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School education in Ukraine in the context of the crisis: challenges and strategies to overcome

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Abstract

School education forms the foundation for developing human capital, a critical economic growth and innovation driver. This study aims to analyze the impact of war and other crises on the Ukrainian education system and explore strategies for overcoming challenges in the post-war context. The research employs a systematic review of scientific literature and statistical analysis of educational funding and enrollment data. Primary data sources include World Bank statistics, and Ukraine's Ministry of Education reports for 2014-2022. The results show a sharp decline in school enrollment, particularly in frontline and rural areas, where infrastructure has been damaged and access to education is limited. The number of teachers has also decreased due to displacement, while many schools face inadequate funding and technological resources. Despite increased public spending on education (6% of GDP in 2022), challenges in providing digital tools and internet access persist, particularly for remote learning. The psychological impact of war on students and teachers further complicates the situation, with many requiring mental health support. The study concludes that addressing funding gaps, improving access to digital tools, and providing psychological support are essential for the education system's recovery. Future research should focus on implementing reforms to enhance digital literacy, develop inclusive education strategies, and ensure equal access to education in a post-war setting. Expanding distance learning infrastructure and rebuilding educational institutions will be key priorities.

Keywords: education, digitalization of education, social reforms, psychological support, students, distance education, infrastructure school, financing, distance learning

Дағдарыс жағдайында Украинадағы мектептегі білім: қиындықтар мен күресу стратегиялары

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Түйін

Мектептегі білім адами капиталды дамытудың негізін, экономикалық өсу мен инновацияның маңызды факторын құрайды. Бұл зерттеудің мақсаты-соғыстың және басқа дағдарыстардың украинаның білім беру жүйесіне әсерін талдау және соғыстан кейінгі жағдайдағы қиындықтарды жеңу стратегияларын зерттеу. Зерттеу барысында ғылыми әдебиеттерге жүйелі шолу және білім беруді қаржыландыру және студенттерді қабылдау туралы мәліметтерді статистикалық талдау қолданылады. Деректердің негізгі көздері Дүниежүзілік Банктің статистикасы және Украинаның Білім Министрлігінің 2014-2022 жылдарға арналған есептері болып табылады. Нәтижелер мектептердегі оқушылар санының күрт төмендегенін көрсетеді, әсіресе инфрақұрылымы бұзылған және білімге қол жетімділігі шектеулі алдыңғы қатарлы және ауылдық жерлерде. Халықтың қоныс аударуына байланысты мұғалімдер саны да азайды, ал көптеген мектептер қаржыландыру мен техникалық ресурстардың жетіспеушілігіне тап болды. Мемлекеттік білім беру шығындарының ұлғаюына қарамастан (2022 ЖЫЛЫ ЖІӨ-нің 6% - ы), әсіресе қашықтықтан оқыту үшін цифрлық құралдармен қамтамасыз ету және Интернетке қосылу проблемалары сақталуда. Соғыстың студенттер мен оқытушыларға психологиялық әсері жағдайды одан әрі қиындатады және олардың көпшілігі психикалық денсаулықты қолдауды қажет етеді. Зерттеу қорытындысы бойынша білім беру жүйесін қалпына келтіру үшін қаржыландырудағы олқылықтарды жою, цифрлық құралдарға қолжетімділікті жақсарту және психологиялық қолдау көрсету қажет. Болашақ зерттеулер цифрлық сауаттылықты арттыруға, инклюзивті білім беру стратегияларын әзірлеуге және соғыстан кейінгі жағдайларда білімге тең қолжетімділікті қамтамасыз етуге бағытталған реформаларды жүзеге асыруға бағытталуы керек. Қашықтықтан оқыту инфрақұрылымын кеңейту және білім беру ұйымдарын қайта құру негізгі басымдықтар болады.

