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INTERDISCIPLINARY APPROACH IN THE FORMATION OF "THIRD GENERATION" INNOVATIVE AND ENTREPRENEURSHIP UNIVERSITIES

РОЛЬ МІЖДИСЦИПЛІНАРНОГО ПІДХОДУ У ФОРМУВАННІ ІННОВАЦІЙНО-ПІДПРИЄМНИЦЬКИХ УНІВЕРСИТЕТІВ «ТРЕТЬОГО ПОКОЛІННЯ»

РОЛЬ МЕЖДИСЦИПЛИНАРНОГО ПОДХОДА В ФОРМИРОВАНИИ ИННОВАЦИОННО-ПРЕДПРИНИМАТЕЛЬСКИХ УНИВЕРСИТЕТОВ «ТРЕТЬЕГО ТЫСЯЧЕЛЕТИЯ»

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Abstract. *The article considers the problems of introduction and use of interdisciplinary approach in the formation of innovative and entrepreneurial universities of the third generation. Interdisciplinary connections, which provide an interdisciplinary approach in the field of education, scientific base, as well as the system of education as a complex of fundamental and taxonomic disciplines are studied in the article. The use of an interdisciplinary approach in the training of future professionals is seen as part of the process of forming their professional competence through the implementation of links with the disciplines of humanities, socio-economic and scientific training. In a competency-based approach, interdisciplinary connections allow knowledge, skills and abilities to be transferred from one area of science and professional activity to another. The interdisciplinary approach is aimed at the connection of disciplines, when the contradictions in the mastery of ideas, methods and techniques of research between sciences are smoothed out and there is a complex use in professional activity of theory and practice obtained on the basis of studied disciplines. Both significant advantages and problems that arise when using an interdisciplinary approach are considered. It is proved that the demand for specialists with universal skills and abilities, formed under the influence of the study and interconnection of disciplines of different fields, is relevant. The necessity of strengthening the role of the interdisciplinary approach in the formation of "third generation" universities as innovative forms of entrepreneurial activity is substantiated.*

Key words: *interdisciplinary approach, competence, integration, innovation, information technology revolution, entrepreneurship.*

Анотація. *У статті розглядаються проблеми впровадження та використання міждисциплінарного підходу уформуванні інноваційно-підприємницьких університетів третього тисячоліття. Досліджуються міждисциплінарні зв'язки, які забезпечують міждисциплінарний підхід у сфері освіти, наукова база, а також система навчання як комплекс фундаментальних і таксономічних дисциплін. Використання міждисциплінарного підходу у професійній підготовці майбутніх спеціалістів розглядається як частина процесу формування їх професійної компетентності шляхом реалізації зв'язків із дисциплінами гуманітарної, соціально-економічної та природно-наукової підготовки. При компетентносному підході міждисциплінарні зв'язки дозволяють переносити знання, вміння та навички із одної сфери науки і професійної діяльності до інших. Міждисциплінарний підхід спрямований на зв'язок дисциплін, коли згладжуються протиріччя в опануванні ідей, методів і прийомів дослідження між науками та відбувається комплексне використання у професійній діяльності теорії і практики, отриманих на основі вивчених дисциплін. Розглянуті як суттєві переваги, так і проблеми, що виникають при використанні міждисциплінарного підходу. Доведено, що актуальним є попит на фахівців, що володіють універсальними вміннями та навичками,сформованими під впливом вивчення і взаємозв'язку дисциплін різних галузей. Обґрунтована необхідність посилення ролі міждисциплінарного підходу в формуванні університетів «третього покоління» як інноваційних форм підприємницької діяльності.*

Ключові слова: *міждисциплінарний підхід, компетенція, інтеграція, інноватівність, інформаційно-технологічна революція, підприємництво.*

