

# Covid-19 and Distance Education: Analysis of the Problems and Consequences of the Pandemic

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## Summary

In the spring, 2020, the pandemic caused quarantine and all educational institutions switched to distance learning, which led to significant changes in the field of education around the world. It has become necessary to build its capacity to provide distance learning to protect education and create opportunities for more individualized approaches to teaching and learning not only during future pandemics but also during other possible issues, such as natural disasters, when a developed flexible curricula could be taught face-to-face or online. The article presents an analysis of distance education in the world during a pandemic, analyzes significant changes, and implements measures in the field of education in Ukraine and around the world. The role of public and international organizations in the implementation of quarantine in the conditions of COVID-19, which partially took over the functions of state and local authorities, is emphasized. The closure of schools under COVID-19 has led to a de facto deterioration in learning outcomes, so we have analyzed the effects of distance learning and digital inequality in the world. It is shown how the COVID-19 pandemic affected access to public services in Ukraine.

### Key words:

*COVID-19, education, analysis of pandemic problems and consequences, learning outcomes, distance learning, digital inequality.*

## 1. Introduction

The UN's fourth goal for sustainable development by 2030, which is also being pursued by Ukraine, is to "ensure comprehensive and equitable quality education and promote lifelong learning for all people" [1].

The pandemic has led to significant changes in the field of education around the world, it has caused educational problems in Ukraine. At the beginning of the quarantine in the spring of 2020, all educational institutions in the emergency mode switched to distance learning.

The vast majority of countries have closed all educational institutions for at least some time, and in some areas, education has stopped. According to UNESCO [2], in April 2020, all schools were closed in 191 countries, that means more than 90% of all students on the planet were sent to distanced learning.

## 2. Literature review

Let's analyze the publications related to the outlined problem. Researchers Ivan Prokopenko and Svitlana Berezhna note that COVID-19 encourages higher education institutions in Ukraine to implement innovative solutions in a relatively short period and to introduce distance learning by using various web servers, platforms, resources and social networks [3].

Bhutanese scientists Semitra Pohrel and Roshan Cetri in their research paper "Review of the Literature on the Impact of the COVID-19 Pandemic on Teaching and Learning" [4], analyzing the general situation, note that since many pupils and students study at home they experienced psychological and emotional stress, they were unable to be productively engaged into learning [5].

Owen P. Hall notes that many educational institutions quickly adjusted to work due to the COVID-19 situation, ie moved to work on the Internet. He argues that educational institutions will be able to remain competitive and economically viable through the 21st century due to globalization [6].

Researchers Steve Brammer and Timothy Clark point out that under COVID-19, the most vulnerable were those students who lost the opportunity to go abroad during the

crisis. And research and teaching staff have come under pressure from COVID-19 [7].

### 3. The initial presuppositions

In the article, the following research methods were used to solve the set tasks: theoretical (study and analysis of scientific and pedagogical, psychological and pedagogical, reference, specialized literature, regulatory documentation on the topic of research, additional professional advanced training programs; analysis, comparison, classification of the information received and generalization); empirical (pedagogical experiment, observation, questionnaire survey, survey, conversation, testing); mathematical (statistical data processing).

### 4. Methods

The learning process during the quarantine in the spring was stressful for all participants in the educational process. According to a survey conducted by the State Education Quality Service of Ukraine (SSSA) [8], 62.35% (Fig. 1) of principals said that most teachers and students did not have the necessary equipment at home, and 46,9% indicated a low-speed Internet connection. Most teachers shared a computer with other family members, and 6% of teachers did not have access to high-speed Internet. 22.3% of the surveyed parents testify to the low quality of the Internet connection. In addition, 8.8% of parents said that their families did not have a computer. Most children (81.6%) used mobile phones, presumably smartphones, for distance learning. Instead, they use fewer laptops (45.6%) and desktops (34.3%).

