Development of Ukrainian education and science in the context of global challenges and military aggression: results, problems, prospects

Desarrollo de la educación y la ciencia ucranianas en el contexto de los desafíos globales y la agresión militar: resultados, problemas, perspectivas

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Abstract

The purpose of the article is to analyze the state of Ukrainian education and science in the conditions of global challenges and military aggression. General scientific and special scientific research methods were used. In the results, the current state of education and science in Ukraine was investigated, the main post-truth challenges in the conditions of globalization and Russian military aggression were described, the problems and mechanisms for overcoming were determined in the analyzed fields. The conclusions note that the main way to overcome the crisis is the integration of the Ukrainian model of education and science into the European space.

Key words: education, science, Ukraine, Russian-Ukrainian war, ways of development.

Resumen

El propósito del artículo es analizar el estado de la educación y la ciencia ucranianas en las condiciones de los desafíos globales y la agresión militar. Se utilizaron métodos de investigación científicos generales y especiales. En los resultados se investigó el estado actual de la educación y la ciencia en Ucrania, se describieron los principales desafíos posverdad en las condiciones de la globalización y la agresión militar rusa, y se determinaron los problemas y mecanismos de superación en los campos analizados. Las conclusiones señalan que la principal vía para superar la crisis es la integración del modelo ucraniano de educación y ciencia en el espacio europeo.

Palabras clave: educación, ciencia, Ucrania, guerra ruso-ucraniana, vías de desarrollo.

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Introduction

One of the countries whose educational experience is very relevant at the moment is Ukraine. Since 2014, it has experienced Russian military aggression, losing much of its industrial, economic, but also educational potential. In February 2022, Russian aggression was repeated with a much larger scale and corresponding consequences. With military destruction, occupation of parts of territories, and continued warfare, the Ukrainian education system also had the experience of training during the COVID-19 pandemic. European countries have not faced challenges of this magnitude since the war in the Balkans in the 1990s, so the Ukrainian example can be helpful in identifying many of the problematic issues on which there were differences in interpretations.

Contemporary globalization trends are realizing an ambiguous impact on the process of education. At the same time, higher education is responsible for maintaining an independent worldview and the integrity of the nation. In the realities of warfare, it is important to use the principle of the language of science rather than the language of prejudice or stereotypes. The notion of the language of science refers to a special tool for the formation and dissemination of knowledge in the teaching and academic space, which is based on the principles of respect for each participant in the teaching and communication process, critical and logical thinking, comprehensive explanations of judgments, and the extensive use of verification tools. In contrast to mythology or religion, which require unquestioning faith, science by its very nature is markedly drawn to the formation of knowledge, the truth of the latter can be justified or refuted rationally or empirically. With this thesis in mind, we believe that education and science are always inseparable. In a situation where education loses its scientific part, it can acquire anti-humanistic manifestations at any time. Consequently, because of the inseparability of the concepts of science and education, an important issue is to study the state, problems, prospects of the functioning of education and science against the background of the spread of hostilities. The purpose of the article is to analyze the development of Ukrainian education and science under the conditions of global challenges and military aggression, to determine the main results, problems, and prospects relevant to the educational sphere of Ukraine in the future. Consequently, the main issues to be considered in the paper are: analysis of the current state of education and science, characterization of the concept of post-truth as a challenge in contemporary Ukrainian humanitarianism against the background of Russian aggression, analysis of problems and ways to overcome them in the fields of education and science.

Literature Review

The methodological basis of the article is the work of European historians, political scientists, and educators. At the same time, the works of Middle Eastern authors who have analyzed the Israeli-Palestinian conflict are also important. In particular, Rajab (2018) characterized the effectiveness of distance education in regions involved in Israeli-Palestinian clashes. Gordon (2022) identified the situation of Palestinian higher education institutions against the backdrop of military events. On the other hand, the work of Ukrainian historians is important for this work, which proves the separateness of the Ukrainian nation from the Russian nation in the historical context (Parshyn & Mereniuk, 2022). At the same time, Kuzio (2021) compared the peculiarities of the mentality development of the Ukrainian and Russian nation through a historical retrospective. Coulby & Jones (2017) defined the development of the Russo-Ukrainian war through the prism of probable ways and the results of its end. Shah & Gedamkar (2022) described the main preconditions, development, and possible prospects for the development of the Russian-Ukrainian war, its importance for the transformation of the political security of the European region.

