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THE IMPACT OF THE PANDEMIC ON THE MODERN INFORMATION AND EDUCATIONAL ENVIRONMENT

Changes in the external environment can have a significant transformational impact on the service sector. The crisis caused by the COVID-19 pandemic has affected all sectors of the economy, contributing to the urgency of new forms and technologies of work, including remote access and employment at home. The education system was one of the first to face global changes and the need to develop distance learning technologies for security purposes. In this regard, it is important to consider what the consequences and results of the educational process can be in a crisis. The study of changes in the education system in the context of a pandemic, the creation of a comparative assessment is important in terms of further adaptation of the education system to crisis phenomena, the development of effective technologies of remote interaction of participants in the educational process and the impact on the quality of education.

Key words: education, COVID-19 pandemic, distance learning technologies, virtual space, telecommunications, social consequences.

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Пандемияның қазіргі ақпараттық және білім беру ортасына әсері

Сыртқы ортадағы өзгерістер қызмет көрсету саласына елеулі трансформациялық әсер етуі мүмкін. COVID-19 пандемиясынан туындаған дағдарыс экономиканың барлық салаларына әсер етті, жұмыстың жаңа нысандары мен технологияларының, соның ішінде қашықтан қол жетімділік пен үйде жұмыспен қамтудың өзекті болуына ықпал етті. Білім беру жүйесі алғашқылардың бірі болып жаһандық өзгерістерге және қауіпсіздік мақсатында қашықтықтан оқыту технологияларын дамыту қажеттілігіне тап болды. Осыған байланысты дағдарыс жағдайында білім беру процесінің салдары мен нәтижелері қандай болуы мүмкін екенін қарастырған жөн. Пандемия жағдайындағы білім жүйесіндегі өзгерістерді зерттеу, салыстырмалы бағалау жасау білім беру жүйесін дағдарыстық құбылыстарға одан әрі бейімдеу, білім беру процесіне қатысушылардың қашықтықтан өзара әрекеттесуінің тиімді технологияларын дамыту мен білім сапасына әсері тұрғысынан маңызды болып табылады.

Түйін сөздер: білім беру саласы, COVID-19 пандемиясы, қашықтықтан оқыту технологиялары, виртуалды кеңістік, телекоммуникация, әлеуметтік салдар.

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Влияние пандемии на современную информационную и образовательную среду

Изменения во внешней среде могут оказать существенное трансформационное воздействие на сферу услуг. Кризис, вызванный пандемией COVID-19, затронул все отрасли экономики, способствуя актуализации новых форм и технологий работы, в том числе удаленного доступа и занятости на дому. Система образования одной из первых столкнулась с глобальными изменениями и необходимостью развития дистанционных технологий в целях безопасности. В связи с этим следует рассмотреть, какими могут быть последствия и результаты образовательного процесса в

условиях кризиса. Изучение изменений в системе образования в условиях пандемии, проведение сравнительной оценки являются важными с точки зрения дальнейшей адаптации системы образования к кризисным явлениям, влияющим на качество образования и развитие эффективных технологий дистанционного взаимодействия участников образовательного процесса.

Ключевые слова: сфера образования, пандемия COVID-19, дистанционные технологии обучения, виртуальное пространство, телекоммуникации, социальные последствия.

Introduction

Education is a powerful driver of development and one of the most powerful tools for reducing poverty and improving the situation in the field of health, gender equality, peace and stability. Today, education has significant and sustainable benefits, in particular, has a positive impact on income and prevents the growth of inequality. Providing quality education that will help all children get the education they need to work is crucial to eradicating poverty by 2030. Although significant progress has been made over the past decade, about 121 million children in the world still do not attend primary and junior high school classes, and 250 million children cannot read or write, although they go to school. And in the world, which took place in 2020, the covid-19 coronavirus pandemic affected all spheres of public life, Production was suspended, borders of many countries were closed, quarantine and restrictive measures were introduced. Radical changes have also affected the education sector, and students and students have switched to a distance learning format. All students stopped attending school and higher education institutions at some point, and due to restrictive measures, they were banned from walking and attending sports and entertainment events.

