# Development of Higher Education of the XXI Century in the World Context in the Face of Global Challenges

Nataliia Hrechanyk[1,*], Oksana Vasiuk[1], Lesya Matsenko[1], Nataliia Folomieieva[2], Oleksii Koriakin[2] & Svitlana Vyhovska[1]

[1]National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine

[2]Sumy State Pedagogical University named after A.S. Makarenko, Sumy, Ukraine

*Correspondence: Nataliia Hrechanyk, Doctor of Pedagogical Sciences, Professor of Department of Management and Educational Technology National University of Life and Environmental Sciences of Ukraine, Heroes of Defense15, Kyiv 03041, Ukraine. E-mail: grechanikn@nudip.edu.ua ORCID: https://orcid.org/0000-0003-3300-3198

## Abstract

The article is devoted to the problem of higher education development in the twenty-first century in the context of global challenges. Since the scientific research did not include an empirical component, theoretical methods of scientific knowledge (analysis, synthesis, abstraction, etc.) became additional components of the methodological toolkit, and the analysis of relevant scientific publications on educational issues for the period of 2019-2023 was taken as a basis. For convenience, the materials were systematized according to the relevant topics: development and implementation of innovative methodology in the educational process; opportunities for integrating digital technologies into education, digitalization; stakeholder requirements for the personality of a specialist and their implementation in the educational process; problems and prospects for the development of the educational sector; transformation of higher education in Ukraine under the influence of a full-scale war. The purpose of the article was to analyze certain aspects of the development of higher education in the twenty-first century. The analysis of publications allowed us to identify visions of ways to solve educational problems and modernize higher education. Particular attention was paid to the peculiarities of the organization of higher education in Ukraine during the war and the factors that will stimulate/hinder the development of post-war Ukrainian higher education. The generalization of information obtained from relevant scientific sources made it possible to model the process of transformation of higher education today, to identify global factors, to point out the incentives and the path of development that the educational sector is currently moving along. The novelty of the proposed research lies in the attempt to systematize existing scientific studies and build a holistic vision of the transformation processes in higher education. The article is aimed at educators, students, educational reformers, and researchers and aims to draw attention to the importance of educational issues.

**Keywords:** globalization, higher education, transformation, ChatGPT, distance learning, soft skills

## 1. Introduction

### 1.1 Introduce the Problem

It is difficult to overestimate the importance of the educational segment of social existence for the effective development of any country. As a repeater of macro- and micro-processes taking place in the historical, political, and economic spheres, it prepares and accumulates resources for the future successful existence of society. At the same time, effective education is impossible without favorable economic, political, cultural, and historical conditions. This is the essence of its dual nature.

It is safe to say that the modern world is characterized by cultural, economic, and, of course, educational integration. Among the factors that have determined it are, in particular, the change in political narratives and focus on international cooperation; the creation of favorable economic platforms for free trade; democratic processes in most countries of the world, which have provided free access to multi-vector information; the development of innovative

technologies, etc. This, in turn, has put a number of systems in need of unification - the creation and adoption of generally accepted, majority-agreed-upon norms and rules of international interaction. Here we are talking about globalization processes that could not but affect the education sector.

It is worth noting that metamorphosis and innovation are a permanent phenomenon in the education sector. For example, higher education institutions, starting to provide educational services today, must be forward-thinking and train specialists who can confidently realize their professional potential in the future. Therefore, the education system should be flexible enough and sensitive to global and local processes. This has been further confirmed by the events of recent years when the world faced the COVID-19 pandemic, which paralyzed all spheres of life for a certain period of time, and what seemed to be a local conflict, but was, in fact, a full-scale war in Ukraine. This has become a litmus test of the effectiveness and viability of modern globalization, which is inherent in almost all spheres of human existence. These and a number of other arguments, which will be developed later, actualize the study of the problem of higher education development in the context of global challenges.

The purpose of the research paper is to analyze the transformation processes in higher education determined by the global challenges of the twenty-first century.

To solve this problem, the following research architecture was defined:

- – analysis and systematization of the research source base;
- – analyze the impact of the war in Ukraine on the educational segment;
- – to form a dynamic model of higher education transformation;
- – to provide practical recommendations for the modernization of the higher education system.

*1.2 Literature Review*

Analyzing the source base of the problem described in the proposed study, we can confidently say that the scientific heritage that reveals certain aspects of educational topics is quite multifaceted. Since the educational sphere is mobile and open to innovation, and the need to adapt to new conditions and transformations is permanent, the reflection of the segment of scientific research is quite natural.

1.2.1 Scientific Research on the Effectiveness of Implementing Innovative Teaching Methods

The lion's share of scientific publications is devoted to the problem of developing and implementing innovative teaching methods, assessing their relevance and possibilities for further implementation. For example, a study by Lucenko, Hrechanyk, Gavrilenko & Lutsenko showed the effectiveness of the project method in working with younger students compared to traditional methodological approaches to teaching (Lucenko, Hrechanyk, Gavrilenko & Lutsenko, 2022). A study on film pedagogy is also noteworthy. In particular, the authors summarize that the use of thematic films in the educational process can stimulate students' involvement in the educational process, motivate, and develop leadership skills (Kankal, Patra, & Panda, 2023). The positive results of using an online video game, in particular EVE Online, to develop soft skills are confirmed by the results of a study by Pagel, Söbke, and Bröker (2021). Tsekhmister (2022) and Sikora, Skorobahatska, Lykhodieieva, Maksymenko, and Tsekhmister (2023), focus on the need to rethink the educational paradigm in the digital environment. The effectiveness of online learning focused on solving problems related to information retrieval skills was confirmed in the study by Argelagós, Garcia, Privado, and Wopereis (2022). The issue of correlation of the digital competence with successful self-realisation and socialisation of the individual, as well as the factors that directly affect digital competence, is highlighted in the study by Saienko, Kurysh, and Siliutina (2022).

