the technological basis during the transition to a new technological structure, a change in the ratio of various types of assets may be objectively required. For example, during the transition to the 18th-century technological order, the share of intangible assets may increase.

At the same time, in the theory of large systems, the stability of a system is understood as the ability of this system to return to its initial state after a certain external influence on this system has been carried out. This definition of system stability also has its drawbacks. This disadvantage is because, during the transition period, the higher education system must be in the process of constant innovative changes. Such changes are necessary for the higher education system to constantly meet current requirements (customization) and promising trends (customer orientation) in the development of the real economy and society.

In 2024, the external impact on the higher education system can be recognized as the impact of factors related to the crisis and the transition of the economy to a new technological order. The global crisis is precisely the form and mechanism of the transition of society and the economy to a new technological order. In case of insufficient ability of the higher education system to adapt to new factors, there may be a loss of stability in the development of the higher education system.

In the process of sustainability analysis, it is recommended to take into account that as part of the socio-economic development management system, the higher education system should be in a state of conjugation with the real economy and public institutions. The violation of such a conjugation of the conditions of the higher education system, the economy, and society can be considered one of the signs of the loss of stability of the higher education system. At the same time, the very violation of such a conjugation of the conditions of the higher education system of the economy and society can be a sign of loss of competitiveness and stability of the economy and society.

This allows us to interpret the sustainable development of the higher education system as a continuous process: maintaining the interconnectedness of the states of the higher education system, the economy, and society; finding the higher education system in a manageable state; maintaining the characteristics of the higher education system in the field of safe values.

At the same time, to maintain a connected state with the economy and society, the higher education system should ensure: the graduation of such many specialists as is necessary for the sustainable development of the economy and society; the structure of graduate specialties should meet the needs of the economy and society; the quality of higher education

should meet the needs of the economy; the organizational culture and value system of university graduates should allow for innovative development and other things.

The structural elements of the mechanism of adaptation of the higher education system to the conditions of the new technological order can be called the development of project-based higher education and others. At the same time, students of the project form of study will be most in demand in innovatively active organizations. This is because, as already noted, the main organizational form of innovation is innovative projects.

The pedagogy of project-based higher education is defined by analogy with the well-known work [1, p. 2].

The pedagogy of project education will be understood as a set of theoretical and applied sciences that study upbringing, education, and training within the framework of the project form of higher education.

Pedagogy of project education is the science of human education and upbringing in the implementation of educational projects at a university, which: reveals the essence, goals, objectives, patterns, and specifics of teaching and educating students in educational projects; describes the role of project education in the economy, social life and personal development. The pedagogy of project-based higher education appears as the science of the relations of a teaching and educational nature within the framework of educational projects. Such pedagogy is the science of relations arising in the process of the interrelation of upbringing, education, and training with self-education, self-education, and self-study aimed at the development of a person participating in an educational project.

At the same time, the general pedagogy of project-based higher education is a theoretical system of pedagogical sciences that form and study pedagogical knowledge, theory and practice, methods, functions, and tools, the place of pedagogy of project education among other sciences and/or among other areas of pedagogical science (subject education; SMART education and others). By analogy with general pedagogy, we will distinguish two levels in the pedagogy of project-based higher education: the theoretical level and the applied (normative) level l[1, p. 2].

The descriptive factor model of pedagogy of higher project education is given in **Table 1**. The descriptive factor model of the project method in pedagogy, presented in **Table 1**, allows us to talk about the fundamental differences between the project approach in pedagogy and the pedagogy of subject higher education. Thus, the further development of project pedagogy, the segment of higher project education, can be considered justified and necessary. Accordingly, the development of the practice of higher project education generates a request for the development of scientific pedagogy in this form of education.

The next task in the pedagogy of higher project education can be called the development and justification of differentiation methods in the pedagogy of higher education. In this work, differentiation in the pedagogy of higher project education will be understood as the formation of new directions in pedagogy related to the peculiarities of technological, economic, and social development during the period of a new technological order.

The mission of differentiation in engineering pedagogy in the period of a new technological order will mean the public benefit from such differentiation, which consists of the following: ensuring the diversity of the workforce necessary for the development of the economy; ensuring the quality of higher education acceptable to the economy and society; reducing the loss of public and private resources in the educational process; increasing the pace of scientific and technical development and other.

The vision of differentiation in higher project education can be called an inspiring scenario for the development of such differentiation. As such a scenario, we can consider the prospect

of developing such differentiation in the pedagogy of higher project education, which will be associated with the need to solve the problem of the diversity of professions in higher education in conditions of limited public and private resources. With such differentiation, it is important to take into account the increasing importance of the quality of higher education to ensure high rates of socioeconomic progress in the economy and society.

Table 1. Descriptive factor model of pedagogy of higher project-based education.

No	The factor of pedagogy of higher project education	Description of the Pedagogy Factor of Higher Project Education
1.	The purpose of the educational process	Teaching students how to commercialize knowledge, work as part of a project group (team)
2.	The product of educational activity	A comprehensive educational product that includes: knowledge and skills (competencies); professional organizational culture; ability to work in a team; behavioral readiness in project activities, etc.
3.	The object of pedagogical influence	Student Project Team (group)
4.	Subjects of the pedagogical process	Teacher, student project group
5.	The nature of the pedagogical impact	Two-way interaction, Mentoring, consultations, expertise of solutions, analysis of solutions
6.	Features of interaction between the teacher and the project team	The harmonious combination of vertical and horizontal interaction
7.	The main content of the pedagogical impact	Managing the problem-solving method by the project team and individual students
8.	The nature of the educational process	Formation of the values of the project group within the framework of joint activities in an educational project, a personal example of a teacher
9.	The main method of education and instilling values in students	A personal example of a mentor of the group, a teacher
10.	Basic teaching techniques	Justification, argumentation, persuasion
11.	Types of teacher's power in the educational process	The harmonious interaction of the administrative power and the personal power of the mentor of the project (his charisma, expert power, the power of example, etc.)
12.	Areas of competence of the teacher	Law, finance, technology, marketing, management, psychology, pedagogy, innovation, investment
13.	Criteria for evaluating the quality of project education	Effectiveness and efficiency of the educational project
14.	The psychological component of the pedagogical process	Gestalt Psychology

At the same time, there is a rather complex structure of differentiation processes: differentiation of universities by external organizational and economic characteristics (university size, industry, region, tuition fees, etc.); differentiation by the direction of student training; differentiation of universities by forms of educational activity (subject, project education, SAMRT education, etc.); differentiation by the composition of curricula (educational programs); differentiation according to the content of subjects and elements of the educational process, and more.

As a result of scientifically based differentiation, all universities can be divided into groups according to certain criteria. It is agreed to call the mechanism of differentiation in higher project education a set of methods and tools for implementing such differentiation in higher education.

Methods of differentiation in higher education can be considered: forecasting; planning; organization; motivation; control of differentiation processes; system design; system analysis and more. Differentiation factors in higher education can be:

(i)   branch affiliation of the university;
(ii)   the process of clustering regional economies;
(iii)   formation of technological platforms;
(iv)   types of IT systems (databases, CAD, Internet of Things, etc.);
(v)   form of educational activity: subject education; project education; additional education and others;
(vi)   the use of technical means in the process of communication between participants in the educational process (contact or online education);
(vii)   the form of the educational product (competence-based education, system-activity approach, product approach, etc.);
(viii) other factors affecting technology and/or the quality of higher project education in a particular field.

The profound nature of the changes taking place in all spheres of human life and activity in 2024 allows us to talk about "tectonic shifts" in all areas of activity. It is possible to explain such profound changes and predict the processes of such changes only on the basis of new fundamental results, in particular in didactics, differentiation, and other areas of scientific support for higher education.

If we talk about the system of higher project education, then such dangers include the following risks: a decrease in the adequacy of higher education forms to the requirements of the real economy; the discrepancy between the professional structure of graduates and the needs of the economy and society; a decrease in the quality of higher project education, and more. It is natural to assume that changes should occur both in the system of higher project education and in the pedagogy of such education.

At the same time, the depth of changes taking place in the pedagogy of project education stimulates a systematic analysis and revision of basic concepts and approaches in this science. The areas of subsequent professional activity (engineering, humanitarian activities, social security, etc.) can also act as factors of differentiation in the pedagogy of higher project education.

With such a systematic analysis, it is recommended to take into account that at the beginning of the 21st century, such a direction in pedagogy as engineering pedagogy is actively developing, the role of which is increasing. The pedagogy of higher project-based IT education will be considered one of the differentiated areas of engineering pedagogy. Being a complex multilevel system of theoretical knowledge and practical skills, the pedagogy of project education should be developed using the methods of the theory of complex hierarchical systems (Pisarenko, 2017). In the pedagogy of project education, methods of system analysis and design of the pedagogical process can be used (Pisarenko, 2017). The application of system analysis in the pedagogy of project-based higher education can be considered one of the signs of innovative pedagogy.

Scientists propose to develop such theories in the pedagogy of project-based higher education: complex systems, system analysis, analytical pedagogy of higher project education.

At the same time, it should be borne in mind that the connections of pedagogy with the general process of technological development of the economy and society are becoming more and more apparent.

In particular, it is known that the active development of information technologies in the 17th technological order gave rise to the formation of a subsystem of SMART education in a distance format. The results were significant. For example, back in 2015, many experts wondered whether traditional universities with new distance education would stand up to competition (Nesterov, 2015).

The researchers note that differentiation is one of the characteristic features of the higher education system in foreign countries. It is noted that at the beginning of the 21st century, there was an intensification of the processes of differentiation in higher education in the United States, which was already observed in the period of the 1970s and 1990s [8, p. 4]. This was the initial period of the formation of the 17th technological order called "microprocessors".

In 2024, there is again an increase in interest in the problem and methodology of differentiation, and the impact of differentiation on the quality of education is being studied. Can we assume that the new wave of interest in differentiation is related to the understanding of the importance of differentiation for ensuring the quality of higher education and the professional diversity of the workforce?

This can be considered another argument in favor of the development of project education as a result of differentiation.

At the same time, the project pedagogical process should not be perceived as a mechanical connection of several processes (education, training, development), but as a qualitatively new pedagogical system that can unite, subordinate objects and participants in this process to its own laws.

In the 21st century, the patterns of the design form of the pedagogical process are influenced by information technology. The result of the influence of information technology on project-based higher education is: an increase in the dynamics of the pedagogical process; an increase in the overall level of development of the student's personality; an increase in the pace of achieving the goals of the project pedagogical process; an increase in the level of educational and educational work of teachers in an educational project; conditions and motives for increasing the effectiveness of management of project educational programs (curricula); opportunities for motivation and stimulation of all subjects of the project pedagogical process are increasing (for example, due to the prospects of creating your own business); conditions for ensuring the integration of sensory (emotional intelligence), logical thinking and practice in the project pedagogical process are expanding; new opportunities are being formed for the formation of conditions for the unity of external (pedagogical) and internal (cognitive) project educational expand the boundaries of conditionality and differentiation of the project pedagogical process, and more.

Project-based higher education can be considered one of the directions of "instrumental pedagogy". Within the framework of this direction in pedagogy, it is argued that a person learns all his life. Learning can also take place through participation in educational projects. A person draws educational material from his life and project experience. At the same time, in the process of educational project activities, the student is involved in professional and social relationships and receives the necessary social experience and skills. Educational projects contribute to the general well-being on an equal basis with other public institutions, using the interests and energy of students. Educational projects play the role of social institutions and develop public interests and relationships. In addition, educational projects integrate the process of preparing a student for life (traditional pedagogy) and the student's life process itself (instrumental pedagogy).

Project education is a process of more effective and subject-oriented development and improvement of innate personality qualities.

According to the recommendation of the founder of instrumental pedagogy, project-based education (compared to subject-based education) relies more on the innate impulses of students. Some researchers identified four groups of student impulses: social impulse, constructive, expressive, and exploratory. The analysis shows that all these four types of student impulses can be more systematically and effectively implemented in educational projects.

In the context of the formation of a new technological order, it is necessary to adapt the higher education system and specific universities to changes in the external economy (network economy) and social environment (consumer society and network society). Such an adaptation of the higher education system and the university may require reengineering of the educational process at the university, including based on project-based educational technologies.

In this paper, the technology of project education is understood as system integration (aggregation): methods of implementation of such education; infrastructure necessary for the implementation of educational projects (at the university or the faculty); qualification characteristics and competence of scientific and pedagogical personnel. In project education, educational projects act as a tool for adapting the university to the requirements of the external social and economic environment.

The relevance of the growing importance of the principle of customer orientation in project education is due to profound changes in the international division of labor. Due to the development of the international situation, the industries of many national economies are forced to move towards increasing the level of localization of their products. This makes it relevant to train university graduates of all levels (bachelor, master, postgraduate) who can ensure product development at all 5 levels of the "technological pyramid" in the industry. In each industry, the following technological levels can be distinguished: the first (conceptual) level; the second level (synthesis of new technologies); the third level (design and production of goods); the fourth hierarchical level (product operation); the fifth hierarchical level (maintenance and training of product operation). In connection with the development of a client-oriented approach in higher project education, this article proposes to highlight:

(i)   orientation to an external client based on research and forecasting of trends and development interests of leading enterprises cooperating with the university in the industry;

(ii)   internal customer orientation, reflecting the university's desire to fully meet the set of educational needs of its students during their studies at this university.

The development of the pedagogy of higher project education should be based on a certain paradigm of such education.

The paradigm of higher project education is understood as a systemic combination of the philosophy of such education, the ideology of such education, organizational culture, and policies (strategies and tactics) for the implementation of project education.

The philosophy of project education implies the wisest view of the need, goals, and results of the implementation of the project approach in project-oriented education.

The practical significance of such a philosophy lies in the formation of organizational culture values, which can become the principles of this type of project education.