Кілттік сөздері: білім беру, білім беруді цифрландыру, әлеуметтік реформалар, психологиялық қолдау, студенттер, қашықтықтан білім беру, инфрақұрылымдық мектеп, қаржыландыру, қашықтықтан оқыту

Школьное образование в Украине в условиях кризиса: вызовы и стратегии преодоления

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Аннотация

Школьное образование формирует основу для развития человеческого капитала, важнейшего фактора экономического роста и инноваций. Целью данного исследования является анализ влияния войны и других кризисов на украинскую систему образования и изучение стратегий преодоления вызовов в послевоенном контексте. В исследовании используется систематический обзор научной литературы и статистический анализ данных о финансировании образования и количестве учащихся. Основными источниками данных являются статистика Всемирного банка и отчеты Министерства образования Украины за 2014-2022 годы. Результаты показывают резкое сокращение охвата школьным образованием, особенно в прифронтовых и сельских районах, где инфраструктура была повреждена, а доступ к образованию ограничен. Число учителей также сократилось из-за перемещения населения, в то время как многие школы сталкиваются с нехваткой финансирования и технических ресурсов. Несмотря на увеличение государственных расходов на образование (6% ВВП в 2022 году), проблемы с предоставлением цифровых инструментов и доступа в Интернет сохраняются, особенно для дистанционного обучения. Психологическое воздействие войны на учащихся и преподавателей еще больше усложняет ситуацию, и многим из них требуется поддержка в области психического здоровья. В исследовании делается вывод о том, что устранение пробелов в финансировании, улучшение доступа к цифровым инструментам и оказание психологической поддержки необходимы для восстановления системы образования. Будущие исследования должны быть направлены на реализацию реформ, направленных на повышение цифровой грамотности, разработку стратегий инклюзивного образования и обеспечение равного доступа к образованию в послевоенных условиях. Расширение инфраструктуры дистанционного обучения и восстановление учебных заведений станут ключевыми приоритетами.

Ключевые: образование, цифровизация образования, социальные реформы, психологическая поддержка, студенты, дистанционное образование, инфраструктура школы, финансирование, дистанционное обучение

Introduction

School education is the basis for developing human capital, which has become the main driver of economic growth and innovation in the modern world. Quality education allows students to acquire the knowledge and skills necessary to participate in the global economy, adapt to technological changes, and be competitive in the labor market. In the context of Ukraine's integration into the world community, a high level of education contributes to the development of critical sectors of the economy, such as information technology, engineering, and science. In addition, primary education is an essential tool for reducing social inequality.

Providing all citizens access to basic knowledge and skills helps create equal opportunities for social and economic advancement. This is especially important in Ukraine, where differences between regions and social groups can be significant. Quality and accessible education for all population segments helps overcome these differences, creating conditions for inclusive and equitable development of society. Education, as a critical factor in social and economic development, has faced severe challenges associated with the destruction of infrastructure, forced migration, deterioration in the quality of the educational process, and the psychological state of students and teachers. Faced with the devastating consequences of the war, the Ukrainian education system has been forced to adapt to new conditions to ensure access to knowledge for children and young people in an unstable and threatened environment.

Introducing distance learning, revising curricula, and providing psychological support to students have become critical measures to minimize the damage. However, despite these efforts, funding, digital inequality, and shortage of teaching staff continue to exacerbate the existing difficulties. This study aims to analyze the impact of the war on education in Ukraine, identify key issues, and discuss possible measures to mitigate the negative consequences for future generations. Impact of the war on education in Ukraine is extremely destructive and multifaceted, affecting both the physical infrastructure of educational institutions and the psychological state of students and teachers, access to education and the quality of the educational process.

In addition, the destruction of infrastructure, interruptions to the Internet and electricity, postponement of classes, and consolidation of schools at odds with the quality of education also lead to a burden on the budget in the future. The Government has a lot of work to finance education by rebuilding and equipping schools and printing textbooks and workbooks. Some surviving schools have been converted into reception centers for victims or serve as temporary military accommodations.

The war in Ukraine has had a serious negative impact on the education system. Many schools were destroyed or damaged, which led to mass closures of educational institutions, especially in areas of active hostilities. Millions of students were forced to switch to distance learning, which exacerbated the problem of inequality in access to education since not everyone has access to the Internet and the necessary technologies. Population displacement has also led to many children finding themselves outside the school system, needing help adapting to and continuing their education in new places. This article aims to examine the difficulties and new challenges of education in Ukraine.