Аннотация: *В статье рассматриваются проблемы внедрения и использования междисциплинарного подхода в формировании инновационно-предпринимательстких университетов третьего тысячелетия. Исследуются междисциплинарные связи, обеспечивающие междисциплинарный подход к образованию, научная база, а также система обучения как комплекс фундаментальных и таксономических дисциплин. Использование междисциплинарного подхода в профессиональной подготовке будущих специалистов рассматривается как часть процесса формирования их профессиональной компетентности путем реализации связей с дисциплинами гуманитарной, социально-экономической и естественнонаучной подготовки. При компетентностном*

подходемеждисциплинарные связи позволяют переносить знания, умения и навыки из одной сферы науки и профессиональной деятельности в другие. Междисциплинарный подход направлен на связь дисциплин, когда сглаживаются противоречия в усвоении знаний, идей, методов и приемов исследования между науками, и происходит комплексное применение в профессиональной деятельности теории и практики, полученных на основе изучения дисциплин. Отмечены, как существенные преимущества, так и проблемы, возникающие при использовании междисциплинарного подхода. Доказано, что актуальным остается существующий спрос на специалистов с универсальными умениями и навыками, сформированными под. влиянием изучения и взаимосвязи дисциплин разных отраслей. Обоснована необходимость усиления роли муждисциплинарного подхода в формировании университетов «третьего поколения» как инновационных форм предпринимательской деятельности.

Ключевые слова: *междисциплинарный подход, компетенция, интеграция, инновационность, информационно-технологическая революция, предпринимательство.*

Introduction. Since the beginning of the XXI century there is a tendency of synthesis of knowledge within related disciplines in the science. It is based on the paradigm of integrity and interdisciplinary approach to research, organization of science and education with the use of innovative problem-design methods. Interdisciplinary has become a term, on the one hand, which contains the "integrative character of the modern stage of scientific knowledge", which testifies to the lack of a disciplinary, that is "branch" principle of knowledge. On the other hand, it involves the professional mobility of the educational process (prompt response to constant changes in professional, scientific, theoretical and practical activities), as well as a symbiosis of meaningful aspects of learning, skills, competences.

Under the influence of globalization and the information technology revolution, not only quantitative but also significant qualitative changes are taking place in the subjects of scientific and educational systems, first in the classical universities of the world community. One of such changes is the formation and dynamic development in developed countries, including the United States, innovative and entrepreneurial universities of the "third generation", characterized by innovation, high flexibility and adaptation to new technological challenges, expanding the scope of research, close interaction with business structures, creation of start-ups and other small innovative enterprises within the university, the presence of an organizational and economic mechanism capable of ensuring the effective use of innovations created in the segment of higher education.

The purpose of the article is to analyse the possibilities and forms of implementing an interdisciplinary approach as a condition for the transformation of classical educational institutions into innovative and entrepreneurial universities of the new generation, which would meet the urgent challenges of the international environment.

Literature review. The problem of interdisciplinary of economic science in its broadest sense was explored by Zadorozhnyi O., Gomonyuk O., Radionova L., Chaplygina G., Chekmaryov V., Lysenko Y., Sudakov V., Filipenko A., Yakovenko L. However, in the works of these authors, interdisciplinary is highlighted mainly through the elucidation of the evolution of the method of economic science, as well as through the study of individual cases of interdisciplinary in the economy, leaving out the weighing systematic study of its application in educational and professional activities.The analysis of the scientific literature conducted within the research showed the fragmentary approach to the application of the principle of interdisciplinarity as an innovative mechanism of educational and professional activity. Educational institutions are currently both bases for professional training and business entities in the field of educational services. An interdisciplinary approach plays an extremely important role in both dimensions. On the one hand, the interdisciplinary approach is an innovative tool for training universal in the skills and competencies, which fully meets the urgent requirements of the labor market and the conditions of

business structures as the main employers and consumers of skills and competencies of university graduates. On the other hand, universities must be not only drivers of progress, but also participants in it. The principle of interdisciplinarity allows to form "third generation" universities as active participants in innovation and entrepreneurship, initiators and producers of quality change, and, at the same time, effective business structures.

