

## THE FORMATION OF PROFESSIONAL COMPETENCIES OF A HIGHER EDUCATION INSTITUTION GRADUATE IN THE CONDITIONS OF THE UNIVERSITY 3.0 PARADIGM FORMATION

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**Abstract:** The quality of education in the aspect of developing the professional competencies of university graduates today is an extremely complex concept associated with many aspects of social life, and moreover, it does not have a generally accepted assessment system. However, the main parameter of quality is the correspondence of the paradigm and strategies of teaching to the entrepreneurial type of university - University 3.0. The article shows that the widespread rapid development of this type of university in the world has marked a transition to a proactive model of generating technologies, talents, markets and market services, within which universities are turning into city-forming centers of economic clusters. Accordingly, both the approach to the formation of professional competence of graduates and the very concept of this competence are changing. In accordance with model 3.0, the training of innovator specialists is directly related to the development of entrepreneurial competencies, metacognitive skills, self-education skills, and the ability to produce own knowledge and scientific product.

**Keywords:** university models; University 3.0; entrepreneurial university; metacognitive skills; smart education.

### 1 Introduction

The current stage of world development is characterized by active entry into the era of the fourth industrial revolution, which leads to dynamic, large-scale, and multifaceted changes in the field of higher education. Representing one of the fairly stable system-forming social institutions of society, global higher education is forced to quickly and adequately respond to new challenges and acquire new forms in a timely manner. The field of higher education is currently undergoing fundamental changes in terms of its role in the economy and society, principles and methods of work, organization and management. The world's leading universities are in search of new models, actively rethinking their missions, trying to go beyond traditional functions and institutional forms, developing and introducing new technologies. Due to the fact that these changes concern the entire complex of basic functions of modern universities in different countries, one can talk about a global transformation of university models, the model of higher education, and the content of the graduate's "profile".

Modern vocational education, which has now moved to a qualitatively new level due to the introduction of a competency-based approach, is aimed at giving students the tools of both understanding and action, allowing them to perceive new socio-economic realities, as well as navigate changing learning conditions and work. In pedagogical theory and practice, experience has been accumulated in the integration of knowledge, which was sufficient in the implementation of the "knowledge paradigm". Integration of knowledge was a condition for the effectiveness of this paradigm. With the orientation of education towards the formation of competencies, the idea of their integration seems objective, promoting the growth of systematicity and seeming to be a condition for the effectiveness of the competency-based approach to specialist training.

In addition, at the end of the 20th century, a time of instability began for universities in their classical sense. Higher education institutions were forced to carry out transformations under the influence of external factors in order to maintain the quality of education. In a classical university, the educational process was aimed at obtaining knowledge focused on the beauty and logic of scientific theory, while the basis of the new educational model began to be information that made it possible to navigate the rapidly changing flow of knowledge, adapt and find opportunities for self-realization in a state of constant change.

At the beginning of the 21st century, classical universities practically cease to exist. In this regard, there is a need to develop multi-profile universities to successfully adapt to rapidly changing realities and the market for educational services, as well as the emergence of a need for mass training of highly qualified specialists in various fields of activity [2].

The university of the 21st century can be classified as a third generation university. The emergence of higher education 3.0 is one of the main social changes of the modern era. Along with University 1.0, which has the function of teaching, and University 2.0, which combines teaching and research, University 3.0 additionally takes on the mission of social and economic development. The success of its implementation predetermines the development of a knowledge society, that is, a society where the following phenomena come to the fore: awareness of the role of knowledge as success in any field of activity; the presence in society of a constant need for new knowledge necessary to solve new problems, create innovative products and services; efficient functioning of knowledge production and transfer systems; effective interaction between society, educational organizations, and enterprises. One of the most important components of this academic mission is the commercialization of knowledge. It includes innovative and entrepreneurial activities, including the transformation of scientific results into a commercial product, bringing it to the market, creating new businesses, commercial management of intellectual property, and the use of university intellectual resources in the regional economy [10]. Being a complex self-organized system, a modern university combines fundamental education and the research process, and also strengthens the practice-oriented orientation of the university and transforms traditional structures into entrepreneurial ones.

