

1. Value characteristics of education and its transformation in modern realities

Abstract. The purpose of this paper is to analyze the value characteristics of modern higher education and to explore its transformation in the context of globalization and digitalization of society. Education is not only the transmission of knowledge but also the cultivation of worldview, ethical orientation, cultural identity, and the ability for critical thinking. High-quality training of specialists in higher education is the foundation for economic development and societal stability. Education guides individuals toward respect for human dignity, freedom of choice, and self-realization. It shapes the citizen as an active participant in public life.

Higher education ensures social mobility, societal cohesion, integration of different cultures and values, and contributes to the formation of democratic citizenship. It serves as a channel for transmitting cultural traditions, national identity, and intercultural dialogue. The training of qualified professionals promotes innovation and sustainable economic development.

In modern realities, this value is being transformed in accordance with global, social, and technological changes. Digital technologies are radically changing teaching methods, making education more accessible, personalized, and mobile. Modern education is increasingly focused not only on knowledge but also on the development of practical skills, soft skills, critical thinking, and emotional intelligence. Today, the priorities include accessibility of education for all, regardless of social, economic, or physical status.

The importance of international cooperation, mobility of students and educators, and interdisciplinary approaches to learning is also growing.

The issues of educational transformation and its impact on the future of society are addressed in the works of Hurevych R. [11], Horokhivska T. [10], Lokshyn O. [18, 19], Kovalenko S. [14], Sokol M. [24], and other researchers. Among foreign scholars, it is worth mentioning Ken Robinson (UK), known for his critical views on traditional education (particularly his TED Talk *“Do schools kill creativity?”*, where he explores

how education must transform to meet the needs of a creative and innovative society) [12].

In his books “*21 Lessons for the 21st Century*” and “*Homo Deus*”, Yuval Noah Harari (Israel) analyzes how artificial intelligence, automation, and changes in the economy are transforming education. The scholar believes that the key skills of the future are flexibility of thinking, emotional intelligence, and the ability to learn throughout life [29].

However, the dynamic development of society requires ongoing research into strategic directions in higher education to ensure the training of professionals meets the evolving societal demands.

To achieve the research objective, test the hypothesis, and accomplish the outlined tasks, a comprehensive set of scientific methods was used:

Theoretical methods included: analysis of philosophical, methodological, psychological, and pedagogical literature related to the research problem; examination of regulatory and methodological documents in the field of education to define the conceptual terminology of the study; clarification of the nature of education in foreign countries and in Ukraine; content analysis of educational programs for professional training of higher education students at agrarian universities; analysis, comparison, and synthesis of scientific ideas, knowledge, and facts; systematization of approaches to addressing the research problem; generalization of empirical material; data ranking; hypothesis construction; thought experiments and modeling.

Empirical methods included: pedagogical observation of the educational process in agrarian institutions of higher education; diagnostic interviews, surveys, questionnaires; expert interviews, testing; self-assessment by participants of the educational process; quantitative data analysis and reliability testing of experimental results.

Practical Significance. The practical significance of the research lies in its potential to inform justified decisions regarding education system reforms, funding priorities, and curriculum updates. Proposed directions for adapting educational programs to labor market demands are outlined. The analysis of professional and

technological development trends helps to anticipate which specialties will be in demand in the future, thereby preparing graduates with high competitiveness.

The study allows the identification of weaknesses in the education system and helps to improve its quality — such as outdated teaching methods, lack of practical training, or insufficient digital skills among students. Analyzing trends in higher education development enables timely responses to global challenges such as digitalization, artificial intelligence, and the need for lifelong learning.

Value/Originality. The research findings can be used by higher education institutions to shape effective educational policies. A scientifically grounded rationale is proposed for flexible changes to curricula in order to ensure the competitiveness of university graduates.

Introduction

Over the past decades, we have witnessed rapid changes in all spheres of life — the economy, technology, culture, and social structure. Along with these transformations, higher education is also evolving, as it is inherently linked to the needs of society and the labor market.

The goal of modern education is to meet the needs of both individuals and society for professional educational services of an appropriate level, taking into account labor market demands; to ensure equal access to quality education; and to foster a creative, spiritually enriched individual, considering their personal needs and abilities [1].

In Ukraine, the main factors influencing the further development of higher education include demographic changes (a declining birth rate and a reduction in the working-age population due to the war with Russia), increased demand for a skilled workforce, deepening discrepancies between the demand for highly qualified professionals and the current level of their training, and a decline in the quality of professional education caused by the loss of skilled specialists from the workforce as a result of the war. Additionally, the development of production based on the implementation of new technologies, materials, and equipment, as well as the growing

role of social partnership, significantly shape the direction of educational transformation.

Among the key areas in which modern higher education is transforming under the influence of societal development, researchers highlight the impact of digital technologies, the orientation toward practical skills, and the focus on soft skills. It is appropriate to examine the value-based characteristics of education and its transformation within the context of a globalized labor market environment. This is of particular significance for Ukraine. In the 21st century, quality education has become one of the main factors of sustainable national development, competitiveness, and security.

In the context of globalization and the intellectualization of the economy, the integration of Ukraine's higher education system into the European and global educational space is not only desirable but a necessary precondition for the modernization of the entire education system. This process opens new opportunities for students, educators, and researchers, contributes to the modernization of the educational environment, and enhances the international image of Ukrainian education.

Ukraine possesses the intellectual potential to become a full-fledged participant in the global educational community — what is crucial now is to realize this potential through strategic vision and deliberate action. Ukraine has been a participant in the Bologna Process for over 15 years, which marked an important step toward educational integration. Therefore, the transformation of its value characteristics should be studied in the context of the historical foundations of the development of modern higher education.

1.1 Historical Preconditions for the Development of Modern Pedagogy and Shifts in Priorities in Higher Education

Given Ukraine's aspirations for European Union membership, it is important to examine the historical development of European higher education and outline the gradual shift in civilization's educational priorities. The evolution of European higher education can be divided into several stages.

The first stage (Medieval universities, 12th–15th centuries) marked a transition from the spontaneous formation of early archetypes of medieval universities — closely linked to specific professions — to the more structured and territorially expanded institutions of the late Middle Ages. The first universities, such as the University of Bologna (founded in 1088) and the University of Paris (founded in 1150), were created as self-governing corporations of students and teachers. They were composed of faculties (theology, law, medicine, arts), and teaching was based on the scholastic method, which emphasized logic and dialectics. These universities were closely tied to the Catholic Church, which controlled many aspects of their operations [12, 18].

The second stage (Renaissance and Early Modern Period, 15th–17th centuries) saw universities begin to include classical texts by ancient authors in their curricula, leading to the development of humanism. New sciences and research methods emerged, giving rise to disciplines such as astronomy and physics. Universities began to play an increasingly significant role in scientific discoveries. The social role of universities grew as they came to represent key aspects of national identity, and they were often drawn into the dynastic and religious conflicts of the era. Political changes and the Industrial Revolution fostered a new socio-economic order that transformed universities and revitalized other forms of higher education.

The Enlightenment era (18th century) was marked by the secularization of education and widespread reforms. Universities gradually freed themselves from church influence, becoming more autonomous and secularized. Many European universities implemented reforms aimed at improving teaching and scientific research. For instance, German universities such as the University of Göttingen introduced new models of learning and academic inquiry.

Finally, after 1914, World War I and the Great Depression brought profound shifts in the cultural, economic, social, and political foundations of higher education. This period saw the rise of the Humboldtian model of the university, developed by Wilhelm von Humboldt, which combined research and teaching. This model became a prototype for many European universities.

This stage was characterized by the expansion of the university system: institutions began to admit more students and create new faculties — particularly in technical fields — to meet the needs of the industrial revolution. Conditions were created for mass access to higher education and for the integration of science and production into education.

The crisis of the early 1970s interrupted this multifaceted development and posed challenges for higher education institutions in terms of funding, access, and differentiation. This led to growing tensions between the ideology of higher education, the organizational structure of universities, the accessibility of education, and funding mechanisms. These issues remain central to current debates on the theory and practice of higher education.

In 1999, the Bologna Process was launched with the aim of creating a common European Higher Education Area. This led to the harmonization of academic programs and greater mobility for students and faculty. The implementation of the Bologna principles also oriented higher education toward the adoption of modern information technologies. Universities increasingly integrate digital technologies into the educational process, including online courses and distance learning.

1.2 The Competency-Based Approach as a Methodology for Specialist Training in the 21st Century

The implementation of the competency-based approach in higher education has fundamentally changed the goals of professional training for future specialists. It can be argued that the Bologna Process played a historic role in the new concept of higher education.

The early 1990s were characterized by crisis phenomena in higher education, which were global in nature and affected many countries around the world. This crisis was caused both by problems in the global economy and by the mismatch between higher education and the demands of society. During this time, in many countries, funding for higher education was significantly reduced, which led to a decline in the quality of education, lower salaries for faculty, and increased tuition fees for students.

This caused greater social inequality in access to higher education. At the same time, in the 1990s the number of people wishing to obtain higher education rose sharply. This demand led to the oversaturation of higher education institutions, resulting in an insufficient quantity of resources and teachers to ensure a quality educational process [9,11].

Most universities could not adapt in a timely manner to rapid changes in the labor market and in society, which caused a discrepancy between what was taught in universities and what was required by the labor market. This aggravated the problem of unemployment among graduates. Globalization led to increased competition among universities in different countries. Many European universities began to lag behind American and Asian universities, which became an additional challenge for the higher education system.

The fall of communist regimes in Eastern Europe and the collapse of the USSR led to significant social and economic changes which affected the education system. There arose a necessity to reform educational systems that had been created under planned economies, and to adapt them to the new conditions of a market economy. These factors together created a crisis situation in the higher education system that required serious reforms and new approaches to management, financing, and organization of the educational process. The Bologna Process was one response to these challenges, aimed at modernizing and integrating European higher education.

In the early 1990s in Europe there existed many different higher education systems, which made mutual recognition of diplomas and mobility of students and faculty between countries difficult. The Bologna Process was aimed at harmonizing these systems and creating a unified European Higher Education Area.

In a world where competition among educational institutions is growing, Europe needed to establish a system that would correspond to modern challenges and be globally competitive. One of the main goals of the Bologna Process is to promote international mobility of students and faculty, which is an important factor in forming a unified European community. The emergence of the European Union and the drive for integration supported the development of the idea of a common educational space,

which aimed to provide comparability of qualifications and the creation of common standards in education.

Thus, the Bologna Process was initiated in order to make European higher education more coherent, accessible, and competitive, with the goal of promoting mobility and integration within Europe.

In Bologna in 1999, representatives of 29 countries agreed on a common vision of the European Higher Education Area (EHEA). They emphasized that this vision was politically relevant to each of the participating countries, and transformed it into operational objectives, as embodied in the Bologna Declaration. Key elements of the European Higher Education Area envisaged at that time included: European countries with different political, cultural, and academic traditions being able to cooperate to achieve a shared goal; European students and graduates being able to move easily from one country to another with full recognition of qualifications and periods of study and access to the European labor market; European higher education institutions having the ability to cooperate and exchange students/staff based on trust and confidence, as well as transparency and quality; European governments embedding their national higher education reforms into the broader European context; higher education in the European region increasing its international competitiveness and engaging in dialogue and improving collaboration with educational systems in other regions of the world [21].

Over the past 25 years, thanks to voluntary convergence and an intergovernmental approach, the Bologna Process has led to the building of the foundation of the European Higher Education Area — a shared structure that includes the overarching qualifications framework of the EHEA, a common credit system (ECTS), shared principles of student-centered learning, European standards and guidelines for quality assurance, a common register of quality assurance agencies, a shared approach to recognition, and a common set of methodologies and sustainable achievements established by European higher education institutions.

The Bologna Process is a dynamic progression from the Sorbonne Declaration to the European Higher Education Area, which today defines the future of higher education in EU countries.

It is advisable to study the history of the Bologna Process's transformation. The ministers of education who participated in the celebration of the 800th anniversary of the University of Paris (The Sorbonne Joint Declaration, 1998) shared the opinion that the segmentation of the European higher education sector was outdated and harmful. The decision to take part in a voluntary process of creating the European Higher Education Area (EHEA) was formalized a year later in Bologna by 30 countries (the Bologna Declaration, 1999) [9]. At its inception, the Bologna Process targeted strengthening the competitiveness and attractiveness of European higher education, fostering student mobility and employability opportunities by introducing the bachelor's and postgraduate structure with clear programs and degrees. Quality assurance also played an important role from the very start of the Bologna Process. However, various ministerial meetings since 1999 have expanded this agenda and refined the tools developed. The bachelor/master degree structure was changed to a three cycle system, which now includes the concept of qualification frameworks with an emphasis on learning outcomes. The concept of the social dimension of higher education was introduced, and qualifications recognition is now clearly seen as central in European higher education policy. Thus, the evolution of the main objectives of the Bologna Process occurred in a certain sequence.

