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## La educación a distancia en el sistema de factores de adaptabilidad de la esfera social de Ucrania

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**Resumen.** Debido a la reducida accesibilidad del proceso educativo bajo las restricciones actuales (que, junto con el COVID y la ley marcial, continúan por cuarto año), se están produciendo procesos críticos que afectan directamente a la disminución de la calidad de la educación, lo que, a su vez, no permite la formación de las competencias necesarias en los escolares modernos. El objetivo del estudio es evaluar las complejas consecuencias de la difusión de la educación a distancia en las escuelas secundarias ucranianas en relación con la capacidad de la esfera social ucraniana en general y de la esfera educativa en particular para adaptarse a las condiciones y desafíos de la vida moderna. Utilizamos los métodos de agrupación analítica, análisis factorial de series temporales, análisis estructural-funcional y otros métodos científicos. El estudio concluye que las actuales condiciones de compromiso entre la accesibilidad (prevalencia) y la calidad de la educación en Ucrania implican un giro hacia la preservación de la accesibilidad a costa de una reducción forzosa de la calidad, así como una potencial distancia. educación como factor de mejora de su calidad no se aprovecha plenamente.

**Palabras clave:** ámbito social, educación a distancia, adaptabilidad, eficacia, potencial.

## Distance education in the system of factors of adaptability of the social sphere of Ukraine

**Abstract.** Due to the decreasing accessibility of the educational process under the current restrictions (which, together with COVID and martial law, are continuing for the fourth year), critical processes are taking place that directly affect the decline in the quality of education, which, in turn, does not allow to form the necessary competencies in modern schoolchildren. The purpose of the study is to assess the complex consequences of the spread of distance education in Ukrainian secondary schools regarding the ability of the Ukrainian social sphere in general and the educational sphere in particular to adapt to the conditions and challenges of modern life. We used the methods of analytical grouping, factor analysis of time series, structural-functional analysis and other scientific methods. The study concludes that the current conditions of compromise between accessibility (prevalence) and quality of education in Ukraine imply a shift towards preserving accessibility at the cost of a forced reduction in quality, as well as potential distance education as a factor in improving its quality is not fully utilized.

**Key words:** social sphere, distance education, adaptability, efficiency, capacity.

### INTRODUCTION

The issue of effective management of distance education today should be considered in the context of the fact that from the beginning of the pandemic to the present day, this form of education has been important for the educational environment, while education in general is the basic guarantor of the development of the capacity of the social sphere to adapt to further challenges. In 2022, in addition to isolation and sanitary restrictions due to COVID, security conditions in some regions became another challenge for the effectiveness of the social sector in general and the educational system of Ukraine in particular. As a result of the large-scale invasion in the Eastern and Southern regions of Ukraine, the organization of the educational process has been complicated. In some regions, due to constant threats and challenges, online education through remote channels remains the only available form of education. In this aspect, it is important to prevent a decline in the quality of educational services.

In 2024, the issue of quality training and adaptation of the educational process to the conditions of security threats arises, which will force the periodic use of distance learning. It is already necessary to determine the organizational and methodological levers for developing the necessary competencies of students who will be responsible for the restoration of Ukraine. At the same time, distance education is still seen mainly as a factor in ensuring its accessibility and continuity in wartime, but a full picture of the impact of the spread of distance education (in some regions, it has become the dominant form of organizing the educational process) on the adaptation of the social sphere to the conditions and challenges of the current period requires much more thorough research, in particular on changes in the quality of education that accompany the transition to a distance form of its organization. After all, it is important to take into account both the impact of the spread of distance education on the ability of the education sector to maintain the desired level of coverage of educational programs and the



quality of education, its effectiveness, that is, its ability to act as a significant factor in the growth of labor productivity and income of today's students in the future.

At present, the conditions of functioning of the social sphere in general and the education sector in particular are studied mainly in the context of maintaining the availability of basic services for the population, but the qualitative changes that are taking place in the social efficiency of such services, the ability of the social sphere to ensure the effectiveness of investments in human capital do not receive the necessary scientific reflection, due to the lack of both primary information (shortcomings of the statistical base) and shortcomings of the methodological support for processing such information.