The COVID-19 pandemic has caused disruptions in the educational process around the world and has had a huge negative impact on students and teachers around the world and the work of preschool institutions, secondary schools, technical and vocational education and training institutions, universities, adult education institutions and advanced training centers. The crisis exacerbates the problem of previously existing inequality in education, reducing the opportunity for the most vulnerable segments of the population, young people and adults, a significant proportion of people living in poor or rural areas, girls, refugees, disabled people to continue their education. In addition, the cost of Education threatens to cover future generations and destroy the progress made over decades, which contributes to the access of girls and young women to education and the continuation of their studies. If we talk about the economic consequences of the pandemic,

in 2021, another 23,8 million children and young people (from preschoolers to university students) may drop out or become inaccessible to education (UN). In addition, the disruption of the educational process leads to serious consequences outside the educational system: the closure of educational institutions affects children and other communities, including complicating the organization of proper nutrition, affects the ability of many parents to do their job, and contributes to an increased risk of violence against women and girls. The global pandemic has consequences that threaten the success achieved at a high price in terms of improving global education [1, p. 12].

However, it should be noted that the crisis has stimulated innovation in the field of Education. To ensure the continuity of training and professional training, innovative approaches are used, from radio and television broadcasts to the provision of a set of materials for home study. Thanks to the rapid response measures taken by governments and partners around the world, including within the framework of the Global Education Coalition under the auspices of UNESCO, to organize the continuous learning process, distance learning solutions have been developed. In addition, this situation reminded us of the important role of teachers and reminded us that the government and other key partners are tasked with caring for education workers.

Methodology

By mid-April 2020, the pandemic had affected 200% of students in 94 countries around the world, i.e. 1.58 billion children and young people (from preschoolers to university students) (World Bank).

Even if there is a response to the spread of COVID-19, it is clear that school closures will in any case cause educational losses for children and young people studying at school. Data on the consequences of the polio pandemic of 1916 [3, p. 22]; World War II [4, p. 58]; and various natural disasters show that disrupting the normal learning process in school has long-term consequences. According to research, school closures have a negative impact on learning for two reasons: first, students receive less learn-

ing material when schools are closed. Secondly, stopping attending school usually leads to a loss of previously acquired knowledge and skills, which is reflected in the loss of knowledge of vulnerable groups of students during the summer holidays [5, p. 3].

The pandemic also has a side effect on education. This is the financial well-being of the people. Due to budget tax problems and an increase in the burden on development assistance systems, education funding can pose a serious threat, exacerbating the huge deficit of funds allocated for education before COVID-19.

All these cases indicate the importance of analyzing the impact of the COVID-19 pandemic on the information and educational environment that occurred in 2020. To find out how the education system of Kazakhstan has changed, it is necessary to conduct a detailed statistical analysis. In addition, in order to consider the global consequences of this pandemic situation, we can determine the level of

impact of the covid-19 pandemic on education by conducting a comparative analysis for the countries of Central Asia and Europe.

What is the impact of the pandemic on the information and educational environment?

In September 2015, at the world high-level meeting on Sustainable Development under the auspices of the United Nations in New York, Member States officially adopted the Sustainable Development Agenda for the period up to 2030. This goal is to provide comprehensive and fair quality education and encourage lifelong learning opportunities for everyone (including seven tasks and three methods). This agenda included 17 goals, including the new global education goal (SDG 4 – sustainable development goal 4). SDG 4 – provide comprehensive and fair quality education and encourage lifelong learning opportunities for all. And in the picture below, you can see the deficit in the amount of funds planned to reach the SDGs 4 [1, p. 17].