Literature review

School education is an essential stage in developing a person's personality. On the one hand, Ukraine took into account the requirements of educational standards of the former CIS countries; on the other hand, it took into account the innovative approaches of the EU. Even before COVID-19, there was a need to improve digital literacy among school teachers and students. The state began to actively equip schools with modern equipment and increase the implementation of ICT in schools, technical schools, and universities [1,2,3]. However, educational reforms were brewing not only in the field of digitalization. The need to change educational standards was dictated by time and the strengthening of supranational interethnic organizations that sought to improve education. Scientists Lokshyna, O. I., Dzhurylo, A. P., Glushko, O. Z., Shparyk, O. M., Topuzov O. wrote that schools have become more inclusive and accessible, especially the conditions for admission to the first grade have been simplified [4,5,6]. Changes in the school education system are needed most in areas where critical problems are concentrated, such as insufficient funding. The issues associated with financing school education in Ukraine have been studied by several studies, which highlight the insufficiency of budgetary funds to meet educational institutions' current and future needs [7,8].

Although there are private schools in the country, some of which operate on public-private partnership models, the leading financial burden still falls on the state budget. This creates significant obstacles to ensuring the proper quality of education in the public sector. Lack of funding directly affects critical aspects of school functioning, such as equipping classrooms with modern equipment, timely printing and distributing educational materials, and providing schools with all the necessary resources for a typical educational process [9]. In particular, some academic institutions need more modern technologies, including computers and multimedia devices, which reduces the opportunities for introducing innovative teaching methods and hinders the development of students' digital competencies. This is especially important in the context of global digitalization and the growing importance of information and communication technologies in the educational environment.

In addition, delays in printing and delivering educational materials negatively affect the effectiveness of the educational process and lead to uneven student access to academic resources [10]. These problems are particularly acute in rural schools and remote regions, where budget funding is limited and infrastructural issues further complicate access to educational resources.

The military actions have significantly destroyed schools, universities, and other educational institutions in the affected regions [11]. According to the Ministry of Education of Ukraine, thousands of schools were shelled or destroyed, forcing students to switch to distance learning or seek alternative forms of continuing their studies in less affected regions. This fact has sharply reduced the availability of quality education, especially in active hostilities areas, where restoring educational buildings or providing safe conditions for classes is impossible [12,13]. The forced transition to distance learning caused by both the COVID-19 pandemic and the war has exacerbated existing problems with access to the internet and digital resources, especially in rural and frontline

areas [14]. Many students and teachers lack computers or reliable internet connections to participate fully in the educational process [15]. Moreover, not all teachers were prepared to work in the new environment, which led to a deterioration in the quality of teaching and learning.

Massive population displacement as a result of the hostilities has significantly affected the number of students and teachers in various regions. Internally displaced persons (IDPs), including schoolchildren and students, find themselves in new educational environments where they are faced with the need to adapt to new conditions, teachers, and programs [16]. At the same time, there is a shortage of teachers in frontline areas, which further complicates the educational process. In addition, many students and teachers have been forced to emigrate, creating a shortage of qualified personnel in the Ukrainian education system.

War has a significant psychological impact on students and teachers. Constant stress, anxiety, and traumatic experiences associated with military action hurt students' ability to concentrate on their studies and absorb material. This requires implementing psychological support programs for students and teachers, another essential task in military conflict. Martial law leads to a significant burden on the budget. The state has to invest in restoring destroyed schools; there is not enough funding to publish textbooks, and humanitarian aid points are being opened in functioning schools [17]. An even more significant burden on education transformation is expected after the war's end [18]. A plan is already being developed under which, in the post-war period, financial resources will be directed explicitly to technical schools for the rapid retraining of the most needed specialists.