The main principles of the project-oriented pedagogical process can be called: the humanistic principle of pedagogy, which forms opportunities in an educational project to combine the development goals and life attitudes of a particular student and society; the

principle of interpenetration in project education, in which the theoretical orientation of the pedagogical process is enriched as a result of systematic unification (aggregation) of the content, forms and methods of teaching and educational university work and the whole economic and social life; the principle of using educational projects as a tool for adapting the university to changes in the economy and society during the formation of a new technological order; the principle of aggregation (systemic unification) of the theoretical principles of the learning and upbringing processes with the practical actions of students in educational projects in the interests of forming students' values (useful personal and business qualities); the principle of scientific and project education It is being further developed on the basis of: deeper penetration into the material world (nanotechnology); deeper insight into the mechanisms of the human brain and psyche (neurotechnology); raising the awareness of teachers and students; the principle of orientation of the pedagogical process towards the formation of a systemic unity of knowledge and skills, consciousness and behavior in project education, based on understanding and verifying theoretical material supported by practical actions; the principle of collectivism of the processes of project education and upbringing receives new technological opportunities within the framework of the project educational process. Network economy and network society; the principle of consistency, continuity and consistency in the project pedagogical process receives its full and reliable information support; the principle of visibility in project education, the pedagogical process leads to the development of thinking from figuratively concrete to abstract; the principle of aestheticization of learning processes and educational work in project education creates an opportunity to form an artistic taste in the subjects of the pedagogical process and to see the uniqueness and value of social principles; the principle of interrelation of elements of project education, which consists in the interrelation of pedagogical management and students' independence in the implementation of certain explicit and hidden curricula (educational programs) and specific types of work; the principle of student consciousness plays an important role both in intellectual education and in project education; the principle of a reasonable attitude in project education is supported by the manifestation of initiative and an active position the student; the principle of combining responsibility and unity of respect for one's own personality in project education is based on the strengths of the individual; the principle of accessibility and feasibility of project education is ensured by the student's participation in projects, taking into account his real capabilities; the principle of the influence of individual characteristics of student participation means that the possibilities of establishing the correspondence of the content, form, methods and means of organizing the educational process to the pedagogical project are expanded; the principle of the effectiveness of the learning process results, which is based on the integrated use of knowledge, the specifics of mental activity, gestalt psychology of participants in the framework of the pedagogical process. Therefore, the possibility of differentiation in higher education into subject and project forms of such training can be justified.

At the same time, the analysis shows that the main way of differentiation in higher IT education can be recognized as the differentiation of educational programs within the framework of the development of curricula.

Structurally, the curriculum can be divided into two parts: an explicit curriculum (reflected in the educational program); and a hidden curriculum. The following elements can be included in the hidden curriculum: organizational culture; student motivation system; university student ecosystem and more. The student ecosystem of the university is understood as a set of services aimed at improving the quality of higher education by increasing the comfort level of the extracurricular life of students (Vladimirovich, 2023).

Because the word "curriculum" is not very often used in the practice of the Russian higher education system, it is necessary to dwell on this concept in more detail. It is well known that the concept of "curriculum" is most often used as a synonym for the term "course of study". At the same time, an explicit curriculum (as a synonym for the concept of "course of study") describes the theory and concept that are used in the field of education, which can mean a paradigm (model) of education; a description of a set of problems (pedagogical process, methodological regulation of learning processes); recommendations aimed at achieving higher learning outcomes; an organizational system for implementing project-based education technologies. The main methods of differentiating curricula in higher education can be considered client orientation and customization of the university's work.

Given this, the term "curriculum" in this article will be interpreted as a concept reflecting an expanded version of the term "educational program". The possibility of such a description of the concept of "curriculum" may be related to the structuring of explicit and hidden curricula. Based on this, in this paper, we will assume that structurally the curriculum consists of two parts:

The first part reflects an explicit curriculum, which in its content is close to the concept of the educational program;

The second part is just a hidden (implicit) curriculum that can integrate elements such as the organizational culture of the curriculum; the educational process; the university's existing student motivation system; characteristics of the student ecosystem and much more.

At the same time, historical analysis shows that the previous surge in interest in differentiation methods in higher education in the United States occurred during the 1970s and 1990s. In the absence of a theory of technological structures, it was impossible to clarify the causes and identify significant factors of such differentiation. Within the framework of the theory of technological orders, it can be established that the named period (1970-1990) was the period of transition of the higher school of the USA to work in the conditions of the previous technological order. This previous technological order was called "microprocessors". It covered the years 1970-2010. In 2024, a specific hypothesis of this study may be put forward that the intensive growth of new technologies may be the cause (source) of the increased need for differentiation of higher education in the United States and other countries. In addition, the sources (causes) and factors of differentiation in higher education can be studied through research using the following methods: theory of systems; theory of technological orders; crisis in pedagogy; general theory of pedagogy; didactics; methodological provisions of differentiation in higher education, etc.

An express analysis of the situation in Russian higher education shows that due to the development of a new technological order shortly, universities will need to switch to customization and/or customer-oriented differentiation in higher education, and possibly in other types of higher education. This is due to the constant growth in the number of professions. In this situation, the mechanism of differentiation in higher education will be in demand.

The mechanism of differentiation (the formation of customized or customer-oriented curricula (programs)) We will denote a set of interrelated ways and tools for creating different curricula (programs) in higher education.

As predicted, the first stage of differentiation of higher education in the 21st century may be the division into subject, project, and distance education.

At the same time, an increase in interest in project education is associated with the intensification of innovative activities, which are mainly implemented within the framework of innovative projects. At the same time, in fact, the situation is still such that a significant

part of the scientific and pedagogical staff of universities do not realize the fundamental difference between projects within the framework of the subject-based teaching method (subject pedagogy and didactics) and the project-based teaching method (project pedagogy and didactics).

A comparative analysis of subject and project pedagogy allows us to clarify the situation, which reveals the following:

(i)   When performing a course project on a subject, the student works alone, and when performing an educational project, students are part of a small project group (the competence of working as part of a small project group is realized);

(ii)   when performing a course project on a subject, the student works on a project on a topic predetermined by the department, and when performing an educational project as part of a small project group, the project topic is generated by this project group itself;

(iii)   in a course project on a subject, a student practically implements competencies for a specific academic subject, and in the implementation of an educational project, a project group of students implements a set of competencies corresponding to the topic and content of the project, which (a set of competencies) has an interdisciplinary character and more. The results of this comparative analysis give grounds to conclude about the qualitative difference between the pedagogy of higher subject and higher project education.

Due to the increasing degree of diversity of higher education curricula (programs), it is necessary to substantiate the mechanism of differentiation of curricula in such higher education. The creation of the theory of technological patterns opens up the opportunity to use the predictive component of the theory of technological patterns to substantiate the factors and principles of differentiation in higher education during the new 18th-century technological order. The constant growth in the number of professions (by about 500 professions per year) can be considered a reason for the need for differentiation in higher project education. Therefore, it can be assumed that differentiation should be based on the following: instrumental pedagogy; product approach (educational products); customization, and customer orientation of universities.

The analysis shows the possibility of forming such a mechanism for the synthesis of customized and/or client-oriented curricula of higher project education: a description of the architecture and elements of the mechanism for adapting higher education to the conditions of the new 18th-century technological order; further formation of a scientific and methodological platform and methodological provisions of differentiation as part of the general theory of higher education; characterization of the essence (functions and roles) of project higher education as a structural element of the mechanism of adaptation of the sphere of economy and society to functioning in the conditions of the 18th-century technological order; structuring, description and study of factors of differentiation of higher project education during the 18th-century technological order; description of architecture and structural elements (explicit and hidden) curriculum of higher design formation of a methodology for designing a customized and/or client-oriented explicit curriculum of higher design education; development of a methodology for designing a hidden (implicit) curriculum of higher project education; development of a four-level model, positioning and analysis of the effectiveness of the curriculum; study of sources and description of the nature of risks at all stages of the life cycle of the curriculum of higher project education.

The use of the concept of curriculum makes it possible to integrate formal and informal components in the pedagogy of higher project education, which can contribute to improving the quality of such education. In more detail, the methodological foundations of the

formation of client-oriented curricula are described, in particular, in the works (Glushcenko, 2023b).

This part of the work is devoted to the development of the didactics of higher project education. The purpose of this section of the work is to study and describe the specific properties of the didactics of higher project education. It is known that the concept of "didactics" (Greek: διδακτικός, which means "instructive") characterizes an important structural element (section) of pedagogy and theory of education, which deals with the study of learning problems. Didactics reveals the patterns of teaching activity in their systemic connection with the process of assimilation of knowledge, and skills, and the process of forming beliefs among students, which determines the scope and structure of the content of education.

When studying the didactics of higher project education, it should be borne in mind that the main question of didactics can be formulated in different ways: firstly, as a question of the content of education and upbringing; secondly, didactics studies exactly how the thinking process of students occurs during the study of certain academic subjects; thirdly, this discipline deals with by researching what needs to be taught and how exactly it should be taught?.

One of the key tasks of the pedagogy of project-based higher education can be recognized as the formation of a didactic model of this form of educational activity.

The descriptive factor didactic model of project-based higher education will be understood as a simplified representation of the didactics of this type of education, which can be used to solve design problems and analyze the nature and specifics of interaction between a scientific and pedagogical worker and a student within the framework of this form of higher IT education. In essence, such a factorial didactic model of project-based higher education is a description (characteristic) of the factors of interaction between a scientific and pedagogical worker and trainees in the process of implementing educational projects.

First of all, it is necessary to substantiate the statement that the didactics of project-based higher education are fundamentally different from the didactics of subject-based higher education. This can be done by comparing the factors of didactics of project and subject education.

The purpose of training in project education is to teach methods of knowledge commercialization (in subject education, such a goal is the acquisition of competencies (knowledge and skills) in individual subjects).

The educational product in project-based higher education is an interdisciplinary complex of competencies and socio-professional organizational culture, which together provide the opportunity to commercialize the knowledge of a university graduate.

The technology of educational activity in project higher education is based on: the integrated use of students' competencies during the implementation of an educational project; horizontal communications of project group participants; the priority of the teacher's personal power in the process of managing a student project group; performing the role of mentor (curator) by a university research and teaching staff and others.

In project-based higher education, the learning process is of a group nature, accompanied by the distribution of roles between the participants of the project group, while subject education usually has the character of individual student participation in the educational process.

Based on these and other data: firstly, the fundamental difference between the didactics of higher project education and the didactics of higher subject education is proved; secondly, a factorial descriptive model of the didactics of higher project education can be formed.

Such a didactic factor model should describe the most significant features (factors) of the pedagogical impact of a scientific and pedagogical worker on a student project group during the implementation of an educational project by this group.

A descriptive didactic factor model of higher project education is given in **Table 2**.

Table 2. Descriptive didactic factor model of higher project education.

No	Structural elements (factors) of a teacher's activity in project-based educational activities	Description of the content of the mentor's activity factor in an educational project
1.	A brief description of the specifics of project activities for students	Summary of the goals and content of the project team's work to students
2.	Consulting support for goal setting in the work of the project team	Description of the project goal, types of goals, the role of the goal in the activities of the project team, SMART goal analysis, the concept of a graph tree of goals
3.	Competence and psychophysical diagnostics of the project team members	Latent testing and psychophysical assessment of the potential of the project team members
4.	Advisory support for the process of forming a project group (team)	Description of the team structure and the set of roles in the project team, formation of recommendations on the distribution of roles in the team
5.	Advisory support for the distribution of roles and the beginning of the functioning of the team	Description of the relationship between the graph tree of project goals and the distribution of roles in the team, monitoring the distribution of work and responsibility among team members
6.	Verification of the correct distribution of functions and roles in the project team	Argumentation of the correctness of the distribution of roles in the team, adjustment of the distribution of roles in the project team
7.	Prevention and diagnosis of conflicts in the team	Analysis and forecasting of possible conflict situations, mentoring by the team leader
8.	Expert support of the project implementation process	Advising the team on technical, marketing, and other project issues
9.	Mentoring team members in the process of solving project problems	Description of your project experience, and transfer of this experience to team members during the project implementation process
10.	Organizing the collective generation of ideas by members of the project team	Description of the procedure for collective idea generation, monitoring, and correction of the process of collective idea generation in a group
11.	Management of methods for solving technical and managerial tasks in the project group	Analysis and verification of methods for solving technical and managerial tasks by participants of the educational project team
12.	Verification of achievement of local goals by members of the project team	Analysis of results, formation of criteria for achieving goals, verification of achievement of goals, adjustment of goals and methods of achieving them
13	Advising project team members on the issues of risk management of an educational project	Description of the concept of "risk", project risk management methods, analysis of the correctness (verification) of risk management by the project team, analysis of the risk level
14.	Creating a favorable organizational culture and moral climate in the project group	Analysis of the organizational culture of the team, the uniformity of the load distribution in the team, the study and adjustment of the relationships of team members
15.	Formation of a motivation system for project team members	Description and analysis of factors of external and internal motivation of team members, formation of a system of rewards and punishments

Table 2 (continue). Descriptive didactic factor model of higher project education.

No	Structural elements (factors) of a teacher's activity in project-based educational activities	Description of the content of the mentor's activity factor in an educational project
16.	Development of professional and interpersonal communications between team members	Explanation of the role of effective communication in ensuring effective teamwork
17.	Verification of the fact that the student team has achieved the project goal	Analysis of the results of the educational project, formation of criteria for achieving the project goal, confirmation of the achievement of the project goal
18.	Organization of reflection of the project team based on the results of the educational project	Organization of the subsequent analysis of the process and results of the project, personal achievements and failures of project participants, generalization of project experience, concluding the future
19.	Advisory support for the formation of the mission and vision of the project development	Description of the concept and content of the mission and vision of the future project by the team, monitoring of the synthesis process verification of the mission and vision
20.	Advisory support for the formation of a strategic development plan for the project	Intellectual support of the team creation process, verification of the strategic development plan of the project

Source: developed by the author

When forming this model, techniques of functional analysis of works were used. As you know, the purpose of analyzing the work of a teacher in the project form of higher education is to make an objective description of each work of an educational project mentor.

The factorial didactic model of work in the educational project of the curator (mentor) of the project, formed through the analysis of the works in this book, has:

Firstly, scientific significance, which consists of an objective description of didactics in the project form of teaching students;

Secondly, this model has important practical significance.

The practical significance of the descriptive factor didactic model of a teacher's work in an educational project in substantiating job descriptions and criteria for evaluating the quality of work of a scientific and pedagogical employee of a university as a mentor (curator) of an educational project.

In particular, the results of the table can be used to assess the level of readiness of a teacher to perform the functions of a curator (mentor) of an educational project.

In addition, the results of Table 2 can be used in the process of educating teachers to prepare them as curators of educational projects, in particular, when drawing up an educational program for the training and certification of teachers of the project form of education at all levels of the educational system.

The organization of systematic teacher training can be recognized as an important step in the development of higher project education and in improving the quality of such education. Professional retraining of teachers in the field of "Teacher of project education" may probably be required. This can be ensured by the active use of additional education (Glushcenko, 2022a).

The next task of the pedagogy of higher project education can be called the formation of the pedagogical and psychological mechanism of such a form of higher education. It describes such a pedagogical and psychological mechanism of higher project education, taking into account the results of the work (Glushcenko, 2023a).