The Sorbonne Declaration was signed in 1998 by the ministers of four countries: France, Germany, the United Kingdom, and Italy. The aim of the Declaration was to create a common education system within the envisaged European Higher Education Area where mobility should be ensured both for students and graduates as well as for staff. Moreover, the new European Higher Education Area was intended to enhance the advancement of qualified specialists in the labor market. The aims of the Sorbonne Declaration were confirmed in 1999 through the Bologna Declaration, where 30 countries expressed their willingness to commit to strengthening the competitiveness of the European Higher Education Area, emphasizing the need for further development of independence and autonomy for all higher education institutions. All provisions of the Bologna Declaration were established as measures of a voluntary harmonization process rather than provisions of a mandatory contract. To

implement the Bologna Declaration, every two years ministerial conferences were held, in which the ministers expressed their vision through appropriate communiqués.

Thanks to the Prague Communiqué in 2001, the number of member countries grew to 33, and objectives were expanded in terms of lifelong learning, student involvement as active partners, and increasing the attractiveness and competitiveness of the European Higher Education Area. In addition, participating ministers committed to further development of quality assurance and national qualifications frameworks. This aim is related to the goal of lifelong learning, since it is considered an important element of higher education which must be taken into account in building new education systems. It is also worth noting that the social dimension theme was introduced for the first time in the Prague Communiqué. The next ministerial conference took place in Berlin in 2003. Thus, the Berlin Communiqué raised the number of countries to 40 members. The main provisions of that communiqué concerned broadening the objectives in terms of linking the European Higher Education Area with the European Research Area, as well as promoting quality assurance in education. Another important aspect mentioned in the Berlin Communiqué related to the establishment of certain structures to support the process between two ministerial meetings. This agreement contributed to the creation of the Bologna Follow-Up Group, the Board and the Bologna Secretariat. In this communiqué, ministers also agreed that each of the participating countries should establish a national structure for follow-up action.

In the Bergen Communiqué 2005, the importance of partnership including stakeholders – students, higher education institutions, academic staff and employers – was emphasized, along with further enhancement of research, especially in the third cycle – doctoral programmes. Moreover, this communiqué stressed ministers' desire to ensure more accessible higher education together with increasing the attractiveness of the EHEA for other parts of the world. The London Communiqué 2007 expanded the number of participating countries to 46. In that communiqué attention was focused on assessing progress up to that point in terms of mobility, degree structure, recognition, qualification frameworks (both general and national), lifelong learning,

quality assurance, the social dimension, and also setting priorities for 2009, namely: mobility, social dimension (which was defined here for the first time), data collection, employability, the EHEA in a global context, and summing up. For 2010 and beyond it was emphasized that there is a need for continued cooperation, considering this as an opportunity to reformulate the vision and values of higher education.

The Leuven/Louvain-la-Neuve Communiqué. In the Leuven/Louvain-la-Neuve Communiqué of 2009, main directions of work for the next decade were identified with emphasis on: the social dimension, lifelong learning, employability, student-centred learning and educational mission, international openness, mobility, education, research and innovation, as well as data collection, funding of higher education and tools of multi-dimensional transparency. These main working areas demonstrated a new orientation of the Bologna Process toward a more in-depth approach to reforms that ensures the completion of the Process implementation. Another change, in terms of internal mechanisms, concerned the procedure of presidency in the Bologna Process: from the previous arrangement where the presiding country in the Bologna Process was the country holding the EU presidency, to the situation in which two countries preside — one being the country holding the EU presidency and the other a non-EU country — named in alphabetical order, starting from July 1, 2010.

Budapest/Vienna Communiqué. In March 2010, during the Budapest-Vienna ministerial conference the EHEA was expanded to 47 members. The Budapest-Vienna conference was the anniversary conference marking the tenth anniversary of the Bologna Process [9]. On that occasion the European Higher Education Area was officially launched, meaning that in terms of a shared European higher education structure the goal set in the Bologna Declaration was achieved. However, the existence of the EHEA itself did not mean that all the aims agreed upon by the ministers participating in the Bologna Process had been accomplished. Thus, in 2010 the Bologna Process and the European Higher Education Area entered a new phase, namely consolidation and operationalization, especially in light of significantly differing responses to implementation of the Bologna Process in Europe [4, 23].

The Bucharest Communiqué. The main message of the Bucharest ministerial conference, held on 26-27 April 2012 with the participation of 47 European ministers responsible for higher education, was that higher education reform can help return Europe to the right path and create sustainable growth [9]. Ministers agreed to focus on three main goals in the face of a likely economic crisis: to provide quality higher education to more students, to better equip students with skills that enable employability, and to increase student mobility. The 47 countries adopted a new European strategy to increase mobility with the specific goal that at least 20 percent of those who finished higher education in Europe by 2020 would have the opportunity to study or do an internship abroad.

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Yerevan Communiqué. The Yerevan ministerial conference took place on 14-15 May 2015 [9]. During the conference several policy measures were adopted: the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) were revised; the European Approach for Quality Assurance of Joint Programmes was adopted; the ECTS Users' Guide was reviewed as an official EHEA document. The Yerevan Communiqué recognized that the vision of the Bologna Process had successfully inspired the European Higher Education Area. Nevertheless, to realize the full potential of the EHEA it was necessary to continuously upgrade higher education systems and increase more widespread involvement of academic

communities. The need for reviewing the original vision and consolidating the structure of the EHEA was emphasized.

EHEA governance and working methods must evolve to meet new challenges. Common objectives implemented in all participating countries include: increasing the quality and relevance of teaching and learning; fostering graduate employability throughout their working lives; creating more inclusive systems; implementing coherent structural reforms.

The reasons for introducing the competency-based approach into the educational process in universities have social and economic roots. The modern labor market demands from university graduates not only theoretical knowledge, but also practical skills and competencies that allow them to work effectively in a professional environment. This concerns both specialized professional skills and general competences, such as critical thinking, communication, and the ability for self-development. Rapid technology development changes job requirements and creates new professions. Universities must adapt their curricula to these changes in order to equip students with relevant knowledge and skills.

In a globalized world, competition in the labor market is increasing. To ensure that university graduates can successfully compete for jobs, they must have a high level of professional competency. Universities are increasingly aligning with international education standards, which requires them to develop competencies that are recognized and in demand internationally.

Employers more often look for specialists who already possess the necessary competencies to carry out professional duties from day one. They expect universities to prepare students for real working conditions, providing them with appropriate knowledge and skills. Thus, the formation of professional competency in modern universities is a key component of preparing students for successful careers, ensuring their competitiveness in the labor market and adaptation to the demands of the contemporary world.

Professional competency is the combination of knowledge, skills, abilities, and personal qualities that enable an individual to perform tasks effectively within a given

profession. Nowadays, increasing attention is being paid to the development of personal qualities. It includes several components (see Fig. 1).

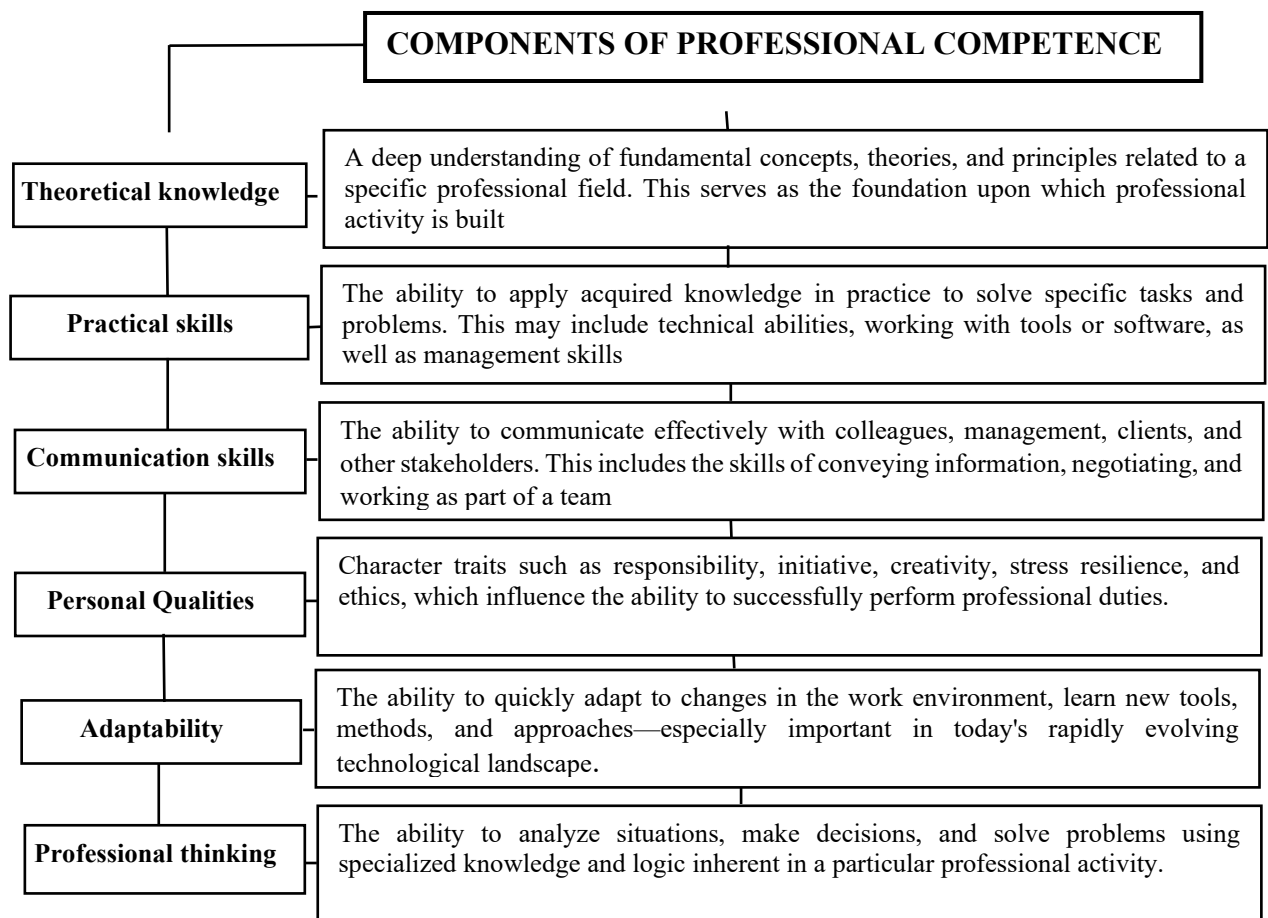


Figure 1. Components of professional competence

Source: generalized by the author based on [1, 4, 6]

Thus, professional competency encompasses not only knowledge and skills, but also broader aspects including personal development, the ability to interact with others, and adaptability to changes. It is a key factor in successful professional activity and career development.

Today young people often ask: “Why pursue higher education?” After all, there are many examples of successful people without a university degree, such as Bill Gates. However, it is important to recognize that while exceptions like Gates exist, they are more the exception than the norm. For every person who finds success without higher education, there are many others who struggle due to a lack of the skills and knowledge necessary for employment and successful life management. Although unique paths may lead to success, obtaining higher education is often considered the most reliable

and safest way to achieve success. Therefore, it is necessary to discuss with students the numerous advantages of higher education, while also emphasizing some legitimate concerns that often arise in people, especially today, during the war with Russia. For most people, university is a crucial stage in their personal and intellectual growth. It is a period of self-discovery, diverse experiences, and acquisition of knowledge that lays the foundation for future aspirations [6]. It provides people with tools to navigate the complexities of the world and achieve various goals. Below we highlight some key areas in which the university has a direct impact, each of which makes a significant contribution to personal development. At the same time, it should be emphasized that higher education has value, but its importance can vary depending on specific circumstances, goals, and field of activity. We consider it important to emphasize the following points.

1. Career opportunities. In many professions higher education is a necessary condition for employment or career advancement. A degree may become a gateway to better-paid and more prestigious positions. Attending university and choosing the right specialization can lead to expanded career growth opportunities, since many professions require academic degrees that can be obtained through higher education. Individuals who hold higher education have better employment prospects than those with lower educational attainment. Studies on higher education issues convincingly show that those with a bachelor's or higher degree demonstrate higher rates of employment than those without higher education.

2. Knowledge and skills. University education provides not only specialized knowledge but also develops critical thinking, research, communication, and problem-solving skills. These are useful in both professional and personal life. Universities provide students with a structured environment for acquiring specialized knowledge and developing the necessary skills for their chosen fields. Through rigorous academic programs, hands-on learning, and exposure to the latest developments, universities help students become experts and succeed in their careers. Furthermore, by offering direct access to active researchers and real-world practices,

students gain access to cutting-edge information, promoting innovation and adaptability.