Main results of the research. The globalization challenges facing modern post-industrial society objectively turn education and science into a decisive factor in the further innovative development of countries, strengthening their competitive position in the global environment, ensuring high living standards. As practice shows, the creative modernization of the university's existing potential and the identification of new opportunities in the arsenal of traditional approaches, methods and forms of learning are carried out with a considerable number of errors (organizational, meaningful and methodical). This is due to the increasing intensity of reform of the education system, which does not allow observing the principle of reversibility - the possibility of returning to the old, time-tested positions. The above agrees with one of the ideas expressed by B. Readings (Ридингс: 2009), who insisted that “the university is not only a place for discipline and a reproduction of the system of professional competencies, but also a place where these boundaries are constantly demonstrated”. Interdisciplinary of modern scientific knowledge and education is formed within the synthesis of four spheres: natural science knowledge (knowledge about the nature of the world and the nature of human habitat), techno-science (knowledge about the artificial world and artificial environment of human habitation), social science (knowledge about society) and humanitarian knowledge (knowledge about the person). Since interdisciplinary in education is a hierarchical concept, its character differs both in the degree of complexity of the structural characteristics of higher education, in the educational spheres, in the areas of training or specialties, and in the degree of interaction within individual educational structures (Oxford Handbook: 2017).

Modern megatrends for the development of digital technologies, including the cognitive information-analytical and geoinformation systems as a "soft power 2.0" in the conditions of Industry 4.0, in a new way define the innovation-technological cycles, directions and dynamics of the situation-crisis global economy and international e-commerce, genesis of educational ecosystems. That is why today many scientists (Гэлбрейт: 2013; Полтерович: 2013; Родіонова: 2014; Vakhshtayn&Erofeeva: 2015) consider the problem of the limitation of theoretical instruments of economic science as a "crisis of constraints", which is caused by the lack of balance between the real cost of economic growth in the conditions of solidarity and the adequate redistribution of wealth within today's global ecosystem. The four principles of evolution: nonlinearity, instability, openness and dynamic hierarchy characterize the phases of transformation, system renewal (following it the path of death of the old order), chaos, testing, alternatives and the birth of a new understanding of educational technology and knowledge assessment. Today, the scientific base and the training system are represented by a complex, interdependent set of disciplines, among which it is customary to single out (Future Agendas: 2017).

- fundamental sciences (the sphere of knowledge that is determined by theoretical and experimental scientific studies of the basic phenomena and the search for patterns). In the disciplinary complex of economic sciences, economic theory, economic statistics and accounting can be considered as fundamental.
- taxonomic sciences (disciplines of a specific subject organization, which are used in the study of certain groups of objects of the basic science program). Macro- and microeconomics, econometrics can be attributed to the taxonomic sciences

In the current context, many studies in the field of interdisciplinary (Krasnov: 2018; Осмоловская& Краснова: 2018; Мальцева, etc.: 2018) show that each educational discipline has its own object and tools of study, while in many of them they are the same and interdependent and, therefore, an interdisciplinary approach takes into account the accumulation of an information and historical knowledge base. It is impossible to cover it comprehensively, so identifying the key elements of the overlapping disciplines allows students to absorb and apply the knowledge base,

minimizing its meaningful interpretation. Thus, interdisciplinary involves two generally accepted approaches.

The first approach determines the relationship of two or more disciplines with related terminology, research system, objects of these studies, etc., and this set helps to thoroughly study the problem of research, creates a wide field for scientific projects. In this case, the system of knowledge for the preparation of future specialists takes a modern look and helps to solve scientific problems.

The second approach allows to expand the field of knowledge that cannot be fully explored by already existing scientific disciplines because they are on the verge of their intersection. It contributes to the deepening of knowledge, provided that the subject of study, is too complex and the formulated scientific problem is large-scale for one discipline.