**The purpose of the study.** The purpose of this study is to assess the complex of consequences of the spread of distance education in secondary schools in Ukraine in terms of the ability of the Ukrainian social sphere in general and the education sector in particular to adapt to the conditions and challenges of the current period. This goal involves the following tasks:

- to identify the challenges of managing distance education;
- analyze the current state of distance education in Ukraine;
- to assess the dynamics of both accessibility and quality of education in Ukrainian schools against the background of the growing importance of distance education.

## ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

The problems of studying the social effect of the functioning of the social sphere in the context of adaptation to the problems and challenges of the current stage of development of the national economy have been considered in many publications. In particular, the problems of the correlation between resource and institutional factors of social efficiency of the social sphere are considered in the publications of Ukrainian researchers (Verba et al, 2021; Kudina & Verba, 2014); the problems of adaptation of the social sphere (in its broad interpretation) to the digitalization of the economy in the work of A. Kolot (Kolot, 2019); prospects for the development of the social sphere in general and the educational sector in particular in the context of the economic recovery of Ukraine - in the works of (Lopushnyak et al. (2023); Simakhova and Tserkovnyi, (2022), Oleksenko et al. (2018)).

Since the launch of distance learning, researchers have been interested in its effectiveness and the successful use of tools that will not deteriorate the quality of knowledge. Numerous analyses have focused on the statistical reflection of the number of students who were taught in distance learning and the quality of their education (M. Bondar (2021) and M. Voloshyn (2023)). The results of such analyzes pointed to problem areas and bottlenecks in distance learning, which were the focus of subsequent studies (Hnatiuk, 2021; Oleksenko et al. 2023). Since 2022, research on the problems of organizing distance learning under martial law has been updated (O. Hnatiuk (2022)). Current research focuses on evaluating the effectiveness of individual distance education tools and organizational measures for its implementation (Klopov et al. (2023); Nikitenko et al. (2022)).

## MATERIALS AND METHODS

The research methodology involves the identification of the object of study with the formulation of the subject of study and hypothesis, which, in accordance with the established purpose, allows you to choose the appropriate methods for research.

The object of research is the system of general secondary education in Ukraine in the context of the COVID-19 pandemic and martial law. The subject of the study is the impact of distance education on the ability of the social sphere of Ukraine to adapt to the conditions and challenges of the current period.

To formulate the hypothesis, it is worth noting that distance education in Ukraine has been widely used since 2020 due to the pandemic. At the same time, its introduction did not correspond to the strategic vision of education development in Ukraine, so the mechanism itself and the means and channels were not properly prepared. In 2022, as a result of Russian aggression, distance education in many regions became the leading and sometimes the only form of education that provided students with access to education in general. Lack of infrastructure support and insufficient teaching and learning materials in the field of distance education pose numerous risks and challenges to the ability to achieve the appropriate quality. Given the above, we formulate the initial hypothesis of the study as follows: in the context of the forced (caused first by the COVID-19 pandemic and later by martial law) expansion of the scale and importance of distance education, there are both risks to the social efficiency of the education sector (in particular, due to the erosion of education quality standards and obstacles to the acquisition of certain competencies) and opportunities (in particular, due to increased access to education and the harmonious combination of different educational programs within the same educational periods).

The materials for the study are statistical data on general secondary education published by the State Statistics Service for the last 5 years and the results of the PISA survey for 2018 and 2022.

The research methods involve an integrated approach.

The following methods were used to highlight the challenges of managing distance education in the context of the COVID-19 pandemic and martial law in Ukraine: analysis of literary sources and regulations, analysis of reports, recommendations and publications covering distance education issues, such as NUS reports (2020); analysis of the structure and functioning of distance education in a pandemic and martial law, primarily studying the implementation and use of digital platforms such as All-Ukrainian School Online, the system of automation of inclusive and resourceful education. The article uses the analysis and structuring of modern challenges for distance education based on the study of theoretical sources, which became the basis for generalizing the challenges of distance education management.

The following methods were used to analyze the current state of distance education in Ukraine and to study its impact on the adaptive capacity of the education sector: analysis of statistical data (data from the State Statistics Service of Ukraine (2022) were used to determine the number of general secondary education institutions, the number of students and teachers, which made it possible to assess the dynamics of changes in these indicators for the period from 2018/2019 to 2022/2023 academic years); analysis of the number of schools that switched to distance learning and the number of students covered by distance learning

Statistical methods were used to analyze statistical information on secondary education institutions based on data from the State Statistics Service, which allowed us to analyze the current state of distance education in Ukraine.