3. Network of contacts. Universities often become places where one can find like-minded individuals, mentors, and future colleagues. The network built during one's studies can be very useful in later career stages. Sometimes who you know is just as important as what you know. Thus, in addition to providing knowledge and skills, colleges and universities also offer great opportunities to build one's social network, which may lead to internships, job opportunities, projects, or mentorship. From interacting with peers and alumni to learning from experienced faculty at leading institutions around the world and engaging with professionals in specific fields, students have opportunities to build sustainable partnerships in college and beyond, which can have long-term positive impact on their careers.

4. Social status. For some people, holding a diploma is an important aspect of social status and self-realization. The reasons for this are both historical and sociocultural. Education is perceived as a symbol of intellect and knowledge. A diploma is traditionally regarded as proof that a person has gone through a certain intellectual path, acquired knowledge and skills, knows how to think critically and work on oneself. This automatically increases their authority in the eyes of society. In many countries (especially post-Soviet ones) higher education has historically been a sign of social prestige. A person with a diploma is perceived as “educated”, “cultured”, “successful”. Parents and family often view attainment of a degree as a required step in the child's “formation”. In many fields a diploma is a formal requirement (for example, medicine, education, law) or an informal filter used by HR professionals, even when real skills are more important. Without a degree certain “doors” remain closed — therefore it becomes a symbol of “access” to career growth. As shown by a survey of graduates of Vinnytsia National Agrarian University, almost all graduates associate obtaining the diploma with completing an important life stage, with confirmation of their efforts, perseverance, intellect, feeling that one is “not worse than others”, meeting societal or family expectations. It should be noted that a diploma helps a person feel belonging to a certain group (scholars, professionals, educated people),

higher self-esteem, confidence in their ability to influence life and the surrounding world.

5. Contribution to community and society. Colleges and universities, overall, make significant contributions to society through innovative research and discoveries. They serve as centers of breakthroughs, where brilliant minds unite to address pressing problems and expand the boundaries of knowledge. Researchers can solve important issues in unconventional ways. For example, what if brain tumors could be treated painlessly at home without anesthesia? It may sound impossible, but researchers at Stanford Medical Center are developing a small wireless device that one day may do exactly that. Another example – Johns Hopkins University was the institution that ensured the flyby of the New Horizons spacecraft past Pluto, while MIT developed a heat engine with no moving parts [8]. Thus, the possibilities can be considered boundless.

6. Personal growth and self-sufficiency. Finally, colleges and universities are often dynamic environments that provide more than subject-matter knowledge. While students definitely gain experience in their chosen areas, these institutions also help students develop essential life-skills. In addition to mastering complex concepts, students learn time management, problem solving, communication, teamwork and various other domains. Thus, higher education institutions endow them with practical skills and competencies necessary for thriving in a diverse and multifaceted world.

7. Alternatives. However, it is important to note that higher education is not always the only path to success. In many fields such as technology, entrepreneurship, arts, etc., people achieve considerable success without a university degree. Alternatives such as professional courses, self-directed learning, or hands-on experience can also be effective.

8. Time and cost. Higher education can be quite expensive and require significant time, so it is important to weigh the costs and benefits for each individual situation.

So, higher education may have great value, but it is not the only path to success and is not always necessary to achieve one's life goals.

Despite the clear significance and numerous benefits of higher education, some factors may cause young people to hesitate about entering university. Below we consider some common criticisms and concerns young people may have about higher education, which should not be silenced but discussed openly with youth.

Higher education faces substantial criticism, especially about rising tuition fees burdening students with long-term debt. Recent data show that over the past two decades there has been a significant increase in tuition and fees at private universities, with a rise of 134%. Public universities charging tuition have experienced an even greater increase of 141% [12].

Against the backdrop of fast-changing global labor markets, concerns remain about the adaptability of traditional degrees. Traditional university programs may not equip graduates with effective means for responding to the dynamic transformation of the modern labor market, influenced by technological advances and shifting industrial “landscapes”. Clearly, students may hesitate whether to choose universities that do not meet current job requirements or do not deliver the skills needed in the market, which may lead to difficulties in securing relevant positions and the necessity of continuous upskilling to maintain competitiveness.

Strategies to address higher education challenges should also be topics for discussion with prospective students. First, to alleviate the financial burden of tuition, one can suggest exploring scholarship opportunities and financial aid packages offered by universities and external organizations. Scholarships can significantly reduce the overall cost of education and make higher education more accessible. Moreover, many institutions provide grants and work-study programs offering financial assistance and opportunities for gaining work experience simultaneously. Alternatively, part-time, online, or distance education options may offer more cost-effective pathways to obtaining a degree or completing required courses.

When choosing a university, prospective students should examine the relevance of the program to the specialization chosen. It is important to guide young people toward selecting programs that emphasize practical skills, hands-on experience, industry partnerships that offer internships or collaborative learning opportunities.

Such experience provides real exposure and helps bridge the gap between the academic environment and industry. Although a university undoubtedly offers numerous benefits such as enhanced career prospects, skill development, and personal growth, the sharp rise in tuition and uncertainty around the usefulness of certain degrees have cast doubt on the value of this investment. Ultimately, it is important to remember that personal ambitions and circumstances also shape the value of a university education. The key is to make informed decisions that resonate with the long-term goals of the young individual.

Another important point is to recognize that education does not end with the diploma. Therefore, one should be prepared for continuous learning, professional development, and upskilling to remain competitive and mobile in an ever-changing labor market.

1.3 Transformation of the Process of Education, Learning, and Development in Higher Education

The processes of education, learning, and personal development are considered the primary objects of pedagogy, which are also closely correlated with the general trends of societal development. Higher education pedagogy examines various aspects of the educational process, the interaction between teachers and students, as well as the conditions, methods, and tools that contribute to effective learning and upbringing. Pedagogy as a whole encompasses all aspects of educational activity, starting from preschool education and extending to adult education. The main focus is on the development of personal qualities, moral values, intellectual abilities, and social skills of pupils, students, or learners.

Modern pedagogy also pays attention to such aspects as individualized learning, inclusive education, integration of information technologies into the learning process, critical thinking, creativity, emotional intelligence, and preparation for life in a globalized world.

The object of modern pedagogy has undergone significant changes compared to previous centuries. The main transformations are presented in Table 2.

Table 2

Key Transformations of the Object of Pedagogy

Essence of the Object of Pedagogy in Past Centuries	Essence of the Object of Modern Pedagogy
Pedagogy was largely focused on upbringing, the formation of moral and religious values, and preparing youth to fulfill social roles defined by traditional societal structures.	Modern pedagogy places greater emphasis on the development of intellectual abilities, critical thinking, and creative skills of students. Education is now viewed as a means of personal development and preparation for active participation in social life.
Education was standardized, oriented towards the “average” student. All students received the same material and teaching methods.	Modern pedagogy emphasizes the individualization of learning approaches, taking into account the needs, interests, abilities, and developmental pace of each student. This includes the application of differentiated learning, flexible curricula, and teaching methods.
The education system often excluded certain groups of the population, such as girls, children with special needs, or children from poor families.	Today, pedagogy is oriented towards inclusion, ensuring equal access to quality education for all students, regardless of their social status, physical or intellectual abilities.
In past centuries, the main teaching tools were books, written assignments, and oral lectures	Modern pedagogy integrates information and communication technologies into the learning process. The use of digital tools, online resources, multimedia materials, and interactive platforms has become an essential part of education.
Pedagogy of past centuries was mainly oriented towards national or regional values and knowledge.	Modern pedagogy considers global challenges and opportunities, focusing on intercultural education, preparation for life in a multicultural world, the development of tolerance, and understanding of global processes.

Source: summarized by the author based on [4, 9, 11]

Thus, the main changes are related to a shift in focus from upbringing to learning, the individualization of education, inclusion and equality, the technologization of education, globalization, and intercultural education. These changes reflect the evolution of society and the changing needs and expectations placed on the educational system. In accordance with the object of pedagogy, the goal of higher professional education is to prepare highly qualified specialists capable of effectively performing their professional duties and contributing to the development of their fields. This goal encompasses several key aspects:

- Acquisition of professional knowledge and skills: students receive in-depth theoretical knowledge and practical skills necessary for carrying out specialized tasks in a particular professional field.

- Development of critical thinking and an innovative approach: higher education aims to develop students' ability to analyze information, critically evaluate problems, make well-reasoned decisions, and find innovative solutions to complex issues.

- Preparation for scientific and research activities: part of the goal of higher education is to prepare students to conduct scientific research, develop new knowledge and technologies, and participate in academic activities.

- Formation of professional ethics and responsibility: higher education seeks to instill in students high moral standards, professional ethics, and social responsibility, which are essential for the successful performance of professional duties.

- Preparation for adaptation in a rapidly changing environment: as the modern world changes quickly, higher education must equip students with the knowledge and skills to adapt to new challenges and technologies, be flexible, and engage in lifelong learning.

- Intercultural and global competence: Higher education is aimed at developing students' ability to work in international environments, understand and respect cultural differences, and function effectively in a globalized world.

Thus, the purpose of higher professional education is not only to acquire specific professional skills but also to form a well-rounded individual ready for continuous professional growth and active participation in societal life.

Since the main purpose of higher professional education is aimed at the professional formation of future specialists and their personal development, three main vectors are distinguished in the functions of higher professional education: educational, developmental, and formative. Each of these vectors can be detailed as follows:

- Theoretical function: the formation of pedagogical theories, principles, and concepts that explain the processes of education and learning.

- Research function: the study and analysis of pedagogical phenomena, development of new teaching methods and technologies.
- Practical function: implementation of scientifically grounded methods and technologies in educational practice to enhance the effectiveness of teaching and upbringing.
- Predictive function: forecasting trends in the development of education, identifying possible directions for its improvement.
- Normative function: the development of pedagogical norms, standards, and recommendations for educational practice.
- Social function: ensuring the socialization of the individual, the formation of value orientations, behavioral norms, and social roles.

These functions are interconnected and aimed at the comprehensive development of the individual throughout the process of learning and education.

With the development of society, the functions of higher professional education are also transforming, driven by global changes in society, the economy, and technology. In the past, higher education primarily focused on transferring knowledge and information within a specific field. Today, the emphasis has shifted to the development of competencies, which include not only knowledge but also the ability to apply it, critical thinking, creativity, problem-solving skills, and communication abilities.

Modern higher education is becoming increasingly globalized, with an emphasis on international cooperation, student and faculty mobility, and the integration of intercultural aspects into academic programs. This enables students to gain experience in various cultural contexts and increases their competitiveness in the global labor market.

Higher education actively incorporates digital tools and platforms, enabling the implementation of distance learning, interactive teaching methods, virtual labs, and simulations. The use of technology also supports the personalization of education, allowing students to learn at their own pace and according to their individual needs.

The role of the teacher is evolving from a traditional source of knowledge to a facilitator and mentor who supports students' independent learning, assists in the development of their projects, and helps shape their professional and personal competencies.

Given the rapid development of technology and changing labor market demands, higher education is increasingly oriented toward preparing students for lifelong learning. This includes the development of postgraduate education programs, certification courses, and short-term learning formats that allow professionals to continuously update their knowledge and skills.

Higher education also actively integrates elements of entrepreneurial thinking into educational programs to prepare students for launching their own projects, businesses, and innovations. This includes entrepreneurship and management courses as well as support for student startups and entrepreneurial initiatives.

Modern educational programs are more focused on developing students' sense of social responsibility, ethical behavior, and environmental awareness. This is reflected in course topics, research projects, and practical activities aimed at solving social issues and promoting sustainable development.

Higher education increasingly includes interdisciplinary approaches that allow students to acquire knowledge from various fields and apply it to complex projects. This contributes to the formation of specialists capable of working effectively in today's complex and rapidly changing world.

These transformations reflect higher professional education's adaptation to new challenges and the needs of modern society, ensuring the preparation of students who are ready for successful careers and active participation in social life.

The competency-based approach in education has contributed to the development of the concept of lifelong learning, which is now also seen as a global trend. Lifelong learning develops, on one hand, as a pedagogical concept and, on the other, as a practical phenomenon linked to the formation of specific competencies.

Lifelong learning accompanies the process of growing a person's educational (both general and professional) potential throughout life. This process is supported by

a system of state and public institutions and meets the needs of both individuals and society. The goal of lifelong learning is the formation and development of an individual during periods of physical and socio-psychological maturation, as well as during aging, when compensating for lost capacities becomes a priority.

A system-forming factor of lifelong learning is the societal need for the continuous personal development of each individual. This determines the organization of a multitude of educational structures — primary and parallel, basic and additional, state and public, formal and informal. Their interconnection, mutual influence, subordination by levels, coordination of goals and purposes, and interaction among them transform this entire array into a unified system. For a democratic state, lifelong learning is a leading form of social policy aimed at ensuring favorable conditions for the general and professional development of every individual. For society as a whole, lifelong learning serves as a mechanism for the expanded reproduction of its professional and cultural potential, a condition for the development of social production, and a driver of socio-economic progress in the country.