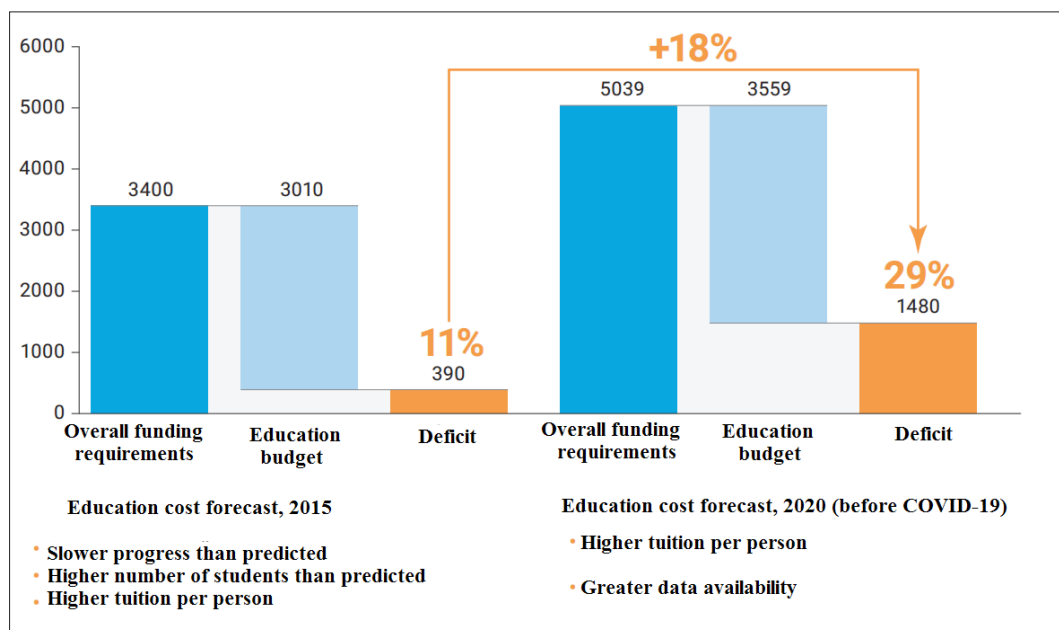


Figure 1 – Shortage of funds to achieve SDGs before COVID-19 (million. US dollar)

In addition to closing schools, the economic downturn caused by the pandemic could lead to more students leaving, leading to a further increase in education costs. Currently, government agencies and educational institutions are doing everything possible to reduce the consequences of school closures, ensuring the possibility of switching to distance learning. There were huge differences be-

tween the countries in the level of preparation for the transition to distance learning, in some cases the transition to distance learning was carried out urgently. There is little data to assess the effectiveness of distance learning at the basic general education level, and it is difficult to assess the effectiveness of these cost reduction measures. However, it is now becoming increasingly clear that distance learning

differs from full-time learning by “inequality of opportunities”. In this case, an important role is played by such characteristics as the availability of the internet and the necessary technical means, as well as the presence of family members who can help children during classes.

UK experience shows that during school closures in March-May 2020, children from wealthy families spent 30% more time studying at home than children from low-income families [6, p. 7]. According to other studies, differences in homeschooling have shown significant inequality in opportunities between regions and social groups. Thus, a pandemic can eventually lead not only to a decrease in average academic performance, but also to an increase in inequality in educational outcomes.

In Europe and Central Asia, girls ‘education results are higher than boys’, but in distance learning, girls have less time to study if they have to work more at home than boys, so they may lose this advantage. In addition, if school dropouts increase, boys may fall even further behind. Students with special needs may also suffer, as not all forms of distance learning are possible for them [2, p. 12].

Due to the closure of schools, the ability of the pandemic to respond depended on the level of development of the country: for example, in the second quarter of 2020, in countries with a low Hu-

man Development Index, 86% of primary school children stopped studying, and in countries with a very high Human Development Index, this figure was only 20%. The deficit in funding for education was 1 148 billion for low-income and low-income countries. According to calculations, in a year and in the current conditions, this amount may increase by a third.

