

# Educational Crisis in the Modern Information and Digital Society Against the Backdrop of Russian Armed Aggression

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## Summary

The educational space is being integrated into the information and digital format of social activity. Sociocultural processes and events determine the intensity of the involvement of scientific and technological progress in the educational environment. The last three years have been a real crisis for Ukrainian education. COVID-19 pandemic and Russian armed aggression actually transferred organizational and training elements of the educational system into online mode. This caused the actualization of all manifestations of digitalization in Ukrainian education. Therefore, the purpose of scientific intelligence is to analyze the information and technological factors that respond to the crisis phenomena in modern education. The article aims to highlight the practical digital resources that have become in demand in the preservation of the functioning of the education system in the conditions of the Russian-Ukrainian war. The most appropriate methodology capable of analyzing the problems and risks in the digital cluster of education associated with military actions is a systemic, structural-functional, and comparative analysis. Thus, the educational crisis in Ukraine was an obvious consequence of Russian armed aggression. The information and digital educational environment play an important stabilizing role, allowing to maintain the functioning of this sphere of public activity. Digitalization has introduced innovative manifestations in the administrative and organizational, educational and methodological, and information and communication clusters of education. At the same time, the processes of digitalization have

also come under attack by the aggressor and faced the risks caused by gross violations of rights in educational cyberspace.

**Key words:** digitalization of education, education and digital space, educational crisis, Ukrainian education, Russian military aggression.

## 1. Introduction

Education is a conservative sphere of social activity by its very nature. Normatively and procedurally - all innovations in education should take place gradually, with a clear analysis of each subsequent step, and the study of short-term advantages and disadvantages. The results of the implementation of individual elements of digitalization of education are studied and subsequently included in the strategic plans for the development of education. We are talking about a large-scale set of issues related to the clear introduction of technological elements that will be used to organize the educational process.

The uniqueness of modern Ukrainian education is that the processes of digitalization are implemented and approved in the conditions of force majeure. COVID-19 pandemic, full-scale military aggression - events that could potentially destroy the education system. However, these

challenges have only prompted self-organization and adequate response to threats.

Education depends largely on the socio-cultural realities in which it develops. As Wolton [1] notes, concerns about the influence of the outside world are answered by the success of new information and communication methods in schools. Digital technology for modern society is an excellent chance to modernize education and adapt it to modernity. Revolutionary for the XX century radio and television could not become an alternative to traditional educational principles. ICT of the XXI century has all the chances to integrate into the education system in a dimension that will change the fundamentals of education itself. There is already talk about the exorbitant power of GAFA firms (Google, Amazon, Facebook, Apple) and the potential of the digital format of education to become its basic version, rather than being an alternative or auxiliary element of education.

“Global standards for digitalization in education are based on the latest concept of the DQ system, which describes a combined set of technical, cognitive, metacognitive, and social-emotional competencies that can help people thrive in a digital world”[2].

Today, society is faced with a significant variety of digital risks [3]. The military invasion of Ukraine has added a new manifestation of not only the potential but also the practical format of digital threats. The functioning of the digital educational environment in the context of a full-scale war between two powerful countries has not yet had actual examples. Military confrontations of this scale last took place during World War II, when computer technology did not even exist yet. Consequently, modern science has no substantial research of this nature.

Risks in the digital space are grouped into two main clusters:

- threats to digital resources;
- psycho-digital risks[4].

This distribution allows us to group the quantitative and qualitative characteristics of security in the digital space. Threats to digital resources are generally considered any interference with software, content, or communication tools. Such impact is calculated according to the total amount of information technology resources compromised. The consequences of such unauthorized interference are determined by appropriate specialists who assess the degree of damage to the technical and software components. More complicated is the assessment of

psycho-digital risks, which inherently have delayed consequences.

Russian aggression has caused significant losses in the educational and digital potential of domestic education. This refers to the physical destruction of technological equipment and means of communication. In addition, the psycho-digital problem, which concerns the information and communication transformation of the educational space, will also have significant consequences. During hostilities, the traditional formats of information and communication clusters in education undergo changes or are destroyed altogether. This leads to psychological problems for the participants in the educational and digital space.