1.2.2 Research on the Impact of the COVID-19 Pandemic on Education

Since the cornerstone of the proposed study is the correlation between the development of higher education and global challenges, it is appropriate to analyze the phenomenon that has swept the entire planet, COVID-19. And although the World Health Organization has noted that the greatest danger from it has now passed ("Coronavirus disease" 2023), the long lockdown with all the restrictive measures announced at the time has become a powerful trigger for irreversible changes in both the private and public spheres of human life.

The metamorphosis in the education sector, including higher education, can be traced most clearly. Therefore, an overview of publications on this topic will be useful. According to Karakose (2021), the pandemic cannot be assessed as an exclusively negative phenomenon, its nature is dual, because it has simultaneously revealed the most problematic aspects of the modern educational process and opened up new opportunities for educational transformation. The thesis "the crisis brings with it many opportunities" was also supported by Rak-Młynarska

(2022). The researcher notes that if earlier the process of active digitalization could have been declarative, sometimes populist, because educators did not want to completely abandon traditional tools and work with sometimes inconvenient technologies, it was the total lockdown that reformatted the basic vectors of their direct professional activity; it forced them to look for new alternatives not only in the field of theoretical research but also in the emotional plane (Rak-Młynarska, 2022). Naturally, the period of adaptation to the new realities was not easy. Thus, among the problems faced by participants in the educational process were difficulties related to the use of digital technologies and an increase in the learning load compared to face-to-face learning (Aristovnik, Keržič, Ravšelj, Tomaževič, & Umek, 2020).

Looking at the COVID-19 problem in retrospect, it is worth referring to the work of Daniel (2020). Along with the basic need for asynchronous learning through digital technologies, the author draws attention to the need for communication with students, students, and their parents. Its purpose was to reduce the psycho-emotional tension caused by a stressful situation and to reorganize them into new formats of interaction (Daniel, 2020).

1.2.3 War in Ukraine and Education in the Focus of Scientific Research

A full-scale war was another powerful trigger for both the world and Ukraine, first of all. This was immediately reflected in scientific research. Galynska and Bilous (2022) focused on covering a phenomenon that has been studied repeatedly - distance learning - in an atypical setting: wartime. And, despite the difficulties in its implementation related to the war, it is currently the most effective form of intraction between student and teacher, which does not allow higher education to be driven into a state of stagnation (Galynska & Bilous, 2022). This thesis is also supported by Ivanchenko, Lurie, and Melnikova (2023). Not only the current situation, but also a historical retrospective of higher education in Ukraine since 2014 is described by Antoniuk (2023). The author notes that despite the destruction of the educational infrastructure, the transformation of higher education is taking place by leaps and bounds. International support and proven methods of distance learning play an important role in this process (Antoniuk, 2023). Along with the analysis of the current situation, cautious forecasts for the post-war period in Ukraine are described by Safonov and Fliarkovska (2023). The authors note that the key to successful dual education is: stable funding, close international relations, development of alternative forms of education, support for pupils/students through appropriate social programs, and an adequate level of security for all participants in the educational process (Safonov & Fiarkovska, 2023).

A brief review of the above-mentioned scientific sources has shown that educational topics are diverse and topical in academic circles. Usually, studies are highly specialized and cover only a single side of the problem. The novelty of the proposed study lies in the accumulation of theoretical developments that reveal the problem of global and local challenges of higher education, establishing correlations and identifying the basic determinants of existing problems. As a result, the data obtained will help to form a holistic vision of the problems existing in the higher education sector in order to effectively address them and prevent future risks.

This article is an overview. The practical implications are primarily focused on drawing attention to the pressing problems of higher education and the promising directions of its development; on stimulating and popularizing the topic of higher education in the scientific community; on further discussions and exchange of views.

## 2. Research Methodology

### 2.1 General Background

Since the proposed research did not involve an empirical component, theoretical methods of scientific knowledge were used, namely: analysis and synthesis, induction and deduction, abstraction, the method of comparison, and analytical and synthetic information processing. The study was conducted in compliance with the principles prevailing in the scientific community (scientificity, objectivity, consistency, academic integrity).

### 2.2 Data Analysis

The theoretical nature of the study involved the processing of polyvector information sources, of which 25 titles are relevant, for the period 2019-2023, scientific studies related to the stated issues.

To specify the main aspects of the problem of global educational challenges of the XXI century, the basic vectors of the analyzed issues were identified, in particular: development and implementation of innovative pedagogical methods and methodology; opportunities for using technical learning tools, digitalization of education, including those caused by the COVID-19 pandemic; correlation between basic labor market demands for specialists and educational programs for training specialists; existing problems and promising vectors of education development; the

impact of a full-scale war in Ukraine on challenges in higher education.