An interdisciplinary approach has both advantages and problems arising from overuse. Thus, interdisciplinary research is successful only in the case of a well-defined goal, a thoughtful idea and a hypothesis of the solution, and otherwise it is doomed to the absence of clear boundaries of objective reality. In interdisciplinary relationships (coherence of curricula, topics, sections, general terms used, determined by didactic goals and content), the borrowing of ideas and skills from one discipline to another (an example is a specialist in additional education).

Intensification of scientific, technical and innovative activities in the field of education is aimed not so much at ensuring the leadership of new innovative and entrepreneurial universities of the "third generation" in the humanities, socio-economic, natural and technical sciences, but at their transformation into "producers" of new knowledge, active participants of their distribution and use through innovative activities. The principal features of the modern new university of the "third generation" are:

- interdisciplinarity of research and development;
- close cooperation with the real sector of the economy;
- development of small innovative entrepreneurship within the university;
- formation of innovative productions and organization of management of innovative structures;
- internationalization of scientific activity and formation of international research teams, internships in foreign research centers, publication of research results in leading foreign publications.

Third-generation universities solve the problem of generating new knowledge and forming an innovative intellectual environment, forecasting further scientific and technological development and attracting young professionals to research.

Solving these problems is part of the development strategy of new universities and aims to organize education through science in order to improve the quality of training, scientific and scientific-pedagogical staff, intensification of applied activities of university units in solving socio-economic problems of individual regions, national, sectoral and regional scientific and technical target programs.

Today, the practice of leading Western universities shows that the formation of innovative "integrative economy" determines their high importance in the process of generating business when they become the most important source of new scientific knowledge - both technical and entrepreneurial. In Ukraine, the need to develop innovative entrepreneurship in higher education is becoming particularly apparent. Nowhere does technical discovery play such an important role in the creation of a new venture enterprise as in the "third generation" universities, which are the modern fertile ground for scientific achievements and technological innovations.

Areas of research and innovation of new "third generation" universities (based on the already established base of "second generation" universities) are formed on the following performance indicators:

- high priority of research development and introduction of new educational technologies; a flexible system of combining basic and applied research with competitive commercial developments;

• created infrastructure for training and retraining in the field of innovation and scientific and technical entrepreneurship, subject to participation in research work of all subjects of the educational process: students, graduate students, doctoral students, faculty and scientists;

• the created material and technical base for the development of small innovative enterprises is effective and the system of attracting additional funds through targeted innovation programs and grant competitions, research funds, etc.; system of participation of university scientists in international scientific and educational programs, creation of conditions for attraction of foreign investments.

The "second academic revolution" of the XXI century, according to the authors of the model "triple helix" (Triple Helix) L.Leydesdorff and H.Etzkowitz (Itzkowitz&Leydesdorff: 1998) involves the third mission of universities (in addition to education and research) - to be an active player in sustainable economic development scientific and technological knowledge and, as a consequence, innovation. That is, the university becomes a leader in relations with business and the state, built in a "innovation ecosystem" to obtain new knowledge, technologies, innovations through the creation of small innovative enterprises at universities (a key indicator of university performance) based on a set of infrastructure elements (investors, venture funds, service companies, technology parks, technology transfer centers, startups). The leading feature of such an association is its main characteristic - self-organization as a symbiosis of material resources (funds, equipment, equipment, etc.) and human capital (students, teachers, staff, industrial researchers, etc.) of business communities that are part of the structures involved in the "innovation ecosystem".