Academic performance in Central Asia and Europe in the context of the COVID-19 pandemic

On the eve of the pandemic, almost all countries of the world completely closed all institutions of their educational systems, thereby trying to increase social distancing and prevent the spread of infection. In countries that have closed educational institutions, the number of Lost study days varies from 38 in Denmark, to about 120 in Azerbaijan and Georgia (Table 1). Previously, schools in the region were closed during a severe outbreak of seasonal flu, as well as during a pandemic known as swine flu (H1N1) in 2009. According to epidemiological data, the closure of schools helped reduce the spread of infection. Data on the effectiveness of this measure in the case of coronavirus infection are contradictory. The results of one study show that school closures had little or no effect on the spread of COVID-19. However, this is one of the most effective non-medicinal measures [2, p. 4].

Table 1 – Impact of the COVID-19 pandemic on academic performance for Central Asian and European countries

Countries	Assessment of the potential of mobilization	Number of schools closed	Duration of school education, years (current state)	Scenarios for changing the duration of school education		
				Optimistic	Intermediate	Pessimistic
Central Asia	2,3	104	8,8	-0,63	-0,6	-0,9
Kazakhstan	3	108	9,1	-0,3	-0,6	-1,0
Kyrgyzstan	2	108	8,7	-0,4	-0,6	0,9
Tajikistan	2	74	6,8	-0,3	-0,5	0,7
Uzbekistan	2	108	9,1	-0,3	-0,6	-1,0
Eastern Europe	2,2	74	9,9	-0,4	-0,6	-0,9
Ukraine	2	87	9,9	-0,4	-0,6	-0,9
Northern Europe	5	33	11,4	-0,2	-0,7	-1,1
Denmark	5	38	11,1	-0,2	-0,7	-1,1
Russian Federation	4	101	10,9	-0,3	-0,7	-1,0
Azerbaijan	3	121	8,3	-0,3	-0,6	-0,9
Georgia	3	122	8,3	-0,3	-0,7	-1,1
Southern Europe	4,9	93	10,5	-0,3	-0,7	-1,1
Western Europe	4,7	62	11,3	-0,2	-0,6	-1,1

* World Bank report on the economy of Europe and Central Asia

According to the estimates of the World Bank specialists of the Department of global practice in education in Europe and Central Asia, when differentiating the effectiveness of distance learning regimes, a tool was used to simulate the impact of school closures on the inequality of educational outcomes (efficiency for the poorest students – 25%, for the average students – 50% and for the richest students – 75%). As a result, it was found that in the course of distance learning, the gap in the educational achievements of the richest and poorest groups of students should increase by 8-30% in Central Asia, by 11-18% in the South Caucasus, by 11% in the Western Balkans and by 9% in Central Europe (World Bank). The impact of such a failure on higher education is more difficult to model due to the lack of an estimate of the «amount» of knowledge gained in a normal academic year.

Universities in almost all countries of the world have also switched to online learning. Therefore, the quality of education in higher education institutions is also influenced by factors in the basic general education system, namely: access to technical means for the use of it, the availability and quality of internet communication, a place for classes or training, and the necessary training and content for training in an online environment. The transition to full online learning can be an obstacle to high school graduates' timely admission to higher education institutions. In case of delay in admission to the university, there are such problems as the inability of some of these students to study at the university (or do not enroll in the University). Universities where many international students usually study can lose a significant portion of their income if enrollment decreases.

The economic downturn caused by the pandemic can also have negative consequences for university graduates. The experience of Canada shows that during a recession, students who graduate from college for at least a decade face constant difficulties from low wages, mainly limited opportunities in the labor market, which exacerbates the initial problem of inequality.