The pedagogical and psychological mechanism of the project method in higher professional education will be called a complex of interrelated pedagogical and psychological techniques, measures of the influence of the teacher on the educational project group. Such a pedagogical and psychological mechanism of project education is designed to provide: diagnostics of students' competence and psychological state; implementation of an educational project; improvement of the quality of higher professional project education, etc. All this is achieved based on the teacher's application of these specific methodological techniques within the framework of the project method of educational activity.

The following can be distinguished as features of the pedagogical and psychological mechanism in higher project education.

The pedagogical and psychological mechanism of the project approach in higher education is characterized by cooperation between the mentor and the student project team in the following areas: between the student project group (as a whole) and their mentor; between individual students and the mentor and others. The pedagogical and psychological mechanism of the project approach is characterized by the following specifics of the organization and cooperation between the mentor and students in a joint scientific and educational project at the university: students are not only the object of learning, perceiving, and memorizing educational content prepared in advance by the teacher; students themselves actively participate in the implementation of the project. Influence the organization of an educational project; students determine the characteristics of an educational project through personal participation in the planning and implementation of an educational project, etc.

The characteristic features of the pedagogical and psychological mechanism of an educational project can be recognized as the integration of processes: the introduction of students' knowledge (obtained by them in the subject part of the educational process); obtaining new knowledge in the process of applied scientific research during the implementation of the project; eliminating gaps in knowledge on the subject by expanding knowledge about the relevant components of the project; developing students' psychological readiness to implement innovative activity based on the manifestation of one's initiative; the formation of empathy among the participants of the project team, the psychological readiness of students to help each other and much more.

The main result of the student's educational project at the university can be considered: not only the student's assimilation of the competencies provided for in the program but also the ability to use them in practice; the assimilation of values and the formation of the foundations of professional organizational culture; the comprehensive development of the student's personality in the process of joint (with a mentor) project activities of the group in the implementation of innovative, research educational projects. At the same time, in the process of implementing an educational project, the main scientific and pedagogical task of the mentor is to create and organize conditions and motives that initiate active scientific, cognitive, and practical innovative behavior of students in the project (innovative, research, and educational) process. This contributes to improving the quality of education, understood as the degree of readiness of students for further professional activity in the real sector of the economy.

At the same time, the mentor's position and role in a group of students studying the project method is as follows: the mentor should come to the students not only with a ready answer on the project and/or professional problem but also with a question about the method and tools for solving problems based on knowledge and skills acquired earlier in the classroom.

This can motivate students to increase their activity in studying academic subjects at the university.

The analysis shows that when a mentor works with an educational project team, organizational behavior management skills can be useful (Glushcenko, 2023a). The mentor's skill in curating an educational project and a student group also consists in creating a sense of the feasibility of the tasks set for students (D. Carnegie also pointed out that it is necessary to present it in such a way that a person considers the task feasible), which reduces the fear of action.

Fear of action can be understood as a psychological state that blocks a student's activity due to fear of failure or punishment for taking the initiative in an educational project. Educational projects successfully implemented by the student: reduce the fear of action; increase the student's self-esteem; and motivate him to participate in new, larger, and more complex projects. The mentor should understand that the fear of failure is an emotion that can restrain the student's active participation in the project. A mentor can reduce a student's fear of action by organizing the work of the project team in such a way as to enhance student interaction during the implementation of a joint project, using team building methods and others.

At the same time, confidence in the co-authorship of the project idea makes the project management system participatory, which increases the activity of students in the project. The broader participatory nature of project management and an active position in an educational project of a student (a member of the project team) is as follows: active implementation of their knowledge within the project; taking the initiative; studying methods of knowledge commercialization; participation in collective idea generation; analysis of business processes, technologies, relations in the professional field (including its competencies and culture); creating a system of mutual control and support within the framework of an educational project and a friend.

A survey of students studying in IT specialties (with a subject form of study) showed a rather low level of internal motivation of students (40-60%). Another survey showed that participation in educational projects: increases students' internal motivation; and changes the structure of students' motivation (90% of students stated that they have a different motivation in projects than in studying academic subjects).

The functions and role of a mentor within the framework of the project approach in higher education are not only in teaching and upbringing but also in creating a moral and psychological atmosphere of active research based on the manifestation of creative activity of students; consulting support for the work of the project group; ensuring the adequacy of the research and innovation process in the educational project group; formation of communication systems and maintenance educational contact with the project team and individual students in the group.

The analysis allows us to consider psychological processes (sensation; perception; memory; imagination; thinking) as the main objects of psychological influence of a scientific and pedagogical worker on a student. This has a good effect on the quality of the process and the level of results of higher professional education within the framework of the practical psychological system of project-based education at the university.

In the psychological system of project-based higher education, the ability to effectively apply and/or update the psychological processes and/or tools studied above can act as the main reserve for improving the quality of project-based higher education.

The features of the pedagogical and psychological mechanism are described and investigated in more detail in (Glushcenko, 2023a).

For the growth of the quality and socio-economic efficiency of higher education, it is also important that the project method of education can improve the emotional state of mentors and their students at the same time. It is known that emotions are defined as the mental reflection of phenomena and situations by the subject in the form of a direct biased experience of the life meaning of these phenomena and situations. At the same time, such a biased experience of the life meaning of these project phenomena and situations will be conditioned by the relationship of their objective properties to the needs of a particular subject of project education.

It should be noted that emotions are not classified as cognitive processes. At the same time, it is important that a positive emotional background, formed by a sense of one's higher competence and professional readiness within the framework of the project model of scientific and educational work at the university, can generate additional internal satisfaction in mentors and students with their activities in the project. For students, their participation in projects can form their increased satisfaction with the quality and results of the higher education process at the university. At the same time, internal satisfaction, in turn, is considered a factor of internal motivation of subjects of scientific and pedagogical activity at universities. Therefore, internal satisfaction (as a factor of internal motivation) of the project subjects (mentor and student) can lead to an increase in the level and effectiveness of projects, research, and education at the university.

In addition, it is possible to put forward a private hypothesis of this study that participation in educational projects develops the emotional intelligence of the mentor and students. Therefore, it should be borne in mind that project education contributes to the development of emotional intelligence among mentors and students as a result of their joint work and analysis of project results.

In 2024, emotional intelligence is considered an important factor of human capital and the potential for building a career for university graduates (Zakaryan, 2018). This type of intelligence is responsible for the emotional perception of information. It became clear that based on emotional intelligence (EQ), an economic entity can achieve success. Therefore, scientists and practical psychologists began to actively study this topic and describe the properties of EQ. In turn, employers, when hiring, began to pay more attention not only to the competencies but also to the social skills of candidates.

Emotional intelligence (EQ, emotional quotient) is defined as the ability of an individual to: identify his own and others' emotions; understand and predict the intentions of the interlocutor, his motivation and desires; the ability to use knowledge about the emotions and intentions of the counterparty to solve practical problems. It is known that Google HR analysts, in one of their research projects, carried out an analysis of the principles based on which employer companies hire managing managers. In the course of this study, it turned out that the candidates' technical knowledge was not so important. It turned out that priority is given to: the ability of candidates to balance the negative and the positive in the team; and the ability to listen to colleagues and be a good conversationalist for them.

With this approach, the ability to understand colleagues, understand the way colleagues think and predict their actions and feelings are the basis for success. The development of these skills is defined as elements of the process of developing emotional intelligence, which can be implemented within the framework of educational projects during the student period.

Psychologists usually distinguish four components (elements) of emotional intelligence. It looks at these components of emotional intelligence, taking into account the impact of educational project activities on them:

(i)   Awareness of emotions, which means the ability to identify your emotion and name it correctly. The environment plays an important role in a person's awareness of emotions (it can be the environment of an educational project). If a student participates in the work of a project team with an open organizational culture, which is characterized by the fact that members of the project team do not hide their emotions, then such a student will be more emotionally aware than a student who participates in a team with a closed organizational culture, within which it is not customary to talk about feelings.

(ii) Understanding the emotions of other members of the project team. This understanding is based on the awareness of one's own emotions. This is because a person perceives the feelings of other people, projecting onto his experience according to the "formula": "I understand how this person feels because I know how I feel in such a situation."

(iii) The ability to correctly disclose, express, and discuss your emotions and those of colleagues. Developed emotional intelligence allows you to tactfully (environmentally) express your feelings without hiding them. This can be learned (acquired skills) in the framework of interpersonal communication between participants in educational projects.

(iv) The ability to manage your own emotions and the emotions of other people. It should be borne in mind that learning to manage other people is possible only based on experience when a person knows how to manage their emotions.

The analysis of the structure of emotional intelligence carried out in this work shows that it is possible to identify the fifth element of emotional intelligence. Such a fifth element of a student's emotional intelligence may be the ability to correctly and constructively use emotions to solve urgent project tasks. Constructive use of emotions in work can be learned in the process of managing emotions related to the work of project team members. When using, and working with emotional intelligence, it should be borne in mind that it (emotional intelligence) belongs to the category of "soft professional skills". These skills can and should be developed and trained (pumped) to ensure effective interaction with people (members of the project team). Mastering such a skill opens up the opportunity to: quickly analyze the situation; understand the essence of the emotional problem of the project; use the appropriate management technique in a specific situation; and ensure maximum results in the project.

Project-based learning can also be an effective tool to reduce the negative impact of clip thinking on the quality of higher education.

As you know, the clip consciousness of students (and mentors) is characterized by the fact that: professional reality appears in the mind of the subject as a series of video images, the result of cognition.

The project-based pedagogical process can reduce the negative impact of clip thinking on the quality of higher education.

It is considered the mechanism of the positive impact of the project form of education on the quality of higher education among students with a clip type of thinking:

(i)   A student with a clip type of thinking cannot concentrate on information for a long time, while his ability to analyze this information significantly decreases, since any information does not linger in his mind and is quickly replaced by new information. Consideration of the project situation and information, research of the object from different sides, practical implementation of a logical and comparative analysis of the properties of the design object, and the process of implementing an educational project within the framework of the project can increase the level of concentration and logical thinking of students in educational projects;

(ii) Students with clip thinking have a lower academic performance and a lower learning rate. This is because students do not read much and/or do not understand the meaning of what they read, quickly forget what they have recently been taught, and cannot master the topics they have covered. A specific compensating pedagogical technique in project training: a repeated study of the object or design process from different positions, in different contexts; a systematic approach with the study of the object and the progress of the educational project;

(iii) Students with clip thinking become more susceptible to manipulation and influence. This is due to the emphasis on the perception of information on emotions when a person largely loses the ability to think and analyze information. Pedagogical and psychological counteraction to this effect in the technology of project education: the formation of a project group in the process of work, the creation of an atmosphere of play and competition (gamification of classes) in the classroom during the implementation of the project, mutual support and control of members of the project group;

(iv) Clip consciousness in students can weaken the sense of empathy, which prevents the humanization of education and socio-economic reality. Pedagogical counteraction to this effect within the framework of project higher education: consolidation of efforts in the implementation of the project, development of team spirit, mutual support, active exchange of information between members of the project team;

(v) Clip thinking protects the brain from excessive information overload. Within the framework of the project form of education, pedagogical counteraction to information overload consists of the following: teaching the division of information into relevant (related to the project) and irrelevant (not related to the project; giving practical examples of the relevance (importance right now) of certain project information; timely application of unloading, attention-shifting techniques in the process of implementing an educational project.

(vi) With the clip consciousness of students, they develop multitasking thinking of students, which can distract the student from the topic of classes. Within the framework of project education, multitasking can be used to solve several project tasks in parallel, to establish the degree of priority of solving project tasks in the current period;

(vii) In students, their clip consciousness accelerates their reaction. The project form of higher education allows you to orient this property (accelerated reaction) of students in the project in such a way as to achieve timely solutions to problems by the participants of the project group.

In the process of researching the pedagogical and psychological mechanism, the existence of differences in project education was established not only at the levels of methodology and pedagogy but also in the psychological aspect. For subject education, the methods of traditional psychology are more suitable, which consist of dividing the student's psychological state into psychological processes (sensation, perception, memory, imagination, thinking). However, the analysis showed that the psychology of project-based higher education can be more adequately reflected and described within the framework of Gestalt psychology. This conclusion is based on the fact that Gestalt psychology focuses on the integrity of the perception of the project experience of project team members and the practical use of this previous experience in an ongoing educational project (Glushcenko, 2023c). In addition, when assessing the feasibility of using Gestalt psychology in project education, the following should be taken into account. The basic concept (category) of this trend in psychology is Gestalt. A gestalt is understood as a certain integral structure, an image consisting of many parts, and signs combined into one figure. The presence of common features (multi-element,

integrity, completeness, etc.) allows us to consider the concept of "gestalt" and the concept of "project" as close to each other. At the same time, one of the key, basic properties of the gestalt is its desire for its completeness. This is another argument in favor of the proximity of the concepts of "gestalt" and "project". In Gestalt psychology, the term "close the gestalt" is interpreted as the need and ability to exhaustively, "that is," sort something out and put an end to the subconscious, in awareness of something, in a particular process and/or issue. The project also assumes completeness.

All this can make Gestalt psychology more adequate and productive within the framework of project-based higher education. Therefore, we can say that it is possible to improve the quality of higher project education through such tools: the integrated use of pedagogical and psychological tools by a mentor; the creation of a favorable moral environment in the student project team; the development of emotional intelligence among students during the implementation of projects; the use of Gestalt psychology methods and others.

The formation of a productive organizational culture of higher project education can also be considered one of the key tasks of the pedagogy of such education. The organizational culture of project-based higher education is a structural element of the hidden curriculum in higher project education. Therefore, the organizational culture should be in certain harmony and systemic unity: firstly, with elements of an explicit curriculum (curriculum, pedagogy, psychology, etc.); secondly, with other elements of a hidden curriculum (motivation, student ecosystem, etc.). At the same time, the organizational culture is in connection with the philosophy, pedagogy, and psychology of such higher project education.

In the process of forming project pedagogy, the development of project-type organizational culture is also of great importance. At the same time, philosophy and cultural studies can play an important role in the pedagogical system of higher project education. The organizational culture of higher project education should be in harmony with the culture of entrepreneurship and professional culture in a certain way. It is considered the organizational culture of higher project education.

At the same time, we will take into account the role of organizational culture in the conditions of the 18th-century technological order. Experts believe that the competition of organizations, including universities, will move from the field of products to the field of organizational culture.