Of the top fifty universities in the Times Higher Education ranking, 46 declared the mission of entrepreneurship as a "top priority." And of the 20 best universities included in the ranking of BRICS countries, all 20 declared entrepreneurial ecosystems as key parameters of their development [7]. Such popularity of the university model is explained by the fact that it allows them to effectively respond, integrate and, most importantly, manage the processes of accelerated technological development, which are radically changing all global economic and social landscapes. And although there are no clear established criteria and parameters for this model (it is quite flexible, since "University 3.0" is gradually transformed into the next version "University 4.0"), one fact has become generally accepted: entrepreneurial universities that actively create startups are developing much faster than those universities where innovative projects are lacking [23].

The concept of "University 3.0" involves the creation of an integrated entrepreneurial ecosystem based on universities, in which they become key providers of innovation. This means a transition to a proactive model of generating technologies, talent, markets and market services, within which universities are turning into city-forming centers of economic clusters. In fact, they begin to act as economic agents, large companies that know how to manage the results of intellectual activity and well understand the principles of the functioning of new markets.

Accordingly, both the approach to the formation of professional competence of graduates and the very concept of this competence are changing. In particular, Universities 3.0 are a place where teachers are not just carriers of knowledge, but also real entrepreneurs who commercialize university developments through the created ecosystem of support for university-based startups. On the one hand, this creates an additional source of income for the university; on the other hand, it increases the number of competencies that can be transferred to students. In accordance with model 3.0, the training of innovator specialists is directly related to the development of entrepreneurial competencies [11]. Forming the ability to sell and effectively implement the product of own intellectual activity is one of the most important areas at a new generation university. However, the difference between a “bad” and a “good” University of Model 3.0 lies in the extent to which the “corporate ethos” and “entrepreneurial culture” are ingrained in the curriculum, rather than in “external” technology parks and incubators [11].

It is obvious that the commercialization of the results of intellectual activity is most successful not when introducing the developments of university researchers, but when presenting high-tech products to the market: technologies, materials, and developments made through the integration interaction of research, educational, and production components based on joint project activities [6].

The problem of competency-based training of university graduates has always been acute, because technical, technological, and social development of society has always been ahead of academic science. That is, university textbooks are always published with a certain time lag from advanced scientific achievements and new technologies. The problem has become so acute in the 21st century that very serious attention has been paid to the issues of competency-based advanced education at the level of UNESCO, the World Bank, and other world organizations. Similar steps to improve the higher education system are being taken by the Ministries of Education in almost all countries.

A number of scientists focus on the rapid aging of professional knowledge [11]. They note that in conditions when up to 20% of professional knowledge is updated annually, the emergence of new scientific and technological information reduces the competence of a specialist by 50% [1]. The intensity of this process is constantly increasing. While 50% aging of knowledge of a graduate in the 1940s occurred in 12 years, for a graduate of the 1960s it took 8 years, and for a graduate of the 1970s – 5 years. Today, this threshold for changing knowledge is less than 5 years, i.e., knowledge are aging even before the end of university studies [3].

The introduction of the University 3.0 paradigm allows solving this long-standing problem, enabling students to participate in the latest developments and gain new knowledge, similar to what happens in corporate education, since the competitiveness of University 3.0 is possible only with a high level of knowledge management.

Businesses, according to studies, are currently emphasizing on graduates' general competencies [14]. Employers seek university graduates who can generate knowledge and innovations tailored to specific creative enterprise needs, who can build a professional social network, and who can adapt to a constantly changing professional performance environment by leveraging the overall potential of information and communication technologies (ICT). Enterprises and government agencies are dissatisfied with graduates' critical thinking, problem-solving, and creativity abilities, as well as adequate information processing and management abilities, among other things; however, there is less dissatisfaction with graduates' professional knowledge and skills [1].

A student's ability to critically interpret information obtained from a wide variety of sources is one of the most important skills today. But the paradox of today smart education is that the student can acquire these skills only in the process of direct

personal communication with the teacher. Without such communication aimed at developing the student's critical thinking skills, the “millennial”, an active user of digital technologies, risks drowning in a ‘sea’ of “false” knowledge.

The value of transferable skills has increased in recent years. Because of global competitiveness challenges, graduates must provide more to an employer than the academic talents normally reflected by the subject and degree class. Various reports from government, industry, higher education authorities, and scholars have urged the higher education sector since the 1990s to incorporate transferrable skills into students' learning experiences [10]. Universities and colleges, according to the reports, should prepare to assist graduates in developing employability skills, which signal graduates' work preparedness.