There is no clear understanding of the impact of the recession on the outflow of students from higher education institutions. On the one hand, families may not be able to support adult children due to a decrease in household income. On the other hand, in times of economic downturn, especially in places with high unemployment rates, the cost of studying at a higher educational institution decreases. Data on the outflow of students from colleges in Italy dur-

ing the recession of 2008-2009 show that these two effects (the recession and the decline in tuition fees) compensate for each other, and there was no change in the rate of dropout [7, p. 51].

Information and educational system of Kazakhstan in the context of a pandemic

The education system in Kazakhstan made every effort to ensure high-quality education for all students before the COVID-19 global pandemic began. However, in PISA 2018 (program for International Student Assessment), student performance decreased compared to 2012 (in 2012-393 points, in 2018 – 387 points) and was lower than the OECD average. Two-thirds of the students tested by PISA showed low results in functional literacy. Despite these problems, the COVID-19 pandemic has forced Kazakhstan to close schools and switch to emergency distance learning using online platforms and television broadcasts. Due to the extreme nature of distance learning initiatives, the effectiveness was expected to be lower than that of full-time education.

In Kazakhstan, the COVID-19 pandemic has led to significant learning costs and has not pushed many students into functional illiteracy. It is estimated that the student will receive 40 points from PISA during the year, schools will be closed for an average of about four months, and, considering that distance learning in the country is twice as effective as full-time education, it is estimated that the PISA rate of study in Kazakhstan will decrease to the equivalent of 8 points (Figure 2). In addition, according to estimates, the percentage of students with low functional literacy increases by 3% (from 64% to 67%) [8, p. 3].

The differentiated accessibility and effectiveness of distance learning expands the learning gap between students. Distance learning may not be effective for all students, but it is extremely inefficient for students from the lower socio-economic group. When parents work from home, the need for parental work prevails, and only students from well-connected families and those who have multiple computers, electronic devices, and TVs can take full advantage of distance learning. Students with special needs may face unique access problems to distance learning content. According to PISA 2018 data on access to learning forms and forecasts of differentiated effectiveness, the gap in academic performance between children from poor and rich families is expected to increase by 18% after the short-term closure of the school (PISA 45 to 53 points) (Figure 3).