Important for this article are the works of Ukrainian educators who have investigated the peculiarities of the use of distance education under conditions of war. For example, Marusiak (2022) described the state of Ukrainian education on the background of the Russian-Ukrainian confrontation and described key aspects of its functioning. Armitage & Pavlenko (2022) investigated the transformation of medical education in Ukraine, described the main problems and prospects of development against the background of global social challenges. At the same time, Armitage & Williamson (2022) analyzed the development of physiotherapy in Ukraine during military changes.

Prokopenko (2021) analyzed the main technological challenges of the digitalization of the education system. Orozonova et al., (2021) identified the importance of media literacy for Ukrainian education, which suffers from

information attacks from the enemy. On the other hand, Tytova & Mereniuk (2022) - peculiarities of digital literacy formation for future teachers against the background of the spread of Russian aggression against Ukraine. However, the problem of the development of Ukrainian science against the background of the Russian-Ukrainian war remains understudied. Also, an overview of the main problems in education and science and the main ways to overcome them requires more thorough study.

Materials and methods

To implement the main goal used two types of research methods: general scientific, special scientific. Among the general scientific methods, we distinguish analysis, synthesis, abstraction, induction, explanation, generalization. The use of historical research methods was particularly important: historical-comparative, historical-typological.

Based on abstraction, the transition from the analysis of general globalization challenges to the study of specific problems and prospects of the development of Ukrainian education and science was carried out. Based on the method of concretization, it was possible to consider in detail the problem of the main challenges of functioning of humanitarian education through the prism of analysis of the phenomenon of post-truth in the conditions of globalization and military aggression.

At the same time, as a result of using the principles of forecasting, our own judgments about the future development of education and science were formed, possible prospects were characterized and the main ways of overcoming the current negative trends in the development of these spheres were outlined.

The main materials of the study are the Ukrainian legislative acts, in particular:

1. Concept of digital transformation of education and science of Ukraine (Ministry of Education and Science of Ukraine, 2021).
2. Higher Education Development Strategy of Ukraine for 2022-2031 (Ministry of Education and Science of Ukraine, 2022).
3. Law of Ukraine on Higher Education (Law of Ukraine No. 1556-VII, 2014).

This theoretical study was implemented in several stages. On the first - the relevance of the work was determined, the content-analysis of modern literature was carried out.

At the second - the current state of education and science in Ukraine was characterized, the problem of Ukrainian humanitarian education and science through the prism of post-truth analysis was covered, the main problems and prospects of development of these areas of social being were analyzed. At the last stage, the results are summarized and conclusions about the further development of education and science in Ukraine are formed.

Results and Discussion

The state of education and science in Ukraine against the backdrop of global challenges and military aggression

One of the main global challenges was the Covid-19 pandemic, which created the need for the digitalization of many social systems, including education. Ensuring the continuity of education against the background of the closure of educational institutions was a key goal of the Ukrainian government (Ministry of Education and Science of Ukraine, 2021). Consequently, many information technologies were used, new learning platforms and resources were developed to effectively organize the learning process (Tytova & Mereniuk, 2022). The problems of digital literacy and digital competence formation have become almost basic from now on. In addition, due to the closure of educational institutions, it became necessary to evaluate the typical ways of assessing students, and in some situations to abandon them altogether (Sherman et al., 2021). For example, at some Ukrainian universities, probation was moved to a different term, and at other institutions, it was abolished (Prokopenko, 2021). Other universities used compromise methods, such as offering exams in a distance survey or testing format.