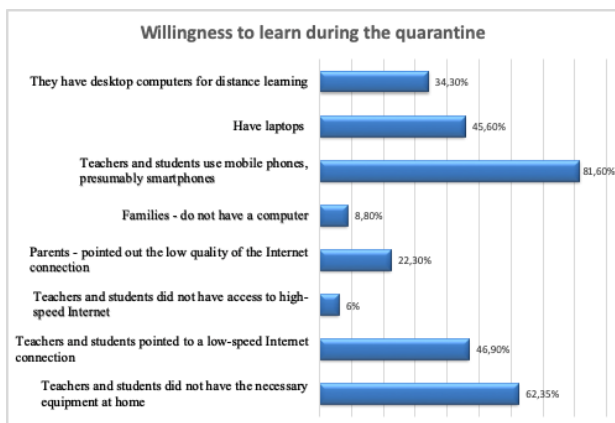


Fig 1. Willingness to learn during the quarantine

In the study "Education and Pandemic: What Ukrainians Think About Distance Learning and How They Evaluate EIT" [9], we have the following results.

In July 2020, the majority of Ukrainians rated the quality of school education in Ukraine as average (44.5%), another 10% - as positive, and a third of citizens – as very low (11%) or rather low (25%). Also, 26% of respondents indicated that with the transition to distance learning the level of children's success decreased (Fig. 2).

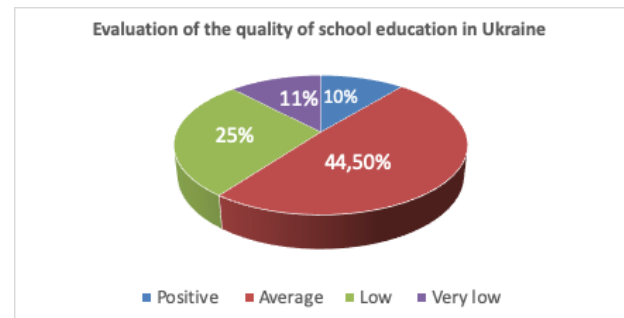


Figure 2. Evaluation of the quality of school education in Ukraine

Let's consider the measures implemented in Ukraine to support distance learning. Primarily, support for distance teaching and learning began with the broadcast of video lessons on television and the use of online distance learning platforms. Organizations such as EdCamp Ukraine [10] have organized online training and exchange of experiences for distance learning teachers. Together with UNICEF, Ukraine also conducted information campaigns such as "School, we are ready" to inform teachers, school leaders, students and parents about the recommendations for safe and lifelong learning in COVID-19 in the 2020-21 school year.

In many educational institutions, distance learning looked like sending material for self-study from a textbook, written assignments to test knowledge and evaluate results without any discussion, feedback and explanations.

In a parents survey at the beginning of the pandemic, [11], parents were asked how motivated their children are to study in quarantine and whether they are engaged in self-education. Assessing children's motivation on a scale from 0 to 5, unfortunately, 8.1% of students, according to parents, had no desire to learn at all, 26.8% had only some motivation, and 58.6% of students had a moderate desire to learn. 6.5% indicated that their children showed an excessive thirst for knowledge (Figure 3).

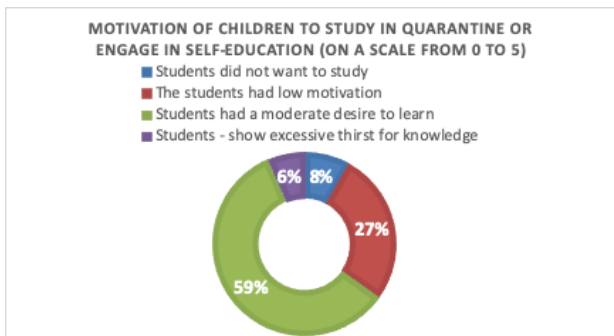


Figure 3. The motivation of children to study in quarantine and whether they are engaged in self-education (on a scale from 0 to 5)

Therefore, for a child to be quarantined, parents used coercion, encouragement, reminders, promises, persuasion, praise, motivation and even blackmail [5].

All-Ukrainian International organizations provided informational and educational support to:

- UNICEF, together with the Ministry of Education and Science, launched an information campaign on safe learning during the School, We Are Ready pandemic [14];
  - USAID together with the Ministry of Health created information materials for educational institutions [13];
  - The Swiss Confederation within the DECIDE project ("Decentralization for the Development of Democratic Education") supported the development of the website mon-covid19.info, as well as the online course "On distance and blended learning formats";
  - Google has provided educational institutions with free access to all G Suite for Education tools and services [13].
- Information and material support of public and international organizations has facilitated the transition to distance learning for students and their parents, as well as for employees and management of educational institutions.