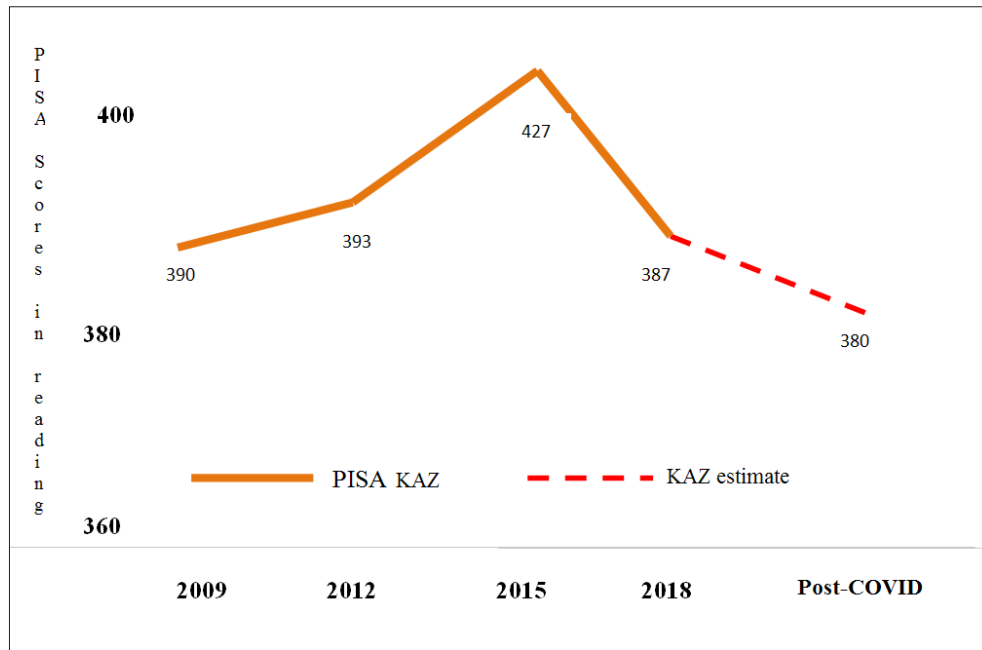


Figure 2 – Assessment of PISA scores related to COVID-19

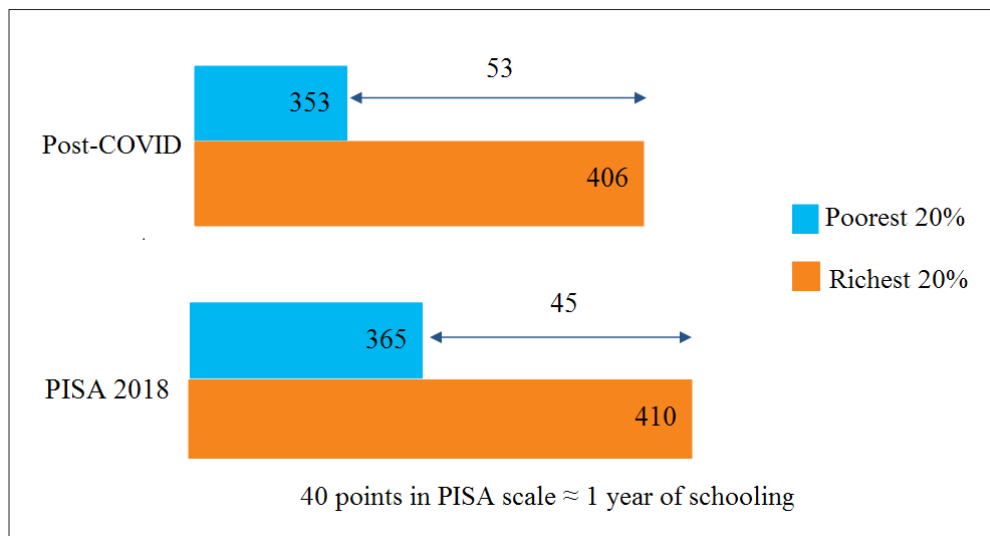


Figure 3 – The impact of COVID-19 on the difference in socio-economic achievements

Geographical inequality often worsens the social situation. Experts have divided Kazakhstan into four regions with different income levels, life expectancy, birth rate and other indicators that affect the Human Capital Index (HCI). The difference between four different regions is large: for example, there is a four-fold difference between regions with high efficiency in terms of income and low efficiency, the north of the country in terms of birth can be compared with Europe, the South shows the trends of countries with low income, and the north-west of

Kazakhstan in terms of life expectancy is similar to sub-Saharan Africa.

The results of the PISA also confirm the differences in human capital across Kazakhstan, according to which low-performance regions lag behind high-performance regions by four years and show weak results in rural and urban schools. Regional performance is high, and the gap between urban and rural schools shows that the indicators of the smallest North Kazakhstan region show that there are opportunities for other regions (Figure 4).