For the global community, lifelong learning is a means of preserving, developing, and mutually enriching national cultures and universal human values. It is also an important factor and condition for international cooperation in the field of education and in addressing the global challenges of today.

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1.4 Tasks of Higher Professional Education and Their Transformation in Contemporary Realities

The tasks of higher education pedagogy lie in studying, shaping, and improving educational processes in universities. These tasks are interrelated and aim to ensure high-quality and effective teaching and upbringing both in society at large and in its specific spheres (professional, personal, etc.). However, the historical development of society alters the tasks of higher education. For example, let us consider the tasks of

education in the Middle Ages and compare them with those of contemporary higher professional education.

In the Middle Ages, pedagogy primarily fulfilled religious-moral and ideological tasks, serving the interests of the Church and feudal society. It was not an independent science, as it is today, but rather part of theology and philosophy. Religious education was a priority goal, aimed at cultivating deep faith in God and obedience to the Church, acquainting students with the fundamentals of Christian doctrine, the Bible, lives of saints, and nurturing in the spirit of Christian morality — humility, obedience, chastity, mercy. Considerable attention was paid to moral and ethical formation: virtues such as obedience, submission to God's will and authority, patience, and modesty. Devotion to tradition was accompanied by suppression of individualism and critical thinking. Education aimed to prepare monks, priests, theologians, and also civil officials, scribes, physicians, and jurists — but always on a religious foundation. Latin was the basis of education, allowing reading of the Bible and classical texts. The process of preserving and transmitting knowledge significantly differed from modern methods. Pedagogy supported the goal of preserving the classical heritage, but only insofar as it aligned with Christianity. Knowledge was transmitted by memorization, copying books, dictation reading. Accordingly, upbringing aimed at service to the feudal-religious ideology. Education was meant to reinforce the existing social order: the monarch's power was divinely ordained, hierarchy was god-pleasing. Pedagogy helped cement each individual's role within their social "estate": clergy, feudal lords, peasants. Notable figures of medieval pedagogy include Augustine of Hippo (ideas about nurturing the soul, the significance of divine will), Thomas Aquinas (the combination of Christian faith and reason, education as a path to knowing God), Alcuin, John Scotus Eriugena (who promoted education in monasteries and royal courts). Thus, medieval pedagogy had a sacred, conservative character, with its principal aim being the cultivation of obedient Christians and the preservation of a stable social order.

The tasks of higher education pedagogy in the contemporary world have undergone radical changes. In the National Doctrine of Education Development, it is

proclaimed that the goal of state policy is to create conditions for the development of personality and creative self-realization of each citizen of Ukraine. The main goal of higher education is made concrete in three directions:

1. First direction — creating conditions for individuals to master knowledge and skills in the professional sphere, acquire qualifications or requalify, enabling participation in socially useful labor according to their interests and abilities. At the same time, higher professional education may be viewed as a means of personal self-realization, since professional activity most fully reveals a person's abilities, and as a means of social self-protection, stability, and adaptation to market economy conditions.

2. Second direction — fostering socially active individuals who in their lives are guided by universal (honor, conscience, justice) and culturally national (diligence, freedom, tolerance, etc.) values and capable of creative professional activity, new production, economic, social relations, and able to take responsibility for the results of their actions.

3. Third direction — satisfying urgent and future production needs for qualified specialists whose level of preparation would meet the demands of scientific, technical, and social progress; professionals who are mobile, possessing broad professional and general educational competences.

Thus, the issue of the future specialist's higher education centers on ensuring their personal development. The directions named above define the principal tasks of higher education pedagogy. The main tasks of higher education pedagogy are:

1. Development of theoretical foundations of education: higher education pedagogy studies the patterns of learning and upbringing and formulates principles, methods, and approaches to educational activity.

2. Formation of personality: a central purpose of higher professional pedagogy is the comprehensive development of personality, cultivating moral, ethical, and intellectual qualities in future specialists.

3. Organization of the educational process: higher education pedagogy designs structures and models for organizing the learning process in institutions,

choosing teaching and upbringing methods according to students' age, psychological and sociocultural characteristics.

4. Training of pedagogical personnel: developing and improving systems for preparing instructors, mentors, and enhancing their professional competencies.

5. Analysis and evaluation of educational effectiveness: higher education pedagogy investigates learning and upbringing outcomes, assesses the effectiveness of various methods and forms of instruction.

6. Adaptation of education to modern conditions: higher education pedagogy continuously updates its approaches considering changes in society, scientific and technological progress, cultural traditions, and social demands.

In the modern era, didactics continues to evolve, adapting to changes in the higher education environment. New technologies, globalization, and societal changes demand constant adaptation and the development of new approaches to teaching. Current didactic research focuses on individualization of learning, integration of digital technologies, and development of students' critical thinking. Contemporary didactics is characterized by considerable evolution prompted by scientific and technological progress, societal changes, and the growth of pedagogical thought. In modern didactics, special attention is given to students' individual characteristics, their needs, abilities, and rates of learning. Personalized educational plans and approaches allow each learner to move along their own path. Instructors adapt tasks and methods to each student's level and learning style. This supports more effective assimilation of knowledge and development of abilities.

A hallmark of modern didactics is its emphasis on the competency-based approach. Contemporary didactics aims not only at transmitting knowledge but at developing not only professional but also transferrable competencies such as critical thinking, communication, collaboration, problem solving, digital literacy, etc. Learning is oriented toward preparing students for real life and professional activity. Competence development often occurs through integrated classes in which knowledge from different subjects is combined to solve concrete tasks. This allows students to see the connections between disciplines and real life applications.

The use of computers, the internet, mobile applications, interactive whiteboards, and other digital technologies has become an integral part of modern learning. ICT enables creation of interactive materials, delivery of distance learning, and increased accessibility of education. Models of learning based on Massive Open Online Courses (MOOCs) and educational platforms like Google Classroom or Moodle facilitate dissemination of knowledge and access to educational resources on a global scale.

Combining traditional (in-person) learning and online (distance) formats has become a popular approach, offering flexibility and adaptation to different conditions, including during pandemics or remote working environments. Students are engaged in designing and executing educational projects, allowing them to apply knowledge in practice, develop teamwork and independence.

At the current stage of social development, approaches to quality control in higher education have changed. Assessment has become more process-oriented and focused on supporting learning. Formative assessment implies continuous feedback, adjustment of the learning process, and helping students achieve better results.

Modern didactics orients teaching activity toward partnership and collaboration, assuming more horizontal relationships between instructors and students. The teacher acts not just as a source of knowledge but as a mentor who supports and fosters the student's development.

Thanks to globalization, students and lecturers have opportunities to participate in international exchange programs, cooperate with foreign universities, and access knowledge from all over the world. Contemporary didactics targets developing students' ability to understand and respect other cultures, which becomes an important skill in a globalized world. Another key feature is equal access to education. Modern didactics actively implements an inclusive approach, ensuring equal opportunities for all students, including those with special educational needs, aiding their adaptation and integration into the university environment.

Thus, modern didactics is multifaceted, flexible, oriented toward personality development, ensuring equal access to quality education, and preparing students for the challenges of the contemporary world.

The educational process in higher education should be seen as a system organizing learning, upbringing, and development of students in higher education institutions. It includes a set of actions and measures aimed at acquiring knowledge, forming professional skills and competences, and developing personality. Education as a process is dynamic and systematic, aimed at personal development, acquisition of knowledge, abilities, and skills. This process includes not only information transfer from instructor to student, but also active interaction, independent inquiry, and the practical application of knowledge.

This process is guided by both national higher education standards and individual institutions' educational programs, which allow preparation of highly qualified specialists.

Among the main components of the educational process one can distinguish academic activity, research activity, upbringing activity, practical training, and technological aspects. Let us consider each of these components as a dynamic part of the educational process:

- Academic activity involves organizing lectures, seminars, and practical sessions. Out-of-class work includes preparation for classes and independent work (essays, research, projects). A special form of academic activity is assessment (tests, exams, quizzes, etc.).

- Research activity is an integral component of modern higher education. It helps develop research skills, critical thinking, independent analysis, and synthesis of knowledge. Student research activities include preparation of coursework and theses based on scientific inquiry in their specialization; writing a master's thesis (in which a student deeply investigates a problem and proposes a novel solution); participation in scientific conferences (presenting research, publishing abstracts); publishing scientific articles (individually or in coauthorship with faculty); involvement in research clubs; developing projects or startups; applying for grants; conducting experimental research

in laboratories or field conditions. Research involvement increases professional preparation and broadens knowledge and skills essential for future scientists and specialists.

- Upbringing activity in the university focuses on cultivating moral and ethical values, social and civic engagement of students. Instructors and mentors, through courses, discussions, and real life examples, foster behavior norms, integrity, mutual respect, tolerance, and honesty. Students learn ethics, human rights, civic education, and may engage in community work, volunteer projects, charity actions, fostering empathy, social responsibility, and awareness of aiding others. Participation in student self-government develops leadership and management skills.

Patriotic education is fostered through events tied to national holidays, cultural traditions and history; involvement in projects preserving historical heritage, national identity, and fostering patriotic consciousness. Emphasis is placed also on healthy lifestyle formation via sports, clubs, marathons, training and lectures on healthy nutrition, physical activity, prevention of harmful habits, mental health support via counseling, stress and burnout mitigation.

Cultural and aesthetic education involves student engagement in cultural events: theatre, literary evenings, exhibitions, film screenings, concerts. Universities support creative student groups (choirs, theatrical studios, music bands), fostering creativity.

In a technogenic world, ecological consciousness is vital. Hence, universities conduct ecological campaigns, highlight environmental protection issues, promote sustainable resource use, involve students in greening and cleanup initiatives.

Universities provide psychological support: counseling and personal development trainings help students manage adaptation to academic life, stress, motivation, self-esteem. Institutions actively implement measures ensuring equal opportunities for all students, regardless of social, ethnic, physical characteristics, and inclusive education to integrate students with special needs.

Thus upbringing activity aims at holistic development of the student, helping them become responsible, engaged citizens and professionals capable of making ethical decisions in their future life and career.

Practical training is a vital component aimed at developing professional skills and competences required for future work in their field. It bridges theoretical knowledge with real professional conditions, allowing students to gain practical experience. Types of practical training vary: internships in enterprises, institutions, organizations matching their specialization, enabling direct application of theoretical knowledge to professional tasks. Industrial practice enables gaining valuable field experience. Pre-diploma (capstone) practice occurs near the end of study, often before the diploma defense, deepening knowledge in the chosen domain and preparing materials for the thesis. Students work on concrete tasks tied to their diploma project or research topic.

Within academic settings, students perform lab work, practical tasks, and projects in university or specialized labs, applying knowledge from lectures in sciences, engineering, medicine, informatics, etc. Educational projects and internships become increasingly common: students may execute real projects with companies, preparing business plans, engineering designs, social programs. Internships in companies or government agencies deepen skills and may lead to employment post-graduation.

Dual education (blended work and study) is also spreading: a model combining theoretical university instruction with practical work on site. Students work in enterprises while continuing studies. This approach lets students simultaneously gain knowledge and hands-on experience under real production conditions.

Students may engage in research or practical projects funded by universities or external bodies, helping them develop research competencies. In some fields (medicine, education, aviation) practical training may include simulation exercises, replicating real-world professional situations (e.g. patient treatment, flight control, conducting lessons).

Students may also independently work on real projects or create startups during study, applying knowledge in practice, gaining experience in business or client interaction. Thus practical training gives students real experience necessary for successful adaptation to modern labor markets and professional growth.

Among the fundamental elements of education as a dynamic process, the following must be considered:

1. Educational goals: defining what is to be achieved in learning — which competences, knowledge, and skills should be formed. Goals may be general (personality development) or specific (mastery of particular disciplines).
2. Content of education: the material covered in the process, including scientific knowledge, cultural values, moral and ethical norms.
3. Methods and forms of instruction: the approaches and means by which knowledge and skills are acquired — lectures, seminars, practical tasks, interactive methods, projects, etc.
4. Subjects of the educational process: instructors and students. Both actively interact: the student is an active participant who does not only receive knowledge but contributes to constructing it.
5. Educational outcomes: not only accumulation of knowledge, but the development of the student's personality — their thinking, creativity, capacity for critical analysis and self-development.
6. Feedback: a crucial element enabling evaluation of learning effectiveness: tests, assessments, discussions that allow instructor and student to appraise achieved outcomes.

In general, higher education as a process is characterized by continuity (education continues throughout life — lifelong learning, from early childhood to adulthood), social character (learning occurs in a social context and influences personal socialization), adaptivity (the educational process continuously changes under influence of scientific and technological progress and social needs), and cultural context (education helps transmit a society's cultural and moral values).

Thus, education as a process is multifaceted, not only providing knowledge transmission but facilitating holistic development of individuals and society.