The development of school education in Ukraine faces numerous challenges, many of which have been exacerbated by the ongoing war and the global COVID-19 pandemic. Although efforts have been made to modernize educational infrastructure and align it with CIS and EU standards, the lack of adequate funding remains a critical issue. This has directly impacted the quality of education, particularly in rural and remote areas, where access to modern equipment and educational materials is limited. The war has further complicated these issues, with the destruction of schools, displacement of students and teachers, and the necessity to shift to distance learning, all contributing to a significant decline in educational access and quality.

Additionally, the psychological toll on students and teachers due to constant stress and trauma cannot be underestimated, highlighting the urgent need for psychological support programs. The post-war reconstruction of the education system will require significant financial investment to rebuild physical infrastructure and address the ongoing need for digitalization and innovation in teaching methods. A comprehensive strategy that includes immediate relief and long-term planning will be essential for restoring and enhancing the educational system, ensuring that future generations have the skills and knowledge necessary to thrive in a post-war society.

Methods

The study used several complementary methods to analyze the problem and its context. A detailed analysis of scientific and analytical publications related to the

research topic was conducted at the initial stage. The literature review included works devoted to analyzing educational systems in times of crisis and materials concerning the impact of conflicts on education systems. The sources were scientific journals, books, and articles in peer-reviewed journals.

For a meticulous analysis of changes in education, we employed a method that involved comparing data for different years. This approach, which allowed us to identify key trends and dynamics of changes in Ukraine's education system, was efficient. By comparing education expenditures as a percentage of GDP and the number of students, we could discern the relationship between budget financing and the availability of education. All data were meticulously structured and visualized using statistical analysis software, ensuring the accuracy of our findings.

As part of the quantitative analysis, data provided by the World Bank, covering the period from 2014 to 2022, were used. These data included statistics on education sector funding, student enrollment, quality of education services, and changes in access to education due to the conflict. The data will allow tracking of changes in the number of schoolchildren in primary education and teachers in secondary education in Ukraine over the specified period. The data will also enable a comparison of how the number of students changed compared to the number of teachers at different times.

An essential factor is that some data are incomplete when collected since, as a result of the war, the Ukrainian statistical committee could not always determine the exact number of teachers and students. Using descriptive statistics and methods, it was possible to identify the main trends and dynamics of indicators for the specified period.

Results

Public expenditure on education as a percentage of GDP is a critical macroeconomic indicator that allows the state to assess the priority of the education sector in the context of its overall expenditure and economic development. Analyzing changes in education expenditure as a percentage of GDP over several years allows for tracking trends in public financing of the sector. Although there is no direct relationship between the rate of GDP and the quality of education, higher expenditure may be reflected in improved educational infrastructure, higher teachers' salaries, the introduction of new technologies in the learning process, and other factors that affect the system's quality. This analysis is instrumental in understanding the balance of the country's budget priorities.

The total amount of public expenditure on education demonstrates the degree of importance the government attaches to human capital development. This indicates the extent to which resources are directed toward improving and supporting the country's education system and, thus, towards creating a more skilled and competitive workforce in the future (Figure 1).