Russian militaristic and informational aggression has been known since the days of the Soviet Union. Xenophobia and mental slavery became the basis of the so-called Kremlin ideology of the "Russian World". Such aggressive and addicted to European democratic consciousness, both in the twentieth century and in the twenty-first century, political aggression caused the banning of everything that belonged to the field of humanistic views. For example, we can cite professional Ukrainian theology. Such disciplines as iconology and iconography, theology of the icon, or sacred art were completely banned in the modern Ukrainian information-digital society, and all artistic processes within Christianity were considered non-canonical.

The problem of the crisis of the Ukrainian educational and digital space against the background of Russian armed aggression should be studied with certain remarks. First of all, they relate to the lack of sources on these issues, as this problem has only just taken shape in recent months. Consequently, we can use the scientific achievements of the past years, which give an idea of the essence and manifestations of the crisis of the educational and digital environment under force majeure circumstances.

## 2. Methods

Considering the aspects of the educational crisis in the educational-digital space, caused by armed aggression, it is necessary to use various methodological approaches. At the same time, we should note that classical models of methodological arsenal will not allow to study all the nuances of crisis phenomena in the processes of education digitalization. The general scientific way of analysis is a more acceptable element for the study of fears of a similar nature. However, it is always necessary to make adjustments to the state of affairs,

which is typical for the modern educational space. For example, the comparative analysis is effective when studying the results of the digitalization of education under various force majeure situations (COVID-19 pandemic, military aggression, etc.), but it is not yet possible to compare the crisis phenomena in the educational digital space under full-scale hostilities, because there have been no such large military conflicts since the approval of digitalization.

There are new ideas in the methodological guides for developing cybersecurity that point to the effectiveness of topological evaluation of concept maps for two cybersecurity courses: digital forensics and SCADA system security[5].

Synergetic methodological models that help to overcome the centralized system of the educational environment and emphasize self-organizing aspects are important. This methodological approach allows for a clearer understanding of the practical manifestations of the crisis from the point of view of the subjects of the educational process.

### 3. Results

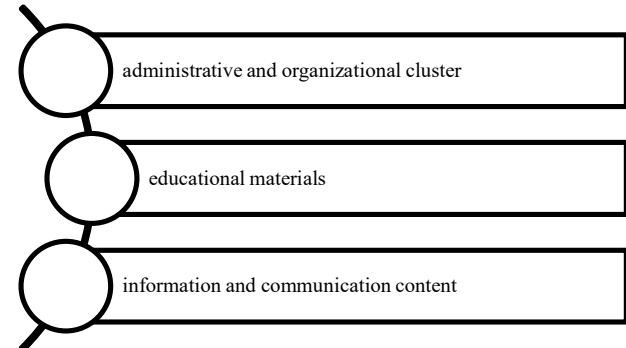
The course towards innovative transformations in all areas of public life is becoming the main goal of public policy in the leading countries of the world. The creation of digital resources greatly improves the dialogue of the citizen with state institutions and avoids inconveniences. The educational sector in Ukraine has also actively adapted to the new requirements of the time and quickly integrated into the new digital formats. Education, despite its traditional conservatism, has shown flexibility and readiness for the new realities.

Modern Internet technologies and social media are gradually but surely gaining dominant status as means of communication and sources of information. A kind of digital citizenship is being formed, reflecting the level of digital literacy in society [6]. Also important is the actual share of digitalization in the general education system. Considering Ukrainian education, we note that in recent years there was a rapid development of the digital component in this area. Digitalization in education manifested itself in several key directions:

- transition of the document flow to digital media;
- organization of the educational process based on the information and technological resources;
- formation of an educational and methodological arsenal thanks to digital content;
- communication tools between the subjects of the educational environment.

It is worth noting that the digital format is attached to the main manifestations of the educational space (see Fig. 1).

Figure 1: Elements of the educational space influenced by digitalization.