In particular, two main quantitative characteristics of the adaptive potential of distance education are proposed. The first one is the dynamics of the number of students and the share of the school-age population enrolled in Ukrainian schools as an indicator of the ability of the education sector to maintain accessibility and wide coverage of the population in a pandemic, and later - a full-scale invasion. The second is the level of success of students in mastering knowledge within the basic elements of educational programs, which reflects the ability of the education sector to adapt to modern conditions while maintaining the quality of educational services.

To evaluate the effectiveness of distance education in Ukraine, a comparative analysis of the PISA results for 2018 and 2022 was used, and generalizations were made about the impact of distance education on the level of students' competence, which is the main performance indicator for managing distance education. To position the educational sector of Ukraine in relation to the dynamics of educational results of schoolchildren in European countries, the method of assessing the deviation of an individual value from the group average was used. The results of this comparative analysis allowed us to draw conclusions about the effectiveness of distance education.

The method of graphical display was used to visualize the results of the study.

## RESEARCH RESULTS

### Challenges of managing distance education

Distance education is one of the available forms of education for Ukrainian students in accordance with the Law of Ukraine "On Education" (2017). The choice of distance education is made by parents or other legal representatives of the child. Martial law expands the coverage of distance education, and schools can create remote classes/groups for children who have gone abroad or do not want to study offline for security reasons (Ministry of Education and Science, 2023a).

In 2020, the main problem with the effectiveness of distance education was the lack of systematic communication at the school level, which negatively affected both teachers and educational managers, as well as students and their parents (NUSH, 2020).

Thus, O. Hnatiuk (2021) notes a number of main challenges that should be taken into account when managing distance education to ensure its effectiveness. Thus, the main challenges in managing distance education can be structured as follows:

- 1) organization of students' self-education, including the development of independent learning skills; insufficient readiness of students to master the educational material independently; the need to involve parents in their children's education and control;
- 2) student motivation. A critical requirement for the effectiveness of distance education is the need for conscious motivation for distance learning, while proper motivation in distance learning is becoming a complex problem;
- 3) communication, including the reduction of social communication and problems in organizing communication during online meetings and asynchronous learning
- 4) time management;

- 5) difficulties in individualizing learning in a mass school during distance learning;
- 6) identification of students, including avoidance of falsification of results due to insufficient methods of control over the actions and results of students in distance learning;
- 7) the need for teachers to master new means and methods of teaching in the digital environment;
- 8) lack of a single unified platform (Hnatiuk, 2021).

Regarding the management of distance education during martial law, the Ministry of Education and Science of Ukraine has implemented important measures to enhance the effectiveness of this process, such as the introduction of the All-Ukrainian School Online electronic platform; launching a system for automating the work of inclusive resource centers; and connecting schools to the AICOM system, which introduces electronic diaries and journals (Hnatiuk, 2022). At the same time, the learning process itself can be provided in synchronous and asynchronous modes using numerous digital platforms and communication services. In recent years, the methodology of distance learning has been improving (Hnatiuk, 2022). At the same time, the effectiveness of distance education management has not been sufficiently studied either during quarantine or martial law. The significance of the issue is due to the formation of a significant gap in research on the impact of distance education on the quality of learning.

### Current state of distance education in Ukraine

Table 1 presents the general dynamics of educational institutions and students of general secondary education institutions at the beginning of the academic year (AY) according to the State Statistics Service (2022).

**TABLE 1.** General secondary education institutions at the beginning of the academic year, thousand

Years	Number of general secondary education institutions	Number of students in general secondary education institutions	Of these, in institutions		Graduation of students from general secondary education institutions		Number of teachers in general secondary education institutions
			Daytime	evening (variable)	received a certificate of basic general secondary education	received a certificate of complete general secondary education	
2018/19	15,5	4042	4017	25	345	195	441
2019/20	15,2	4138	4116	22	352	198	440
2020/21	14,9	4211	4191	20	345	222	440
2021/22	14,0	4230	4103	17	363	229 6	435
2022/23	13,0	4042	3122	12	366	221 6	402

Source: compiled from (State Statistics Service, 2022).

In the 2020/2021 academic year, the number of distance education schools amounted to 4,882. About 30% of students were enrolled in distance education. This situation required adaptation and changes in the education system, and many teachers, parents, and students began to actively use distance resources and online courses (Bondar, 2021).