The organizational culture of higher project education will be called a unique set of such components: norms of behavior of project participants; values of beliefs of project participants; ways to respond to external and internal threats, and more. All these elements together determine the way groups and individuals come together in an organization to achieve certain organizational goals. In this case, the development and implementation of the project form of higher education at the university is considered the goal.

The relevance of the development of philosophy and cultural studies of higher project education is determined by the fact that in 2024 it is necessary to solve the problem of improving the quality of higher project education. Therefore, the development of philosophy and cultural studies of this form of education can be considered a structural element of solving the problem of developing the pedagogical system of higher project education. Such development of philosophy and cultural studies should be carried out within the framework of a certain philosophical concept (for example, education as a right, education as a service, value education, and others). The philosophy of the cultural studies of education itself can be considered the logical basis of a cultural system, including a cultural system of project-based higher education.

It should be borne in mind that in 2024 culture is considered not just as a product of biological evolution, but as its integral element, the main mechanism of adaptation (including education) to changes in technology, economy, and society. According to existing views, culture in the context of a global crisis is considered a complex of symbols with the function of adaptation. This set of symbols can vary from one form of higher education (or curriculum) to another.

At the same time, the culture of higher project education in its cultural aspect can also be studied as a set of norms of behavior in such education. In this understanding of culture, such components of culture can be considered components of culture:

(i) The vital values of educational project activity, which designate the most important categories, and concepts of the educational project implementation process and act as the basis of the organizational culture of project higher education.

(ii) Norms of behavior as a structural part of the organizational culture of project higher education, which are reflected in the concepts of "morality" and "morality". These norms of behavior determine how participants in project activities can behave in various situations. In the organizational culture of educational project activities, sets of rules should be formed that define and describe these norms. At the same time, the rigidity of certain rules of behavior of mentors and students in educational projects may be determined by the influence of this norm on the effectiveness of the project team and the effectiveness of the implementation of educational projects.

(iii) Artifacts of project education (tangible works, software, etc.) represent the results of educational projects, for example, a project of a voice assistant in a car, a presentation of the student ecosystem of the Moscow Polytechnic University, etc.

Since the values of project education include factors that affect the effectiveness of educational projects, the organizational culture of higher project education can affect the quality of such higher education. When evaluating the productivity of the organizational culture of project education, it is recommended to take into account that there is a known method for predicting the financial results of an organization's innovation activity, which allows us to establish a relationship between the quality of education (in the form of staff competence) and the financial results of an organization in the real economy.

Cultural studies explore the subject, method, and functions of culture, give an idea of cultural universals and cultural identity of society, and reveal the types and forms of culture.

It is logical that project-based higher education should have its specific philosophy and culture based on it and can be the object of cultural studies. The method of cultural studies of project education can represent a unity of explanation and understanding of formal and informal processes in such education.

By the culture of higher project education, we mean a system of meanings that have their internal logic, which is related to the essence and specifics of project education and is comprehended through rational explanation. The highest achievement of the cultural studies of project education can be the completeness of understanding, which allows you to penetrate the field of such education, in particular into the culture of project education, and to understand more deeply the subcultures included in it: student; faculty; management of project education. In addition, the following subcultures can be distinguished in project education: planning, organization, motivation, and control of educational project activities; a subculture of conflict resolution; a subculture of copyright compliance and more.

At the same time, the culture of improving the quality of project education can be considered an integral part of the cultural studies of education and a certain "semantic core" of the purposeful influence of subjects. The following can be considered subjects of the

cultural process: government agencies; society; university administrations; the teaching community; employers; and students. All these subjects can influence the process of developing and consolidating an organizational culture in the social environment and economy to improve the quality of project education. In turn, an increase in the quality of higher education leads to an increase in the competence of staff and an increase in efficiency in the real economy.

The cultural studies of project education cover the study of fundamental problems that reflect the humane goals of humanity. Such cultural studies are designed to create a methodological basis for studying: the impact of project education on economic growth; and the degree of equitable organization of project activity processes; to determine the place of project education in the structure, development, and structure of society.

The cultural studies of higher project education should be focused on understanding and achieving appropriate prospects for the development of the national education system in the process of forming the 18th-century technological order. In addition, the cultural studies of project-based higher education should contribute to solving the problems of the real economy and the state in the field of improving the quality of education, determine the nature of the relationship between the culture of improving the quality of education and the nature, culture of development of the national innovation system.

The cultural studies of project education should explore the question of how the culture of relations between students faculty, and education managers will change in the process of project education and the subsequent professional life of students. The structure of cultural studies of project education also includes the study of the problems of changing the culture of relations within the community of scientific and pedagogical staff of universities.

The cultural mechanism of the influence of business (employers for university graduates) on the formation of curricula (curricula), topics of educational projects, and methods of such education can also be included in the structure of cultural studies of project education.

A structural component of the cultural studies of project education should also be a general view of the content and role of culture as a mechanism for quality control of project education on the part of stakeholders (university administrations, employers, society) of this form of education.

At the same time, the culture of improving the quality of higher project education will be largely a culture of innovation development in education, the real economy, and society.

It is defined that the organizational culture of improving the quality of higher project education includes a set of the most important postulates that are accepted by subjects, and stakeholders (the Ministry of Education, the rector's office of universities, the business community, teachers, and students).

As already noted, the principles of project-based higher education are at the same time the values of the organizational culture of such education. This ensures a systematic relationship between philosophy, cultural ideology, and the policy of such higher project education.

At the same time, as is well known, two approaches can be distinguished in the philosophy of project-based higher education:

(i) Philosophy is the science of sciences, with this approach philosophy acts as a general methodological science;

(ii) Any science (and practice) is a philosophy in itself, with this approach it is postulated that any of the sciences or practical fields of activity forms the philosophy inherent in this science (or practice) in the process of its development. Thus, it can be argued that project-

based higher education in itself (regardless of the desires of its participants) forms its own philosophy and organizational culture.

The principles of the philosophy and values of the organizational culture of higher project education can be named: the principle of independence of the project group; the principle of efficiency; the principle of mutual support by members of the project team; the principle of fairness in the distribution of work and remuneration; the principle of mutual control of project participants; the principle of mutual learning of participants in the process of their communications during the implementation of an educational project; the principle of initiative by students; the principle of dividing the risks of the project and distributing them to the entire team; the principle of collective protection of the project, its results and participants; the principle of conflict avoidance; the principle of fair conflict resolution and others.

To understand the essence of organizational culture in the field of improving the quality of higher project education, it is necessary to formulate its functions and roles. There are several classifications of organizational culture functions. Within the framework of the simplest classification in the organizational culture of higher project education, two functions can be distinguished (external adaptation and internal integration).

As part of the function of external adaptation, the organizational culture of higher project education is part of the mechanism for adapting the higher education system to the conditions of a new technological order. At the same time, each educational project and the organizational culture formed within its framework contribute to the adaptation of the higher education system to the requirements of the 18th-century technological order.

When performing the function of internal integration, the organizational culture of higher project education unites all project participants into a single whole, called the student project team. When studying this function of the organizational culture of project education, it is recommended to take into account the provisions of the general theory of project teams (Glushcenko, 2022b).

With another approach, a greater number of organizational culture functions are highlighted (protective, integrative, regulatory, substitute, etc.). The protective function of the organizational culture of project education includes a national system of values, norms, and rules adopted in the national economy and society, which act as a barrier to the penetration of negative values and/or undesirable trends into the project team.

The integrating function of the organizational culture of improving the quality of project education provides all subjects (actors) of an educational project with the opportunity to consider themselves part of a single whole, describe their role and responsibility, develop a sense of community among project participants, helps to unite students, mentors and other subjects, creates an original image of the subsystem of project education as part of an educational and innovative system.

The regulatory function of the culture of higher project education is manifested in the fact that it forms unambiguity and order in the processes of project educational activity.

The replacement function of the organizational culture of project education is that such an organizational culture is able to replace formal mechanisms and relationships with informal mechanisms of project work, which provides savings on management costs and reduces the risks of an educational project, the risks of the process of improving the quality of project education in general, reduces risks in the national economy.

The adaptive function of the organizational culture of project education allows new educational and/or economic entities to master and comply with the rules of conduct in the

field of educational project activities, and methods for improving the quality of project education.

The educational and developmental functions of the organizational culture of project education and the growth of the quality of education make it possible to increase the overall level of education in this area (through mutual training of project team members), thereby increasing the competence of social and economic actors in the interests of improving the quality of education. The effectiveness of the activity. Projects in the real sector of the economy that improve the quality of education.

The quality management function of the organizational culture of project education determines the quality of the conditions for the implementation of educational projects (the work of the project team), the working environment, the microclimate in the team of the project team, and the university (or department), which, in turn, determine the quality of the implementation of educational projects. The effectiveness of innovative projects, the quality of project education, and the quality of innovative development processes of the national economics.

In the culture of project education, which improves the quality of project education, there should also be a function of achieving a balance between the values of the project group, corporate values, and the values of the external educational environment, the ability to adapt the values of the project group to the values of the organization, by the interests of the state, the economy and the needs of society.

The most important element of the organizational culture of project education, which improves the quality of education, should be the feedback culture of the university and graduate students. In Russian practice, university alumni associations and student organizations can be involved in performing this function of organizational culture. Civil society organizations play an active role abroad in shaping the organizational culture of clusters and technology platforms.

Within the framework of the organizational culture of project education, the organizational culture of improving the quality of higher project education, an important place should belong to the culture of measurement and objective assessment: the effectiveness of educational projects; and the competence of university graduates.

Within the framework of the socio-historical direction of cultural studies of project education in the modern organizational culture of higher education in the country, such managerial subcultures of education can be distinguished:

(i) a subculture focused on leading scientific and pedagogical schools headed by famous scientists and teachers, within the framework of this subculture, higher education developed based on the results of scientific research of leading scientific and pedagogical schools, students were considered unique specialists and personalities, the basis for the development of personnel of scientific organizations. organizations. and pedagogical educational institutions by co-opting the most capable students, which was the motive for the personal achievements of a scientist or student (Glushcenko, 2022c;

(ii) the subculture of project education, focused on the function of the organization, arose as the material support of the project scientific and economic activities of scientific and educational institutions became more complicated, the driving force behind the development of which were the organizers of the scientific and educational process (business angels, venture investors, etc.);

(iii) the subculture of management of higher project education and science.;

(iv) The organizational subculture of financial management in project education develops as the market of scientific and educational services becomes saturated, within the

framework of this subculture, a scientific or educational organization is considered a profitable asset;

(v) It is expected that the promising, humanistic subculture of project education will combine the three previous subcultures within the framework of a situational approach in the management of scientific and educational organizations, taking into account the requirements of the labor market.

(vi) It is logical to assume that the motivation of students is also a structural element of pedagogical science.

The student motivation system belongs to the hidden curriculum of higher project education. The motivation system of university students is to create such learning conditions in which the students strive to improve the quality of their education. Each university has its own conscious, formal (assessment), or informal system of student motivation. Because motivation has a complex structure, it is recommended to form a student motivation policy to optimize motivational processes.

Surveys of students in the framework of project activities in 2020 at Moscow Polytechnic University showed a fundamental difference between the project motivation of students and the motivation of the same students in the subject segment of the educational process. During the survey, about 92% of the students surveyed confirmed this thesis.

In addition, from the point of view of the specifics of the student motivation system within the framework of project activities, it is important that the meaning of the project may be a factor in such motivation. We will study this specific feature of students' project motivation in more detail, in particular, the emphasis will be on studying the influence of the content (meaning) of educational projects on the nature of students' motivation.

The general psychological dictionary of the international IT company Yandex provides the following definitions of the concept of "meaning": "1) the essence, the main thing, the main content (sometimes hidden) in a phenomenon, message or behavioral manifestations; 2) the personal significance of certain phenomena, messages or actions, their relation to interests, needs and life context in general, a specific person."

Based on the interpretation of these definitions, it can be concluded that the concept of "meaning" in project management can be interpreted in two ways:

Firstly, the meaning can be understood as a mission (social significance), a vision for the development of an educational project (as a personal motivation in this process for staff), the purpose of implementing an educational project;

Secondly, the meaning can also be called the motive of the activities of the participants of the educational project group (team).

As part of this work, we will consider the meaning of the educational project as a motivating factor, taking into account the context of the mission, vision, and purpose of the educational project.

The meaning of an educational project can be expressed in the potential profitability of projects of this kind. And, as you know, profit has a stimulating function (it is from net profit that additional financial incentives for personnel are made). Thus, the meaning of an educational project can be considered (for example, within the framework of Viktor Vroom's theory of expectations (1964, his work "Work and Motivation")) not only as a factor of non-material but also material motivation.

The study of motivation in "coordinates": material and/or non-material motivation is more typical for the Russian School of Personnel Management. Abroad, it is more common to consider the issue of motivation in terms of external and internal motivation. The analysis shows that even with this approach, the meaning of an educational project can be considered

simultaneously as an element of internal and external motivation of a student participating in an educational project.

When studying the meaning of an educational project as a motivating factor for students, it is recommended to take into account that, according to expert data, the most significant motivating factors are the following job requirements: work should give a good income (86% of respondents); work should provide prosperity (77% of respondents); work should be interesting (61% of respondents).

At the same time, during motivation studies abroad, about 37% of respondents stated that they are aware of the purposeful nature of their work in the organization (what they want to achieve by working in their organization, and why). The participation of students in educational projects can increase the proportion of employees who purposefully carry out their activities in the real economy. This is especially important in conditions of increasing complexity of production and commercial processes. At the same time, only one out of five surveyed employees of the company see a connection between what he does and the work of other employees. Students' participation in educational projects will allow students to better understand the relationship of their work with the activities of other employees, which will positively affect the quality of the workforce in the real economy.

On this basis, it is possible to recognize the meaning of an educational project as one of the most significant (and probably the least understood and researched) factors of the quality of education (the quality of the workforce) and factors in the motivation system of students and employees of the real economy. At the same time, experts believe that in the Russian practice of personnel management, less attention is paid to the meaning of activity as a factor of motivation of employees of the organization than abroad.

Against this background, it is important to remember that motivation is considered the basis of human management in an organization [38, p.105].

At the same time, it should be recognized that in the practice of educational project activities, there is still no generally recognized methodology for designing motivation systems for project teams and their participants.

Therefore, the writing and approval of key provisions of the motivation system for project groups (for example, internal regulations; job descriptions of team members; key performance indicators of the team, etc.) can become a structural element of the process of project activity and training in project management.