Some contend that traditional education no longer adequately prepares individuals for work. The traditional emphasis on knowing what and why is too disconnected from practical knowledge [3]. Formal education and training must be supplemented by hands-on learning and experience in order to obtain know-how information, which can only be learned through hands-on learning and experience. In addition, there is an increasing emphasis on interpersonal aspects of skill: the “know who” side of knowledge. It is based on the notion that the dynamic interplay of codified (mainly know what and why) and tacit (primarily know how and who) knowledge is a primary vector of innovation and advancement.

Thus, a highly relevant task today is to develop models and methods that promote the formation of competencies in their interrelation with each other in the process of professional training of students at University 3.0 - the professional competence of a graduate capable of successfully functioning in a “smart society”.

## 2 Materials and Method

The research methodology included the study and analysis of literature on the research problem, generalization of pedagogical experience on the problem of integration in pedagogy, practice of training specialists, analysis of regulatory and educational documents on the issues of higher professional education, investigation of the experience of Universities 3.0 in different countries, generalization, systematization.

## 3 Results and Discussion

As noted above, according to a number of authors, in the 20th century, new models of universities are developing, in which modern pragmatic ideas and universal values are mixed, and under the influence of the scientific and technological revolution, a model of a post-classical university is being formed, which finds its development in the 21st century [4]. From this point of view, universities are turning into complex self-organized systems that combine fundamental education and the research process as the main characteristics of classical university education and a pragmatic approach that strengthens the practice-oriented orientation of the university and transforms its traditional structures into entrepreneurial structures.

The mission of the entrepreneurial university and its scientific activities is thus the following: creation of a system of innovative science, education and elite training of innovator specialists; development of fundamental and applied research as the basis for innovation; formation and implementation of a full innovative cycle of scientific and educational activities at the university; support of existing and formation of innovative scientific and pedagogical schools; formation of a sustainable system of strategic partnership between the university, state, industry, scientific organizations, and business; creating a system of incentives for students, teachers, and university staff to integrate academic values and entrepreneurial culture; ensuring the university's leadership in domestic and foreign core markets [5].

One of the reports of the UNESCO International Institute for Higher Education in Latin America and the Caribbean (IESALC) presents such models of universities of the future as a network learning center, a laboratory university for sustainable development, and an environmental (“green”) university [18, p. 29-31]. The Deloitte report (cited in Selingo et al. (2018)) describes five models of universities of the future: entrepreneurial university, sharing university, practice-oriented university, subscription university, partnership university [19, p. 2-3].

Table 1 presents features of the strategic priorities of the universities aimed at global or regional influence.

Table 1: Features of the strategic priorities of the universities aimed at global or regional influence

Main activities of universities	Strategic guidelines of universities aiming for global impact	Strategic guidelines of universities aimed at regional influence
Higher education	Implementation of unique educational programs, preparing students to achieve success at the global level	Improving the quality and competitiveness of educational programs
Science	Implementation of breakthrough scientific research at a global level	Increased research and publication activity
Innovation activities	Development of innovative startups in the innovative areas that can change the world	Promoting the spirit of entrepreneurship, commercialization and technology transfer
Continuing Education	Implementation of competitive continuing education programs in the global educational market	Implementation of continuing education programs in demand in the regional market
Integration	Creating mutually beneficial partnerships and networks at the global level	Strengthening regional partnerships, developing international relations
Staff development	Attracting the highest level of personnel, developing their competitiveness and succession planning	Improving the quality of human resource management, improving the motivation system, optimizing the structure
Implementation of sustainable development goals	Contribution to solving global problems, to the development of the world community	Contribution to solving problems of sustainable development at the regional and local level

An analysis of development strategies of leading universities included in the top 100 according to QS indicates that they are focused on creating a model of a university of global influence, which involves maximizing efforts towards solving global problems through implementation (Table 2).