Let's analyze the consequences of distance learning and digital inequality. The closure of schools under COVID-19 has led to an actual deterioration in learning outcomes [15]. Research is still ongoing, but the first data obtained in Belgium [16], the Netherlands [17], Switzerland [18] and the United Kingdom [19] demonstrated as deteriorating learning outcomes and increasing the level of inequality. It is worrying that the level of such deterioration is much higher among students from families with low levels of education. These findings are supported by a study showing that children from families with better socioeconomic status received greater support from parents for schooling during school closures [20].

According to a study [21] of educational inequalities in Europe and physical school closures during COVID-19, in half of the 21 countries surveyed, 4th-grade students with low socioeconomic status have at best, they are twice as likely to have access to the Internet as their more privileged peers. In general, students from poor families are more

likely to have less access to digital learning resources, such as a personal computer or laptop, high-speed Internet, and a comfortable learning environment, including their room or desk, quiet privacy, and parental support. In Ukraine, access to the Internet, especially in villages and small towns, is limited, which could significantly increase educational inequalities.

According to the State Statistics Service [22], households in large cities are almost twice as likely to have access to the Internet than rural households - 80% vs. 44%. 79.5% of residents of large cities use the Internet, while 55.9% of rural residents reported it. The Ministry of Finance investigated [23] access to broadband high-speed Internet (broadband internet). It turned out that more than 17 thousand settlements out of 28 thousand do not have optical networks at all. About 65% of villages are not covered by high-quality broadband. In total, 5.75 million citizens do not have the opportunity to connect to a high-quality fixed broadband system. More than 4 million Ukrainians live in villages where there is no high-quality fixed Internet. 40% of schools, mostly located in villages or small towns, do not have access to high-speed Internet (Fig. 4, 5,6).

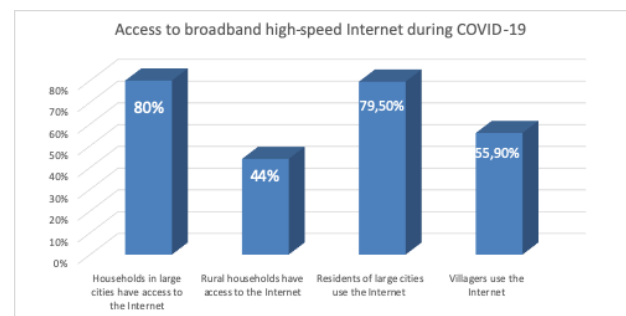


Figure 4. Access to broadband high-speed Internet during COVID-19

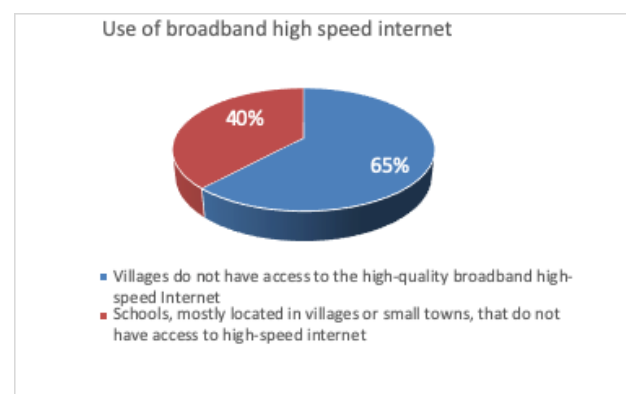


Figure 5. The use of broadband high-speed Internet

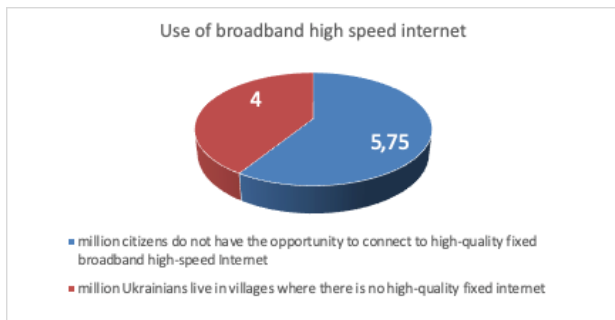


Figure 6. The use of broadband high-speed Internet

Therefore, schoolchildren from rural areas do not have well-developed digital skills and skills in using the Internet [24].