At the next stage of designing motivation systems for project team members, it is recommended to analyze well-known motivation theories, one of which can become the logical basis for building a motivation system for the project team and its participants [38, p.105].

When creating motivation systems for student project teams, it is recommended to proceed from the key definitions of this area: a motive is a need that has become so important to motivate a student to take action; a student's need is something that arises and is located inside a person and requires satisfaction. At the same time, it is important that a person's needs can be conscious and unconscious.

As is known, the physiology of motivation consists of the excitation of the nervous structures of the human body (nervous system, brain), encouraging the student (person) to perform acts of behavior (actions) aimed at satisfying their needs. During the survey of students of Moscow Polytechnic University, it was confirmed that 92% of the surveyed students consider their motivation in an educational project to be fundamentally different from motivation in the subject area of study (Glushcenko, 2022c).

When developing student motivation systems in project activities, it is recommended to take into account that at the beginning of the 21st century there are several dozen theories of motivation in the world. This is due to the variety of working conditions and personal characteristics of the staff, and their goals.

When analyzing motivation, researchers identify four integrative factors of motivation: 1. the importance of achieving success in the project; 2. the hope of success in the project; 3. the subjective estimated probability of success; 4. subjective benchmarks for achieving success in the project.

Methods of motivating students in educational projects can be classified based on various theories and motivation factors.

It is customary to distinguish such groups of theories of motivation: meaningful theories of motivation (Abraham Maslow *et al.*), procedural theories of motivation (Victor Vroom *et al.*); theories of motivation based on a person's attitude to work (Douglas McGregor *et al.*), value theories of motivation; non-standard theories of motivation (Glushcenko, 2022c).

When classifying based on motivation factors, the following are distinguished: external and internal motivation; material and immaterial; economic and psychological; stable and unstable, etc.

In the Russian school of management, historically, until 1991, it was customary to distinguish and study material and non-material motivation.

In foreign theoretical management, it is customary to distinguish between external motivation (everything that an organization gives) and internal motivation (what an employee gets for himself). Motivation, which is based on human needs, is recognized as stable since it does not require additional reinforcement. In this form, the following basic types of motivation are distinguished: "from" and "to"; the carrot and stick method.

Awareness of the meaning of activity can be considered a movement according to the scheme "from" (denial of the importance of the meaning of activity) and "to" (awareness of the importance of the meaning of activity as a motivation of personnel).

Individual, group, and intellectual motivations are also distinguished. Individual motivations are aimed at the physiological state (absence of hunger, thirst, striving for good working conditions). Group motivations are taking care of offspring, and searching for a place in the group hierarchy, inherent in this type of community structure. Cognitive motivation manifests itself: in the research behavior of students; a playful approach to project activities; and the desire to establish themselves in society through the implementation of projects; It may be associated with the manifestation of feelings in an educational project (self-esteem, ambition, self-esteem).

The meaning of project activity can be studied simultaneously as individual, group, and organizational motivation, as well as student motivation aimed at increasing self-esteem, increasing self-esteem, satisfying professional ambition, and reflecting professional self-esteem.

Sometimes the desire for self-affirmation in an educational project refers to the motivation to improve the image of a student and increase the prestige of learning in connection with the socially significant meaning of the activity.

The motive for identifying with another person (a famous researcher, an idol) is the desire of a member of the project team to be like an authoritative person, which encourages the student (person) to develop (especially at a young age). The meaning of project activity can also be considered a component of this type of motive.

The motive of power in the implementation of educational projects is based on the desire of the student (person) to control other people. In part, the meaning of project activity can be

(indirectly) attributed to the motive of power. If the meaning of an educational project is of great economic and social importance, then this increases at least the personal power of such students in the student environment and is a reflection of their leadership qualities.

The economically and socially significant meaning of an educational project can also be reflected in the motive of the prestige of participating in the project. Procedural and substantive motives include the motive of achievement, the desire to achieve high results, and mastery within the framework of a specific educational project. In the work of a student participating in a project team, such a motive is manifested in the choice of difficult tasks and the desire to complete them, come yourself and lead the entire project team to success.

The most common methods of motivating staff in organizations are the meaningful theories of motivation by Abraham Maslow and Frederick Herzberg.

According to A. Maslow, there is the following hierarchy of human needs: physiological, safety and security, social (belonging to a team), respect (recognition and self-affirmation), and self-expression (the fullest use of one's abilities).

It can be shown that the meaning of project activity can be included as a component in all these motives (physiological, striving for safety, social, respect, in self-expression).

It should be borne in mind that usually, a student (person) feels several needs that are in complex interaction. Needs motivate a person if they are not satisfied. When one need is satisfied, another still unsatisfied need takes its place. The needs of a higher level begin to affect a person after the needs of a lower level are generally satisfied. The needs of a higher level can be met in more ways than the needs of a lower level.

Within the framework of F. Herzberg's theory, all motivation factors are divided into hygienic factors and motivation factors. Hygienic factors (health factors) in this theory correspond to the lower needs of a person, and motivation factors correspond to the needs of higher levels. F. Herzberg found that the process of gaining satisfaction and the process of increasing dissatisfaction in terms of the factors that determine them are two different processes. Eliminating the factors that caused an increase in dissatisfaction did not necessarily lead to an increase in satisfaction. And, conversely, from the fact that any factor contributed to the growth of satisfaction, it did not follow that with the weakening of its influence, dissatisfaction would grow. It is possible to increase labor efficiency only by using motivation factors. At the same time, their absence does not cause an increase in dissatisfaction.

At the same time, it is known that needs are satisfied sequentially from the lowest levels of the hierarchy to the highest, and satisfaction of the needs of the higher levels begins after satisfaction of the needs of the lower levels.

At the same time, observations show that people can simultaneously strive for a number of their needs (while prioritizing meeting certain needs and achieving goals). This theory of motivation has been called the "cyclic theory of motivation".

The analysis shows that the motivation process can be divided into six stages: the emergence of a need; assessment of possible ways to eliminate the need; determination of goals and directions of action; implementation of actions to eliminate the need; receiving remuneration for the actions performed; elimination of the need. This sequence of stages is observed when a need is satisfied as a result of individual actions, for example, by an entrepreneur-manager.

If we are talking about an employee (and this is 95% of employees), then the satisfaction algorithm becomes more complicated because an employee can satisfy his needs by entering and working in an organization.

When satisfying needs by entering an individual into an organization of the innovation sphere, the algorithm of the employee motivation process includes the following steps: the

emergence of a need; analysis of ways to meet a need; making a decision that a need can be met when entering an organization; selection of an organization (potentially providing satisfaction of this need), entry (integration) of an individual into the organization; the work of an individual in the interests of achieving the goals of the organization; achieving the goals of the organization; the participation of an individual in the distribution of the results of achieving the goals of the organization; receiving remuneration from the organization; meeting the individual needs of an employee. Increasing the number of steps in the motivation process reduces the likelihood of achieving a positive result (satisfaction of a need). However, the analysis shows that the meaning of activity can act as a factor in the integration of all these stages of the motivation process. Thus, the meaning of the project as a motivation factor for the project team members can: increase the likelihood of achieving a positive result in the process of motivating students; and act as a factor in reducing the likelihood of conflicts in the motivation system of students in their project work.

The task becomes even more complicated, and the importance of the meaning of activity as a motivating factor increases if an employee strives to satisfy several needs at the same time.

The meaning of the activity affects the values of the student project team, and therefore the organizational culture of this project team (subsequently, an innovative company, IT organization, etc.).

Procedural theories of motivation cover theories such as Victor Vroom's expectations, John Stacy Adams' theory of justice, and Porter-Lawler's complex theory of motivation. The expectation theory states that every employee expects an appropriate reward for doing a certain job. At the same time, the individual's receipt of the expected remuneration reinforces the motivation for conscientious work.

In John Stacy Adams' theory of justice, it is argued that each student (person) evaluates the fairness of his remuneration against the background of other team members (employees of the company).

Within the framework of the Porter-Lawler complex theory of motivation, five main motivational variables can be used by the project curator to motivate students in the project group: the efforts expended by the student (person); the results obtained in the project; the student's reward for the results; the student's perception of remuneration; the degree of satisfaction with the reward received by the student.

A fundamental innovation of the Porter-Lawler complex theory of motivation can be called the conclusion that productive work leads to satisfaction. This conclusion is considered a counterweight to the opinion formed within the framework of earlier theories of motivation: achieving high results in work is conditioned by satisfaction.

In contrast to early theories of motivation, Lyman Porter and Edward Lawler voiced the conclusion that the very feeling of completed project work leads to satisfaction, which also increases productivity. The meaning of project activity as a motivating factor is more in harmony with the complex theory of motivation.

A preliminary analysis allows us to conclude that it is the procedural theories of motivation that can be most productive in motivating students within the framework of educational project activities.

Presumably, it is precisely from the point of view of high labor costs and the relatively low value of material remuneration that modern students consider innovative and scientific project activities to be unattractive. However, the emphasis on the factor of the meaning of activity in motivation, increasing the internal motivation of students and postgraduates in

their project activities can play an important positive role in attracting young researchers to project scientific and innovative activities.

The third group of motivation theories are theories of motivation based on a person's attitude to work. This group of motivation theories includes the following theories: David McGregor's X and Y theories and William Ouchi's Z theory.

It should be noted that this group of theories (U. Ouchi's Z-theory) takes into account the Japanese experience and in this part can be useful in the process of motivating employees in the innovation sector.

The fourth group of theories – value theories of motivation includes the following types of motives: technical and functional motives; general management; independence; security and stability; entrepreneurial streak; the desire to be useful, and devoted to business; a test of strength in its purest form; lifestyle). It is considered the well-known type of value motivation of students in the framework of educational projects.

(i) The technical and functional motives of students in the project consist of the student's pronounced interest in becoming a good professional in his work, therefore he needs to participate in the project, in professional communication for professional growth.

(ii) General guidance as a student's value motive is the student's desire for general guidance and control of the rest of the project team members. Such students are characterized by a developed sense of responsibility and the ability to organize everyone to do a common task.

(iii) Independence and independence as a student's motive in the project are characteristic of those who strive to do their share of project work in their original style, and their assessment of the quality and timing of their project work is primarily important to them.

(iv) The motive of "a sense of security and stability" is typical for such students who strive to get a stable job for a long time; they work well in a team; at the same time, they show an innovative approach to work problems, but they are not interested in new roles (they are afraid).

(v) The entrepreneurial streak as a motive of students in project work consists of a constant desire to create new business enterprises, develop their vision of the business, and implement this vision in reality. There may be an application of a rationalizing and creative approach.

(vi) The student's desire to be useful and dedicated as a motive in educational project activities finds its expression in the desire to help other team members, work is of personal importance to them, they like to teach and advise other students.

(vii) The student's motive of "testing strength in its purest form" as a value motive consists of the constant desire for the student to achieve new heights in educational projects, to test himself in the process of solving new professional and personal problems for himself, and such a student is ready to take on a risky and difficult task of the project. When motivating such students from the NPR (project curator), it is necessary to conduct conversations with such students in advance to find out which works will be of interest and which projects (parts of the project) will be a test of their strength for them. The NPR should take into account that such students need to prove themselves in the project in critical situations and situations of high complexity.

(viii) The student's motive of "project lifestyle" finds expression in the fact that project work should correspond to his ideals, the student's idea of his life, while performing project professional duties should not take up all personal time, for such students, a balance between project work and personal life is important, such students appreciate style organization, the flexibility of project work.

As already noted, the meaning of activity can be an integrator of the values of an organization and, therefore, is an important factor in the project organizational culture, first at the university, and then at the enterprise.

A survey of students involved in project activities revealed such a structure of their motivation. In 2021, as part of a project to improve the university's position in international rankings, the structure of student motivation was revealed, as reflected in **Table 3**.

Table 3. Structure of students' motivation in an educational project

	The content of the motive of the student participating in the project	The importance of motivation for the student (in %)
1	The motive of increasing (improving) one's knowledge (technical and functional motives)	13%
2	The ability to carry out the overall management of the group as a student's value motive	10%
3	The opportunity to show independence and independence in the project	10%
4	The motive for creating a sense of stability and security by gaining higher competence	4%
5	The motive for the realization of entrepreneurial abilities, the opportunity to create your own business	9%
6	The desire to be useful and dedicated as a student's motive	7%
7	Testing one's strength in its purest form as a student's value motive	6%
8	The motive to test your knowledge in the project	8%
9	Project lifestyle as a student's motive	5%
10	Participation in an interesting team, interest in communicating with other team members	11%
11	The desire to work under the guidance of a specific scientific supervisor	4%
12	The desire to improve their professional skills within the framework of a project	13%
	Total:	**100 %**

Source: developed by the author

In 2024, there will be more and more result-oriented motivational systems. In these motivation systems, a student's academic performance is determined using key performance indicators (KPIs). Most theorists of such motivation systems tend to conclude that such motivation for results is the most perfect motivation system. This opinion is based on the fact that such performance indicators: justify to the business the amount of remuneration paid to employees; employees receive income depending on the efforts made.

At the same time, critics of this approach believe that excessive enthusiasm for the use of KPIs in educational project activities can lead to the fact that the motivation system will turn into an incentive system. In this situation, members of project teams working for the future may be unprofitable, the results of whose work will manifest over time and affect the prospects for the development of the project in the future. In the context of the development of student motivation systems focused on the result of an educational project, the meaning of activity can act as a factor in integrating and smoothing the contradiction of formal and informal approaches in the motivation system of members of the student project team.

The meaning of the activity directly or through organizational culture can influence the development and effectiveness of non-traditional student motivation systems (bonuses from industrial partners, etc.).

The methodology of designing a motivation system for project participants, taking into account the meaning of this educational project, is based on establishing logical connections and rules for using these documents in the process of designing a system of group and/or individual motivation of student project team members. These logical connections can be defined taking into account the meaning of the educational project as follows. The meaning of the activity determines the rules of the internal work schedule of the project team. At the same time, it is the meaning of the project activity of each team member that allows you to correctly distribute and adequately control the student's performance of project work. It is the awareness and description of the meaning of the student's activity that gives objectivity to the rewards and punishments of students in the entire field of motivation. Key performance indicators, determined based on the meaning of the educational project, make it possible to more accurately quantify the successes and shortcomings in the activities of individual participants in student project teams.

In general, we can say that the system of motivating students to project activities should be based on the analysis of the project goals tree. Within the framework of the motivation system, the achievement of local and final project goals (positive motivation) should be encouraged and punishment for failure to achieve project goals (negative motivation) should be applied.