The statistics on the number of distance education institutions for 2021/2022 and 2022/2023 academic years according to the State Statistics Service (2022) are presented in Table 2.

In 2021/2022, 3.3 thousand schools in Ukraine were engaged in distance learning (Ukrinform, 2021). In the 2022/2023 academic year, the educational process was implemented in a distance form in 4,363 institutions, and another 4,608 institutions followed a mixed form. In five oblasts - Donetsk, Zaporizhzhia, Luhansk, Kharkiv, and Kherson - constant threats to the security situation and rocket attacks do not allow for the educational process to be conducted in person or in a mixed form, which is why all schools operate remotely (NUSH, 2023).

**TABLE 2.** Number of students enrolled in distance learning in 2021/2022 and 2022/2023

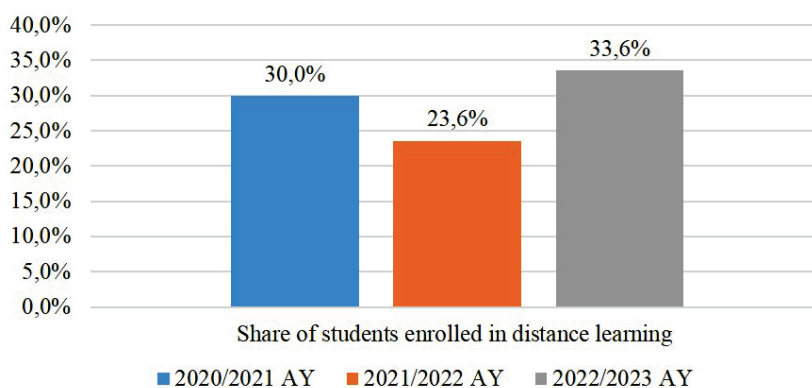
Indicator	Total	2021/2022 AY		Total	2022/2023 AY	
		In urban areas	In rural areas		In urban areas	In rural areas
Number of institutions, total	13 991	5 545	8 446	12 976	5 278	7 698
Total number of students, persons	4 230 358	3 034 679	1 195 679	4 041 976	2 907 979	1 133 997
Number of students enrolled in distance learning	17 688	17 256	432	747 893	589 358	158 535

Source: compiled from (State Statistics Service, 2022).

According to the Ministry of Education and Science, 12929 secondary education institutions started the 2023/2024 academic year, with 3.9 million students and 388 thousand teachers (Ministry of Education and Science, 2023). 15% of institutions work remotely (Voloshyn, 2023).

So, in Figure 1 shows the dynamics of the share of students studying remotely.

**Figure 1.** Dynamics of the share of students who studied at a distance, %



Source: compiled by (State Statistics Service, 2022).



In 2020-2023, the share of students enrolled in distance education was 30-33.6%.

Accordingly, according to the first criterion for assessing the impact of the spread of distance education on the adaptive capacity of the education sector, there is a significant positive impact of distance education. Against the background of a slight decrease in the absolute scale of this form of educational process (the number of institutions that used this form of educational process decreased by 7.3%, and the number of students enrolled in distance education - by 4.5%), there is a significant increase in the importance of distance education in meeting the needs of the population in educational services (the share of students studying remotely increased by 10 percentage points).

### **Assessment of the effectiveness of distance education**

A qualitative indicator that allows to assess the effectiveness of distance education management is the international PISA assessment, the comparison of the results of which for 2018 and 2022 will allow to compare the level of education of Ukrainian students.

PISA-2018, an international study of the quality of education, showed the following results of 15-year-old Ukrainian students:

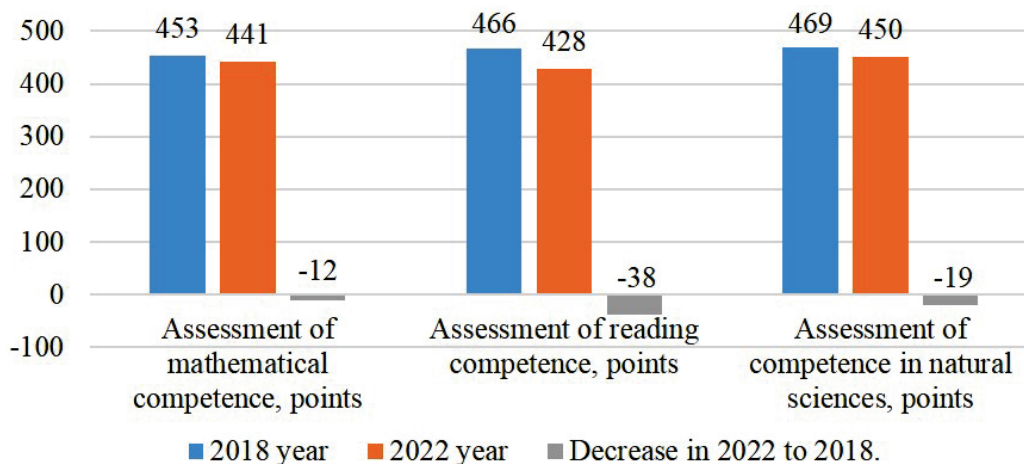
- 1) mathematical competence - the average score in Ukraine is 453 points (the leading country has 591 points, the average in OECD countries is 489);
- 2) reading competence - the average score of Ukrainian students in reading is 466 points (the leading country is 555, the average in OECD countries is 487).
- 3) competence in science - the average score in Ukraine is 469 points (the leading country is 590, the average in OECD countries is 489) (PISA, 2018).

According to PISA 2022 results:

- 1) in mathematics, the main subject of PISA 2022, 15-year-olds scored 441 points compared to the average of 472 points in OECD countries;
- 2) on average, 15-year-olds scored 428 points in reading, compared to an average of 476 points in OECD countries;
- 3) in Ukraine, the average science score of 15-year-olds is 450 points, while in OECD countries it is 485 points (PISA, 2022).

Figure 2 compares the results of PISA 2018 and 2022.

Accordingly, with regard to the second criterion for assessing the impact of the spread of distance education on the adaptive capacity of the education sector, there is a significant negative impact of distance education. Of course, it is incorrect to attribute the decline in the level of competence of school students in all three areas of study recorded in 2022 to the impact of the spread of distance education alone, as a number of other factors also contributed to the recorded dynamics. However, the combination of the two trends (the increase in the share of distance education with a decrease in average student performance) is quite pronounced. The average score in math decreased by 2.65%, although the gap between the performance of Ukrainian students and the European average decreased from 7.4% to 6.6% (by 0.8 percentage points). The average reading score decreased by 8.2%, and the gap with the European average increased from 4.3% to 10.1% (by 5.8 percentage points). Finally, in natural sciences, similar indicators are equal to a 4.1% decrease in the average score and an increase in the gap from 4.1% to 7.2%.

**Figure 2.** Changes in student survey results, %.

Source: compiled by (PISA, 2018; PISA, 2022).

Thus, based on the analysis, we can conclude that the potential of distance education to ensure the adaptation of the education sector to the conditions and challenges of today, while maintaining not only the coverage of the population with educational services, but also the quality of educational services, is not fully realized. Over the past three years, the growth of distance education coverage to 23-30% of the total number of students has been accompanied by a significant decline in their competence in basic subjects.

## CONCLUSIONS

The study found that over the past three full academic years, about a third of students have received educational services in a distance format. This is due to the fact that anti-pandemic restrictions were introduced in 2020/2021 academic year, and in 2021/2022 academic year and 2022/2023 academic year, students were forced to study under martial law. The international PISA assessments in 2018 were conducted under the conditions that all Ukrainian institutions were operating in full-time mode. At the same time, the results of the PISA assessment in 2022 showed a significant decline in the basic competencies of 15-year-old students (in math, reading, and science). Comparing the PISA results in 2022 with those of 2018, it was found that the level of competence has critically decreased, indicating that the introduction of distance education was not effective and its management is carried out at an inadequate level, without taking into account the requirements of the times, which has a direct impact on the lack of educational services and, accordingly, the reduction in the effectiveness of education in general. This creates a range of threats to the further development of Ukraine's educational system and the adaptive capacity of the social sphere. The persistent negative dynamics of inadequate quality of distance education undermines Ukraine's long-term ability to ensure social growth and well-being of the population.

Further research should be aimed at improving the efficiency of distance education in Ukraine, given the importance of educational potential for the development of the social sphere. In addition,

it is necessary to analyze regional changes in the quality of education, especially focusing on regions where distance education has been introduced due to the increased danger of students' physical presence in educational institutions. This will give impetus to further optimization of distance education in Ukraine by identifying gaps in management processes and eliminating them.

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