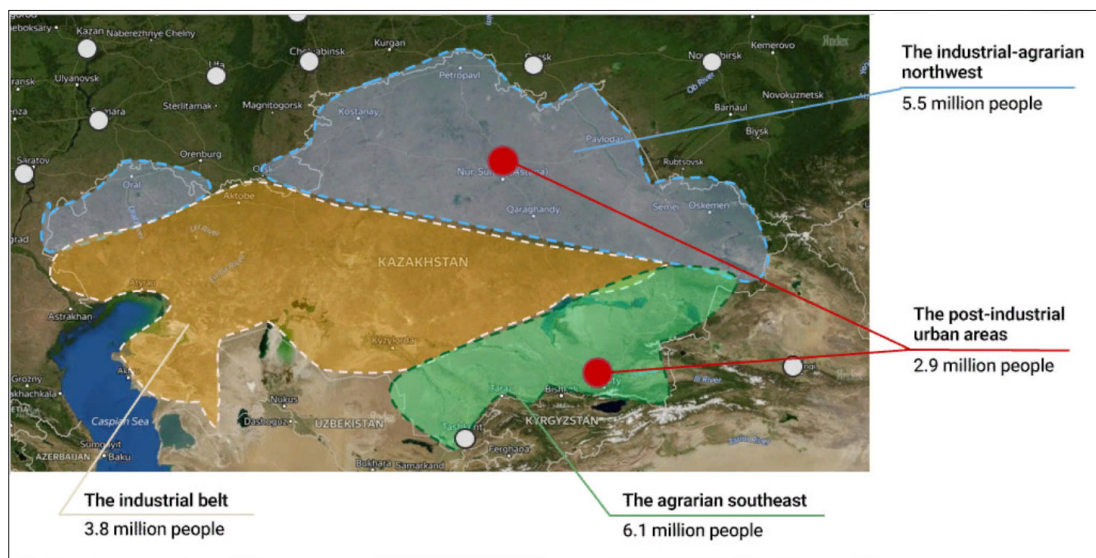


Figure 4 – Geographical features of human capital in Kazakhstan

Another concern is the gap between the best and low-performance students. Take Nazarbayev Intellectual Schools (NIS), a network of 22 highly competitive schools for the best students aged 5 to 18 years. NIS students were ahead of their peers by 124 points according to PISA, which indicates almost three years of study time.

As for functional literacy, the academic performance of NIS students also differs significantly: according to the PISA results for 2018, only 6.2% of NIS students were recognized as functionally illiterate (out of 67% across the country).

The impact of academic performance and income shocks caused by the current pandemic can lead to higher school dropout rates in the medium term. Students who lag behind in their studies are more likely to be demotivated and have a higher risk of dropping out of school. The loss of household income due to COVID-19 also tests the ability of households to pay for the maintenance of students in school, increases the number of young people who do not attend school, and prevents the transition to post-secondary education. If the authorities do not take measures to compensate for the cost of training and protecting human capital in the affected group, the impact of COVID-19 on education will have a decade-long impact on the economy. Since years and quality of school education are associated with the possibility of generating income in the future, closing schools can lead to a decrease in the income of those affected. According to estimates, in Kazakhstan, four months after the closure of schools in March-June 2020, future revenues may decrease by

2.9%, which is equivalent to a total economic loss of 1.9 billion per year.

Kazakhstan needs to increase the cost of education and Justice, ensure recovery to compensate for the cost of Education, prevent the expulsion of students and invest in the creation of a sustainable education system for other crises in the future, as well as the need to achieve the level of development that the country strives for.

The HCI value shows how productive the child will be in the future if he is healthy and educated. In the period from 2010 to 2020, Kazakhstan's HCI index, although average, showed a slight increase from 59 to 63 points. This increase was mainly due to improved health: increased survival rates for adults and reduced growth retardation among children under the age of five [9, p. 53].

Conclusion

The pandemic has clearly shown that in times of crisis, there can be a significant increase in inequality in access to quality education. Distance learning, which has become a necessity as a result of the pandemic, has posed a challenge both for teachers, who have not always had the necessary skills for this form of learning, and for students, who have not always had access to the digital technologies necessary for distance learning. School closures can lead to educational losses even when alternative forms of education are provided. Their closure can be particularly detrimental to children from socially vulnerable families. In addition, today's labor markets

require a higher level of human capital development than in the past; therefore, having a solid foundation becomes increasingly important, since basic education will not be enough.

Strengthening human capital is an urgent task for a country that seeks to enter the top 30 most developed countries by 2050. Kazakhstan is the largest landlocked and sparsely populated country in the world, and it cannot rely solely on natural resources or densely populated markets to ensure growth. For this purpose, Kazakhstan plans to increase funding for education from the current 3.4% to 7% of GDP by 2025. This is a long-awaited initiative that will bring the country to the average level of OECD spending, but it is important to ensure that these investments are used wisely and effectively, and that they benefit all children.