In general, the materials of this part of the study suggest that the motivation system for students' project activities is an important part of the hidden curriculum in project education. At the same time, the meaning of students' project activities is a significant, multicomponent motivation factor and, as a motivation factor, can largely determine the organizational culture, the effectiveness of student project groups, and the quality of project education.

One of the tasks of pedagogy of higher project education is proposed to consider the design of the university's student ecosystem. Such an ecosystem can be a way to improve the quality of higher project education.

The ecosystem approach in the provision of educational services is a characteristic feature of the new 18th-century technological order. In the field of higher education, two elements of an ecosystem approach can be distinguished: firstly, an ecosystem approach in the field of educational services; secondly, an ecosystem approach in extracurricular work and everyday life of students (creation of a university student ecosystem).

The ecosystem approach in the provision of educational services by the university may include the following components: the development of a standardized and/or client-oriented list of educational services (curricula) according to the nomenclature of specialties that meet the interests of university stakeholders; the formation of a complex of educational services by their types (subject education, project education, SMART education, etc.); the formation of a complete set of services for levels of education (Bachelor's, Master's, postgraduate, doctoral); development of methods of financing educational services (budget financing, personal financing, bank lending, targeted training, etc.).

The analysis shows that due to the almost exhaustion of extensive factors (academic workload of mentors, informatization of the educational process, etc.) to improve the quality of higher education, the university's student ecosystem can play an important role in improving the quality of higher education. The study shows that if we talk about university student ecosystems, they can be a significant reserve for improving the quality of higher project education at the university.

Historical analysis suggests that university student ecosystems have existed for as long as universities themselves have existed. Initially, the university's student ecosystem includes a library; a campus; a canteen; a sports hall, and more. This is a material segment of the

university's student ecosystem. The intangible segment of the student ecosystem is associated with the development of student public organizations; the existence of information services and technologies in the extracurricular sphere; the organization and holding of cultural events and other things. The development of information technology in the period of the 18th-century technological order opens up the possibility of creating new elements of the student ecosystem: distance education systems (EED); and communication services for students and others.

The analysis shows that the university's student ecosystem can be considered as firstly, a structural element of the hidden curriculum of project education; a way to improve the quality of higher project education (Vladimirovich, 2023). It should be noted that the initiators of the innovative development of the student ecosystem are the students themselves. For example, it is a well-known fact that the student innovation to create a service in the field of personal communications of students on the university campus in the process of its development has become a global Facebook network.

The student ecosystem of the university will be called a set of services aimed at increasing creative potential and improving the level of education and the comfort of students' lives within the framework of the educational process at the university. It should be emphasized that the creation of the university's student ecosystem covers processes beyond the student's classroom work. The university's student ecosystem does not directly affect the educational process at the university.

The student ecosystem can be considered a SMART technology (smart technology) to improve the quality of higher project education at the university. SMART technologies can be tools for managing the processes of creating student ecosystems at universities

The essence of the university's student ecosystem (as a scientific category) can reveal and explain its functions and roles in the educational process and the extracurricular life of students.

The functions of the university's student ecosystem can be called:

(i) reducing the student's time and energy spent on searching for educational literature and other educational content in the process of students' independent work;
(ii) an increase in the degree of student involvement in the organization of a student's life outside the classroom educational process;
(iii) the transition to participatory management of the processes of extracurricular activities of students;
(iv) reduction of unproductive waste of time and energy of students in solving their everyday problems;
(v) the development of self-government and the activity component in the process of teaching students at the university;
(vi) improving the efficiency and comfort of students in the process of their rest from classroom activities;
(vii) expansion of students' business and personal communications during their studies at the university;
(viii) improvement of the moral and psychological atmosphere and the level of mutual support among students;
(ix) the development of an innovative organizational culture in the student environment of the university and more.

The roles of the formation of the university's student ecosystem can be called: improving the quality of higher education; increasing student involvement in the independent

educational process; increasing the level of comfort of students' living and social conditions, and more.

The paradigm of the development of the university's student ecosystem will be called the aggregation (systemic unification) of such elements of its development as philosophy, ideology, politics, organizational culture, mission, goals, and vision of the development of this ecosystem. The practical necessity of forming such a paradigm is determined by the desire to harmonize these elements of the paradigm with each other. The process of forming a development paradigm (in this case, the university's student ecosystem) can be considered the application of a SMART approach in the process of creating this system. Such self-management of the development process of the university's student ecosystem, in particular, involves checking the goals of creating this ecosystem for its compliance with such requirements (specific, measurable, achievable, significant, Timely (Specific, Measurable, Achievable, Relevant, Timely)).

The philosophy of creating a university student ecosystem will be called the wisest and most general view of the process and results of the development of such a student ecosystem at the university. The principles, culture, ideology, and policy of developing such an ecosystem at the university are formed on the basis of the philosophy of creating a student ecosystem.

The philosophy of the formation of the university's student ecosystem should be created and reflect the mechanism of influence of such an ecosystem in the following areas: improving the quality of education at the university; growth of the activity part in university training of students; increasing the level of comfort of living conditions of students; increasing the quality of labor resources in the economy; increasing the creative potential of labor resources; improving business and personal communications of students; development and improvement of the moral and psychological environment, etc.

By the mechanism of influence of the university's student ecosystem on the quality of labor resources in the national and global economy, we will mean a system of methods and forms using which the named system can influence individual components of students' lives and the quality of the university's workforce as a whole.

At the same time, the services included in the university's student ecosystem should be aimed at optimizing the actions of students during extracurricular time and during the performance of household activities.

The basis of the philosophy of the university's student ecosystem development can be considered a logical chain that reflects the impact of reducing the unproductive waste of students' efforts and time during their studies at the university and living on the university campus. Therefore, a significant place in the philosophy of building the university's student ecosystem should be occupied by an idea aimed at reducing the unproductive waste of student's time in the educational process (for example, searching for necessary information) and in everyday life (for example, the time spent searching for the right audience or the university campus building).

The university's student ecosystem needs to be designed. The student ecosystem project represents an image of the future of this ecosystem.

Under the guise of the student ecosystem, we will understand the structure and main characteristics of the services included in it.

The philosophy of designing and creating the university's student ecosystem is characterized by certain principles. Such basic principles can be considered the following provisions:

(i)   The main motive for creating services included in the university's student ecosystem can be considered: improving the quality of education; improving the quality of life of

students during their studies; developing students' creative abilities and skills; developing students' innovative activity and more;

(ii) the university's student ecosystem is formed based on the initiative of students, created by students for students themselves, based on the study of problems and needs of students;

(iii) in the process of forming the idea of the service and during the implementation of the project to create a student ecosystem of the university, students use advanced IT technologies and learning outcomes at the university;

(iv) the project of creating the university's student ecosystem uses a post-industrial approach, which is based on the active use of scientific achievements to create new needs for students;

(v) The active basis for the creation of the university's student ecosystem can be considered the active innovative participation of students themselves in improving the extracurricular educational process and the way of life of students;

(vi) the basis for the formation of the university's student ecosystem is the personal and group initiative of students;

(vii) the collective and individual promotion of ideas to improve the quality of education and the comfort of students' lives is encouraged;

(viii) the principle of self-organization and horizontal communication of students in the process of their participation in the creation of the university's student ecosystem;

(ix) voluntary participation of students in the creation of the university's student ecosystem;

(x) respect for copyright and other rights of participants in the process of creating the university's student ecosystem;

(xi) the principle of freedom of creativity and self-realization of participants in the process of creating a student ecosystem of the university and more.

These principles of creating a student ecosystem of the university can simultaneously be considered the values of the organizational culture of the named ecosystem and the student environment of the university. The organizational culture of the university's student ecosystem is understood as a set of principles and beliefs of participants in the process of creating such an ecosystem; a set of their norms of behavior that determine the response of the organization (this ecosystem) to problems arising in the process of development; the relationship of stakeholders with participants in the process of creating the university's student ecosystem. It should be noted that the values of organizational culture include everything that contributes to the development and efficiency of the university's student ecosystem.

The ideology of the functioning of the university's student ecosystem can be called: 1. The main idea of creating such a system (improving the quality of higher education with the active participation of students themselves in this process); 2. The method of distributing power in the process of creating the university's student ecosystem (reliance on leadership and personal power (expert power, charisma, the right to power, etc.)) of students participating in the process of creating this ecosystem.

The policy of forming the university's student ecosystem can be called a set of coordinated activities aimed at achieving the goals of the project to create such an ecosystem. At the same time, the policy of creating a university student ecosystem can be divided into the strategy and tactics of this project (or process). The University's student ecosystem development strategy is aimed at generating long-term results when creating such a system at the university. The tactics of creating a student ecosystem provide solutions to current problems

and ensure the sustainability of the project, the process of creating a student ecosystem of the university.

To form the image of the university's student ecosystem, a concept of the named ecosystem can be developed.

Under the concept of forming the university student ecosystem, we will understand a systematic view of the following aspects of its development: the appearance of this ecosystem (characteristics and structure of the ecosystem); the place and role of the university student ecosystem in the student's life; the role of the university student ecosystem in the process of improving the quality of higher education.

The university's student ecosystem includes services that can be focused on obtaining the following effects: increasing the activity component in the learning process of students; improving the efficiency of students' life activities during extracurricular time; reducing time losses in the process of extracurricular life, and others.

These effects can provide an improvement in the quality of higher education at the university.

The mission of the university's student ecosystem can be understood as describing the importance of the development of such systems for the university, students, and society as a whole. The mission of the university's student ecosystem can be considered to increase the efficiency of social production based on improving the quality of higher education at the university by developing student activity, reducing the loss of time and effort of students in extracurricular work and increasing the level of comfort of life and educational processes.

The vision of the development of the university's student ecosystem will be called the inspiring scenario for the administration, mentors, and students of the development of this system at the university. The vision of the development of such an ecosystem should show how the university's student ecosystem will move from its current state to its promising state. The vision of the development of the university's student ecosystem can take the form of a scenario for the development of this ecosystem. In turn, the scenario of the development of the student ecosystem is a logical chain of events that transfers this ecosystem from its current state to its desired future state.

The goal of developing the university's student ecosystem can be considered to improve the quality of higher education through the intensification of many factors, including out-of-class educational activities of students. To clarify the structure and harmonize the interaction of local goals of the university's student ecosystem, a graph tree of goals of this ecosystem can be formed. Such a graph tree of the goals of the university's student ecosystem will reflect the interrelationships of local (private) goals of this system at various hierarchical levels. The method of constructing a graph tree of goals is known, it is based on graph theory.

By the mechanism of influence of the university's student ecosystem on the quality of education at the university, we understand a set of methods and forms of influence by which such an ecosystem can have an impact on the quality of project education at the university. Tools for the impact of the university's student ecosystem on improving the quality of education at the university can be considered: the development of an activity-based approach in student education (services are provided by students and for students); development of business and personal communications between students in the process of creating and functioning of the university's student ecosystem; reduction of unproductive time and effort of students in the process of their extracurricular activities; raising students' awareness of their opportunities to benefit from the support of the university or the university's student ecosystem; improving professional orientation and assistance in student employment during their studies and There's more after him. It is predicted that the intensification of the impact

of these factors will lead to an increase in the quality of higher project education, which in turn will generate an increase in the efficiency of public production in the real economy.

Under the structure of the university's student ecosystem, we will understand the totality of its elements and the connections between them. The structure of the university's student ecosystem may include the following elements, which generate factors of influence of this system on the quality of education.

The following IT services can be structural elements of the university's student ecosystem:

(i) IT service for the development of extracurricular personal communications and mutual assistance between students during their course of study in extracurricular work (may include video lectures by students, information exchange related to the study of books and scientific articles, etc.);

(ii) service for additional professional orientation of students and assistance in employment, taking into account the stage of study at the university;

(iii) An IT service to minimize the time spent by a student searching for classrooms, premises on campus, a canteen, a laundry room, a hairdresser, etc.;

(iv) An IT service to help students optimize student spending on clothing and create their style of clothing;

(v) service for the development of general (museum, art, etc.) and musical culture of students, including musical self-realization of students in various kinds of music, theater studios and clubs;

(vi) service for the selection of enterprises for internship and employment during training and/or after graduation;

(vii) service for fitness, sports sections, travel and more.

When creating student ecosystems at universities, design thinking and redesign can be used.

It is recommended to take into account the following in the process of creating and functioning the university's student ecosystem. Because the university's student ecosystem is a complex system, conflicts, and disharmony may arise between its hierarchical levels and elements. To eliminate such disharmony between the organizational conditions of the development of various elements of the university's student ecosystem, it is recommended to use the ergo design method. The method of ergonomic design in the formation of the university's student ecosystem can be used to solve the following tasks: ensuring that stakeholders perceive a set of elements of such an ecosystem as a whole; creating balanced and harmonious services (a set of elements); harmonizing relations between elements of the internal environment of this ecosystem; harmonizing relations between the university's student ecosystem and its external environment (classroom the ecosystem of the university, employers, students, etc.).

The task of the university's student ecosystem can be considered as such ecosystems comprehensively ensure the safe and comfortable life of students during extracurricular time.

The design and functioning of the university's student ecosystem must meet the following requirements: ensuring the safety of students' activities outside of school hours; sustainability of the development processes of this ecosystem; a high degree of completeness of satisfaction of educational, cultural, and household needs of university students; minimizing environmental damage; timely restoration of the environment in case of damage to the external environment; harmonization of conflicting interests of stakeholders (interested parties) of the University.

The characteristic features of the university's student ecosystem include comprehensive service to the cultural, social, and everyday needs of university students; the desire to avoid

competition between universities by creating an original student ecosystem as a system of comprehensive service to the cultural, social and everyday needs of students; reliance on the traditional way of life of university students (taking into account the specialties of training); orientation to the whole the student's period of study at the university; taking into account the opinions and interests of residents of the home region; consideration of business opinion, etc.

In 2024, the development of university student ecosystems can be considered a new, additional (to the main) paradigm of quality management of higher project education. The modernization project of the Polytechnic University should take into account the traditional ways of life of all categories of stakeholders of this university. Such a development paradigm can be based on the interests, needs, and habits of various categories of stakeholders (business, students, teachers, etc.) of the university.

Anthropogenic ecosystem engineering can be considered a methodology for designing and forming university student ecosystems. Such ecosystem engineering can develop as a new field of knowledge. This field of knowledge harmoniously combines knowledge from various fields of science and practice to effectively solve the problems of creating students and other types of anthropogenic ecosystems. The scientific methods of anthropogenic ecosystem engineering include the theory of complex hierarchical systems; the theory of technological structures; the theory of organizations; the theory of organizational behavior; economics; innovation; marketing of places (universities); design thinking; ergo design and other areas of modern science.