The latter has three components: university research, driven by market needs; teachers who constantly participate in innovative activities and cooperate with industrial enterprises at all stages; translational research that improves technology transfer from universities to industry (as a result of rapid and efficient innovation). An integrative feature of these components is the entrepreneurial culture, built on the management system within the model Science to Business (S2B) - from science to business, which ensures the achievement of a synergistic effect. At the same time, the role of the student (or student business team, SBK) as an innovative intermediary, which acts as a catalyst and integrator of economic, scientific, cultural, social and strategic capital in two models - S2B and B2B. Creation and participation of students (or SBK) in small innovative enterprises at universities is determined by both environmental factors (institutional conditions of small innovative entrepreneurship in the country, regardless of models and trajectories of their creation) and internal university factors (business incubation system, which is evaluated through university policy, development of science and technology, entrepreneurship education, infrastructure and entrepreneurial culture). Initiation of entrepreneurial activity - creation of innovative micro-enterprise (IMP) determines the model and trajectory of its creation: 1) at the student level - his entrepreneurial culture and mentality, the presence of entrepreneurial competencies and business ideas that determine commercial potential, psychological characteristics and personality type; 2) at the level of SBK - the internal potential of SBK, as a cumulative characteristic of the internal factors of the first level, ensuring the ability of the team to create their business (Lendner: 2007; Prodan: 2007).

Nowadays, the most acceptable assessment of the entrepreneurial "innovation ecosystem" of the university is the method of expert assessments based on two components: the incubation system and entrepreneurial culture. The level of development of the incubation system at the university is defined as a set of weighted average assessment of a set of indicators of the following factors:

• university policy (number of created IMPs; support of employees' entrepreneurial initiatives by the administration);

• training and consulting (implementation of interdisciplinary semester special courses in entrepreneurship);

• science and technology (level of R&D funding; dynamics of the number of patents set up for commercialization);

• infrastructure and information systems (level of development: techno park structures at the university - coworking centers, business incubators, technology parks; information systems centers and technology transfer; availability of a single information space for all infrastructure facilities);

• business networks (cooperation with business angels and venture funds; links with research organizations and patent holders outside the university).

The minimum value of the level of development of the incubation system at the university can be equal to -10 (provided that at the university each of the factors has a strong negative impact on the development of UTI), and the maximum positive value of this indicator can be +10 (otherwise).

To assess the level of development of entrepreneurial culture at the university it is necessary to monitor the attitude of students to entrepreneurship, which is determined by the following indicators:

• the level of values (the share of students for whom the values of entrepreneurship are related to intangible benefits (self-realization, independence and prestige), is calculated as the ratio between the number of students who associate the creation of "their business" with spiritual values and the total number of respondents students;

• the level of entrepreneurial-oriented students (student's positive attitude), ie the share of students who have a positive attitude to entrepreneurship is calculated as the ratio between the number of students who have a positive attitude to entrepreneurship and the total number of surveyed students;

• level of entrepreneurial energy (student's energy), the share of students actively participating in entrepreneurial projects and competitions is calculated as the ratio between the number of students participating in at least three entrepreneurial projects / competitions in the last year and the total number of surveyed students;

• the level of entrepreneurial maturity (student's ripeness), the share of students prepared to start their own business during the year is calculated as the ratio between the number of students prepared to start their own business while studying at university and the total number of surveyed students;

• the level of entrepreneurial activity (student's entrepreneurship activity), the share of students who have their own business is calculated as the ratio between the number of students who have their own business and the total number of surveyed students.

The maximum value of each of these indicators is one, because the number of students that characterizes anindicator may not exceed the total number of students in the sample. At the same time, the maximum value of assessing the level of development of entrepreneurial culture can be equal to 5, because one student can be simultaneously considered in different indicators.

Thus, the degree of formation of the entrepreneurial "innovation ecosystem" of the university is as follows:$-50 \leq Eco = Culture \leq 50$.

These assessments and calculations are an important tool for identifying the level of entrepreneurial activity of students and increasing the number of created IMP, strengths and weaknesses of the university to generate business, allow to develop mechanisms for developing entrepreneurial "innovation ecosystem" and create a "belt" of IMP around higher education.

The implementation of the concept of the new "third generation" university requires systemic changes in the activities of universities, which relate to both the organization of research and the content and methods of the educational process. At the same time, on the one hand, research and development become a real part of the activities of all teachers and most students, unifies the compatibility of the fundamentals of education by focusing academic knowledge on the deep development of general academic knowledge with their applied orientation by teaching ways to create, improvement and restoration of technologies. The principles of targeted support of the most productive scientists and stimulation of specific research results both within the target projects and within the remuneration of the teaching staff are changing.