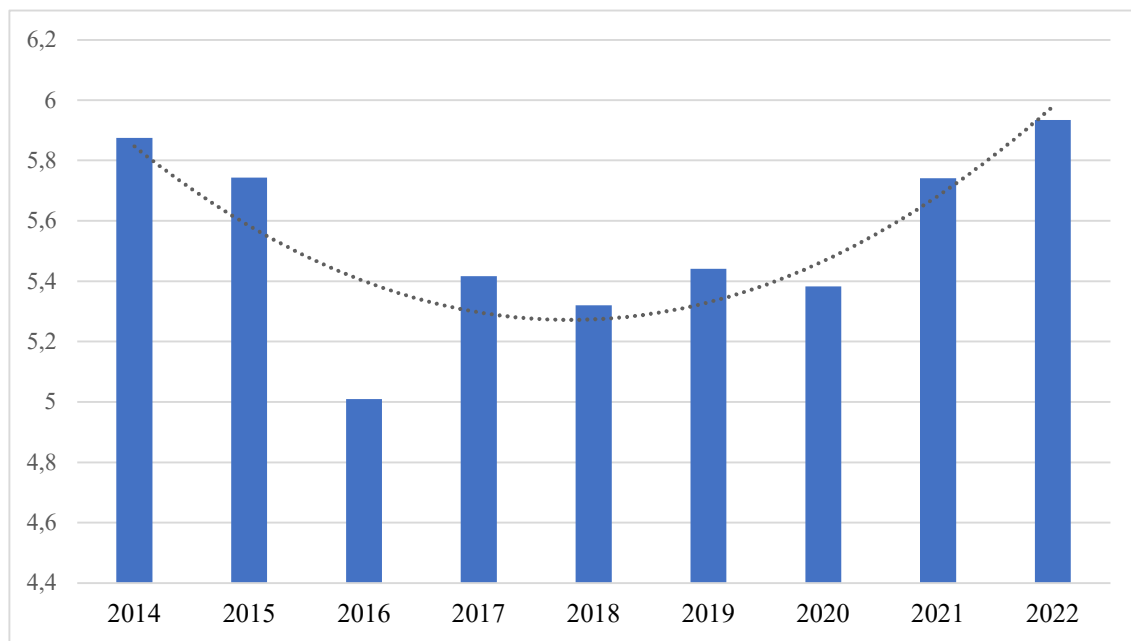


Figure 1. Government expenditure on education, total (% of GDP)

Note: compiled by the authors based on source [19]

The level of education funding is not just a financial consideration but a strategic investment in long-term economic development. An educated workforce is a cornerstone of sustainable economic growth, and public expenditure on education is a crucial part of a strategy to enhance human capital. In the context of Ukraine's challenging financial and economic situation, especially in recent years, it is vital to evaluate public expenditure on education and other budget items, such as defense, healthcare, and social programs.

In 2014, education expenditure amounted to about 5.8% of GDP, the highest figure at the beginning of the observed period. In 2015, there was a slight decrease to 5.6%, but expenditures remained relatively high. In 2016, there was a significant drop to 5%, the minimum level for the analyzed period. However, in 2017, the recovery process began, and the percentage of expenditures increased to 5.4%. However, in 2018, there was another decrease when the share of GDP allocated to education decreased to 5.2%. In 2022, expenditures reached their maximum for the entire period - about 6% of GDP, which indicates an increase in the priority given to education: investment in education was necessary to restore destroyed schools and improve the destroyed infrastructure.

The Ukrainian government sought to increase secondary and higher education coverage and succeeded until 2019. The maximum increase in Figure 1 is 84.48%. During the war, school enrollment decreased (for example, 70.72% in 2022). Further data is missing from the Derzhstat and World Bank websites. This is due to population migration or the inability to collect accurate data. Parents want their children to study safely in schools, but this has been virtually impossible in some regions of Ukraine in recent years.

The bar chart represents the percentage of gross school enrollment in tertiary education from 2014 to 2022. Each bar reflects the total enrollment in tertiary institutions as a percentage of the population that is officially of the age group corresponding to tertiary education (Figure 2).