**Table 1.** Systematization of Processed Scientific Publications by Topic

| TOPICS | Development and implementation of innovative methodology in the educational process | Opportunities to integrate digital technologies into education, digitalization | Stakeholders' requirements for the personality of a specialist and their implementation in the educational process | Problems and prospects for the development of the education sector | Transformation of higher education in Ukraine under the influence of a full-scale war |
|---|---|---|---|---|---|
| SOURCE | 1.Daniel (2020) 2.Kankal et al. (2023) 3.Karakose (2021) 4.Ledger and Fischetti (2020) 5.Lucenko et al. (2022) 6.Pagelet al. (2021) | 1. Argelagós et al. (2022) 2. Dai, Liu and Lim (2023) 3. Firaina and Sulisworo (2023) 4. Rasul et al. (2023) 5. Sikora et al. (2023) 6. Saienko et al. (2022) 7. Salnyk, Grin, Yefimov, and Beztsinna, (2023) | 1. Espina-Romeroet al. (2023) 2.Lyu and Liu (2021) 3.Younis, Sunderraman, Metzler and Bourgeois (2021) 4.Sutherland, Freberg, Driver, and Khattab (2020) 5.Karaca-Atik, Meeuwisse, Gorgievski and Smeets (2023) 6.Kwarteng and Mensah (2022) | 1.Aristovnik, et al. (2020) 2. Kornytska, Alforof and Honcharuk (2023) 3. Rakhimov and Mukhamediev (2022) 4. Rak-Młynarska (2022) | 1. Antoniuk (2023) 2. Galynska and Bilous (2022) 3. Ivanchenko et. al. (2023) 4. Safonov and Fliarkovska (2023) |

The results of the systematization of the processed publications are presented in Table 1.

The search for the evidence base of the study was carried out using available search engines and scientific resources (Google Scholar, Elsevier, Researchgate) using the terms "higher education", "innovation", "digitalization". The description of the results and their presentation in the form of tables and diagrams was carried out in accordance with the requirements of APA.

In general, the research design is focused on a toretical analysis of the problem of education development in the context of global challenges of the XXI century.

## 3. Results
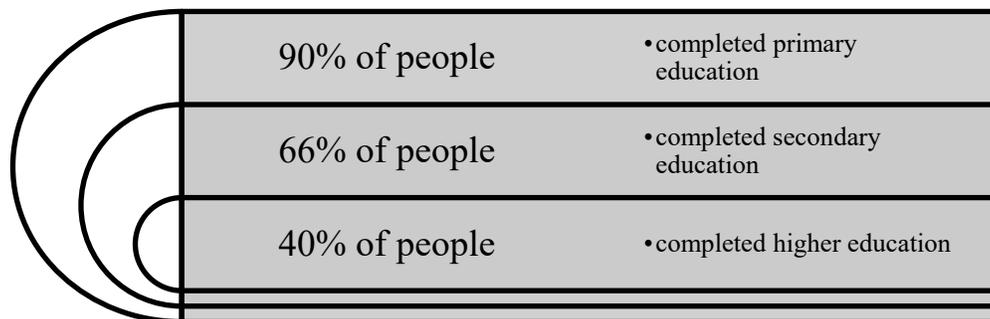


**Figure 1.** Statistical Data Based on the Results of the Statista Research Department (Education worldwide, 2023)

The end of two large-scale military conflicts in the last century plunged humanity into the false illusion that things could not get worse, and that the future should be better than the past. Such an attitude toward universal existence has long hindered the active implementation of changes and deviations from established traditions. This is particularly true in the field of education. The conventional wisdom that higher education is a necessary component of the formation of a well-rounded personality, a conscious citizen of the state, is at odds with the actual statistics.

Education statistics for 2020 show that less than half (40%) received higher education, while the figure for secondary education was 66% and primary education was 90% (Education worldwide, 2023) (Figure 1).

The statistical results can be explained by the fact that countries with the highest population do not always create favorable conditions for their citizens to obtain higher education. Such countries may be interested in the large working class, for whom primary education is sufficient, at best. This situation demonstrates the need to popularize and raise the status of higher education in the world.

*3.1 Some Aspects of Using the Innovative Methodology in the Educational Process*

In the context of the permanent challenges faced by the education sector, the problem of finding and integrating new methodological paradigms into the educational process has always been a pressing one. The long-term dominance of scholastic learning is no longer effective in the age of gadgets. Therefore, theorists and practitioners are trying to find an alternative that would, on the one hand, work to achieve pedagogical goals, and on the other hand, make the educational process relaxed and modern.

We can distinguish the following determinants of innovative approaches to methodological tools: available material and technical capabilities and resources, the latest developments in psychological science, and the demands of society in general or the economic sphere, in particular, for the personality of a pupil, student, or specialist. If earlier among the innovations in the development of methods one can find the concepts of "Case Method" and "Business Gaming" (Nakano, Matsuyama, & Terano, 2007; Gonglewski & Helm 2010; Jones & Monieson, 2015), "Problem-Based Learning" (Yew & Goh, 2016; Chan, 2012), which involved direct interaction of participants, today we are talking about close integration with the capabilities of digital technologies. For example, there are methods that involve the use of computer games or watching movies. This approach makes the educational process more efficient and maintains a high level of motivation among students, as it meets their interests in many aspects. In particular, a systematic review of the literature describing the experience of film pedagogy by Kankal et al. (2023) showed that "films can enhance students' engagement and learning experiences, help retain subject interest, teach critical management skills performance, and develop camaraderie and leadership skills." In other words, the focus of film pedagogy is both on the "here and now" situation, which concerns the educational process itself and on the formation of qualities and skills that will be useful in the near future (Kankal et al., 2023).

Despite the well-established association of video games exclusively with gaming disorder, the results of the study by Pagel et al. (2021) demonstrated the positive possibilities of using them in the educational process. The authors note that multiplayer online games are a promising area for developing soft skills (Pagel et al., 2021). That is, in fact, a tool (in this case, a video game) that does not involve direct interaction between participants may still be able to form social skills.