One of today's strategic directions in higher education is the approach of teacher-researchers to higher education as both science and art. Higher education as a science is an interdisciplinary field that studies the higher education system from pedagogical, social, economic, psychological, managerial, and other perspectives. This science analyzes, develops, and refines principles, methods, forms, and structures of the educational process that ensure preparation of qualified specialists and growth of society's scientific potential.

The main research directions of higher education as a science are presented in Table 3.

Table 3.

Research direction"	Contents
Higher education pedagogy".	Research on effective teaching methods and organizational forms. Development of advanced pedagogical technologies, interactive teaching methods, curriculum design, and student assessment. Study of innovative approaches to learning, including the use of distance learning technologies and inclusive education.
Philosophy and theory of education".	Study of the essence, goals, and mission of higher education in the context of societal development. Analysis of ideas and concepts of higher education in terms of their impact on society, culture, and the economy. Examination of ethical issues in higher education, such as academic integrity, equal access to education, and university autonomy.
Sociology of education	Research on the social role of higher education and its impact on social mobility, economic growth, and culture. Analysis of the social structure of universities, interactions between students and faculty, and the formation of academic communities. Study of the influence of education on social processes, professional values, and the career strategies of graduates..
Economics of higher education".	Research on the financing of higher education, the role of the state and the private sector in organizing educational processes. Study of the impact of higher education on economic development, workforce training, and innovation. Analysis of the economic efficiency of educational programs, the cost of education, and its return on investment for society and individuals.
Psychology of education	Research on the psychological aspects of learning, such as student motivation, cognitive processes, and personal development. Study of students' adaptation to new learning conditions and the formation of professional identity. Development of psychological support programs for students and faculty.

Continuation of table 3

Education management"	Research on models and practices of management in higher education institutions. Study of the role of leadership in education, organization of educational processes, and university governance. Analysis of higher education development strategies at the national and international levels, especially in the context of globalization..
Internationalization and globalization of education"	Research on the impact of globalization processes on higher education, student and faculty mobility, and international university cooperation. Study of trends in the internationalization of higher education, including exchanges, dual degree programs, and English-taught programs.
Innovations in higher education	Development of new approaches to organizing learning, such as distance learning, blended learning, and the use of artificial intelligence and big data in educational processes. Study of the impact of technologies on the creation of educational content and communication between faculty and students.
Academic culture and ethics	Research on issues of academic integrity, plagiarism prevention, and the development of ethical standards in scientific and educational activities. Analysis of interactions between faculty and students, and the formation of academic traditions.
Assessment and quality control of higher education	Development of quality assessment systems, accreditation of educational programs and institutions. Research on the impact of various assessment methods on the effectiveness of the educational process.

Source: summarized by the author based on [1, 3, 6, 8]

Higher education as a science studies various aspects of the functioning of higher education institutions and educational systems in general, focusing on finding effective approaches to improving the quality of education and adapting it to modern challenges and societal needs.

Considering higher education as an art emphasizes that the learning process in higher education institutions is not only a rational transmission of knowledge but also a deeply creative process that involves intuition, inspiration, and an individual approach. It is the art of teaching that shapes not only professionals but also creative, free individuals capable of critical and creative thinking. This perspective views the educational process as a creative and individualized activity that goes beyond the technical aspects of learning and requires a creative approach to teaching, learning, and managing the educational process. In this context, higher education is seen not merely as a mechanical transfer of knowledge but as a process that demands intuition, inspiration, innovation, and a personalized approach.

Teaching in higher education requires educators to adapt to different types of students, approach material creatively, and use innovative teaching methods. Educators do not simply transfer knowledge but create a unique learning environment that inspires students toward creativity, critical thinking, and independent research. Teaching can be likened to artistic performance, where the educator improvises and adapts depending on the situation, making the learning process lively and engaging. Higher education promotes not only professional skills development but also the formation of aesthetic taste, cultural understanding, and values important for students in the modern world.

Students may study not only purely technical disciplines but also integrate cultural, artistic, and philosophical elements that help them gain a deeper understanding of the world. Coursework and thesis work can take on a creative character, where students freely experiment with new ideas and approaches.

The interaction between teachers and students is a special "art of communication," where it is important to find a balance between guidance and freedom. Educators act as mentors, helping students find their own path and voice in the professional environment. The educational environment is viewed as a space for dialogue, where new ideas, thoughts, and creative approaches to problem-solving are born.

Education as art involves an active role for students in creating their own educational experience. Students become co-authors of the learning process, taking responsibility for their development and striving for individual achievements. The learning process ceases to be one-sided: students do not passively receive knowledge but actively shape their own path by exploring new ideas and approaches.

Higher education as art requires intuition and the ability to consider the emotional state of students. Educators must understand the emotional and psychological needs of their students to help them overcome challenges and obstacles. Teaching can be not only a rational process but also one that engages emotions, inspiration, and intrinsic motivation. Like artists, educators often need to improvise and adapt to various situations. Depending on the student group or circumstances,

methods and approaches may change. Just as an artist adapts to changes in their work, educators constantly adjust the teaching process according to students' needs and current global events.

Innovative approaches to organizing learning, including the use of cutting-edge technologies such as virtual reality, interactive platforms, and artificial intelligence, can be regarded as the art of creating new forms of learning experiences.

Higher education is constantly transforming, opening new forms and methods that combine a creative approach with technological innovations.

Universities can be spaces where students experiment with their ideas, freely express themselves, and find new ways for self-expression in scientific and practical fields.

It is important that the educational process is not limited by formal requirements but creates opportunities for the development of students' unique talents and abilities.

The fundamental rules and guidelines that define an effective process of acquiring knowledge, skills, and competencies form the system of learning principles. They reflect the regularities of the learning process and help organize learning to be as productive as possible.

Changes occurring with societal development transform the system of learning principles. For example, in the Middle Ages, education was based on religious, philosophical, and authoritarian principles. Traditional principles at that time included theocentrism (God at the center), authority of tradition, scholasticism, Latin language, church monopoly on education, the seven liberal arts, mnemonics, and memorization. The principle of theocentrism defined serving God and the salvation of the soul as the primary goal of education. All knowledge was considered derived from divine revelation. The Bible and works of the Church Fathers were regarded as the main sources of knowledge.

According to the principle of authority of tradition, knowledge was perceived as immutable, passed down from ancient authors and church teachers. Great importance was given to authority figures — notably Aristotle, Augustine, and Thomas Aquinas. Students were not encouraged to engage in critical thinking.

The principle of scholasticism defined methodological approaches to education. The main teaching method in universities was based on combining logic (mainly Aristotelian) with theology. Education was conducted through disputations, syllogisms, and logical analysis.

Latin was recognized as the main language of education, science, and the church. All educational materials were written and taught in Latin. Knowledge of Latin was a mandatory requirement for access to higher education.

The principle of church monopoly on education was reflected in the fact that in the early Middle Ages, schools were organized in monasteries, cathedrals, and later universities. Secular education developed very slowly. The main teachers were monks and priests.

The principle of the seven liberal arts formed the basis of the curriculum: the trivium — grammar, rhetoric, dialectic (logic); the quadrivium — arithmetic, geometry, music, astronomy.

The principle of mnemonics and memorization reflects the essence of teaching methods. The primary method was rote learning. Repetition and declamation were the key to mastering the material.

Modern learning principles differ fundamentally from those mentioned above.

Adhering to learning principles is important as they ensure the effectiveness and quality of the educational process. Learning principles are fundamental rules or guidelines that help organize the learning process to promote the maximum development of students' knowledge, skills, and competencies.

The development of the personality of the future specialist can be considered the main task of higher education, which indicates the necessity of its humanization. Therefore, scholars particularly emphasize the principle of humanization of education as a foundational principle of higher education.

Classification of learning principles allows for a better understanding of which approaches can be applied at different stages of the educational process to ensure maximum learning efficiency. Various classifications can be combined depending on specific educational conditions, student levels, and learning objectives. There are

several approaches to classifying learning principles, each highlighting different aspects of educational activity. Below are the most common classifications of learning principles (Table 4).

Table 4

Classifications of Learning Principles

Classification feature	Principles of learning
<u>According to didactic requirements (traditional classification)</u> This classification is based on the requirements for organizing the learning process.	Principle of scientific approach: Learning should be based on modern scientific achievements. Principle of systematicity and consistency: Educational material should be presented in a sequential and systematic manner. Principle of accessibility: Material should correspond to the students' level of preparation and gradually become more complex. Principle of visibility: Use of visual methods and tools to facilitate understanding of the material. Principle of consciousness and activity: Learning should be conscious, and students should actively participate in the process. Principle of knowledge retention: Material should be retained for a long time through repetition and reinforcement. Principle of connecting theory with practice: Knowledge should be applicable in real-life or professional situations.
<u>According to the nature of the activities of the teacher and the student</u> This classification focuses on the activity and interaction between the teacher and the students.	Principle of activity: Students should actively participate in the learning process, ask questions, engage in discussions, and solve problems. Principle of independence: Students should be capable of working independently with the material, thinking critically, and drawing conclusions. Principle of encouragement and motivation: The teacher should motivate students to learn and create conditions for the development of intrinsic motivation. Principle of individualization of learning: Learning should take into account the personal needs, abilities, and interests of each student.
<u>According to the logic of the learning process</u> Principles that reflect the stages and organization of the learning process.	Principle of gradual complication: Start with simpler concepts and gradually move to more complex ones. Principle of repetition: Ensure regular repetition of learned material for reinforcement. Principle of knowledge integration: Combine knowledge from different subjects to provide a holistic understanding of the issues. Principle of problem-based learning: Present students with problematic questions to develop critical thinking..

Continuation of table 4

<u>According to the psychological aspects of learning</u> Classification of principles based on psychological and pedagogical research.	Principle of considering age and psychological characteristics: Methods and approaches should take into account the age-related, cognitive, and emotional characteristics of students. Principle of positive motivation: Teaching should stimulate students' interest and desire to learn. Principle of fostering motivation for learning activities: Emphasis on developing students' intrinsic motivation to learn. Principle of developing self-control and self-assessment: Students should be able to independently evaluate their achievements and monitor the learning process.
<u>According to the focus on content or form of learning</u> Principles that emphasize the content or organization of the learning material.	Principle of meaningfulness: The material should be meaningful, meet scientific standards, and be relevant. Principle of formalization: The learning process should be clearly structured, with its stages interconnected. Principle of coherence: Different topics and aspects of learning should be interconnected.
<u>Innovative principles of learning</u> This classification corresponds to modern approaches to learning in conditions of rapid changes and technological innovations	Principle of learning through practice: Learning should be oriented towards solving practical tasks. Principle of technology use: Active implementation of modern technologies to enhance the effectiveness of the learning process. Principle of learning through research: Involving students in scientific research and project work as part of the educational process. Principle of flexibility and adaptation: The learning process should be flexible to adapt to students' needs and contemporary challenges.

Source: summarized by the author based on [3, 7, 9].

Let us examine in more detail some of the above-mentioned principles of learning.

Principle of scientific approach: The principle of scientific approach means that the educational material should correspond to modern scientific knowledge and be relevant to contemporary science and practice. This is important to ensure high-quality education and to prepare students capable of working in conditions of rapid changes in science and technology.

Principle of systematicity: Knowledge should be presented logically, sequentially, and in connection with previous experience. The principle of systematicity implies a logical and consistent organization of educational material, allowing students to gradually build their knowledge and understanding of the subject.

Adhering to this principle helps students better absorb new information and avoid confusion and chaos.

Principle of activity:Students should actively participate in the learning process, independently seek answers, and solve problems. The principle of activity stimulates students to engage actively in learning, develop critical thinking, and solve problems independently. Active learning promotes better retention and understanding of material as well as the development of creative thinking and self-directed work skills.

Principle of consciousness and retention:Knowledge should be deeply and reliably assimilated so that it can be used in various life situations. The principle of consciousness emphasizes the importance of a conscious approach to learning, where students understand the goals and significance of the material they study. Adhering to this principle fosters the development of independent thinking and the ability to work autonomously, which is crucial for professional growth.

Principle of individualization:The learning process should take into account the individual characteristics, abilities, and learning pace of each student. The principle of individualization requires considering the personal traits of each student: their learning pace, preparation level, interests, and motivation. This allows adapting the learning process to meet the needs of each student, ensuring more effective knowledge acquisition and development of individual abilities.

Principle of accessibility:Educational material should correspond to the students' level of preparation and development. It is important that the material is accessible for understanding by students considering their preparation level. The material should not be too difficult or too easy. Following this principle ensures gradual complication of material, allowing students to progress from simple concepts to more complex ones.

Principle of visibility:The use of visual aids (diagrams, charts, images) facilitates better knowledge assimilation. The principle of visibility means using visual materials, examples, and demonstrations during learning. This helps students better understand abstract concepts and imagine how they work in practice. The use of diagrams, charts,

models, videos, etc., makes learning more comprehensible and accessible for students with different learning styles.