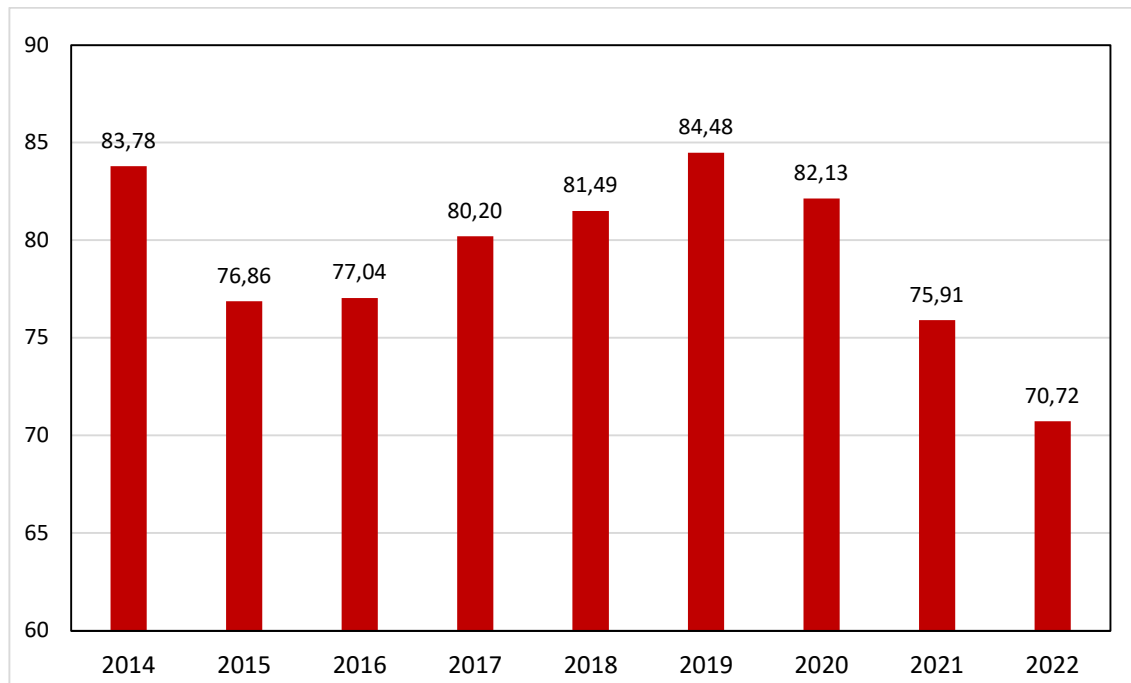


Figure 2. School enrollment, tertiary (% gross)

Note: compiled by the authors based on source [19]

The bar represents the percentage of gross school enrollment in tertiary education from 2014 to 2022. Each bar reflects the total enrollment in tertiary institutions as a percentage of the population that is officially of the age group corresponding to tertiary education. With an increased transition to distance education, the costs of purchasing technical equipment and laying the Internet network, especially in rural areas, led to an increase in investment in the educational environment. The enrolment rate in higher education, expressed as a percentage of gross enrolment, helps to assess the accessibility and prevalence of higher education among young people.

In 2014, the enrollment rate was 83.78%, demonstrating a relatively high level of participation in the higher education system. However, a slight decline was observed in 2015 and 2016: 76.86% in 2015 and 77.04% in 2016. Since 2017, a gradual increase began, and the rate increased to 80.20%, and in 2018 it reached 81.49%. The highest enrollment rate was recorded in 2019 - an impressive 84.48%, indicating a peak in the interest and accessibility of higher education during this period. Since 2020, a decline in enrollment has begun, which can be due to various factors, including the COVID-19 pandemic, which has led to a change in the operation of education systems worldwide. 2020, the indicator drops to 82.13%, and in 2021, it falls even more - to 75.91%. The

lowest value was recorded in 2022 - 70.72%, which may indicate a significant change in access to education during this period.

It can be noted that after steady growth and reaching a peak in 2019, enrollment has been steadily declining since 2020. The economic consequences of the pandemic, the transition to distance learning, changes in the labor market, and the war have affected students' ability to enroll in Ukrainian schools.

The analysis of changes in the structure of the educational system at the school level showed the impact of martial law on schools. Data on the number of schoolchildren and teachers in Ukraine for 2014-2022 allowed us to assess trends in the number of students and teachers in the context of political and economic instability caused by the armed conflict and changes in the country's demographic situation.

Figure 3 contains indicators of the number of teachers in schools and students in Ukraine.