On the other hand, changes in the direction of research organization and management system require the development of adequate "blocks of responsibility" for research, protection of intellectual property and the formation and improvement of innovation infrastructure.

Indicators of the development of research and innovation in the new "third generation" universities, which characterize both the development of the research component and the form of educational activity, are:

• increase in the volume of university orders (including small innovative enterprises of universities) for R&D from the real sector of the economy;

• growth in the volume of high-tech products produced by small innovative enterprises of the university;

• increasing the citation index of publications of the teaching staff of the university;

• increase in the number of students undergoing internships at enterprises of the real sector of the economy or in scientific organizations;

• increasing the share of teaching staff in the implementation of commissioned research work and initiative research projects of the university.

The organizational structure of the commercialization of research in "third generation" universities, including American ones, is extremely flexible. As a rule, it has a three-tier structure that has proven its effectiveness in the field of knowledge and technology transfer. For example, the first level of the University of North Carolina is a self-sustaining technology transfer office that manages intellectual property created in the university's laboratories - it prepares documentation, negotiates and monitors the market, and manages licenses, options, and more. agreements in the field of intellectual property. The second level is the Technology Business Incubator, which provides small innovative companies with infrastructure resources, as well as a set of information services in the field of business planning, marketing strategy and opportunities to finance their projects and developments. The third level is the Small Business and Technology Development Center, which has offices throughout the state and works closely with the US Small Business Administration. The latter is funded by the federal and state governments through programs to support business development, assistance in setting up small businesses, technology development and commercialization. The main activities of the Center are business consulting: 1) conducting training seminars and programs, legal advice and assistance in finding finance for researchers who carry out applied development; 2) regular organization of "ideas fair", where leading venture investors are invited; 3) participation in the implementation of federal programs SBIR and STTR; 4) publication of a large number of publications, manuals and guides on the creation of start-up companies, intellectual property and the search for possible ways of financing.

Today, American "third generation" universities are creating whole associations to optimize their innovation. An example is the National Council of Entrepreneurial Tech Transfer (NCET2), an informal association of a number of US universities working to attract entrepreneurs and private investors to the innovation sector by funding new companies at universities. The term "entrepreneurial technology transfer" implies the involvement of entrepreneurs in the creation of new companies at universities, exchange of experience and the formation of a constructive dialogue on the best methods of joint activities in the field of innovation.

To discuss the interaction between science and business, the leaders of new universities, the largest companies, as well as fund managers use the Business Higher Education Forum (BHEF). This is an unusual coalition, which includes corporate members, research organizations and foundations, as well as higher education institutions. The main goal of the Forum is to promote long-term economic growth of the country by removing barriers to the transformation of a scientific idea into its commercial implementation, while one of the professed paradigms - knowledge-based economy, only reinforces the importance of sharing this knowledge. The main task of the Forum is to develop the necessary solutions for the US government to improve public policy in higher education, innovation climate, meeting the needs of business corporations, etc.

The main purpose of the interdisciplinary approach in the universities of the "third generation" is to achieve a single basic integrated competence, which is the ability to identify, analyze, evaluate and solve current, complex, complex problems and tasks, make independent, informed, balanced decisions and generate new, creative ideas. Although universal competencies are common to many disciplines, they ensure the integrity of personal and cognitive development

and self-development, interdisciplinarity, and the continuity of vocational training. To implement behavioral competencies requires the existence of the following skills: 1) self-regulation and self-control, 2) control of their own behavior and emotions, 3) the ability to reflect, 4) self-mobilization to perform tasks, 5) psychological stability. Today in the universities of the "third generation" research and design works are integrative, interdisciplinary in nature and meet the cognitive interests and professional needs of students. At the same time, the use of situational learning methods contributes to the acquisition of practical experience in real situations existing in everyday life and professional activities (including the development of "research position", responsibility for the consequences of the decision, etc.).