Source: author's own development

Since the first days of the armed aggression, education in Ukrainian educational institutions was suspended for two weeks throughout the country. However, realities pointed to a long-term conflict, so the decision was made to resume the educational process online in regions where there were no active hostilities. Such a format requires significant transformations in the organizational, teaching and methodological, and personal aspects.

#### 3.1 Administrative and Organizational Digital Cluster of Ukraine's Educational System in the Context of Russian Military Aggression

The organizational component of the digitalization of education consists in the digitalization of much of the information related to the activities of educational administrations and the functioning of educational institutions. The Russian invasion manifested itself in aggressive actions long before full-scale combat operations. It was expressed through systematic cyber-attacks. One of the targets of these attacks were state institutions, including educational institutions. Interference with the websites of state institutions, DDoS attacks, and theft of corporate and individual data is by no means a complete list of cybercrimes committed against Ukrainian educational institutions.

Military aggression in Ukraine is accompanied by the aggressive behavior of Kafirs in the information and digital space. The first large-scale cyberattack on the main resource of the Ministry of Education of Ukraine was carried out back on January 14, 2022 [7]. Since today the Ukrainian applicants for education are forced to spend considerable time online in the INTERNET network, the risks of becoming a victim of cyber-attacks from the aggressor are also increasing significantly. The dangers which have a generally accepted classification are actualized: cyberbullying, protection of personal data, and filtering of informative flows [8]. The concept of cyberbullying has gone beyond intra-social problems. Nowadays bullying of children and youth has got a dimension of planned and organized aggressive actions. The implementation of such inhumane actions contradicts any norms and rules. With the beginning of military aggression, the issue of preserving the individual and confidential data of the subjects of educational activity became acute. This problem became especially evident in the occupied territories, where the aggressor gained access to information directly on the digital resources of educational institutions. As for filtering information, which also poses threats to the security of the educational system, we should note the need to build digital literacy and educational work, which should be aimed at limiting the negative impact of harmful content.

A full-scale military invasion actualized the egregious need to evacuate educational institutions for the twenty-first century. Such an emergency situation required rapid decision-making on evacuation priorities. Moreover, Ukraine already had experience evacuating educational institutions in 2014 after the occupation of Crimea and Donbas, when many resources were lost because they were not digitized in time. The evacuations primarily involved human resources (faculty, students, and staff). The lightning-fast pace of military operations prevented the removal of the vast majority of material assets and documentation. However, as early as 2022, thanks to the timely duplication of information, the vast majority of intellectual resources were saved. Modern electronic or virtual media (primarily cloud resources) allow large volumes of information to be stored and, if necessary, quickly used. Consequently, the destructive consequences of the Russian aggression were directly related to material resources (buildings of educational institutions, material assets).

### **3.2. Teaching and learning materials in the digital format of Ukrainian education under Russian military aggression**

The issue of the actualization of innovative learning strategies in Ukrainian education has been raised for the last three years and was related to the organization of distance and blended learning in a pandemic environment. This definitely mitigated the catastrophic consequences of the armed aggression on the territory of Ukraine. Considerable attention was focused on the flexibility of the education system in a rapid transition from traditional to online learning with the use of digital teaching and learning material.

The educational-methodological arsenal is the least vulnerable to force majeure situations since it can be maintained autonomously. At the same time, this potential can be applied in different variations. Information and communication technologies ensure flexibility of the educational process because teachers have an opportunity to organize the educational process remotely, using their own experience and expertise. Education applicants, in turn, have unlimited access to all the materials they need to acquire knowledge and skills.

### **3.3. Information and communication content of Ukrainian education against the backdrop of Russian military aggression**

Modern education, thanks to ICT, has rid itself of many of the dependencies that were characteristic until recently. Dependence on direct physical contact with the teacher has been leveled thanks to the introduction of online learning. The COVID-19 pandemic accelerated this process. Military aggression dramatically caused a mass migration of the population. At the same time, it did not cause a crisis in communication between administrators, teachers, and education applicants. Being in communication is now identical to the notion of contact learning. Only physical presence in a single educational and learning space is replaced by virtual. The means of communication used by Ukrainian educational institutions are oriented toward Asian, European, and American technological and software products. Consequently, Russian aggression cannot affect this communication apart from physical impact. This state of affairs has preserved the ability of the Ukrainian education system to function even after a full-scale invasion.