Table 2: Universities aimed at global and regional influence

University	Place in the QS ranking	Key provisions of the strategic goal
Massachusetts Institute of Technology (USA)	1	Global leadership in education and research to serve the world and society
Oxford University (UK)	2	Delivering world-class research and education to benefit communities locally, regionally, nationally, and globally
Stanford University (USA)	3	Contribution to the development of society by solving pressing global problems
National	11	A leading global university shaping the

University of Singapore (Singapore)		future
Yale University (USA)	14	World leadership in education and research on issues of global importance
University of Hong Kong (Hong Kong)	22	A world-class university with cutting-edge research and education in cutting-edge fields

Entrepreneurial universities actively drive new venture creation (see Figure 1 below), and this process is integrated in methodology and approaches of teaching and assessing students, in shaping their professional competence.

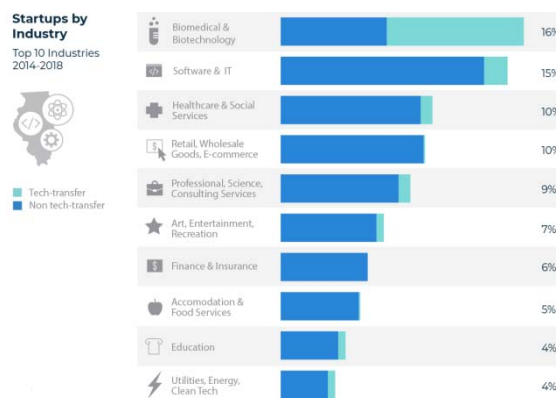


Figure 1. 2019 University Entrepreneurship Index (Illinois, USA) [13]

In the 21st century, there is a fundamental transformation of ideas about the future, and at the same time a change in ideas about the role of “applied” and “theoretical” knowledge, about the role of its owners. As Pitirim Sorokin showed, the type of culture and sociocultural process is determined by the dominant attitude towards the world in society. Today, the world is changing and, accordingly, the dominant attitude towards the world is changing in society. The response to the challenge of the crisis state of the nature of sociocultural development is formed in the public consciousness, formulated by modern sociologists, teachers, philosophers, psychologists, and economists. Society develops the principles of sustainable development, its indicators, the content of culture in a state of liberation from the “yoke of progress”, the culture of fundamental reconstruction of social practices and social ideas, assessment criteria, definition of the role, position, status of an individual, his success.

Experts today are forced to admit: the world of the university is faced with something that it has never encountered before; “it is practically “washed away” by the information flow, in which not a single university can afford stability, because otherwise the world will rush by” [16]. In such conditions, however, it is very important to build management models for an innovative university that would allow preserving the academic community, its core - the bearers of the academic epic. For with all the transformations brought to life by modern digitalization processes, the enduring value of live intellectual communication still remains. It is important not to get hung up on new technologies, which, despite their importance and inevitability, still represent not an end, but a means [6].

In modern educational theory, one can find two different interpretations of the phenomenon of smart education. Some researchers regard smart education as a new round in the development of the educational system, as a global technological revolution, the result of which will be profound changes in the style and methods of teaching at school and university. In this context, one can discern a paradigm of large-scale formational changes in the spirit of Marxist methodology, the main message of which is the assessment of previous teaching formats as outdated and not corresponding to modern times, and emphasizing the advantages of the new model of education as

more progressive and, therefore, having a historical priority. Conventionally, one can call this understanding of smart education “modernist”, the peculiarity of which is a hierarchical worldview and the search for a mono-strategy for the development of the education system. Other researchers offer a more flexible interpretation of the new educational paradigm, regarding it not as the highest point in the development of modern education, but as one of many other learning formats that has both advantages and disadvantages, and can become an addition (but not a substitute) to the already existing educational methods and technologies. This interpretation of smart education is designed in a “postmodern” style, the principles of which are “forced pluralism” of teaching formats and methods, deconstruction of educational paradigms that claim the highest hierarchical positions, and the shaking of established teaching structures.