The flipped learning method has become a practical implementation of pedagogical innovations. By shifting the emphasis in the traditional teacher-student/teacher-student interaction from the role of the student as a passive observer in the classroom to an active researcher during classroom work, this method has proven to be effective for both students and teachers. The positive effects of its use are evidenced by relevant studies, where 67% of the surveyed teachers noted a positive impact on students' academic performance, 88% indicated an increase in satisfaction with the method, and 99% were ready to use it again. Among the advantages are: the development of students' skills of independent processing of information; ample opportunities for teachers to interact with students during classroom sessions; prompt monitoring of the level of mastery of basic knowledge by students and the main difficulties in processing program material (Roehling, 2018, pp. 1-14). At the same time, it is obvious that the proposed method also has its drawbacks, in particular, not all students are highly motivated to work on the material independently, and not all students may have access to the necessary gadgets. An obstacle to the effective use of flipped learning is the failure to take into account the individual psychophysiological characteristics of students with low skills and abilities to self-educate (Shaw & Patra, 2022). Accordingly, the first step before implementing such a method should be to diagnose the objects of the educational process, in particular their motivation to learn, cognitive skills, and information processing skills.

Not only as an object of theoretical research but also as an empirical teaching method, the project method is dominant in the training of design professionals at KEDGE Design School (Marseille, France). Its application helps students to integrate theoretical knowledge and practical skills they have already acquired. The focus is on developing creativity, the ability to model situations, work creatively and outside the box (Bachelor Design, 2023). Just like flipped learning, the project method has its limitations: the student must have information-handling skills, be motivated and independent; be able to use digital technologies freely; and think creatively. Thus, the scope of the project method in education is quite extensive, although there are certain limitations, in particular, it is inappropriate

to use project-based learning in the exact sciences, where the basic material is based on unquestionable dogmas.

As we can see, the use of innovative methodology in the educational process is always aimed at improving educational processes and is focused on the modernization of education as a social institution. Implementation of innovations requires a revision of the general approach to the integral educational system, overcoming established stereotypes and traditions. At the same time, there are advantages and limitations of innovative methods. Among the advantages are the following: promotion of effective learning of program material; formation of a person capable of self-education; development of creativity in participants of the educational process; opportunities for professional self-improvement of teachers. Limitations in the use of innovative methodology are: the need for digital technologies and access to the Internet; specific nature, which makes it impossible to use them universally for all academic disciplines; leveling individual characteristics of students; focus on students with academic achievements of secondary and higher levels (Figure 2).
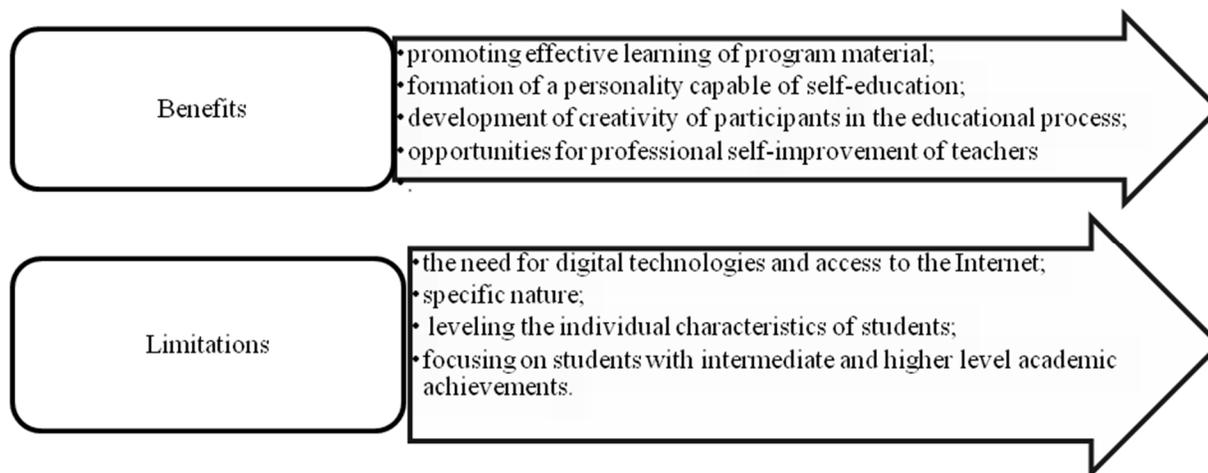


**Figure 2.** Advantages for Limiting the Introduction of Innovative Methods in the Educational Process

*3.2 The Impact of Digitalization on the Transformation of Interaction in the Educational Process*

For a long time, along with stagnation in the methodological arsenal, there was also stagnation in the forms of organizing learning. The dominance of the classroom system, which has its roots in centuries-old practices, was undeniable. Although, of course, the development of technology has adjusted the process of interaction in the teacher-student/teacher-student system to some extent, there was still no need for radical changes. The events of late 2019 and early 2020 have shown that the imperative of the categorical dominance of the learning model proposed by Comenius does not work in the era of the latest global challenges, one of which was the COVID-19 pandemic. Despite the significant damage that has been done to all spheres of public and private life, the pandemic has nevertheless become a trigger for fundamental change. This thesis is supported by Karakose (2021) and Rak-Młynarska (2022). As a result, the global education system has gained practical experience of a complete transformation of the form of education. The dominant role in this was played by available digital technologies, existing online educational platforms, and the Internet in general. As a result, the digitalization of education has transformed from a bureaucratic necessity to a commonplace.

Despite the obvious advantages of asymmetric, distance learning: personalization of the educational process, freedom of access to learning resources (Sikora et al, 2023), there are still many factors that impede or to some extent question its effectiveness in the long run: the lack of "live communication" that stimulates the development of social interaction skills (Ledger & Fischetti, 2020); insufficient level of preparation of educators to interact with digital technologies, especially the generation of teachers with significant experience and knowledge (Sikora et al., 2023), etc.