Ukraine has formed an Information Counteraction Center under the National Security and Defense Council, whose main task is to counter information and communication and technological attacks by the aggressor. In particular, it is reported on: “damage and destruction, destruction of data, prevention of access of Ukrainian citizens to state services, as well as - destabilization of the situation in the country and sowing panic and distrust of the authorities among the population. Since the beginning of the year, the aggressor country has launched at least several malware families in Ukraine - WhisperGate/WhisperKill, CaddyWiper, Hermetic Wiper, Industroyer2, DoubleZero, and others”[9].

Accurate measurement of digital technologies in education is crucial to shape the monitoring of progress and determine the next steps in digitalization. International data on digital education consist of separate clusters: access to education, digital skills, competence, and use, and digitalization results and statistics [10]. All indicators of the educational-digital environment, which are actualized in the conditions of distance learning in the conditions of the impossibility of the organization of the classical educational process during the military threat, are defined by such indicators as:

- the level of individual technological support of the teaching and research staff, since the technological equipment of the educational institution, is not available or limited available for full use;
- software and network support and unification for the educational process, provided that the subjects of the educational process differ in location (some teachers and applicants for education continue the educational process while abroad).

Digital competence and digital literacy are concepts that have become essential skills for the teacher [11]. It is the digital awareness and provision of digital technological and communication equipment that allows the teacher to provide the learning process. If earlier ICTs were an auxiliary element, which improved the teaching activity, now it is an indispensable attribute of the educational system of Ukrainian education.

#### 4. Discussion

Digital transformation is a prime example of innovative development. Despite the radicality and dynamism of digitalization, this process should not be chaotic and haphazard. Force majeure circumstances associated with armed aggression have become a factor that can unbalance the educational system as a whole and

its digital manifestation in particular. Peculiar “digital gaps” in the educational environment are forming[12]. Let's consider several factors indicating the potential disordered digital elements of the education system in the conditions of war:

- using unprotected online conferencing sessions (Meet, Zoom) as a medium to conduct classes with education applicants;
- teachers lose teaching and learning materials and cannot translate or duplicate them digitally;
- lack of technological support as a result of destruction as a result of military action, and redeployment of educational institutions.

The digitalization of society has been accelerated by the COVID-19 pandemic. Currently, new digital competencies are being formed, gradually becoming a cluster of educational competencies [13]. Digital-skills in the current Ukrainian education are not potential development prospects. All digital skills have already been used in practice during the pandemic. Adaptation of digital resources to the functioning of the educational space has taken place. Therefore, there was actually a restart of the distance learning format with the active use of information and communication technologies. Given that the digitalization of education in the pandemic period took place in the context of threats to human life and health, the military threat was no longer a paralyzing factor for the subjects of Ukrainian education. The educational system has adapted to functioning in a digital environment and is successfully implementing such a format.

Digitalization of the educational process requires appropriate software and hardware. In this context, Ukrainian education (unlike other spheres of public activity) is not burdened by dependence on Russian manufacturers since all technological tools and software for them are purchased from Western or Asian countries. Consequently, technological independence from the aggressor became an important factor in the stable operation of the educational and digital environment in Ukraine in war conditions.

Online and offline options are no longer a dichotomy, and this necessitates a concerted effort to reach the maximum audience with a network of digital skills so that they thrive in this digital age[14].

Cybersecurity is constantly changing its key parameters and countermeasures principles depending on the threats posed to users of the digital space [15]. This approach is effective because it allows stopping cyber

aggression online without waiting for approvals, permissions, etc. The experience of cybersecurity elements automatically accumulates and can be activated instantly when a threat.