Principle of motivation: The learning process should support the student's intrinsic motivation for knowledge and development. The principle of motivation emphasizes the importance of stimulating students' internal desire to learn. Motivated students are more interested in learning and willing to put in more effort to achieve results. Motivation helps students not only acquire knowledge but also maintain interest in learning throughout the entire educational period.

These principles help create effective educational systems and teaching methods, providing optimal conditions for the development and self-realization of students.

1.5 Transformation of the Content of Education and Teaching Methods as Key Categories of Higher Education Pedagogy

The Content of Education is the totality of knowledge, skills, abilities, values, as well as ways of thinking and activities that a student must acquire during the learning process. It defines why and how to teach, and what is studied in higher education institutions.

The content of education constantly changes according to the demands of society. For comparison, let us consider the main features of the content of education in the Middle Ages. In the Middle Ages, the content of education was closely linked to religion, as well as to the needs of the church, the state, and feudal society. Education was based on the "seven liberal arts" (*septem artes liberales*), divided into two levels: the trivium and the quadrivium. The trivium (the initial level) included grammar (study of Latin); dialectic (logic) (basics of thinking and argumentation); rhetoric (the art of eloquence). The quadrivium (the higher level) involved the study of arithmetic (elementary mathematics), geometry (basic geometric knowledge), music (mainly music theory with a mathematical approach), and astronomy (mostly astrology based on ancient knowledge).

In modern understanding, the content of education reflects the following aspects: knowledge, skills and abilities, activity and thinking, value orientations. Knowledge is viewed from two perspectives:

1. Knowledge as a result of human cognitive activity, which includes the accumulation of information about the surrounding world, phenomena, events, processes, and patterns. Knowledge helps people understand reality and use this information to solve problems, make decisions, and improve their lives. Knowledge can be transmitted through education, experience, or media, and is an important part of the learning and development process of humanity.

2. Knowledge as a collection of information that a person acquires, accumulates, and uses to understand the surrounding world. It can result from personal experience, observation, learning, or research and forms the basis for further development and decision-making. Knowledge is a key element in the development of both the individual and society because it enables problem-solving, the creation of new technologies, and progress in various areas of life.

Both viewpoints do not exclude but complement each other. Knowledge can be conditionally divided into three types:

- Factual knowledge — specific data, facts, and information about the world (e.g., historical events, mathematical laws);
- Theoretical knowledge — systematized and generalized knowledge that explains connections between facts, principles, and patterns (e.g., theories in physics, sociology);
- Practical knowledge — skills and abilities necessary to perform certain actions or tasks (e.g., driving a car, playing musical instruments).

Skills and abilities characterize a person's capacity to perform certain actions.

- Ability is the capacity to perform specific tasks or actions based on acquired knowledge. Ability is developed through learning or practice and is based on understanding the principles and rules governing the activity. Examples of abilities include solving mathematical problems, creating technical drawings for an engineer,

or drafting technical plans. Abilities usually require cognitive effort and may involve analytical, creative, and other thinking processes.

- Skills are automated actions performed without constant conscious thought. Skills are formed through continuous practice and repetition. They generally require less conscious control and allow for quick and effective performance. For example, typing skills, driving a car, or playing a musical instrument. Skills often complement abilities — for instance, a person might have the ability to play chess (understanding rules and strategies) and the skill of quickly evaluating the situation and moving pieces. Thus, abilities imply conscious application of knowledge, while skills are automated actions performed with minimal cognitive effort. Both are related to practical actions and ways of applying knowledge.

The content of modern education also reflects activity and thinking, associated with the development of cognitive and creative abilities.

The content must reflect a connection to real life. Educational programs are often designed to address current societal tasks and challenges. They prepare students to solve real-world problems, stimulating analytical and critical thinking.

Modern educational content is aimed at forming competencies that meet societal and labor market demands. This includes professional skills (working with information, communication) as well as soft skills (collaboration, adaptability), requiring active engagement and critical thinking.

Many educational programs involve problem-based learning methods. Students are presented with real or simulated problems that require analytical thinking, creative solutions, and collaboration.

Student activity in the educational process increasingly includes interactive methods – group work, project activities, discussions. This stimulates not only active participation but also reflection on their own thinking and problem-solving approaches.

Curricula are more and more focused on developing critical thinking, which involves analyzing information, questioning ready-made solutions, and seeking alternative viewpoints.

Thus, the content of education not only reproduces activity and thinking but also actively shapes them, encouraging students' active participation in the learning process and the development of necessary competencies.

Value orientations play a key role in shaping the content of education, as they determine which ideas, beliefs, and principles should be conveyed through the educational process. Value orientations focus on moral education, civic and social values, cultural and ecological values, individual development and self-realization, inclusivity, and equality.

Therefore, the content of education often includes elements aimed at forming ethical norms and principles. This may be part of subjects like civic education, history, or literature, which emphasize moral dilemmas, values of honesty, justice, and equality.

Educational programs typically include aspects of civic responsibility, human rights, social justice, and tolerance. They aim to cultivate conscious citizens capable of actively participating in public life, respecting democratic principles, and upholding the rights of others.

Through education content, cultural traditions, language, historical heritage, and national identity are transmitted. This helps young people understand their place in the world and their belonging to a cultural community, fostering patriotism and respect for other cultures.

Increasing attention is given to forming ecological awareness in modern educational programs. Students are taught to responsibly treat natural resources, understand the importance of sustainable development, and protect the environment.

The content of education also reflects values of self-development, independent thinking, and responsibility for one's own life. Students are provided with tools to understand themselves, their strengths, and develop skills necessary to achieve personal and professional goals.

An important value is equal access to education and respect for diversity. This is reflected in programs supporting inclusive education, where all students, regardless of their abilities, have the right to quality education.

Thus, value orientations shape the content of education, giving it not only an informational but also an educational dimension, contributing to the development of a holistic, conscious, and responsible individual.

The content of education is regulated by state standards and curricula, which ensure uniformity of learning at all levels and serve as the basis for the creation of educational plans and textbooks.

Designing the content of education is the process of developing educational programs that ensure holistic and effective student learning. This process involves defining goals, content, methods, and means of teaching that meet the requirements of modern society and are aimed at forming key competencies. The algorithm for designing the content of education can be presented in the following stages: definition of learning objectives (General and specific educational goals are defined, reflecting the expected learning outcomes. These goals may be nationwide (at the level of national education standards) or determined by a particular educational institution.); analysis of the educational content (The selection of educational content is based on an analysis of current requirements in the educational field, taking into account scientific achievements, as well as the needs of society and students. The content must be relevant, practical, and correspond to the age and individual capabilities of the students.); selection and structuring of content (The selected content is structured according to levels of complexity, topics, or modules. It is important that the content is consistent and logically organized. The structure of the content includes: theoretical material (key concepts, principles, rules); practical tasks that promote skill development; and integrative elements (connections between different subjects).); orientation towards a competency-based approach (When designing the educational content, a competency-based approach is taken into account, according to which each subject or module should develop specific competencies. This enables students to apply their knowledge in real-life situations.); selection of teaching methods and forms (Forms and methods of teaching are tools that help implement the educational content in the learning process. The content defines which knowledge and skills need to be conveyed, while the forms and methods determine how to do this most effectively. The

success of learning and the development of the necessary competencies in students depend on the right combination of these elements.); assessment of learning outcomes (It is necessary to develop an assessment system that effectively measures the achieved learning outcomes. Assessment should be both formative (to monitor the mastery of the material) and summative (to determine the overall level of achievement). Forms of assessment include: testing; practical tasks; portfolios; oral responses and presentations.); implementation and adjustment of the content (After the content is developed, it is implemented in the educational process. Subsequently, based on the analysis of results and feedback from students and educators, adjustments and improvements to the educational program may be made.).

Let us summarize the most common approaches to shaping the content of education in university pedagogical practice, each of which is aimed at achieving certain educational process goals and personal development.

Traditional (Academic) Approach. This approach focuses on transmitting knowledge accumulated by previous generations and is oriented toward the academic development of students. Its main characteristics include: educational programs are based on classical disciplines (mathematics, natural sciences, humanities, etc.); the primary attention is given to the assimilation of scientific knowledge and facts; learning is based on textbooks, lectures, and classical sources.

Competency-Based Approach. The main goal of this approach is to develop competencies in students—that is, a set of knowledge, skills, and abilities necessary for life and work in modern society. Its distinguishing features include: education content oriented toward real practical tasks; important integration of knowledge from different disciplines; the learning process focuses on developing critical thinking, teamwork skills, problem-solving, etc. The essence of the competency-based approach to designing educational content lies in focusing on the formation of specific competencies needed for successful activity in contemporary society. The primary goal is not so much the transmission of knowledge as the development of students' skills, abilities, and personal qualities that allow them to apply knowledge in practice, solve real-life situations, and succeed in various fields. The key features of the competency-

based approach include: 1) results-oriented: emphasis is placed on achieving specific educational outcomes such as critical thinking, teamwork, and problem-solving, rather than merely the volume of knowledge acquired; 2) integrated knowledge: competency-based learning involves integrating knowledge from various disciplines to develop interdisciplinary competencies; 3) practical orientation: curricula are designed so that students can apply acquired knowledge and skills in real-life and professional contexts; 4) individualized learning: the approach takes into account the individual needs, abilities, and interests of each student, allowing different competencies to develop at different paces; 5) reflection and self-assessment: an important element is developing the ability for independent analysis of one's achievements, reflection on one's learning, and improvement of personal skills.

Thus, the competency-based approach to educational content design emphasizes preparing students for successful life and work through the development of key competencies, rather than merely acquiring theoretical knowledge.

Personality-Oriented Approach. This approach aims at developing the individual abilities and interests of students: educational content is formed considering students' individual needs and characteristics, learning is more flexible and varied, allowing adaptation of the program to the individual; students are involved in choosing subjects and forming educational trajectories. The essence of the personality-oriented approach in education is that the student's personality, with their individual needs, interests, abilities, and experience, is the central element of the learning process. This approach aims to develop the personality as a whole, independent, and self-sufficient individual capable of self-development and self-realization. The main aspects include: 1) individualized learning (the process is built considering each student's unique characteristics such as abilities, learning pace, cognitive style, preparation level, and personal interests; tasks may be adapted; different learning styles such as visual, auditory, kinesthetic are considered; each student can study material at their own level and pace); 2) development of independence and critical thinking (the approach fosters students' skills for independent thinking and decision-making; students are actively engaged, developing abilities to analyze, critically evaluate information, and solve

problems); 3) focus on student motivation and interests (one of the key goals is creating conditions for the development of intrinsic motivation; teachers consider student interests and offer tasks that stimulate a desire to learn, e.g., students may choose project or research topics according to their preferences); 4) teacher's role as mentor (the teacher is not just a source of knowledge but a mentor who helps the student acquire knowledge independently, develop their interests and abilities, supporting and guiding without imposing opinions); 5) humanization of the learning process (respect for the student's personality, rights to self-expression and self-development, creating a psychologically comfortable environment where each student feels valued, protected, and motivated); 6) development of life competencies (the approach helps students develop skills necessary for successful self-realization in life, including social skills, cooperation, responsibility, adaptability, and problem-solving); 7) consideration of the emotional sphere (attention to students' emotional state; the teacher supports positive self-esteem, helps overcome difficulties and conflicts, and stimulates emotional intelligence development); 8) alignment of learning with societal needs (since modern society demands adaptability, lifelong learning, and independence, this approach prepares students for these challenges by developing autonomy and flexibility in decision-making).

The personality-oriented approach places the student at the center of the educational process and aims to develop them as a unique individual. It creates conditions for individual development, encourages independence and responsibility, and supports motivation and interest in learning, contributing to successful knowledge acquisition and formation of necessary competencies for modern life.

Project-Based Approach. This approach is based on the concept of learning through project implementation: students study material by carrying out specific projects that require research, planning, and creative approaches; project activities develop independence, organizational skills, and responsibility. This approach ensures practical application of knowledge in real-life situations.

Systemic Approach. This approach views education as an integrated system where each component interacts with others. Educational content is formed based on a

systematic approach to organizing knowledge and skills, considering comprehensive personality development: intellectual, social, emotional, moral. The systemic approach allows educators to analyze and design educational processes considering their structure, component interactions, and external influences. The pedagogical system is regarded as a whole, where all elements (teachers, students, teaching methods, educational materials, organizational structure) are interconnected and influence one another. The educational process has a specific structure, distinguishing elements such as goals, content, methods, forms of organization, and learning subjects. Components interact closely, for example, changing teaching methods affects the effectiveness of achieving educational goals. The system is built around achieving pedagogical objectives like forming knowledge, skills, and competencies. An important condition is feedback mechanisms that allow correcting the process based on learning outcomes. The pedagogical system is not static; it continuously changes, adapting to new conditions, students' needs, and societal demands. The systemic approach helps optimize the learning process, increase its effectiveness, and ensure the all-round development of the student's personality.