The use of artificial intelligence capabilities in the educational space, such as Chat GPT, is also a controversial topic. Describing the peculiarities of its integration into higher education, Rasul et al. (2023) note that we can talk about both the advantages (Adaptive learning; Individualized feedback; Research, writing, and data analytics support; Automated administrative support; Innovative assessment activities) and challenges (Ethical and equity considerations; Maintaining academic integrity; Potential bias and falsified information in information processing;

Evaluate graduate skill sets; Assessing students' learning outcomes) associated with its use (Rasul et al, 2023). The popularity of ChatGPT in higher education is predictable, because students, compared to school students, have more opportunities, including materials, to use digital technologies. Students' orientation towards self-education and self-development of materials, compared to schoolchildren, encourages them to search for alternative sources of information and online resources. Dai, Liu, and Lim (2023) rightly call ChatGPT a student-driven technology. At the same time, the researchers note that working with it correctly also requires appropriate skills, mastering which artificial intelligence transforms from a digital tool to an active participant who, together with students, can shape educational experience (Dai et al., 2023). An empirical study on the effectiveness of artificial intelligence implementation, whose respondents were academic staff, showed a generally positive attitude towards Chat-GPT by teachers. In particular, it was noted that it greatly facilitates the search and selection of necessary information, although the need to use alternative resources still remains (Firaina & Sulisworo, 2023).

Salnyk et al. (2023) emphasise the ambivalence of the impact of digitalisation on participants in the educational process. The inevitability of the process of integrating VR and AR into the educational process provides a range of advantages (unlimited temporal and geographical opportunities for interpersonal interaction; ample opportunities for broadcasting and demonstrating concepts and processes that are difficult to reproduce in the field or even in the laboratory; VR and AR are more familiar to modern youth compared to the conservative teaching methods and means, educational resources, etc.), which at the same time expose the beneficiaries of the educational process to certain risks, including cybernetic malaise (Salnyk et al., 2023).

*3.3 The Role of Stakeholders in Shaping Educational Programs*

Another problem that constantly, to a greater or lesser extent, stimulates transformation processes in higher education is the synchronization of educational goals, methods, and content with the professional programs offered by stakeholders. The dynamism of the economic segment is characteristic not only of financial transactions but also of the arsenal of personal qualities and professional skills of employees. If a few decades ago computer knowledge was an advantage when hiring, today it is already commonplace, and the focus has shifted to communication skills and the ability to cooperate, to be an effective link in an integral social mechanism called a professional team. Therefore, many scientific studies consider the problem of forming the so-called "Soft Skills" in different directions (Espina-Romero et al., 2023; Lyu & Liu, 2021; Younis et al., 2021). At the same time, while the need for Soft Skills for professionals who work in the human-human system is obvious, the question of their feasibility for professionals who do not directly communicate with people and whose professional focus is on technical devices remains controversial. For example, Younis et al. (2021) emphasize the expediency of developing Soft Skills in computer science students. The study supports the thesis that specialists of this profile need to be able to interact with other team members (Younis et al., 2021) At the same time, the scientific work of Lyu and Liu (2021) demonstrates that Soft Skills cannot be considered dominant in absolutely all areas of professional activity, so it would be illogical to follow the trend towards Soft Skills without any consideration of Hard Skills. After all, incorrect recruitment requirements will not bring efficiency to the workflow in general and to individual employees in particular (Lyu & Liu, 2021).

The aforementioned Covid-19 pandemic has also had a powerful impact on the economy. In the face of limited direct contact between people, businesses have been forced to reorient themselves to interact with customers through social media, which in turn has made adjustments to employers' requirements for employees. Accordingly, the focus of attention has become on the ability of specialists to effectively communicate with the public through various social networks. This situation has become another argument in favor of the importance of public relations as an academic discipline in higher education (Sutherland et al., 2020).

Describing the problem of the arsenal of skills of workers in socio-economic professions, Karaca-Atik et al. (2023) note that it should include such basic components as communication competence and the ability to find solutions to complex situations, and auxiliary components: critical thinking, initiative, social and cross-cultural skills. It is obvious that the proposed approach to the selection of skills and abilities is determined by the specifics of work in the human-human system. The specificity of the requirements due to the field of activity is confirmed by the study of the analysis of skills of accountants. In particular, it is noted that although students have developed two-thirds of the skills necessary for this field, technical competence, which is the basic requirement of the stakeholder, needs to be improved and special attention from the guarantors of educational programs (Kwarteng & Mensah, 2022).

Interaction between labor market participants and higher education institutions should be systematic and work for the future. The content of educational programs and the list of competencies offered should directly depend on the continuous monitoring of stakeholder requirements for specialists. Such an interaction will allow saturating the labor

market with well-trained personnel, reduce the level of employment of specialists in other specialties, which, accordingly, will reduce the need for additional time and material costs for retraining employees.

*3.4 War As a Specific Determinant of Educational Transformations*

After the COVID-19 pandemic, another trigger that put higher education in front of the need to reformat the basic vectors was the full-scale war in Ukraine. Of course, first and foremost, we are talking about domestic processes and transformations in Ukraine itself. Despite the war, Ukraine continues to be a part of the global financial, economic, environmental, and socio-cultural system, so the functioning of the current military and the development of the post-war country correlate in the context of globalizing international processes.

For a long time, the educational paradigm in Ukraine, like in most post-Soviet countries, could not get rid of the traditions imposed by the Soviet Union in the last century. Although there have been attempts to reformat the education sector, bringing it closer to European standards, they have not had a revolutionary effect, including due to weak national identification and close ties with the CIS countries. In retrospect, we can, unfortunately, state that this path was wrong and only exacerbated the existing problems.