The stages of formation of university student ecosystems can be recognized as pre-project research (advance project); development of a project for a specific university student ecosystem; practical implementation of a university student ecosystem project; and observation and analysis of the effectiveness of such an ecosystem.

Ergo-designer of the university's student ecosystem can be called the process of creating a project of such a student ecosystem based on the active use of the redesign methodology. With this approach, ergonomic design at the stage of synthesis of the image of the student ecosystem can solve the following problems: determining factors for structuring such an ecosystem; optimizing the appearance of subsystems of the student ecosystem; harmonizing the relationships between various elements of this ecosystem and others. The process of forming the university's student ecosystem generates its own original organizational culture. Such an organizational culture of the student ecosystem includes the values of such an ecosystem and the process of its creation; the norms of behavior of participants in this ecosystem; ways to respond to development opportunities and threats, and more.

Conducting an ergo design of the organizational culture of university student ecosystems can solve the following tasks: optimization of the elements of organizational culture; harmonization of relations between the elements of the organizational culture of ecosystems and more.

By the effectiveness of the student ecosystem, we will agree to understand the ability of this ecosystem to achieve the goals set for them, provided that this ecosystem fulfills certain restrictions. These may be such limitations of the student ecosystem: on the amount of resources available to them; on the possibility of developing certain services; on the time of implementation of certain socio-economic processes.

The use of the methodology of ergonomic design in the design of such student ecosystems can allow: to increase the efficiency of such ecosystems; and to create a synergistic effect in the functioning of such student ecosystems due to more effective interaction of elements of such ecosystems. The level of effectiveness of student ecosystems can be assessed using

criteria for evaluating the effectiveness of the functioning of such ecosystems. The criterion for evaluating the effectiveness of student ecosystems can be understood as the rule of choosing the best option for such an ecosystem from many alternative options for such an ecosystem.

The criterion for evaluating the effectiveness of student ecosystems can be synthesized by including performance indicators of such an ecosystem in this criterion. Indicators of the effectiveness of student ecosystems will be called the most important indicators of such an ecosystem, reflecting its purpose and main characteristics.

As indicators of the effectiveness of student ecosystems, one can name the growth in the number of university students; the level of competition between university applicants; the growth in the quality of higher education; the growth in the income level of a university graduate; the degree of satisfaction of university graduates; the happiness index of university students; the degree of business satisfaction with the quality of education and more. The main tasks of ergonomic design at the stage of forming sets of criteria for evaluating the effectiveness of student ecosystems include: highlighting the most important indicators of the functioning of such student ecosystems; optimizing a set of parameters for the effectiveness of student ecosystems, and more.

The risk in creating student ecosystems lies in the possibility of negative deviations in the functioning of such anthropogenic ecosystems. The risks in creating student ecosystems may consist of the following: incorrect definition of the mission and objectives of such an ecosystem; incorrect definition of the structure of such an ecosystem; incorrect determination of the desirable characteristics of such an ecosystem; lack of resources for the development of such an ecosystem, etc.

The tasks of ergonomic design in the study of the risks of creating student ecosystems include the following: analysis of the significance of individual risks, taking into account the conditions of functioning of this student ecosystem; ranking the risks of such a student ecosystem according to the importance of their consequences and/or the rate of occurrence of consequences; optimization of risk management methods in the student ecosystem, and more.

The student ecosystem should be created taking into account a set of such factors: the competitive advantages of a particular university in the higher education system; the competitive disadvantages of this university; the market position of the university in question in the national and global educational services markets; the level of customization and/or client orientation of the university under study; specialization of basic partners and employers for university graduates; the organizational culture of the university and its student environments and more.

In general, the materials of this part of the work show that the creation and development of a student ecosystem can be considered an important reserve for improving the quality of higher project education, a way to increase the level of satisfaction of stakeholders with the processes of student training.

One of the urgent tasks of the pedagogy of higher project education can be considered the development of analytical pedagogy, in particular, in the interest of assessing the quality of higher project education.

It is known from the philosophy and methodology of science that the method of research of a certain object (pedagogy) should be adequate to the complexity of this object of research. Since there is an increase in the complexity of pedagogical systems, it is necessary to develop adequate methodology and tools for research on complex pedagogical systems.

The development of project education as a complex system of knowledge of the process and skills of knowledge transfer gives additional urgency to the need to solve this scientific and practical problem of modern pedagogy.

In this paper, the theory of complex pedagogical systems is understood as a set of research methods that allow synthesizing and analyzing complex educational systems and/or processes, and educational products.

A systematic analysis in pedagogy will denote a type of analysis in which research is consistently carried out: factors affecting the content and quality of higher education; study the mechanism of influence of these factors on the quality of project education; investigate the impact of the result (quality) of education on the development of the industry and/or the economy and society as a whole.

Analytical pedagogy will be called a scientific discipline that would be aimed at studying: the socio-economic impact of various pedagogical systems on the quality of higher education; and the impact of the quality of higher education on the real economy and society. The main functions of analytical pedagogy (psychology) of higher education (and analytical psychology in general) can be called: methodological, cognitive, instrumental, legislative, optimization, prognostic, preventive, psychological functions, the function of socialization of knowledge, minimizing man-made and environmental risks.

It clarifies the content of these functions and other methodological provisions of the developing new scientific discipline -analytical pedagogy.

The methodological function of analytical pedagogy (analytpedagogy) consists in the development of the conceptual apparatus, theoretical foundations, and methodology for the study of phenomena and processes, and the formulation of laws and categories of analytical pedagogy.

The cognitive function of analytical pedagogy (or psychology) includes the processes of accumulation, description, study of the facts of pedagogy, and pedagogical systems in connection with the consequences of their impact on the quality of education.

The instrumental (regulatory) function of analytical pedagogy (or psychology) is as follows: the creation of pedagogical (or psychological) tools for management, modeling, and analysis of pedagogical processes and their socio-economic results.

The legislative function of analytical pedagogy is manifested in the development of certain legal norms that contribute to the development of analytical pedagogy.

The optimization function of analytical pedagogy (or psychology) consists of choosing the best ways, techniques, and tools to improve the quality of education, and more.

The predictive function of analytical pedagogy and psychology of higher education includes an assessment of psychological conditions and the effectiveness of pedagogical and psychological tools of the higher education system and their consequences for the national higher education system in the future.

The preventive function of analytical pedagogy and psychology of higher education can be expressed in carrying out proactive and preventive measures based on the results of forecasting the possibility of developing methods and techniques of analytical pedagogy and psychology of higher education to reduce the risks of developing a practical pedagogical and psychological system of higher education.

The psychological function of analytical pedagogy and psychology of higher education consists of orienting subjects of higher education to realize the importance and necessity of further development of analytical pedagogy and psychology of higher education.

The function of socialization of knowledge in the field of analytical pedagogy and psychology of higher education covers the dissemination of knowledge about analytical

psychology of higher education in the national system of higher education and the belief in the need to take effective measures to develop analytical pedagogy and psychology of higher education.

It is proposed to recognize the role of analytical pedagogy in higher project education: firstly, in optimizing the processes of developing scientific and innovative support for the development of the national higher education system; secondly, in reducing risks in the development and functioning of analytical psychology of higher education; thirdly, in improving the quality of education. Higher education is a result of the development and practical application of the analytical psychology of higher education.

The laws of analytical pedagogy and psychology of higher school pedagogy consider stable cause-and-effect relationships, the interaction of parts and relationships that arise in the process of functioning and development of analytical psychology of higher school. The study shows that such laws of analytical pedagogy and psychology of higher education can be formulated:

(i) The increased influence of the human factor on the socio-economic development of society generates an increase in the importance of theoretical and practical pedagogy and psychology, pedagogical and psychological mechanism, and analytical pedagogy and psychology, in particular, the processes of improving the quality of higher education;

(ii) all forms of educational activity (subject, project, INTELLECTUAL education, etc.), each type of pedagogical and psychological processes in the higher education system generate their inherent theoretical and practical pedagogical and psychological mechanism, analytical pedagogy and analytical psychology as an integral part of them;

(iii) the effectiveness of a certain theoretical and/or practical pedagogical and psychological system, pedagogical and psychological mechanism of a certain type of educational activity can be analyzed and evaluated qualitatively and/or quantitatively using methods and tools of analytical pedagogy and analytical psychology of higher education;

(iv) The formation of effective practical pedagogical and psychological systems and mechanisms for managing educational processes in universities should be based on the application of assessments and methods of analytical pedagogy and psychology of higher education and others.

An analysis of the practice of higher school pedagogy at the beginning of the XXI century shows that the pedagogical system can be considered a complex system with all the properties inherent in such systems. Further development of the theory of complex systems, the theory of systems analysis, and analytical pedagogy can be considered a necessary condition for improving the quality of higher education in the context of the increasing complexity of education in the situation of the formation of the 18th-century technological order.

The project model in higher education should be based on the results of studying real innovative projects in a particular industry. It is agreed to call a product in project higher professional education a set (system) of skills and knowledge, an organizational culture that opens up the opportunity for a university graduate to successfully implement real innovative projects.

One of the key tasks of analytical pedagogy can be considered the justification and formation of models for assessing the quality of higher project education.

The need to develop such models is related to the following. One can often hear criticism of the allegedly insufficient quality of higher education. However, the question arises: how correct is it to talk about the quality of higher education, before the tasks of the real economy are formulated, What this quality of education should provide?

At the same time, the quality of education is most often understood as an integral (complex) characteristic of educational activities at a university and the preparation of a student (student) at a university, expressing the degree of their compliance with federal state educational standards, educational standards, federal state requirements and/or the needs of legal entities and/or individuals.

Therefore, in order to correctly talk about the quality of higher project education, it is necessary to investigate and determine the strategic needs of legal entities and individuals in the field of higher education. Scientific support for the solution of such a role of tasks should be provided by the methods of analytical pedagogy.

It should be noted here that the content of the concept and quality indicators of higher design education depends on the level of the technological pyramid (conceptual, technological development, production, operation, or maintenance of products), where graduates of the university work.

The following methods can be used to assess the quality of higher project education:
(i)   assessment of the degree of satisfaction of stakeholders (this assessment remains a key indicator);
(ii) formation of models for assessing the quality of higher education;
(iii) creation of ratings of design universities and much more.

It should be noted that to improve the quality of higher project education, it is necessary to carry out not only an assessment of the quality of higher education but also its diagnosis.

The diagnosis of higher project education is understood as the establishment of observed results in the field of quality of higher education in connection with the factors that led to these results.

Diagnostics of the quality of higher project education can also have an interpretation close to "medical": according to the observed external "symptoms", it is necessary to establish the type, nature, and consequences of the "disease" that reduces the quality of higher education, and then correctly prescribe the "medicine"." to improve the quality of higher project education.

To assess the degree of satisfaction of stakeholders, surveys of key stakeholders (employers, university graduates, government agencies, etc.) can be conducted, and the dynamics of such assessments studied.

Diagnostic models can be developed and used to diagnose the quality of higher project education. Such models should reflect the structure of the educational product, and the mechanism of influence of educational factors on the integral assessment of the quality of education.

To assess the quality of higher project education, a four-level model of educational services was proposed in this study. The three levels of this model correspond to the well-known three-level product model of Phillip Kotler. However, the content of these model levels has been adapted to the specifics of the educational service.

The named hierarchical model of the quality of educational services includes the following hierarchical levels:
(i)   The first level of the educational service reflects the main purpose of the higher project education service, namely, training in methods of knowledge commercialization through the development of project technologies in the educational process, characteristic of the real economy;
(ii) The second hierarchical level of the educational service describes the actual characteristics of the service, namely, higher project education services, and includes

such characteristics: the cost of training, the duration of training, the number of educational projects implemented, the subject of projects, etc.;

(iii) The third hierarchical level of educational services is a service of higher project education with "reinforcement": providing students with housing on the university campus; assistance in finding a job after graduation; the possibility of paying for educational services on credit; the possibility of obtaining an additional (to the main) diploma of project education and more;

(iv) The fourth level of the model describes the strategic impact of higher project education services on the quality of student life at the university and on the career and quality of life of the student after university, including the availability of master's, postgraduate and doctoral studies, the possibility of consultations after completing university studies, and more.

In addition, the assessment of the quality of higher project education can be carried out through a comparative analysis of the quality of education at universities that are similar to each other in terms of the type of educational process (and, consequently, the educational product). For the correctness of the comparative analysis of the quality of higher education, it is recommended to differentiate (divide) objects (universities) into categories (subject universities, project universities, intellectual education, targeted education, etc.).

Within the framework of this study, it was shown that an international and national rating of universities with a project-based form of education can be compiled to assess the quality of higher project education.

The formation of an independent (global and/or national) rating of project universities becomes logical after the fundamental differences between the educational products of universities with subject and project forms of education are established and proved within the framework of this study.

Moreover, it can be recognized that the desire of design universities to participate in the rankings of specialized universities is not entirely correct for the reasons already mentioned, namely, the fundamental difference between educational products; type of educational process; basic enterprises, and others.

In the course of the study, it was found that the rating of universities with a project-based form of education can become a tool for strategic management of the development of the project education segment.

The franchising method, well-known in economics, can be used to develop a project-based form of higher education. In addition, a strategic management system for this process can be created to accelerate the development of the higher project education segment.

To determine the factors based on which it is proposed to evaluate the work of universities with project-based learning, an analysis of publications in the Russian Science Citation Index on the subject of such higher education was carried out.

As a result of such an analysis of publications:

(i) After analyzing the titles and topics of scientific articles by authors from various Russian universities, it was possible to determine the list of the most significant factors for the quality of higher project education, which were included in the rating structure;

(ii) having established the employers (affiliation) of the authors of the articles, it was possible to establish that at least 38 Russian universities practice the project approach in their activities to one degree or another;

(iii) based on the list of authors of articles, a list of experts can be compiled to conduct an expert rating assessment.

Table 4 shows the composition of measures aimed at forming a specialized rating of universities with a project-based form of education.

Table 4. Measures to compile a rating of universities with a project-based form of education.