After the full-scale Russian invasion of Ukraine, it became clear that education and science are areas that are particularly exposed to such a global challenge. Since February 2022, it has become virtually impossible to organize education in a typical format (Romanova et al., 2022). Russian troops have shelled and caused significant damage to Ukrainian educational institutions. Although such terrorist acts are condemned worldwide, Russia continues to destroy Ukrainian educational and academic institutions. Consequently, the process of introducing and developing a distance (in some regions mixed) education system has become relevant again (Marusiak, 2022). With the support of the Ministry of Education and Science of Ukraine since February-March 2022, modern

distance platforms and resources for the organization of training at different levels began to be actively developed and used (Ministry of Education and Science of Ukraine, 2022). With the assistance of the Office of the President of Ukraine and the international organization UNICEF an online platform "United Ukrainian University" was formed, which aims to develop and support modern innovative higher education. This structure is also engaged in the development of individual projects to support all Ukrainian universities in military realities. Another resource Prometheus also contributes to the support of Ukrainian education, it develops and implements free training activities for students in Ukraine. Consequently, there are many such distance platforms in Ukraine. At the same time, their main goal is to support the education system suffering from war. Against the background of the spread of military aggression, the Maidan Open University, which supports civic education through the implementation of non-formal education, has also developed further. There are a lot of such platforms and resources for the development of education in Ukraine, all of them have one goal - to support and develop the national system of youth formation, the formation of competitive skills and abilities (Marusiak, 2022; Safonov et al., 2022).

At the same time, against the background of global challenges, the role and responsibility of scientists is growing, as they are not only representatives of scientific studios, but also opinionmakers in Ukraine and abroad. Through scientists' involvement in public processes, they are not only engaged in the search for engineering solutions to improve Ukrainian weaponry but are also involved in finding direct responses and responses to Russian propaganda. So, the role of science against the backdrop of military aggression is visible and important for society.

Ukrainian Humanities Education and Science: Challenges of Post-Truth in the Context of Globalization and Russian Military Aggression (Conceptual Review)

The current development of educational technology is an urgent problem to investigate, given the latest opportunities of digital technologies and their integration into the learning space using distance learning (Law of Ukraine No. 1556-VII, 2014). The COVID-19 pandemic and related quarantine restrictions demonstrated simultaneously the viability of asynchronous forms of learning, video application education, etc. - these processes evolved rapidly but were a reliable way out of the complex situation that emerged with the global spread of the disease (Jena et al., 2021). Despite the research interest, the treatment of these and many other possibilities, problems, and perspectives is still incomplete because every national experience with modern technology, the digitalization of education is not summarized (the pandemic threat with different intensity is still ongoing) (Rani et al., 2022). In addition, reality "dictates" new challenges, the response to which also requires appropriate changes in the educational system (Tytova & Mereniuk, 2022). In particular, among the proponents of the popular philosophical current of posthumanism, aimed at determining the future of humanity in the coming technogenic times, the concept of post-truth is being actualized. Post-truth can be considered as a rather characteristic notion-state, for which expressions of emotion caused by a situation have more weight in shaping public opinion than evidentiary facts underlying the situation. In other words, conditions are created for which human emotion begins to dominate ratio, emotion in this way begins to substitute for rational thought and becomes the real truth.

There is no single understanding of post-truth among researchers. Some believe that post-truth can be considered a common lie that is replicated in the world using modern digital technology - due to this it multiplies uncontrollably and through digital information channels, social network filters, etc., gets directly to ordinary people, forming their distorted reality (Orozonova et al., 2021). More productive are the positions of other scientists, who argue that it is not necessary to identify post-truth and ordinary lies, on the contrary, such comparisons contribute to "vulgarization" and primitivization of the concept of post-truth, which only makes it aggressive. The essence of the post-truth lies in the fact that it is not a lie, but only one of the interpretations of true events. In this case, the range of interpretations of events is quite large - from the easy adjustment of a truthful fact in the necessary ideological direction to a complete deformation of real events (in fact, this element is often mistakenly recognized as a lie).

In general, post-truths are inherent to ordinary people in their simple perception of the facts, which is evident, for example, in the journalistic titles of materials. They should form a certain message and be perceived accordingly - readers will not always read the material in its entirety, but will limit themselves to the title, although the main text may be of a different nature.

Ordinary users of digital technologies usually do not have the skills to work professionally with information sources, verify, analyze and separate facts from fictions (fact-checking). If relevant messages in information sources are embellished with emotionality that resonates with the experiences of content consumers, these messages go viral and quickly spread through social media channels like snowballs. The effect of one informational "snowball" can only be outweighed by the launch of the following resonant materials.