A number of legal acts on the territory of Ukraine did legitimize European educational values and traditions, primarily the Law of Ukraine "On Higher Education" (2023) and the Development Strategy (2023). The latter is the result of intensive European-oriented integration of the national educational space in accordance with global trends of the future in terms of interdisciplinarity of educational and research programs, freedom of choice, and formation of individual educational trajectories of applicants ("On the approval", 2023). The Law of Ukraine "On Academic Integrity" (2023) was adopted as a response to the problem of plagiarism and non-compliance with copyright law. The legitimization of the ethical principles of scientific activity prescribed in this law reflects the desire of domestic educators and scientists to act in accordance with international legislation in the field of science.

As rightly noted by Rakhimov and Mukhamediev (2022), the European educational model can rightly be considered exemplary, as it is the quintessence of the world's best educational traditions. It is characterized by the humanization and democratization of pedagogical interaction; the dominance of innovative technologies as the predominant pedagogical tools; incentives for self-education; and the academic mobility of students (Rakhimov & Mukhamediev, 2022).

During the pandemic, the discrepancy between Ukrainian educational realities and global educational requirements was particularly acute. However, the experience of distance learning gained during this time helped the national education sector to function during a full-scale war. Among the challenges faced by the educational sector are the destruction of infrastructure and the destruction of the material and technical base of higher education institutions; the involvement of the male population in hostilities; migration of academic staff and students; the suspension of the operation of educational institutions due to the occupation of settlements, etc.

The article by Tsekhmister et al. (2023) examines the significance of soft skills in the professional development of future specialists within the context of distance learning. The study employs both general scientific methods such as analysis and synthesis, as well as special methods like abstraction and prediction. The research underscores the importance of soft skills in career advancement, highlighting their difficulty in empirical measurement. While European and American universities traditionally addressed soft skills through additional classes and paid education, the COVID-19 pandemic has ushered in a plethora of digital platforms offering opportunities for distance learning in this domain. The study also emphasizes the role of modern pedagogical methods in shaping students' social practices, indicating the potential for enhanced social skill development by digital technologies and distance learning. However, it cautions that the swift evolution of digital technologies poses a challenge to conservative pedagogical environments, potentially impeding seamless integration of these advancements into the learning process. Despite the obstacles and difficulties, the well-developed and previously tested model of asynchronous, distance learning has become an alternative that many higher education institutions are using. Under these conditions, it is the optimal educational environment, although, of course, it has its drawbacks, in particular, long breaks in learning, which still reduce its effectiveness and reduce the amount of program material (Galynska & Bilous, 2022). The effectiveness of distance education is also argued in related studies (Safonov & Fliarkovska, 2023; Ivanchenko et al, 2023). In particular, it is noted that the priority vectors of the education sector should be, firstly, a safe educational environment, as far as possible in the conditions of war, as well as the psychological well-being of participants in the educational process. These factors will ensure the continuity of the educational process even in times of war (Safonov & Fliarkovska, 2023; Ivanchenko et al, 2023).

According to Antoniuk (2023), the post-war reconstruction of national education will be successful due to the forced

transformations that occurred due to the full-scale invasion: flexibility in the organization of the educational process; active use of digital technologies and online platforms; international collaboration; optimization of higher education institutions; and expansion of financial autonomy. However, some researchers also emphasize the factors that will hinder the successful development of higher education in the future: the mismatch between the rapid digital transformation and the content of educational programs; transformation of working professions due to the development of robotics; integration of digital and technological skills in the humanities (Kornytska, Alforof &Honcharuk, 2023). The proposed list can be expanded with the following items: destruction of educational infrastructure; the need to rebuild individual buildings (construction of bomb shelters, radiation shelters, equipment with additional entrances and exits, etc.).

**Table 2.** Factors in the Recovery of Higher Education in the Postwar Period

| Post-war higher education in Ukraine | |
| --- | --- |
| *Factors to stimulate recovery:* | *Factors inhibiting recovery:* |
| 1) flexibility in the organization of the educational process; | 1) the mismatch between the rapid digital transformation and the content of educational programs; |
| 2) active use of digital technologies and online platforms; | 2) transformation of working professions due to the development of robotics; |
| 3) international collaboration; | 3) integration of digital and technological skills into the humanities; |
| 4) optimization of higher education institutions; | 4) destruction of educational infrastructure; |
| 5) expansion of financial autonomy. | 5) the need to reconstruct certain buildings: construction of bomb shelters, radiation shelters, equipment with additional entrances and exits, etc; |
| | 6) discrepancies between domestic and foreign educational programs that hinder the academic mobility of students; |
| | 7) reduction of funding for the educational segment |

Working for the future, steps have already been taken today that actually reflect the needs of higher education and society in the near future. The main determinants were the full-scale war in Ukraine and the post-war reconstruction of the state. In particular, the Cabinet of Ministers of Ukraine increased the volume of state orders for the training of medical workers, psychologists, rehabilitation specialists, social workers, and laborers by 3,500 people. The top priority specialties also include automation, computer-integrated technologies, and robotics, information and measurement technologies, armaments and military equipment, international relations, public communications and regional studies, and state border security (State will increase state order, 2023; Zbilsheno derzhzamovlennia; 2023).

The need to increase the number of social workers is also driven by pressing problems in Ukraine that preceded the full-scale war and have only worsened since its outbreak. For example, numerous social problems in rural communities have been unresolved for a long time. This segment of the national structure requires special attention due to economic, cultural factors and geographical separation from regional centers. Imperfect infrastructure that does not allow citizens to receive quality services, including social services, as well as established norms based mainly on informal customs and relationships between community members determine the specific nature of the distribution of social workers (Vasiuk et. al., 2020). The end of the war, the return of war veterans from the front, and the return of internally displaced persons and refugees to their places of residence are an incomplete list of issues that will be on the agenda of Ukrainian society and each specific rural community in particular. Their solution will depend on the coordinated work of social workers, psychologists, doctors, rehabilitation specialists, and their ability to integrate available resources to solve problems together.