No	Activities for the ranking of universities with project-based education
1	Collecting information about Russian and foreign universities with project-based education
2	Identification and analysis of indicators characterizing the university's project activities (rating factors);
3	Analysis of bibliometric and citations of universities in the field of methodology of university project activities according to Elibrary and GOOGLE Scholar;
4.	Analysis of information on the websites of universities with project training to identify factors characterizing the university's activities in project training;
5	Formation of a complex of factors of university activity included in the rating of a project university;
6	Determination of the weighting coefficients of the factors (indicators) of the project university;
7	Calculation of the national ranking of universities with project-based education;
8	Calculation of the global (international) rating of project universities;
9	Drawing up an action plan for the presentation and introduction into scientific and social circulation of national and global ratings of project universities;

Source: developed by the author.

As already noted, based on the analysis of the topics of publications on the project activities of university teachers, factors have been identified based on which a rating of project universities can be formed. It lists the factors for rating the quality of education in design universities. These are the factors of such content:

(i) assessment of the university's contribution to the development of the methodology of project activities and project management in organizations (indicator, measured in the range from 0 to 10; factor weighting factor of 3);

(ii) assessment of the university's contribution to the development of the methodology of project-based higher education (the indicator is measured in the range from 0 to 10; the weighting factor is 3);

(iii) assessment of the university's contribution to the popularization of project-based higher education, including the organization and holding of scientific conferences, the publication of scientific journals on this topic, and others (the indicator is measured in the range from 0 to 10; the weighting factor is 2);

(iv) the availability and volume of information on the university's website about the use of the project method of teaching in its work (the indicator is measured in the range from 0 to 10; the weighting factor is 1);

(v) the number of organizations (enterprises) that are strategic partners of the university, offering the subject of educational projects with the implementation of results at these enterprises (the number of partners is multiplied by a weighting factor equal to 0.5);

(vi) the share of educational projects carried out in the interests and in contact with customer enterprises (this indicator ranges from 0 to 1 and is multiplied by 10 when forming a rating);

(vii) the ratio of closed-type educational projects at the university (the result is known) and open (with an unknown result in advance) projects (this indicator ranges from 0 to 1 and is multiplied by 10 when forming the rating);

(viii) the presence on the site and the level of detail of the standard methodology for the implementation of educational projects (the indicator is measured in the range from 0 to 10);

(ix) availability and content of professional development programs for scientific and pedagogical workers (NPR)-heads of educational projects (indicator, measured in the range from 0 to 10);

(x) the presence in the organizational structure of the university of the Center for Project Activities (CPA), which provides organizational services for programs of project higher education at the university (the indicator is measured in the range from 0 to 10);

(xi) the existence of a subdivision in the organizational structure of the university (faculty, department, CPA, etc.) engaged in the development of the theory of project activities of organizations and the theory of project education (an indicator measured in the range from 0 to 10);

(xii) the proportion of university students involved in project activities (this characteristic ranges from 0 to 1 and is multiplied by a weighting factor of 10 when forming the rating);

(xiii) the university has a policy or system of motivating students to participate in project activities (this characteristic is estimated in the range of numerical values from 0 to 10);

(xiv) the presence of a university policy or motivation system for scientific and pedagogical workers (SPW) to participate in project activities (this indicator is estimated in the range of numerical values from 0 to 10);

(xv) the number of publications on project activities for the entire period: for the global rating in GOOGLE SCHOLAR, and the Russian one in Elibrary (the number of publications is multiplied by a weighting factor of 0.1) and more.

As a result of the work carried out, a questionnaire was proposed to assess the quality of higher education in project universities, and a hypothetical rating of 38 project universities in Russia was compiled. A student educational project based on the calculation of the national rating of project universities was successfully defended at the Center for Design Activities of the Moscow Polytechnic University.

It was not possible to create an international rating of project universities due to the lack of communication with foreign universities implementing the design model of higher education.

The following are the recommendations of the project group on improving the position of the Polytechnic University in the international rankings of design universities.

In general, the materials of this part of the work show that to improve the quality of higher project education, the following can be useful: the development of analytical pedagogy; the creation and use of models (in particular, a four-level model) to assess the quality of higher project education; the formation of a rating of project universities and more. For the development of the project-based higher education segment, the well-known franchise mechanism and others can be used.

The study of the risks of introducing higher project education can also be attributed to the tasks of analytical pedagogy. Since the development of project-based higher education in the period of the 18th-century technological order, in turn, is a project, the risks of implementing such a project need to be investigated (Glushcenko, 2021a, Glushcenko, 2021b). Risk management is understood as purposeful exposure to risk in the interests of reducing the likelihood of risk realization and/or reducing damage when such risk is realized. Risk management methods are: risk limitation; risk avoidance, risk insurance, risk absorption, etc.

Risk classification can be useful in managing the risk of developing a project form of higher education.

Risk classification is commonly referred to as the division of risks into specific groups according to certain criteria in order to achieve the set goals of studying these risks. When classifying risks by possible winnings, it is customary to distinguish: speculative risks are risks

that imply the possibility of a positive result; net risks are risks, as a result of which there may be only negative deviations.

According to the reasons for the occurrence and the number of objects at risk, fundamental and specific risks are identified. Fundamental risks are those risks whose causes are beyond the control of any one person or group of people. Fundamental risks have an all-encompassing effect, i.e. they affect all subjects of educational and financial and economic activity simultaneously. These risks are attributed to force majeure. Fundamental risks during the formation of a new technological order include risks associated with the uncertainty of scientific and technological progress. Such uncertainty of scientific and technological progress, in particular.

The higher education system cannot eliminate fundamental risk, but universities can reduce the level of fundamental risk by adapting their activities to changing external conditions. Therefore, the university's risk management belongs to the field of strategic management of the organization's activities.

Specific risks are associated with a specific university subject of educational financial and economic activities, both for reasons and for the coming damage.

Specific risks are recognized as insurance risks (i.e., suitable for insurance), while fundamental risks are not recognized as such. A particular variant of the manifestation of fundamental risk may be a systematic risk, which is described as the risk of a "fall" of the market as a whole, etc. In addition, it is customary to highlight the risks associated with a certain state. Such risks are called "country risks". They are determined by the process of development of the national economy, and the actions of government bodies.

In particular, in the development of the project form of higher education, country risks may be associated with the specifics of a certain segment of the national economy, the governing influences of government authorities, etc.

A systematic risk in the university's activities is the risk of a "fall" in the market of educational services of the project type as a whole. This risk is a product of fundamental risk. This risk is not associated with specific universities. Such a risk cannot be diversified or reduced by the university's actions in the market. The sources of this risk are outside the specific market: geopolitical processes, the abrupt nature of scientific and technological progress, unfavorable tax policy of the state, etc.

The unsystematic risk of a university is a concept reflecting the aggregation (systemic unification) of all types of risks associated with a specific risk object (university). Such risks can be diversified (distributed) and (or) reduced by the actions of the university management in a particular educational services market (subject education, project education, SMART education, etc.).

According to the specifics of the university's risk sources, risks can be distinguished: objective and subjective; individual and universal; specific, environmental, transport, political, technical, etc. Subjective risks of the university can be called, which can be realized if objective factors of the development of the educational services market are ignored. Objective risks are those whose sources do not depend on the will and consciousness of the university subject). Individual risk is determined by the specifics of the object and (or) the source of risk. Universal risk is inherent in the bulk of certain typical facilities, for example, all universities at the same time. For example, this may be a universal risk of loss of sustainability of the university's development in the process of its transition to a new technological order.

The risks associated with the creation and practical use of educational programs within the framework of project education, according to their place of origin, can be divided into internal and external. The category of external risks of creating client-oriented curricula in higher

project education includes uncertainty of long-term trends in global scientific and technological progress; uncertainty of the development policy of a particular branch of the economy or education; uncertainty of the development strategy of the basic enterprises of the university, and even more.

The internal risks of creating and implementing educational programs include the following: insufficiently expressed nature of motives and/or incentives for creating and implementing individual educational programs; misunderstanding of the importance of client-oriented educational programs in the process of improving the quality of higher education in a new technological order; the need to organize advanced training of scientific and pedagogical staff of project universities; organizational culture of the project university and others.

The analysis shows that in 2024, the main sources of risks for the development of the project form of higher education may be: a relatively small proportion of university teachers with practical skills in implementing educational projects in the economy and society; a relatively low proportion of teachers with experience in project activities in the real sector of the economy; an insufficient number of teachers with a full range of competencies for high-quality project management; low activity and interest of real business in the implementation of joint projects with the participation of students; low level of generalization of knowledge about the project model of organizations in the economy and the project form of higher education, and much more.

As already noted, the analysis shows that to effectively manage an educational project, a teacher needs knowledge in at least eight fields of knowledge: law, finance, investment, technical sciences, marketing, management, personnel management; entrepreneurship.

The risks of reducing the sustainability of the development processes of the real sector of the economy and society, determined by the higher education system, may manifest themselves in the following: insufficient diversity of the workforce for the dynamic development of the economy and society; a decrease in the quality of higher education, which leads to a decrease in the competitiveness of the relevant segment of the national economy and society; a relatively small proportion of university graduates who find work in their specialty is due to the discrepancy between the demand of the economy and the structure of graduate specialties in the higher education system; a decrease in the level of accessibility of higher education for a significant part of the population in terms of financial indicators, and more.

From the point of view of the management system for the development of higher project education, risks are divided into two categories: the risk of cognition and the risk of action. At the same time, the risk of cognition is determined by uncertainty or an erroneous understanding of the essence of the project form of learning.

The risk of actions is associated with the possibility of erroneous actions in managing the development processes of project education.

Further development of the pedagogy of higher project education is designed to reduce the risks of studying this form of education.

In particular, further research and the formation of a paradigm for differentiating curricula in this type of education can help reduce risks in the field of higher project education (Glushcenko, 2023b). The development of the methodology of emotional intelligence in project education and others can also contribute to reducing risks.

In addition to the above-mentioned risks associated with the development of higher project education, the risk of falsification of higher project education can also be highlighted. This risk lies in the possibility of presenting real pedagogical practices under the guise of

"project education", which do not fully correspond to the essence and content of this type of education. Sources of risk of falsification of higher project education may be lack of scientific pedagogy of higher project education; insufficient understanding of the essence of the project model by organizations of the real sector of the economy; insufficient competence of teachers-curators of educational projects, etc.

Further development of the theory of technological structures can reduce the risk of studying the image of the future of this technological structure. At the same time, knowledge about the image of the future new technological order can be useful in forming strategic plans for the transition of universities to functioning in the conditions of the new 18th-century technological order (Glushcenko, 2021d). The development of a strategic plan for the university's transition to work in a new technological environment can help avoid fundamental risks and reduce the specific risks of the university in the process of transforming the educational services market.

In general, the materials of this part of the work indicate the need for risk management in the development of project education within the framework of analytical pedagogy. At the same time, the very development of project education at the university can be considered an element of the strategy and mechanism for adapting this university to activities in the conditions of the 18th-century technological order.

The relevance of the work is due to the formation of a new 18th-century technological order and the development of the practice of higher project education. The practical development of the project form of higher education leads to the spontaneous formation of philosophy, pedagogy, organizational culture, and psychology of this kind of education. The lack of fundamental theoretical developments in the field of methodology, pedagogy, and didactics of project-based higher education can lead to a slowdown in the spread of this form of higher education: a decrease in the quality of such higher education; creating a risk of falsification of higher project education and others. The problem of this work is the development of scientific pedagogy and didactics of higher project education.

To develop pedagogy and didactics of higher project education, the work investigated the factors of the development of higher project education during the 18th-century technological age. This made it possible to determine the trends in the development of the external environment of the higher education system in the context of the fourth industrial revolution, associated with the formation of the 18th-century technological order. On this basis, a mechanism for adapting the higher education system to working conditions in a new technological order was proposed and described. It was further shown that in the context of the restructuring of the international system of division and specialization of labor, the processes of intensification of the emergence of new professions (about 500 professions annually), a mechanism for differentiating forms of education (subject form, project form, SMART education, etc.), as well as curricula in higher education, can be used to ensure the quality of higher education.

The work revealed the essence and content of the elements of the mechanism of curriculum differentiation in higher education pedagogy. The structural elements of the curriculum have been described. The explicit and hidden parts of the curriculum are highlighted in the structure. The elements of a hidden curriculum can be: organizational culture; student motivation system; university student ecosystem and more.

In this work, it was proved that the transition to the project model of the activities of real economy organizations creates a request for the training of students within the framework of the project method in higher education. For the further development of higher education,

this work proposes a factor model of pedagogy; a factor model of didactics of this type of educational activity.

The work proves that the creation of a pedagogical and psychological mechanism for higher project education at the university can improve the quality of higher project education. The paper describes the structure of such a pedagogical and psychological mechanism. At the same time, the possibilities of developing the emotional intelligence of teachers and students in the process of project education are discussed. The paper substantiates that organizational culture can play a significant role in improving the quality of higher project education. This organizational culture is structurally related to the hidden curriculum. Another element of the hidden curriculum is the project motivation of students, and the meaning of the project can be considered an important factor in the project motivation of students.

Due to the almost exhaustion of extensive factors for improving the quality of higher education, the university's student ecosystem can play an important role in improving the quality of higher education. The work develops the philosophy and methodology of the development of the university's student ecosystem as one of the directions for improving the quality of higher project education.

The paper hypothesizes that due to the complexity of pedagogical systems, analytical pedagogy needs to be developed to correctly assess the quality of higher education. The functions and roles, and the laws of analytical pedagogy were described. The paper substantiates that the central tasks of analytical pedagogy are: the assessment of the influence of elements of the educational process on the quality of higher education and; the assessment of the quality of higher project education.

When studying the prospects for the development of higher project education, an important role should be assigned to the study of the risks of introducing a project form of differentiated higher education. The paper describes the risks associated with the introduction of higher project education in universities and discusses methods of managing such risks. It was noted that the development of scientific pedagogy of higher project education is able to reduce the risks in managing the process of such development.

The following promising areas of development of the subject of this work can be named: the study of transformation trends and models of a new technological order; the development of the pedagogical and psychological mechanism of higher project education; the development of emotional intelligence to improve the quality of higher project education, and more.

5. CONCLUSION

In conclusion, this study emphasizes the critical need for a foundational pedagogy for higher project-based education as society enters the 18th-century technological order. The rapid transformation driven by technological and economic shifts demands adaptive educational methods to support emerging professions and foster relevant skills. By examining the mechanisms of curriculum differentiation, organizational culture, and the integration of emotional intelligence, this study outlines a comprehensive framework for enhancing educational quality. Additionally, it highlights the importance of analytical pedagogy to assess and maintain standards in project-based education, while addressing potential risks associated with its widespread adoption. Establishing a robust theoretical and practical foundation for higher project-based education can ensure its sustainable development and improve educational outcomes in alignment with the demands of the modern workforce.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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