A descriptive definition of smart education, which presents its main advantages and varieties, may be considered more meaningful [14]. It is about, first of all, several of the most popular learning formats in our time: firstly, these are modular digital educational environments organized on various Internet platforms (for example, PIES, NGDLE), allowing for the management of student learning online, monitoring its quality and systematicity. Experts see the advantage of this training format in the ease of access to relevant Internet platforms at any time and anywhere in the world, in the possibility of relatively continuous interaction with teachers and students, in the availability of various educational materials (lecture notes, presentations, assignments) that are posted online. Secondly, MOOCs (massive open online courses) are recognized as one of the most popular formats of smart education, which allow users to take certain training courses in order to deepen knowledge, obtain new information, or continue learning after graduation (thus, MOOCs can be considered as form of virtual localization of Life-long learning). The advantage of MOOC is its relevance to all educational contexts (formal, non-formal, and informal); providing users with the opportunity to get acquainted with the world's best educational content, presented by leading employees of the most prestigious universities, as well as flexible training schedule according to an individual plan. Thirdly, smart education can be presented in a formal educational context as a complement to traditional teaching formats (this is about the use of electronic gadgets and interactive Smart Boards during classroom lessons), which provides additional opportunities for searching for relevant information on the Internet, for creating intellectual product online (“here and now”) [17].

In modern theory, smart education is studied in the context of the formation of not only cognitive, but also metacognitive abilities of students, which is understood as the process of “thinking about own thinking”, the ability to track the qualitative and quantitative characteristics of own thinking abilities (speed, content, effectiveness, style, accuracy, range, independence of thinking) [6]. As the results of psychological experiments show, developed metacognitive abilities correlate with higher educational achievements and better academic performance of students [22]. It is difficult to talk about the existence of an unambiguous connection between smart education and the problem of developing students’ metacognitive abilities. On the one hand, modern researchers talk about the necessity and even inevitability of developing metacognitive skills among online students. Since smart learning is carried out in a relatively free format that does not imply strict control on the part of teachers, therefore, in this context, it is required that students have the ability to independently monitor the learning process, search for relevant literature, plan their actions, complete the necessary educational tasks on time, and check the quality of work performed. On the other hand, there is evidence that indirectly indicates that online students have underdeveloped metacognitive skills, such as self-control and monitoring the effectiveness of the learning process. It is about the problematic situation that only 2-19% of students complete online courses, who, apparently, lack the metacognitive skills of self-control and monitoring of their learning activities [22]. An important role in the learning process (including smart learning) is played by the

combination of developed metacognitive abilities with the formed educational motivation and achievement of the individual, which forms a single pattern of cognitive skills [8]. If such a pattern is present, the student will be able to achieve high educational results in the context of both traditional and smart education, which can be combined in the blended learning format.

At the same time, SMART education poses new challenges for teachers. They must not only be well prepared theoretically and practically, have excellent command of modern technologies, be ready to develop professionally and meet the level of training and expectations of students. Technical resources open up new educational and creative opportunities for the teacher to create both individual lectures, seminars, practical training sessions, and entire courses, which, in turn, affects the increase in motivation among students, the formation of a sustainable interest in study and future profession, as well as the achievement of subject-subject relationships in educational activities.

Universities are involved in such a business process as the preparation of human capital. The task is to shape a creative environment in which students will learn to produce their own knowledge and scientific product. This suggests the advisability of “leaving the classroom” and gamification of the educational process, which is based on the understanding that “a lesson is not just four walls: it is necessary to put information into students’ heads in all available ways” [14]. In particular, students’ adaptation to high-quality information can be achieved by familiarizing them with printed publications, existing electronic libraries, educational and scientific sites, and legal reference systems. To do this, modern teachers must formulate tasks in such a way that the student is forced to use a representative source of electronic information or a printed resource. Turning to the primary source, books, magazines, newspaper articles forms the necessary competencies in the student and allows, in the future, distinguishing between reliable and unreliable information.

Readiness for self-educational activity is not only a characteristic of personal qualities, but also an educational system that develops under pedagogical influence, reflecting the degree of formation of certain personality characteristics that contribute to further professional growth.

It should be emphasized that the system of modern university education has a need for the interdependence of the formation and practical implementation of educational and upbringing programs. Moreover, this correlation should have namely a value orientation, since the value-semantic component acts as the foundation for the formation of a professional’s competence [21]. In addition, in general, it serves as a factor in overcoming the so-called “existential vacuum,” that is, the loss or lack of formation of meaning-forming values characteristic of modern youth [1]. Moreover, the value-semantic component of the educational process directly determines the quality of professional self-determination of future specialists, is a source of individual activity, the driving force of his personal and professional growth.