Thus, according to a survey of parents "Teaching children during quarantine" [25], which the Education Ombudsman Service conducted in the first month of the pandemic, at the beginning of quarantine among 8056 respondents, poor Internet quality was 10.1% of families and 3% of families had interruptions to the Internet connection. It is worth noting that the performance of the Internet was worse because those who do not have an Internet connection - did not answer. 66.5% of parents indicated the availability of computer equipment necessary to ensure their children's education (Fig. 7).

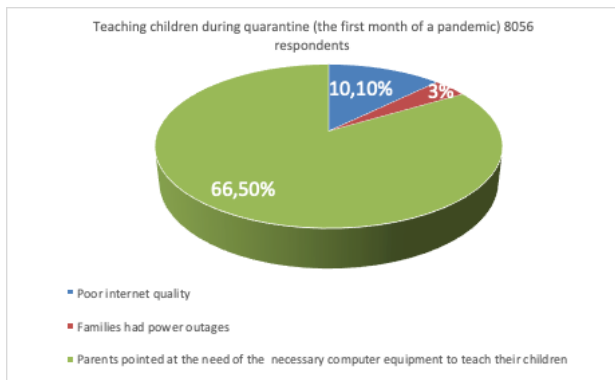


Figure 7. Teaching children during quarantine (the first month of a pandemic) (8056 respondents)

According to the analytical review of the article "Health and Education: how the COVID-19 pandemic affected access to public services in Ukraine", for example, 13,178 students in the mountainous district of Ivano-Frankivsk region had the opportunity for distanced learning, and another could not study remotely due to lack of Internet access and received assignments and materials (Fig. 8).

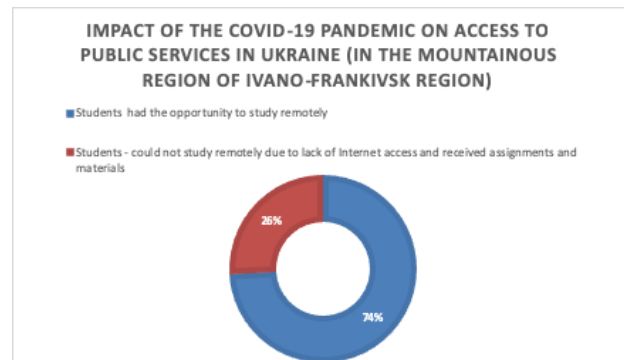


Figure 8. Impact of the COVID-19 pandemic on access to public services in Ukraine (in the mountainous region of Ivano-Frankivsk region)

It is not difficult to understand that the quality and level of knowledge of students who could not fully learn remotely and interact with the teacher online will be different from students who had such an opportunity. Also, according to the survey with reference to the Ministry of Digital Transformation, 2531 schools in Ukraine are located in settlements where there is no internet provider, so teachers and students can not connect to quality Internet. All this accordingly affects the level of knowledge of students [12].

## Results and discussion

The effectiveness of pedagogical support in the process of distance learning is achieved by the following conditions: the presence of computer literacy, accounting for psychological patterns of perception, memory, attention and age of students, their individual and personal characteristics, creating psychological comfort, including the ability of the teacher to dialogue by means of information technologies, to find individual approach to students, realization of specially organized self-control of students and systematic control of teacher on generalization of knowledge provided at development of the corresponding educational programs, possession of skills of independent work, maintenance of effective interaction of all components of distance learning system.

Consequently, the development of the system of education in Ukraine is related to all of modern aspects of informatization of educational process. These aspects are: humanitarization of education, activation of educational activity, humanizing of educational process, intensification of intercourse of teachers and students and gaining specific weight of independent, research character of educational activity, fundamentalization of knowledge and granting the results of studies of practical meaningfulness, integration of educational objects and differentiation of studies in accordance with individual queries, inclinations and

capabilities of students, providing basic levels of knowledge in different spheres.

The transition to distance education during a pandemic can have a long-term impact on educational outcomes, especially among vulnerable populations. According to estimates [26] of researchers from France, Italy and Germany, the weekly deterioration in learning due to the transition to distance learning ranges from 0.82 % to 2.3% of the standard deviation. According to them, such deterioration will be reflected in the test results due to a decrease in the amount of study time compared to the amount of time that students spent on training before the introduction of quarantine restrictions and the transition to online formats.