In Ukrainian military realities, post-truth has become a real challenge for the humanities disciplines. Since 2013-2014, the Russian side has repeatedly launched blatantly false messages and misinformation on Ukrainian society, its history, and its present. It was repeatedly noted that Ukrainians as a separate nation did not exist and that Ukraine was a political project of a third party (in one speech after the start of the new 2022 invasion, the Kremlin leader "accused" Bolshevik leader Vladimir Ulyanov-Lenin of creating Ukraine) (Kuzio, 2021). Russian digital and print and television media emphasized the artificiality of the Ukrainian language, explicitly denied its existence, and accused Ukrainians of Nazism, which had historical origins, even though urban Ukrainians, for example, have lived side by side with many other peoples since ancient times (Parshyn & Mereniuk, 2022). Similar informational messages accompanied the Russian invasion in 2022, serving as an ideological basis for Russian propaganda (Kuzio, 2020). It was noted that because of Ukraine's "art," the Russians were only taking theirs, lands that had seemingly always belonged to them (Marples, 2022). The multiplication of such information occurred at a galloping pace - all possible resources of digital broadcasting, social networks, messengers, etc. were connected to the operation. (Orozonova et al., 2021). This created a picture of the "justice" of Russian anger.

The flow of blatant fabrications and specific interpretations of the past (post-truth) met resistance among Ukrainian scholars and educators. First of all, thanks to a planned information policy, it was possible to reduce the pressure of the Russian media in Ukraine. First of all, it affected Ukraine's highest indices of independence since 1991. In particular, opinion polls have shown that as of August 2022, more than 95% of the population would support Ukrainian independence, while in 2021 such people were 80%, and in 2012 - Only 62%. These results were achieved not only because of the patriotic enthusiasm of the population but also because of the work of scholars and teachers who worked to establish a truthful knowledge of Ukraine's past and present.

The support for this course was also reflected by Ukrainian government agencies. In June 2022, the Concept of national-patriotic education in the educational system of Ukraine until 2025 was adopted. The Ministry of Education and Science of Ukraine is convinced that fostering patriotism as an important personal quality is an urgent task of our time under the conditions of military aggression.

Also, the Concept talks about stimulating interest in the study and research of Ukrainian history, the need to create value orientations, and the rise of civic consciousness. It was proposed that the basic examples for education should be considered examples of the heroic struggle of the Ukrainian people for independence and the formation of their own state. In particular, the relevance of a new interpretation of the sources, scientific study of the periods of Ukrainian history, interaction with other peoples, etc. was also noted. (Marusiak, 2022). An important aspect was the gradual resumption of the teaching of Ukrainian history in institutions of higher education, even for students of non-humanitarian specialties.

For the contemporary European experience, the introduction of such norms seems somewhat unorthodox. However, in conditions of military conflict, measures to improve patriotic education and counteract fake news are a relevant trend in the development of humanitarian education and science (Tytova & Mereniuk, 2022). At the same time, the functioning of Ukrainian education in the realities of martial law is affected by the increased search for new approaches to teaching, innovative means of building the educational process, and productive educational and information technologies.

Problems and prospects of education and science development in Ukraine

The Russian military aggression has caused significant damage to Ukraine's human and material capital. Problems in the restoration of the scientific and educational industry are bound to arise due to financial losses. If the allocation of funds for the educational process is at a more sustainable level, the financing of science is critical. This opinion is also relevant for private institutions: during the war, private institutions of higher education were not subject to an outflow of students (even if compared to state

universities). At the same time, there was a minimal number of private research institutions in Ukraine, and the budget funds for the maintenance of academic institutions decreased every year. This creates a certain imbalance in the further existence of the educational and scientific sphere.

The Russian aggression caused tangible material losses to scientific and educational institutions. In particular, back in 2014, the opportunity to cooperate with educational and scientific institutions in occupied Crimea and the partially occupied Luhansk and Donetsk regions was missed (Marusiak, 2022). After the start of the storming of Kyiv, Kharkiv, Zaporizhzhia in 2022 and a noticeable blow came to the institutes of these regions as well.