Taking into account the problems that exist in the field of higher education in Ukraine now and those that are expected in the future, it would be advisable to pay attention to the following transformation vectors:

- global digitalization of the educational process within the state;

- active development, testing, and implementation of innovative teaching methods;

- formation of close international educational collaboration and exchange of experience;

- unification with international norms of educational legislation;

- ensuring academic mobility of students;
- cooperation with enterprises as a platform for the development of real practical skills in higher education students;
- forming the content of educational programs in accordance with the requirements of the labor market.

Summarizing the above, it can be noted that post-war higher education in Ukraine will undergo significant metamorphoses and reforms in the future. Unfortunately, some of them are determined by the war, while others are the result of negligence, populism, and formalism, which should be eliminated in the future.

*3.5 Vectors of Transformation of Higher Education in the XXI Century*
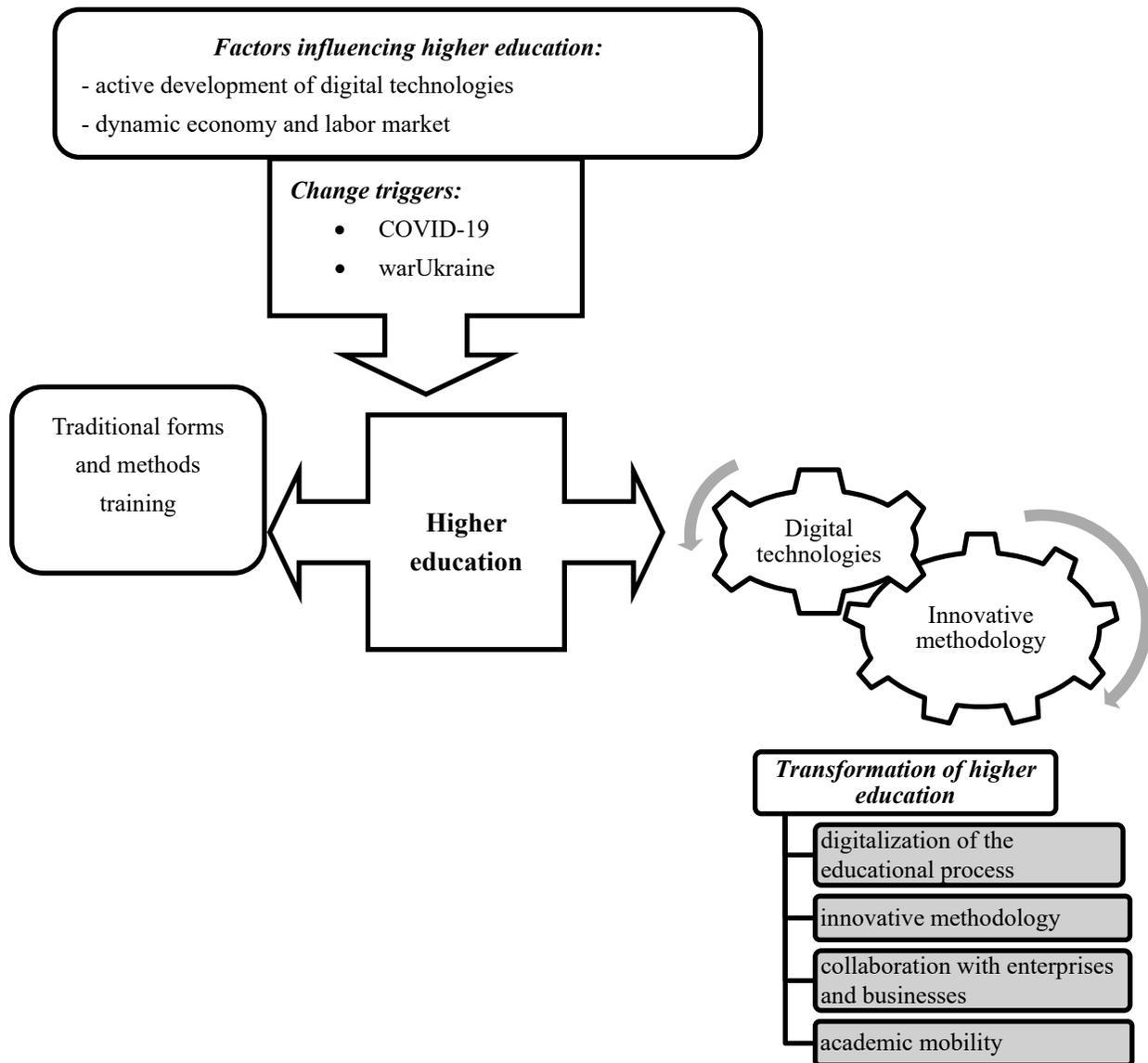


**Figure 3.** Dynamics of Educational Transformations

The global challenges of the twenty-first century have clearly demonstrated the weaknesses of the educational sector, as well as the illusory universality of traditional forms and methods of organizing the educational process. Their inability to solve existing problems has become a trigger for the emergence of new solutions and the use of new opportunities.

The process of transformation of higher education in dynamics can be depicted step by step (Figure 3):

1. Permanent influence of the triad of basic global factors (active development of digital technologies; globalization; dynamism of the economy and labor market).

2. Accumulation of problems.

3. Triggers (COVID-19 pandemic, full-scale war in Ukraine).

4. Failure of traditional methods and forms of organizing the educational process to ensure the adequate functioning of the higher education system.

5. Utilization of digital technologies and innovative methodology to solve problems.

6. Transformation of the educational system.

When refining the proposed scheme, two aspects should be noted. First, it would be a mistake to perceive this triad of influence factors exclusively in a negative connotation. Second, such components as "digital technologies" and "innovative methodology" are dual in nature. They act both as a panacea for solving educational challenges and as an end in itself for modernizing the educational system.