Integrated Approach. This approach involves combining various disciplines and fields of knowledge to form a holistic view of the world. In integrated educational content, learning is based on the integration of knowledge from several areas such as natural sciences, social sciences, arts, etc. This organization helps students understand interconnections between different sciences and real-world phenomena. The integrated approach in pedagogy combines knowledge and methods from various subjects and fields to create a unified learning process. Its goal is to develop students' comprehensive understanding of real phenomena, promote systemic thinking, and the ability to apply knowledge in different life situations. This approach enables students to see links between different subjects and disciplines, improving their understanding of the world as a unified system. Lessons or curricula are built around interconnected topics and concepts from multiple subjects, e.g., combining natural sciences and mathematics, literature and history. This allows students to apply knowledge in various contexts. The integrated approach often uses real-life situations that require knowledge

from multiple fields to solve, fostering critical thinking and problem-based learning skills. Integration helps students analyze complex processes and phenomena from multiple perspectives, seeing cause-and-effect relationships. It supports adapting curricula to students' needs and current demands, using various methods such as project-based learning, group work, discussions, etc. Since integration builds learning around real student interests and needs, it increases motivation and supports deeper knowledge assimilation. It helps students not only acquire knowledge but also learn to think flexibly, apply knowledge practically, and solve problems comprehensively.

Ecological Approach. This approach aims to develop a responsible attitude toward the environment and ecological consciousness. Educational content based on this approach includes ecological aspects and focuses on fostering responsible citizenship, with learning centered on understanding the relationship between humans and nature. The ecological approach in higher education integrates ecological principles and sustainable development ideas into the learning process and upbringing. This prepares specialists aware of the need for harmonious interaction between humans and nature and capable of addressing modern ecological problems. Curricula include courses, subjects, and topics highlighting environmental issues, sustainable development, rational use of natural resources, and environmental protection. This enables students to acquire knowledge of current ecological challenges and methods for their resolution. The approach promotes responsible attitudes towards nature, awareness of ecological safety, and the necessity to preserve natural resources for future generations. Students are provided opportunities to participate in ecological projects, research, and volunteer programs where they can apply ecological knowledge practically, helping develop skills for solving real ecological problems. The ecological approach in higher education combines knowledge from various fields—biology, geography, economics, sociology, law, etc.—allowing students to view ecological problems holistically and seek solutions considering different aspects of human-nature interaction. Ecological ethics education is a vital component, teaching students not only scientific ecology basics but also ethical attitudes towards the environment, the importance of biodiversity and ecosystem preservation. Research activities in

universities also become “ecologized” — ecological and ecosystem process studies are conducted, innovative technologies developed to reduce environmental impact. A significant outcome of this approach is preparing specialists able to make professional decisions considering ecological consequences and work in conditions where ecological responsibility is key. Overall, the ecological approach fosters systemic thinking, critical analysis skills, and responsible attitudes towards nature, essential for solving modern global ecological problems.

Each of these approaches can be applied individually or in combination, depending on educational goals, students’ needs, and societal demands.

Thus, designing educational content is a dynamic process that takes into account contemporary requirements, individual student needs, and scientific-methodological approaches to teaching.

Modern approaches in education set directions for improving teaching methods in higher education. Opportunities for developing effective teaching methods and technologies in universities are rapidly increasing. Research by educators and psychologists has shown that knowledge and activity methods are assimilated at three levels: conscious perception and memorization; applying knowledge and activity methods by example or in similar situations; creative application. Since teaching methods have multiple characteristics, many classifications exist based on various criteria. Methods are classified by sources of transmission and the nature of information perception. According to these characteristics, verbal, visual, and practical methods are distinguished. Depending on the main didactic tasks realized at a specific stage, methods are divided into knowledge acquisition, skills formation, application of acquired knowledge, creative activity, reinforcement, and assessment of knowledge, skills, and abilities. According to the nature of students' cognitive activity in mastering educational content, explanatory-illustrative (information-receptive), reproductive, problem-based, partially exploratory or heuristic, and research methods are distinguished. A popular model combines knowledge sources, cognitive activity and independence levels of students, and the logical path of learning cognition. In the

2000s, a classification considering four aspects of methods—logical-content, source-based, procedural, and organizational-managerial—was proposed.

It is worth emphasizing that Ukrainian scholars actively use both traditional classifications and develop new ones considering humanistic, personality-oriented, and competency-based approaches. For example, today in Ukrainian pedagogy, classification by sources of knowledge transmission proposed by O.Y. Savchenko and S.U. Honcharenko is used. This approach focuses on means and channels of information transmission mentioned above: verbal methods—lecture, explanation, conversation, discussion, reading; visual methods—demonstration, illustration, observation; practical methods—exercises, laboratory work, practical classes, modeling. Classification by the degree of student independence was developed by O.I. Pometun and L.V. Pyrozhenko in the context of implementing the competency-based approach.

In general, across all classifications, it is possible to distinguish between traditional and innovative teaching methods. Among the traditional teaching methods, methods for organizing and conducting cognitive activities are identified.

Innovative methods include interactive methods—actively involving students in the learning process (discussions, projects, debates, role-playing games), personality-oriented methods—taking into account students' individual characteristics (individual assignments, differentiated learning), and others, which we will examine in more detail below.

To date, significant experience has been presented in the scientific literature regarding the improvement of teaching methods based on innovative approaches and information technologies. Therefore, we focus attention on only one method that contributes to increasing motivation, develops students' thinking, and effectively forms professional competence. One such method today is considered business games. The essence of gamification in education lies in the use of game elements, mechanics, and thinking in the learning process with the goal of increasing motivation, engaging students, and improving learning outcomes.

The history of introducing business games into the higher education process is an example of the evolution of educational methods from passive knowledge acquisition to active, practice-oriented learning. Several key stages can be identified in the gamification of education. The United States were pioneers in using business games in business education. In 1956, the first officially documented business game was developed: "Top Management Decision Simulation" at Harvard Business School [8]. The purpose of the game was to simulate business decision-making processes for students in management specialties. This game modeled company operations, where participants acted as managers and had to make decisions regarding finance, marketing, production, and so on.

From 1960 to 1970, business games spread in Europe. European universities began adapting American models of business games. In Germany, France, and the United Kingdom, business games became part of MBA programs. The main emphasis when using business games in European universities was on simulation learning and the development of managerial thinking.

In the 1990s, with the collapse of the USSR and the transition to a market economy, business games also began to be actively introduced in business education in Ukraine and other post-Soviet countries. Economic, management, and marketing simulations appeared in universities. Role-playing games, case studies, and situational modeling became widespread.

The modern stage (2000s–2020s) is characterized by the introduction of digital business games, simulators, and online platforms (for example, Capsim, Marketplace, Business Strategy Game). The development of gamification in learning progresses toward using game elements in non-game environments. Today, the goals of using business games in higher education are connected with the development of practical skills (management, analysis, teamwork), decision-making training under uncertainty, formation of leadership qualities and soft skills, and integration of knowledge from various disciplines into a coherent system.

It is no coincidence that leading universities worldwide actively use business games in the educational process. For instance, students at Grenoble School of

Management (France) participate in the Cesim Global Challenge business simulation for four days [12]. The game allows students to understand the interaction of different functions (marketing, HR, finance, ethics, etc.) and realize the impact of their decisions on the overall results of the company.

In Finnish universities, particularly Saimaa University of Applied Sciences, the Cesim business simulation suite (Global Challenge, SimFirm, Hospitality, etc.) is used over 8–10 weeks [12]. Instructors encourage students to develop strategies, conduct competitive analysis, and keep learning journals. International team competitions with German and Dutch universities have also been implemented.

Another example is Aarhus University (Denmark). Within its entrepreneurship program, several specialized games have been developed: LeapInTime (intellectual property), Savvygoat (team interaction), and ESHIP: Navigating Uncertainty (decision-making under uncertainty) [12]. Results showed a positive effect on the entrepreneurial mindset of future specialists. Analysis of scientific works indicates that most business games model management processes, business analysis, and strategic decision-making. However, we emphasize that currently few business games are developed in universities for students in engineering and technological specialties aimed at forming professional competence related to the engineering and technological components of the specialist's profile.

Today, there are almost no proposals for business games for students in technological fields such as food processing or mechanical engineering. There is also a lack of research on the implementation of business games in the general technical training process, particularly in graphic preparation of future engineering specialists. Therefore, we consider it appropriate to present research results on the development of business games for students studying Food Technology (G13) and Mechanical Engineering (G11) specialties during the study of engineering and computer graphics. Understanding technical documentation is an important part of the professional activity of engineers and technologists. Specialists must be able to navigate technical drawings of equipment, structures, technological lines, etc. Without adequate graphic training, this is impossible since technical documentation is the language of technology. In

scientific and engineering work, it is important to be able to visually present research results in the form of diagrams, charts, and graphs. This allows better understanding, analysis, and discussion of results, as well as presenting projects to investors, farmers, or government bodies. Thus, graphic training is not merely an auxiliary discipline but a necessary component in forming the professional competence of future agricultural specialists. It enables graduates of agricultural universities to be competitive, modern specialists capable of adapting to digital transformations in agriculture. Therefore, studying graphic disciplines is an important prerequisite for a successful career in the agricultural field.

Among the potential opportunities of business games in education that define the goals of their implementation, we highlight the following: development of analytical and strategic thinking; formation of management, planning, negotiation skills; training in teamwork and leadership; actualization and consolidation of knowledge in real or simulated contexts. When developing a business game, it is important to focus on student engagement and motivation, the possibility of safe experimentation, development of soft skills, and practical knowledge testing. We emphasize the need to consider the age and professional characteristics of first-year students. A business game should not only be a teaching method but also a source of motivation to seek new knowledge. Therefore, when developing business games for first-year students, several features related to their age, psychological-pedagogical, and professional aspects should be taken into account. We will explain the essence of these features.

First-year students usually do not yet have deep technical knowledge. Therefore, the business game should be based on basic knowledge (physics, mathematics, computer science). The focus shifts not to the formation of specific professional skills but to the development of general engineering competencies (logic, analytical thinking, teamwork skills, etc.). Thus, it is advisable to avoid overly specialized terminology or provide explanations for them. In the first year, students are still forming their understanding of the future profession. Therefore, the business game should be interesting, interactive, and dynamic, include gamification elements (competition, rewards, storyline), and demonstrate the practical significance of engineering activities

in real life. For first-year students, the development of soft skills is critically important. While professionally relevant, they help students adapt faster to the university environment. Primarily, implementing business games in the first year will promote the development of interpersonal communication, critical thinking, and teamwork skills. Therefore, the business game should involve teamwork; tasks should stimulate communication, role distribution, and leadership. Introducing role-playing (e.g., developer, client, project manager) is also important.

Scientific literature provides in-depth research into the psychological and pedagogical characteristics of first-year students that affect the design of business games, as understanding these characteristics is key to their effective organization.

Firstly, first-year students face adaptation difficulties. They must adjust to a new learning format that differs from school—greater independence, responsibility, and the need to plan their own time. However, not all have well-developed self-organization skills, which often causes stress or lower performance. Additionally, emotional instability is observed at this stage. Many students experience socialization difficulties, feel lonely or insecure. It is important for them to feel support, acceptance, and understanding both from teachers and peers. Therefore, a favorable psychological climate in the learning group plays an extremely important role. Equally important is learning motivation, which often lacks deep professional grounding. Some students exhibit extrinsic motivation—a desire to get a diploma, avoid criticism, or achieve social status. The teacher's task is to help students see the practical value of knowledge, engage them, and form intrinsic motivation for professional growth. It is also important to consider the heterogeneity of students' preparation levels. Some already have a solid knowledge base; others need more time to assimilate the material. The teacher's task is to create conditions where everyone can develop according to their level.

A business game allows simulating elements of professional activity with a high level of interactivity. The success of such a game depends not only on its content, structure, and organizational aspects but also on the students' readiness. Thus, preparation plays a crucial role in achieving the educational goals of the business game. During preparation, students do not simply complete tasks but delve into the topic,

study the context, analyze roles, and consider possible scenarios. This forms deeper subject understanding and develops analytical thinking, which is extremely valuable in professional activities, especially for future engineers or technical specialists. Moreover, independent preparation activates self-organization skills, which are key in higher education. Students learn to plan their time, prioritize, and work with information. Such skills directly affect not only the quality of participation in the business game but also overall academic success. It is also worth noting that independent preparation increases personal responsibility for the result. In a business game, there are no “right” answers, but there are consequences of decisions. A prepared student does not act randomly—they argue, propose, analyze, making the game not only interesting but also effective educationally. Preparation for the business game also has a motivational effect. When a student understands the topic, they are interested in participating, defending their position, and seeking unconventional solutions. This creates positive group dynamics, strengthens team interaction, and thus forms valuable collective work experience. Consequently, the business game ceases to be just a “training exercise” and becomes a real simulator of professional thinking. But for this, an active student stance is needed, which begins with conscious, purposeful self-preparation. Independent preparation is a necessary condition for effective participation in the business game. It allows students not just to “play roles” but to feel like participants in a real decision-making process, laying the foundation for future professional success.