In general, the system of Ukrainian scientific institutions is not quite traditional for foreign researchers. In the U.S. and European countries, scientific research is usually organized based on expanded university centers, creating various structural units for this purpose (Voropayeva et al., 2022). At the same time, Ukraine has inherited from the Soviet Union a problematic model of interaction between higher schools and scientific institutions. Therefore, it is not surprising that there is now a clear division between the educational functions of universities and the research functions of scientific institutions. For a long time, these two directions were deepening in parallel, and scientific work was the advantage of the National Academy of Sciences of Ukraine and its other structural institutions. The problems of this scientific organization are obvious. First of all, it is a lack of funding, and consequently the departure of progressive and talented scientists abroad.

As for the problems of the development of Ukrainian education, there is an obvious imbalance in the support of humanitarian and technical education. On the other hand, a significant challenge since the beginning of the Covid-19 pandemic has been the mastery of teachers to work with digital environments, the formation of their information and digital literacy (Safonov et al., 2022; Romanova et al., 2022; Tytova & Mereniuk, 2022; Tsekhmister et al., 2021). However, the transformation of education and science, even against the backdrop of such complex conditions, demonstrates that there are several options for further development (See Figure 1).
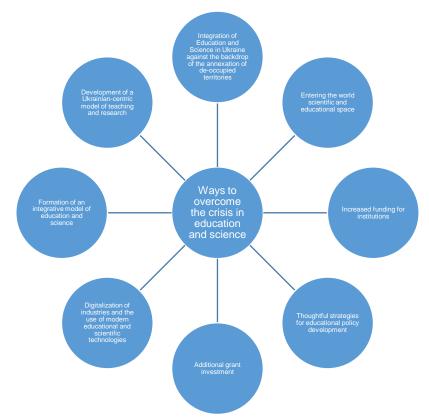

Figure 1. Ways to overcome the crisis in education and science of Ukraine.
Authors' development

The return of Crimea and parts of the occupied Luhansk and Donetsk regions to Ukrainian control will have an impact on the formation of the need to reintegrate all spheres of economic and social life. Along with other sectors, the reintegration of the education system, as well as higher education, by connecting divided education seems particularly relevant. However, now there is a lack of both science-based strategies and precise steps to be taken in this direction. There are four main approaches to defining postwar education and science in the scholarly literature: stabilization, reconstruction, construction, and development. There are several ways and means in which higher education and science can either support or explode leading processes in the realities of postwar reconstruction (See Table 1).

Table 1.
Key drivers of the integrative space of education and science

Driving forces of integrative space of education and science			
Educational policy	Economics of education and science	Cultural identity	Development of the "man of the future"
Practical results Digitalization The principle of fairness and transparency Objectivity Efficiency	Autonomy of use of funds by educational and scientific institutions Diversification of funding sources Commercialization of education and science Innovative economy	Total Ukrainization Development of the Ukrainian language Support of traditions Development of competing innovative curricula Formation of trust and responsibility Democratic type of education	Formation of a caring attitude to nature Creativity Critical thinking Digital literacy Investing in human development High level of professionalism

Consequently, education and science are not peripheral systems that must wait for the end of postwar reconstruction. If education and science are neglected, it can undermine all other postwar reconstruction efforts, and they can act as a "major missed opportunity".

Conclusions

Consequently, Russian aggression has had a negative impact on the development of entire Ukrainian sociocultural systems, in particular, educational and scientific branches. However, the analysis of the current state of these spheres demonstrates that, despite many problems (lack of funding, outflow of qualified and professional personnel), they are still actively transforming under the global challenges of modern trends in education and science. We note the growing role of humanitarian education and science, taking into account the counteraction of Russian propaganda and the formation of information and digital space of functioning of these spheres. The article suggests several ways of overcoming the negative tendencies: integration of the Ukrainian model of education and science into the European space, Ukrainian-centric development of branches, increase of financing and grant opportunities, formation of thought-out strategies of education and science policy development.

The proposed article does not exhaust all the characteristics and challenges that teachers and students have to face under martial law. In particular, the following study will require the problem of the continuity of the educational process at all stages of military operations, the development and implementation of special educational courses for the training of educational managers, teachers, research and teaching staff in the sphere of guaranteeing the continuity of the educational process in conditions of continued military operations. Also, a topical issue is assistance and integration of victims of Russian aggression into the educational process (especially speaking about schoolchildren - future students of higher educational institutions), improvement of existing psychological and pedagogical practices, psychological and social assistance, and other methods aimed at helping teachers, students and scientists.

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