The value-based and competency-based approach in modern higher education consists of the need to train professional personnel, based on their ability to quickly adapt to the needs and demands of employers in the professional field, as well as to the business culture and moral and ethical values formed in the organization or enterprise. In our opinion, one of the main ways of applying the value-competence approach in the educational process is to bring different academic subjects closer to each other, overcome their content isolation, focus on the holistic application of skills acquired by students in the professional field, since the set of disciplines offered for mastering within any specialty reflects an integral complex of reality phenomena. The value-competence system of the educational process of higher education determines the integrative characteristics of specialists training as a harmoniously developed professionally-developed individual. Here it is important to note not only individual

manifestations of the student's professional potential, but also other personal components, including those that may appear in the future. In this segment, the value-competence approach manifests itself both as a quality standard and as a method for modeling the educational process at a university.

The next significant aspect of the implementation of the value-competence approach at a university is the orientation of the educational process towards combining efforts related to the graduate's achievements in the professional field. The final indicator here should be the demand and competitiveness of a young specialist in the labor market. Monitoring the results of educational activities can be carried out taking into account different models of graduates' competencies and their comparison with the tasks set by the market.

The "competency model" serves as the axiological foundation for the implementation of University model 3.0, particularly in the early phases, as an attempt to reorganize the educational process. The trans-discipline develops as a complex tool of knowledge and the search for instructional opportunities with implicit knowledge and awareness of the principles, including through a matrix of competencies (knowledge, abilities, skills). The educational process is increasingly produced through group (network) interaction - forms such as "inverted class" appear [9]. Grecu and Denes (2017) [10] present the overall model of entrepreneurial university (see Figure 2).

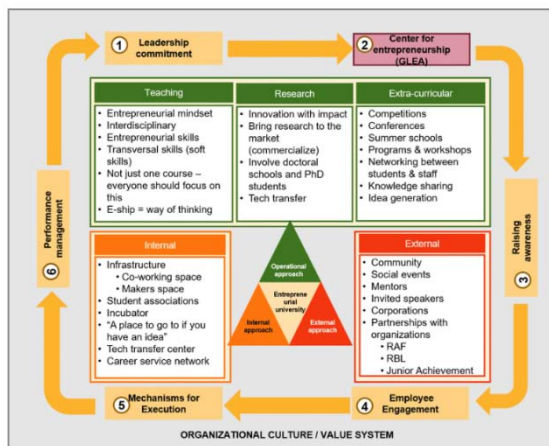


Figure 2. Model of entrepreneurial university [10]

In 2017, the international organization "The Flipped Learning Global Initiative" announced the beginning of a new era in the development of "inverted learning" ("mirror reflection of the audience"), as one of the most popular and effective models of blended learning not only in university education, but also in schools and colleges. With this kind of training, the teacher provides students with remote access to educational material for independent study, and during a face-to-face lesson, performing practical tasks on the topic, the acquired knowledge is consolidated. At the same time, the most common approach is in which students watch a series of short videos on a topic at home, and reinforce their knowledge in the classroom by solving practical problems.

New generation universities often train highly qualified personnel for industry development within the framework of interdisciplinary and project-based learning 2.0 in close integration with industrial partners and the possibility of introducing flexible educational trajectories. The architecture of the educational program in the USA is based on the modular principle "2 + 2 + 2" and represents a constructor consisting of individual educational disciplines, with each module aimed at "unfolding" certain competencies [6]. Within the framework of this model, students, choosing disciplines in the university space, with the support of experienced personal coaches and tutors, independently build their educational trajectory. OECD, in its report named "Transformative Competencies for 2030" emphasizes the necessity of "building "transformative competencies through experiential learning" [15].

Universities, according to the European framework, must be able to develop life competences - a multifunctional package of knowledge, abilities, and attitudes required for personal fulfillment and development, social inclusion, active citizenship, and long-term employability in a knowledge-based society. This necessitates a focus on transversal competencies (soft skills) like as communication in general (especially online communication), teamwork, cooperation, social responsibility, and ethics. Students must be prepared to react and innovate in a rapidly changing world. New skills are required, such as the capacity to foresee, respond quickly, and communicate in inter- and multicultural settings [12, p. 197].