The projected significant impact of the current pandemic on educational outcomes requires commitment and constant monitoring at the highest levels of Public Administration. Strengthening control, evaluation, mentoring, and accountability can help schools and teachers achieve results.

Central Asian countries, including Kazakhstan, can ensure a significant increase in labor productivity by improving the quality of basic general and higher education. To achieve this goal, it is necessary to: 1. modernize the basic general education system to create a solid foundation; 2. improve the quality and relevance of vocational education and higher education; 3. eliminate the inequality of educational opportunities and outcomes, which remains an unresolved problem at both levels of education systems. All strategic initiatives should be made taking into account the post-crisis context in which distance learning plays an important role during the pandemic. The first task that needs to be solved is to provide all students with technical means for using it and the ability to connect to communication channels necessary for full distance learning. The second task is to improve the quality of distance learning. It is necessary to train teachers and school principals to make the most effective use of distance learning mechanisms and provide them with appropriate resources to ensure that children actually master knowledge and skills. The third task is to prevent distance learning from becoming a cause of inequality in educational outcomes.

The main task for world leaders and the entire educational community should be to prevent the education crisis from turning into a generational catastrophe. This is the best way not only to protect the rights of millions of students, but also to promote

economic progress, sustainable development and lasting peace. The UNESCO-led Global Coalition on Education, which includes United Nations entities, international organizations, private sector actors and representatives of civil society, is currently taking active steps to support the education response of countries in response to COVID-19.

To reduce the impact of the pandemic on the information and education system, the following recommendations are being developed:

1. Suppressing the spread of the virus and carefully planning the reopening of schools. The most effective measure that countries can take to reopen schools and other educational institutions as soon as possible is to suppress transmission of the virus in order to contain outbreaks at the national or local level. If they have achieved this, they should then follow the parameters set out below and conduct a thorough preparatory consultation process as they tackle the difficult task of returning to school.

2. Protecting sources of education funding and coordinating actions to achieve results. The pandemic has caused the deepest global economic crisis in modern history. It will have a lasting impact on the economy and public finances. The impact has been particularly severe for low-income and lower-middle-income countries. Despite the constraints on public spending, national authorities must take measures to mitigate the long-term impact on children, with education measures, along with health, social protection and economic recovery initiatives, to be part of national stimulus packages in response to COVID – 19. The international community also needs to take measures to protect the sources of funding for education. The expansion of the budget space, which is already high on the international agenda, especially with regard to education, is becoming a matter of paramount importance. In this regard, several mutually reinforcing aspects should be highlighted: increased domestic revenue mobilization, maintaining the priority share of education spending and addressing inefficiency in spending; strengthening international cooperation to resolve the debt crisis; and protecting sources of official development assistance for education.

3. Improving the viability of education systems for equitable and sustainable development. Education, which is an inalienable human right — is the foundation for a just, equitable and inclusive society and one of the most important factors for sustainable development. Improving the resilience of education systems enables countries to address the immediate

challenges of safely reopening schools and prepares them to better cope with future crises.

4. Rethinking education and accelerating positive change in teaching and learning. Against the backdrop of widespread school closures and the end of non-formal learning, an impressive and innovative response has been put in place to support learning and teaching. But the response also revealed significant gaps, primarily the digital divide. Educational losses resulting from prolonged school closures are jeopardizing numerous educational

achievements. For several reasons, the world will not be the same again. As the “resilience-focused recovery” progresses, education systems must be made more flexible, fair and inclusive.

The titanic efforts made in a short time to respond to the upheaval in education remind us that changes that were previously considered difficult or unattainable are still possible. We must seize this opportunity to find new ways to overcome the education crisis and develop a set of long-term solutions.

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