The analysis of the publications developed and systematized by the dominant topic allowed us to review certain aspects of the problem of higher education transformation in the context of global challenges and to identify the following features that are characteristic of the problems in the educational sphere:

- correlating, interdependent nature (unresolved problem is a prerequisite for the emergence of a new one);

- the inability to immediately assess the effectiveness of educational programs (delayed effectiveness - the litmus test of the effectiveness of the educational process in the future will be the level of employment of graduates and the effectiveness of their professional self-realization);

- combination of the high sensitivity of the educational sphere to external metamorphoses, with really low readiness for global internal transformations;

- the need for powerful transformational triggers (only global factors can ensure fundamental changes in established educational traditions).

Thus, the process of transformation of higher education cannot be called complete, because the dynamism of the external environment for the educational sphere is permanent.

## 4. Discussion

Despite a significant body of research, the age-old debate "Should we abandon traditional methods and tools in favor of new ones?" will probably remain on the agenda without a clear answer. Innovative technologies have long been an integral part of the everyday life of the entire humanity, so it will not be possible to completely abandon their use. At the same time, their unquestionable prevalence should not be allowed either, because the educational process, wherever it takes place - in secondary or higher education - is primarily social in nature and is designed to form a personality, not a PC user. The possible legal, moral, and ethical risks when it comes to using artificial intelligence should not be minimized or underestimated. Therefore, the integration of innovative technologies and teaching methods should be balanced, dosed, and appropriate, relevant to educational objectives and the ultimate goal of the educational process.

It is generally recognized that in the modern world, globalization processes are gaining significant scale and cover all spheres of human life, which, at the same time, is the actual engine of all global reforms. Understanding the essence of complex globalization processes in higher education is relevant because it should provide reliable support for Ukraine's development in wartime and postwar.

The monitoring of publicly available scientific publications shows that educational issues remain relevant. Researchers analyze the challenges and achievements of the education sector in a comprehensive manner, either specifically or more generally.

One of the tasks of the study was to systematize thematic publications since it is obvious that it is physically impossible to cover the entire layer of relevant scientific research. After all, the processes taking place in the field of education are diverse and dynamic. Accordingly, the perception and reflection of the scientific community on them is dynamic and multifaceted. The next limitation of the study is abstraction and generalization - despite the fact that the general processes and phenomena were described, some specific impacts on national higher education systems were

not detailed. Obviously, each stimulus in each individual country had a specific reaction. The selected sample of scientific publications is subjective.

## 5. Conclusion

To summarize, the 21st century was marked by globalization, intense information flow, European and Western integration, the beginning of cooperation between educational institutions and employers, and the orientation of higher education to the needs of the modern labor market. In this regard, society is rethinking the general concept of higher education in modern society through the prism of transformation and modernization processes and strengthening the academic and classical components of university school activities, which is associated with the accumulation and transfer of knowledge, a number of functional elements caused by economic, social and globalization factors.

In accordance with the tasks set, the following conclusions can be drawn:

1. Dynamic processes in the education sector are hypersensitive to the scientific community. The study of the problem of higher education development has made it possible to differentiate scientific publications according to the subject matter. In particular, the following research vectors are popular: the use of digital technologies in the educational process; development, testing, and integration of innovative methodology; portrait of a specialist and employer requirements; vision of problems, challenges, achievements, and prospects of education as a scientific reflection.

2. The current problem of a full-scale war in Ukraine has deepened and exacerbated unresolved educational problems. The next challenges are interruptions in the educational process; difficulties with the uninterrupted use of digital technologies; forced migration of teachers and students; numerous destructions of educational institutions, etc. The experience of going through the peak of the pandemic with the transition to distance learning helped to smooth out the difficult period of adaptation to wartime conditions. However, there is a clear realization that this experience is not enough for the full regeneration of higher education and that efforts and material resources are needed for post-war reconstruction.

3. The process of higher education transformation is influenced by a triad of global factors: globalization; labor market and economy; and the dominance of digital technologies. The COVID-19 pandemic and the full-scale war in Ukraine were the catalysts for these influences. They have demonstrated the inability of existing traditional forms and methods to solve the problems that have accumulated in higher education. Shifting the focus from traditional to innovative contributed to the adaptation of education and prevented its stagnation. The effective tandem of digital technologies and new methods has proven to be effective and contributed to the development of higher education.

4. Given the most significant global processes for the modern world community, the modernization of higher education should not be limited to external metamorphoses, which, in part, only mask deeper problems. The key point should be to rethink the internal, content component. Thus, the defining components of the architectonics of the educational system should be:

- guaranteeing the safety of life and health of all participants in the educational process;
- integration of disciplines related to military training and the development of medical care skills into the educational programs for specialists of all specialties;
- creation of opportunities for reintegration and re-socialization of military personnel and persons affected by hostilities, including the right to unimpeded access to second higher education;
- global digitalization of all stages and components of the educational process;
- development, testing and practical implementation of innovative forms and methods of teaching;
- active international interaction, including the exchange of educational experience, joint scientific conferences, and simplified procedures for student migration;
- thorough empirical training of specialists through the involvement of practitioners in the educational process and the practical part of training at enterprises, firms, and business structures;
- permanent interaction of higher education institutions with the labor market.

Thus, as practice shows and theoretical studies substantiate, the development of higher education requires active integration of digital technologies into the educational process. It is their polyvector nature (as a means of education,

as a component of educational methodology, and as a goal) that makes them perhaps the most universal pedagogical tool today.

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**Data sharing statement**

No additional data are available.

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