When training professionals, sound emphasis is placed on the so-called "future competencies". For example, in the first two years of study (Core module) at some leading universities in Germany, the university carries out targeted work to develop students' transprofessional, or universal, competencies, such as flexibility, adaptability, empathy, and emotional intelligence, the ability to think critically and systematically, work in a team, conduct dialogue, solve non-standard interdisciplinary cases, and learn and relearn throughout life. The second and third modules define the main area of professional knowledge and provide for a bachelor's/master's degree. At the same time, in the second and third modules, students have the opportunity not only to deepen their knowledge within the chosen professional profile, but also to master disciplines from related or even independent professional fields by expanding the number of courses in the Electives and Minor modules. The flexibility of the educational trajectory and personification of the educational process are achieved, among other things, due to the fact that the educational process at the university is implemented using an integrated virtual educational environment and open educational resources (EdX, Coursera, etc.) [16].

Interestingly, an integral part of online learning in the U.S. universities of entrepreneurial type is the use of Big Data technologies based on tracking the "student's digital footprint", which begins to form from the moment he enters the university. The student's digital footprint contains personal data, information about admission, field of study, educational program, academic performance throughout the entire period of study, as well as educational analytics data collected automatically when the student works in distance learning systems and on open education platforms when taking online courses. Based on the analysis of the digital footprint of students, the university plans educational programs taking into account monitoring the demand for personnel, data on personnel and their competencies on specialized platforms [6].

When preparing students, special attention is paid to project-based learning. To achieve this, from the first year the university immerses 100% of students in working on real projects supervised by leading scientists and practitioners. The development of project activities, in which students work to solve real problems of their employer partners, is possible thanks to the implementation of a pedagogical innovation - a "inverted curriculum", which allows students to redistribute their workload in favor of practice-oriented disciplines, starting from the first year.

Another unique feature of project-based learning at today's university (in particular, in Japan universities) is the work of technical, IT, and humanity specialties students in a single team to create a "startup as a diploma" for a specific employer. As a result, 100% of undergraduates have experience in technological developments and their commercialization [24].

The approach to the modern development of education suggests a transition to the optimal choice of trajectory of expected competencies, qualities, skills, that is, educational results that can ensure graduates success in the future. In relation namely to these results, it is necessary to build the content of education and control the degree of mastery and quality of educational programs.

Mastering basic information, norms and rules for solving a problem is certainly necessary. However, much more valuable in the modern world is not so much their mastery, but rather the ability to act in an uncertain situation, creative thinking, initiative, responsibility, the ability to search for information, and not just remember traditional rules, to look for new solutions, and not copy known ones [3]. It is about, among other things, generating non-standard solutions, combining various disciplines in teaching, such as physics and biology, science and humanities, and the ability to competently assess risks and uncertainties to develop approaches to resolving problem situations. Creating conditions for the formation of creative specialists is based on the rejection of archaic educational forms, but at the same time it should include both the development of basic knowledge, norms and rules, and non-standard methods of finding creative solutions that are adequate to new goals, resolving problematic and risky situations, and transferring skills to act in conditions of uncertainty.

At the same time, questions remain open about possible scenarios for the development of universities within different national systems, about accelerated paths of transition from one model to another, and about the possibilities of trans-model transitions. However, already now, knowing the characteristics of the university of the future, it is necessary to think and act proactively, since competent implementation of strategic planning and forecasting makes it possible to manage the future.

Universities cannot abandon changing, since digitalization and the subsequent digital transformation are not only powerful professional tools, but at the same time new social technologies, thanks to which the range of student participation in the life of the university and in the social processes of society is expanding.

The statement that the “genome” of a modern university is an inseparable unity of scientific and educational activity is clearly insufficient, since it is about an extremely important phenomenon: in the humanities, it is realized that we are dealing with a large-scale transition from the polyphony of epistemological characteristics of modernity to the polyphony of life forms, in particular, the theory of training and education does not manage to accumulate and comprehend empirical experience timely [2].

In this regard, we cannot but recognize that the active components of the university’s “genome” are the ‘generalized student’ (the aggregate cross-section of his characteristics) and society with its business- and social environment, which naturally compensates for the lack of social knowledge and empirical basis for the formation of a full-fledged specialist and citizen.

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**Primary Paper Section: A**

**Secondary Paper Section: AM**