Both students and teachers may have deteriorating mental health due to the transition to distance learning during a pandemic. The results of a national survey conducted in the United States [27] on the health of parents and children during the COVID-19 pandemic show that 27% of parents reported deteriorating mental health and 14% - about the deterioration of the mental health of their children. According to a study [28] of the effects of COVID-19 on the mental health of college students in the United States, 71% of students reported increased stress and alarm due to the COVID-19 outbreak. The results of a study [29] of the impact of the coronavirus pandemic on the mental health and well-being of UK educators show that 52% of school teachers reported deteriorating mental health. During a pandemic and quarantine restrictions, people may experience stress, anxiety, fear, isolation, and trauma from the loss of a loved one. In Ukraine, no special studies were conducted on the mental health of educators and workers in this field, but surveys [30] were conducted on the psycho-emotional state of Ukrainians in quarantine. On the one hand, the results of the survey show signs of depression, anxiety, panic, fatigue and sleep disorders in respondents, and on the other hand, according to researchers, "the level of negative emotional states of Ukrainians during quarantine and their dynamics is not a cause for concern." there was no significant increase in the number of disorders such as panic or depression.

Forced isolation at home during quarantine restrictions is associated with an increase in domestic violence in Ukraine and around the world. In the United States, at the beginning of quarantine, 50% more calls [31] to the national hotline on violence against children began to be recorded compared to the same period in 2019. In Norway, the number of calls to the national child helpline has risen sharply, many of them related to conflicts and tensions at home.

At the beginning of quarantine in Ukraine, the number [32] also increased by 30% calls to the Domestic Violence Hotline [33].

During the pandemic, unequal access to education in Ukraine and around the world and psychological aspects in

general had a negative impact on the quality of students' education.

According to the analytical review "Health and Education: how the COVID-19 pandemic affected access to public services in Ukraine" [34], analysts of the The World Bank, analyzing data from 157 countries, suggests that, depending on the total duration of strict quarantine and school closures, the actual loss of school time will range from 0.3 to 0.9 years of schooling.

Researchers at the Oxford Center for Demographic Sciences in Leverhulm [35], has collected data on student learning outcomes in the Netherlands during the first eight-week school closure in 2020, concluded that to a serious deterioration in the learning outcomes of primary school students.

Deterioration in learning outcomes is particularly noticeable in families with a low level of education, in such families, the results of students are 50% worse than in others. Despite quality distance care, primary school students lose one-fifth of the progress they typically make in a year, and children from disadvantaged families have been even more affected.

Researchers are excited because Dutch students have some of the world's best virtual learning opportunities, but have lost an average of 20% of expected progress due to school closures. Taking into account the results of the study, the Government of the Netherlands announced the allocation of a crisis package of 8.5 billion euros for activities to increase school staff, summer tutoring programs, support for the mental health of students.

And researchers from the University of Cambridge and RTI International [36], analyzing data from Ghana (a state in West Africa), calculated that the last annual academic progress achieved by children of the disadvantaged families of the Global South, could be destroyed by school closures during a pandemic. They found that an average of 66% of academic achievement during the school year was lost outside school within three months. But this result is much worse for children who do not have adequate resources for homeschooling or support.

## Conclusion

Educators around the world must not only restore the education system after the pandemic but also be constantly on the lookout for future crises. To do this, each country needs to build its capacity to provide blended learning models. All educational institutions should be better prepared (if necessary) for the transition: from full-time to distance learning. This will protect education and create opportunities for more individualized approaches to teaching and learning, not only during future pandemics but also during other situations, such as natural disasters, by developing flexible curricula that can be taught in-person or

online. In addition, educators need to be well-trained to manage a wide range of IT devices and to guide education reform in line with the standards of the European Education Area. This is a long-term process and Ukraine is working in this direction. Authorities are developing distance education rules, making greater use of blended learning approaches, and working to increase the number of schools with Internet connections and access to digital devices and equipment. Such a focused work will help educational institutions not only to overcome the effects of COVID-19 but also to introduce more sustainable and flexible approaches in future educational activities aimed at maintaining continuity of learning and operational sustainability in higher education, through measures to expand the digitalization of the sector.

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