To form the systemic knowledge in development of integrated courses shows, it is necessary to use the following interdisciplinary links:

1) educational-interdisciplinary direct links (occur when the learning of one discipline is based on the knowledge of another);

2) research-interdisciplinary links of a problematic nature (occurring in circumstances where two or more disciplines have a common object of study or common problems, but are considered from different disciplinary approaches and in different aspects);

3) mental-mediated communication (arise in conditions where the same components, intellectual skills, necessary for professional activity are formed by means of different disciplines;

4) mediated-applied relations (formed under conditions when the concepts of one science are used in the study of another).

Currently, in the leading innovation and business universities of the "third generation" special attention is paid to the use of interdisciplinary problems of problem and competence-oriented nature (supplemented by tasks and cases of project-practical activity) in the formation of universal competencies. Competences are formed and developed, firstly, not only through mastering the content of educational programs, but, to a large extent, the educational environment of the university, the personal influence of teachers who use author's educational technologies based on interdisciplinary interaction. Secondly, due to the active introduction of corporate modules, workshops and workshops in the curriculum, the development of universal algorithms for combining methods of assessment of professional knowledge, skills and abilities with innovative models of assessment of socio-personal and systemic competencies from the standpoint of interdisciplinary integration.

Indeed, multidisciplinary integration defines a multi-level approach based on the concept that educational and professional activities are adequate grounds for integrative knowledge synthesis, a reliable and effective means of ensuring continuity in the formation of universal competences (Лысак: 2016; Крепс:2019). Methodical developments today are based on the following two-factor principle. On the one hand, it is cognitive skills (generalization, comparison, abstraction, concretization, etc.), integrative forms of learning, active and interactive learning methods and technologies (business games, simulation games and exercises, case-method, project learning technology, discussions and brainstorming) gradually develop into relevant professional competencies. On the other hand, there are no less important and interdisciplinary connections, the implementation of which can be carried out at the level of performing problematic tasks, solving problem situations, project activities of the student. This contributes to the development of him as a person who is freely and consciously orientated in the space of society, capable of self-actualization and self-realization in the conditions of various social relations and interactions.

While project thinking is an innovative, creative type of thinking that is problem-oriented, it defines the implementation of an organized set of activities that are closely related to each other but are branched out in time and space. That is, the student must be able to create, model a multifactor space of interaction of individuals in the course of achieving the desired goals, and have the ability to perceive the project situation and see the prospects for its development in the interaction of various processes that form the "basis" of the project. Mastering the basic paradigm of project activities is based on, first, identification of the project design in accordance with the prognostic trend and environment of interaction; second, the harmonization of different approaches,

methodological strategies, technologies and resources; third, the organizational and management component of the project, grouping and time management. And as the emphasis today is gradually shifting from the product itself to the purpose and design environment, the social and humanitarian trend of development of project thinking and activity is gradually dominating. The student must have fundamentally new competencies - the pragmatic and design aspect of design requires him to have increasing responsibility, the ability to predict the consequences and minimize the risks associated with the project, changes in the approach to the design process in general.

Formative skills for finding and choosing alternative solutions, stimulating innovation, enhancing motivation for knowledge, expanding communication experience and being able to choose the best options for effective interaction in group activities are based on practical information skills. The latter contributes to the clarity in the formulation of goals, objectives, hypotheses and the development of effective algorithms for research. Information and communication technologies provide the opportunity to change the model of the learning process itself: the transition from reproductive learning to the creative model. In the “third generation” universities this transition is focused not on one particular subject but allows you to solve problems from the standpoint of many areas of knowledge. That is, the task at hand is not subdivided into parts that are present in individual courses, but is a single whole and requires an adequate, holistic, multidisciplinary approach to solve it (Deloitte: 2019). The importance of students' orientation to acquiring IT skills across platforms and knowledge of the latest technologies is determined by a wider range of economic professions - in the areas of management, finance, consulting, sales, marketing, etc.