This was also the case at the beginning of the military aggression in Ukraine. From the first days of the war, measures were activated to make it impossible to interfere with the digital educational space, both at the governmental state level and at the level of individual educational institutions. Blockchain is a digital and decentralized resource, encompassing a diverse set of blockchain technologies. Blockchain is designed to neutralize threats that are relevant in its constantly updated database. These databases are shared and synchronized across all educational institutions. Recent research on cybersecurity in education confirms the trend toward the decentralization of cybersecurity systems. The availability of cloud services and the development of the Internet of Things (IoT) contribute to the diversity of blockchain technologies[16].

Naturally, the administrations of educational institutions can install cybersecurity and organize autonomous protection from harmful parts [17]. However, it is the individual qualities that the modern world exacerbates. Cybersecurity is the most effective way to ensure the preservation of one's data through digital self-education. Self-protection is a manifestation of self-organizing processes, which is the optimal way of mastering and adapting to the educational information and digital space.

The demand for qualified cybersecurity professionals is significant and growing rapidly [18]. The dynamic development of ICTs has led to an equally rapid advance in cybersecurity. The formation of cybersecurity is a real academic perspective, not just a body of knowledge and skills for individual areas of public activity. Cybersecurity is positioned as a discipline that encompasses a wide range of ICT-related disciplines[19].

In addition, the need for specialists who can conduct educational work in educational institutions is becoming more relevant. In other words, there is a demand for educational services focused on cyber security knowledge. Such trends have developed in Ukraine in recent years. This has provided basic cyber security knowledge and avoided fundamental losses at the outset of armed aggression. In a situation where in some regions where hostilities broke out and communication between administrators, teachers, and education applicants was lost, a digital orientation was a good alternative and a way out of a difficult situation. It is now clear that communities of educational institutions or individual groups (classes) in

messengers have become an important source of information, communication, and coordination in the first hours and days of the invasion. Consequently, there is now a mobilization of all actors in the educational space to overcome the crisis characterized by existential change[20].

A separate source of information about the crisis in the information and digital dimension of Ukrainian education since February 24, 2022, are official reports of government agencies and educational institutions. It should be noted that such sources should be analyzed quite critically because often the official information does not coincide with the real state of affairs and does not always fully disclose the problem. On March 17, the official government resource of the Ministry of Education of Ukraine published information about remote platforms for learning, self-development, and getting help and verified information [21]. Various education quality monitoring centers (both Ukrainian [22] and foreign [23]) indicate in their reports that the educational and digital space in Ukraine functions effectively under the conditions of military aggression. Information and communication technologies are used by the Ukrainian government to solve both current problems (organization of the educational process, regulation of labor relations of teachers) and strategic tasks of the educational system (admission campaign 2022, educational strategies for higher education). Educational and digital space in Ukraine against the backdrop of Russian military aggression demonstrates flexibility and efficiency, despite the threats.

## 5. Conclusion

Naturally, full-scale acts of war are an existential crisis that affects all spheres of public life. Information and communication technologies are essentially axiological in nature. Consequently, Ukrainian education is faced with a fundamental civilizational contradiction, when not ways of development are elaborated, but mechanisms for the actual preservation of the education system are involved. In this context, all the benefits that are made possible by the transfer of the educational system in the digital space are processes that affect the viability of education in general.

At the same time, during the first days of the armed aggression, digital resources of educational institutions in Ukraine (those that were directly located in the occupied areas) were almost the only format in which it was possible to save important information about these subjects of the educational space. In a situation when it is physically impossible to save or transfer the information of

an educational institution, it was the digital format that became a lifeline for Ukrainian education.

Another important aspect of scientific intelligence is the lack of experience in responding to a crisis of full-scale military aggression. Consequently, the organizational component of the functioning of the educational-digital space operates in an online mode format without established and appropriately resourced formats. This leads to a certain limitation of the study since there have been no examples of the educational crisis in the digital dimension against the background of a military conflict of this scale so far. At the same time, the prospects for research of this nature are actualized. Scientific studies of educational and digital development under conditions of military conflict are a good source to analyze the functioning of the education system and the effectiveness of the digitalization of education under force majeure circumstances.

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