The effectiveness of business games largely depends on clear methodological organization. Thoughtful methodological support allows implementing not only didactic but also educational and developmental functions of the business game. The first methodological aspect concerns the targeted design of the game. It is important that the business game has a clearly formulated goal aligned with the educational outcomes of the discipline. The goal should encompass both the formation of professional competencies (e.g., the ability to analyze, make decisions, apply knowledge in practice) and the development of soft skills (communication, teamwork, leadership). The second important element is the scenario, which should logically

reflect the stages of a real production or management process. It should anticipate the distribution of roles, the specification of tasks for each participant, the conditions of the problem situation, timeframes, success criteria, and so on. At the same time, the scenario must be open to variability so that students have space for initiative and unconventional solutions. The third aspect is the role of the instructor in conducting the business game. The instructor acts not only as an organizer but also as a facilitator, moderator, and observer. They create conditions for the independent activity of students, direct their attention to key points, stimulate reflection, and analyze the process and results.

The next methodological component is the stage of preparing students. It includes familiarizing them with the game topic, rules, tasks, and theoretical background. At this stage, it is advisable to use instructional materials, reference notes, videos, or simulation models. It is also important to provide effective forms of assessment for the game results. This can be traditional evaluation (considering task completion and correctness of decisions) as well as self-assessment, peer assessment, and evaluation of teamwork. All this contributes to increasing participants' responsibility and forming a reflective stance.

The final methodological step is the stage of analysis and discussion. It allows consolidating the acquired knowledge and experience, comparing it with real situations, discussing mistakes made, and forming generalizations and conclusions.

Only by adhering to the above methodological principles does the business game become an effective tool for the professional training of future specialists.

For first-year students studying the course “Engineering and Computer Graphics” during the first semester, we propose two games: an educational game and a simulation game. The goal of the educational game, conducted in the middle of the semester, is aimed at developing communication skills, teamwork, and so on. The second game is held at the end of studying engineering and computer graphics. This game has a simulation character and allows introducing certain elements of professional orientation to the studied discipline.

The first educational game, "Interview in a Circle," involves participants taking turns interviewing each other. The essence of the interview is to ask and answer questions related to specific topics in engineering and computer graphics. However, a well-formed question should contain an element of problematization, a need for an answer based on the use of graphic images, performing graphic constructions, and so forth. During such "interviewing," active listening skills, the ability to ask questions, and clarify information are practiced. As a result, knowledge in engineering and computer graphics deepens, while interpersonal communication skills are simultaneously improved. The evaluation of such a game should be soft, motivational, and at the same time structured so that students understand which skills they are training. When assessing, special attention is paid to the quality of the questions. Questions should not anticipate a direct answer in the form of definitions of terms. The discussion aspect, dialogue management, and so on are highly valued.

The main criteria for evaluating the game "Interview in a Circle" that we propose are: quality of questions (whether the questions were open-ended, relevant, stimulated storytelling); active listening (the participant listened attentively, did not interrupt, reacted with facial expressions, clarified); consistency and logical coherence of speech (statements were clear, logically constructed); communicative politeness (showing respect to the interlocutor, friendliness, appropriate tone); reflection / feedback (the participant was able to briefly retell/summarize what they learned).

The correctness of participants' answers and statements is also taken into account. Regarding quantitative assessment, points are distributed according to the grading scale of the course syllabus and can be adjusted by the instructor. However, participation in the discussion of the business game results by all participants is considered important. It is advisable to use self-reflection questions: What did I do well? What was difficult? What do I want to try next time? If there are many students, interviews can be conducted in pairs, changing partners every 5 minutes. At the end, a general discussion should be held: "What new things did I learn about others?" "Which questions worked best?" Given the significant lack of instructional time, the game

duration is accepted to be 15–30 minutes, followed by a discussion lasting up to 20 minutes.

For first-year students in the first semester, other educational games aimed at developing soft skills can also be used. For example: the educational role-playing game “Negotiations” (goal: to teach participants negotiation skills, argumentation, and reaching compromises); the educational game “Press Conference” (goal: to improve public speaking, the ability to answer unexpected questions); the educational game “Problem Discussion” (case study) (goal: to learn how to argue opinions and conduct discussions).

The author’s simulation business game “Project: Technological Process of Hard Cheese Production,” held at the end of studying “Engineering and Computer Graphics,” has a professional orientation and is developed for first-year (bachelor's level) students majoring in Food Technology, specialty G13, under the field of knowledge G Engineering, Manufacturing, and Construction, qualification: Bachelor in Food Technology. The essence of the game is that students work with design documentation related to the process of hard cheese production, specifically the technological scheme. The scheme is accompanied by a process description and a list of equipment used during the process.

For example, technical equipment for hard cheese production includes:

- Milk tank (for receiving, storing, and transporting milk, equipped with cooling and aeration systems);
- Pasteurization unit (for heating milk to a certain temperature to destroy harmful microorganisms; usually plate or tubular pasteurizers);
- Fermentation tanks (made of stainless steel, equipped with temperature control systems, designed for adding starter cultures and fermenting milk);
- Rennet apparatus (for adding and evenly distributing rennet enzyme in the milk);
- Knives or grids for cutting the curd (mechanical or automated devices for dividing the curd into small pieces);

- Stirrers or mixers (for gently stirring the cheese grains during heating and whey separation);
- Cheese presses (hydraulic or mechanical presses for compacting the cheese and removing whey, which may have adjustable pressure and programmable control);
- Cheese molds (of various sizes and shapes, usually made of stainless steel or food-grade plastic);
- Brine baths or salting chambers (containers for immersing cheese in brine, equipped with temperature control systems);
- Ripening chambers (with temperature and humidity control, may have ventilation and humidification systems);
- Packaging equipment (for vacuum packaging or wrapping cheese in food film).

The production of hard cheese is a complex biotechnological process that includes several sequential stages. The main raw material is cow, goat, or sheep milk. Fermentation, pressing, and ripening are crucial in hard cheese technology. Since first-year students have insufficient knowledge about these processes, various additional information is provided to facilitate project work. However, the technological scheme contains some inaccuracies and intentional errors: violations in the design documentation format, omitted equipment, liquids in some pipelines not corresponding to the technological process flow, etc. The project team needs to identify errors and correct them in the electronic version (the technological scheme is given to students in a graphic editor). After corrections, a mandatory discussion of the project and justification of the corrections is held. Students are encouraged to actively discuss by receiving additional points.

For first-year (bachelor's level) students majoring in Mechanical Engineering, specialty G11, field of knowledge G Engineering, Manufacturing, and Construction (qualification: Bachelor in Mechanical Engineering), we propose the game "Design Bureau." The goal of this game is to reinforce knowledge of the basics of engineering

graphics and 3D modeling, develop skills in working with CAD systems, and form skills of team interaction, task distribution, critical thinking, and decision-making.

It is worth focusing on the methodological aspects of designing business games. Designing business games is not only a creative process but also a methodically justified pedagogical activity that should be based on the learning objectives, age and professional characteristics of participants, as well as the logic of competency development. Methodological design of business games begins with a clear definition of the goal, which must correspond to the educational outcomes of the academic discipline. The main objectives of business games can be identified as: the formation of professional-communicative competence; the development of critical thinking skills, analysis, and decision-making; improvement of teamwork and leadership qualities; and the practical testing of theoretical knowledge.

The decision to conduct a business game is made by the instructor based on the analysis of the target audience. The psychological characteristics of first-year students influence the choice of game type, the complexity of tasks, and the pace of information delivery. Such characteristics of the target audience include the age of students (mainly 17–19 years for freshmen), low level of professional experience, a preference for technical thinking over humanitarian (for students specializing in engineering and technology fields), and the need for clear, structured instructions. Depending on the learning objective, the type of game is specified (role-playing game, simulation game, case study, organizational-activity game).

The next stage of designing a business game is determining its structure. It is advisable to adhere to three mandatory stages, which are thoroughly described in scientific pedagogical literature. At the preparatory stage, participants are explained the purpose of the game, the rules, and roles are distributed. The main (game) stage involves direct interaction among participants, solving tasks, modeling situations, and making decisions either as a team or individually. At the final (reflective) stage, actions are analyzed, solution options discussed, results summarized, and feedback actualized.

Special attention is paid to the development of methodological materials. Mandatory materials include: a scenario describing the situation; instructions for

participants (separately for each role); evaluation materials (criteria, questionnaires, self-assessment forms); and recommendations for the facilitator/instructor. Undoubtedly, the instructor plays a leading role in conducting a business game, acting not only as an organizer but also as a moderator (maintaining the game's pace), consultant (providing advice as needed), observer (recording student behavior for further analysis), and expert (helping to reflect on mistakes and achievements).

Determining the number of games to be conducted during the semester is also important. However, quality and integration of the game into the learning objectives are more important than quantity. Sometimes one well-conducted game yields more benefits than several formal ones. In our view, the number of business games per semester depends on the course goals, study load, semester duration, game format (short or full simulation), number of students, and the time available for preparation and execution. Our experience shows that two games per semester are appropriate for first-year students. Simultaneously, it is important that business games harmoniously and systematically fit into the educational process. Therefore, before conducting business games, methodological techniques and educational technologies should be used to prepare students adequately.

To evaluate the effectiveness of the proposed business games, a formative pedagogical experiment was conducted with first-year students at Vinnytsia National Agrarian University specializing in G13 Food Technologies and G11 Mechanical Engineering. A total of 94 students participated. Students in G13 Food Technologies participated in two business games during the semester: the educational diagnostic-developmental game "Round Robin Interview" and the simulation game "Project: Technological Process of Hard Cheese Production." Students in G11 Mechanical Engineering also participated in two business games: the educational diagnostic-developmental game "Round Robin Interview" and the simulation game "Design Bureau Project." Positive results were observed in both control groups and are presented collectively.

A questionnaire was used to evaluate the results of the business games, consisting of blocks: self-assessment, assessment of game organization, feedback on

the educational effect, and open-ended questions. The self-assessment block included statements such as: I was an active participant in the game; I understood the purpose of the game and my role; I worked effectively in a team; the game helped me better understand the topic/material; I acquired new knowledge or skills; I showed initiative during the game; I felt motivated to participate. The response options were “yes” or “no.”

The formation of learning outcomes and competencies was assessed through statements such as: I learned to work better in a team; the game contributed to the development of analytical thinking; the game helped me better navigate professional situations; I feel more confident in decision-making; I can apply the acquired knowledge in practice.

Observations during the exam session also confirmed the positive impact of the implemented business games on the level of graphic skills. The grades according to the ECTS scale in the control groups increased: grade “A” by 12%, “B” by 14%, and “C” by 15%. The grades of students in the control groups in the 2024–2025 academic year were compared with those of students in the 2023–2024 academic year. The equalization of control and experimental groups by the level of prior knowledge was verified and maintained through a diagnostic experiment.

Thus, business games in education represent a pathway from modeling management processes to modern digital simulations that develop the key competencies of the 21st century.

Conclusion. In modern society, the value of education lies in its ability to shape competent, responsible, and critically thinking individuals capable of effective action amid rapid technological changes and a vast flow of information. Digital education significantly expands access to knowledge for various social groups regardless of residence, physical capabilities, or social status.

The digital society requires everyone to possess skills in using digital technologies: critical perception of information; basics of cybersecurity; ethical use of technologies; and formation of new competencies. Modern education should focus not only on knowledge but also on the development of soft skills and metacompetencies

such as teamwork and communication, creativity, adaptability, innovative thinking, self-organization, and lifelong learning. Digital tools allow for adapting the educational process to the individual needs of students.

Education in the digital society must cultivate a value-based attitude towards intellectual property, personal data privacy, and combating misinformation and fake news. The essence of digital society lies in the transformation of all spheres of human life—economy, education, culture, communication, governance, etc.—under the influence of digital technologies. This is a society where information is the key resource, and digital infrastructure is the foundation of functioning.

In the 21st century, higher education undergoes profound transformations driven by globalization, digitalization, the development of artificial intelligence, and changing labor market needs. These changes require rethinking the role of universities, the content of educational programs, and forms and methods of teaching. Digital technologies, including online courses, virtual laboratories, and distance learning platforms, are transforming the traditional university model. They make education more accessible but also require new approaches to quality and pedagogical skill.

Emerging trends in higher education include: shifting from teaching to facilitation; emphasizing competency formation rather than mere knowledge transfer; fostering critical thinking, creativity, and interdisciplinarity; and integrating soft skills into curricula.

Artificial intelligence is changing not only the content of education but also the process itself through adaptive learning platforms, automated assessment, and personalized learning. New ethical dilemmas regarding authorship, plagiarism, and responsibility are becoming increasingly relevant.

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