Ten years ago, the traditional criteria for the quality and effectiveness of the introduction of information and communication technologies into the educational process were considered to be: (I) qualified teaching staff; (II) pedagogical skills; (III) developing a course with elements of application of technological means of training. Today, however, these criteria are based on a comparison of the true situation with the educational standard, which should be defined and used as a kind of benchmark. It is necessary to take into account and analyze other equally important indicators such as: time spent on graduate preparation; correspondence of the number of graduates and their level of training to the goals of the educational institution and the needs of the labor market; economic and social efficiency.

Today, especially in American universities of the "third generation" the main problem is to overcome the contradiction between the motivational stimulating aspects of student learning, passive-contemplative and active-transformative learning activities, psychological comfort and discomfort, standard of learning and individual development, subject-sub ' subject and subject-object relations. Understanding that the problem of assessing the effectiveness of ICT implementation is quite complex, multifaceted and has no final solution, they focused on two principles of creating an interactive information and educational environment (IEE) for the department of "international business". These are integrity (set of basic knowledge and interdisciplinary connections) and multicomponent adaptability (flexible knowledge control systems, databases and reference systems). According to the above, the implementation of the model is based on the fundamental educational process at all levels, which accelerates the implementation of the concepts of "advanced education" based on the use of innovative methods. We are talking, first of all, about social informatics - an interdisciplinary approach that shapes the social contexts of ICT creation and application, which have a rapidly growing potential and demand, while providing ample opportunities for new forms of work and employment in both business and society as a whole. Indeed, the modern digital environment will accelerate the introduction of new teaching methods into the educational process - proactive interaction, group work, "launch" of their own projects.

As for Ukraine, according to the coefficient of development of innovation, most universities belong to the "second generation". Today in Ukraine, when nanoscale industries (nano energy, molecular, cellular and nuclear technology, biomimetics, nano bionics) are transformed into the sphere of application of "critical technologies" of the sixth technological mode, many teachers of

economic specialties simply do not have time to adapt not only to such "strange" terminology, but and to the essence of the changes taking place. It should be noted that the Ukrainian higher school does not yet provide training at the system level at the intersection of technical sciences and the international sphere (the so-called "distributed interdisciplinarity"). Medicine, economics, sociology, law, intellectual property protection and others are not yet ready to interact and participate in solving current problems that are not typical of the past. "Distributed interdisciplinarity" is neither a technological nor a conceptual problem - it is a problem of values, choice and reasonable will. It should not be put on stream, making it a mass product, because at best it will lead to a "stream of profanity", at worst - to the erosion of basic principles and values that have developed in the education system within a disciplinary approach.

Conclusions. Today, the interdisciplinarity of education not only contributes to the content of the invariant part of the educational process, but also helps to develop students' rapid and adequate response to new technologies, new challenges of world markets in unbalanced conditions of uncertainty, maintaining a balance of variability and stability. However, an important problem of epistemology remains the development of both criteria for the examination of interdisciplinary approaches in education, which allow to evaluate innovative works, and methods to prevent dilettantism and unprofessionalism in education. The development of new technologies and the use of educational, scientific, technical and innovative potential of "third generation" universities is based on the development of such priority areas as nanotechnology and materials science, biomedicine and human health, information systems and technologies, ecology and environmental management. Indeed, cooperation with business structures is now an urgent need for higher education institutions, however, this process must be approached with the utmost caution, taking into account all possible negative consequences. The main principle of the partnership should be "development while maintaining": the desire to borrow from each of the parties to the interaction of the most beneficial features, while maintaining the fundamentals of their own activities. Only through comprehensive and mutually beneficial cooperation of higher education institutions, business structures, public authorities, public organizations is it possible to transition higher university education of the era of "developed dogmatism" to the innovative level of "third generation" of university education.

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