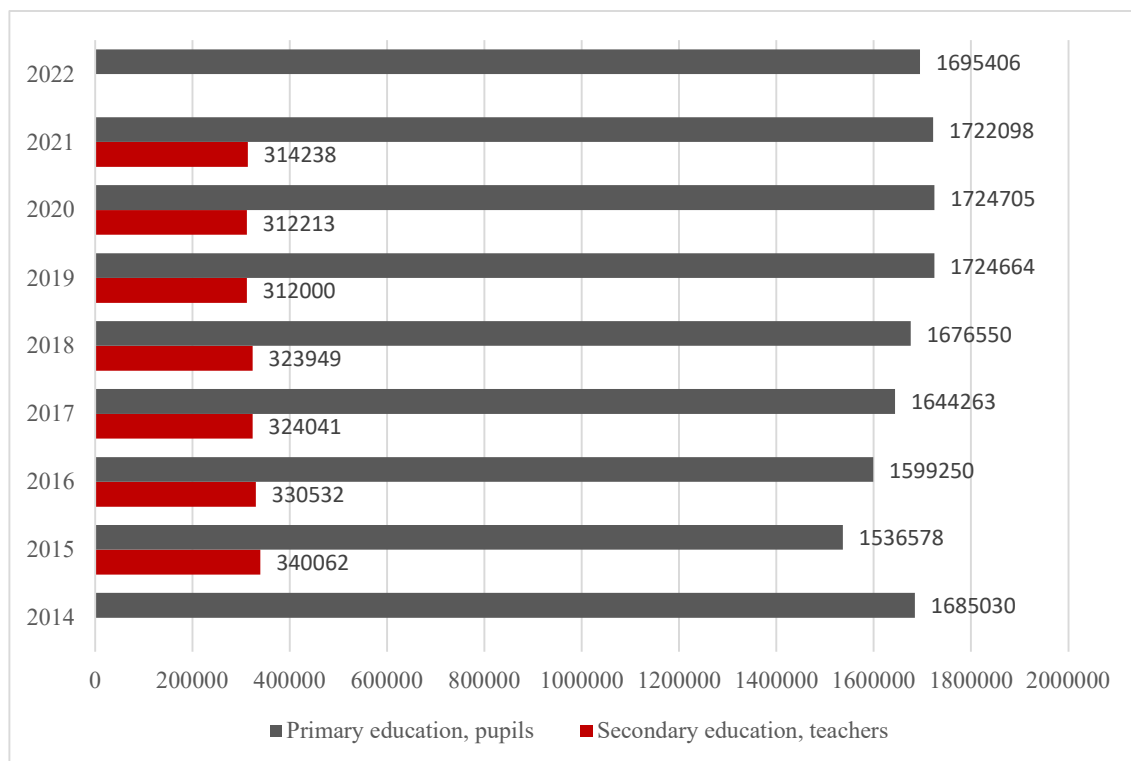


Figure 3. Number of schoolchildren and teachers in Ukraine for 2014-2022, pupils

Note: compiled by the authors based on source [19]

Data for 2014 and starting from 2022 are not available on the Derzhstat and World Bank websites. The number of primary school students (light bars) fluctuated during 2014-2022. The highest number of students was recorded in 2015 (approximately 1.68 million), after which there was a decline until 2016, followed by a slow increase from 2017-2020.

There was a sharp increase in 2021, reaching a peak in 2021 with approximately 1.72 million students, after which the number decreased slightly again in 2022 to 1.69 million. As for secondary school teachers (dark bars), their number has gradually declined since 2014. The highest number of teachers was in 2014 (340 thousand), after which there was a constant decrease until 2016. The number of teachers remained relatively stable in the following years, fluctuating between 312 and 324 thousand people from 2017 to 2022.

Social and psychological problems

The surge in internal migration has significantly impacted the school system in Ukraine. The influx of students in the western and central regions has led to an overload of educational institutions, posing a severe challenge that demands immediate attention and additional resources. Due to forced displacement, many students, both inside and outside the country, were forced to switch to distance learning. This format required developing technical infrastructure and purchasing equipment for training, especially for those who moved to rural and remote regions. Students who moved to new areas or countries faced the need to adapt to new educational systems, teachers, and curricula. This could cause stress and slow down the learning process.

Teachers, like students, were also forced to migrate, fleeing from hostilities. Many had to look for work in other regions or countries, creating staff shortages in the affected areas. Due to the relocation of teachers to different regions, imbalances in providing schools with teaching staff arose. This was especially acute in rural schools and small towns, where there was already a shortage of teachers before the war. Some teachers who moved to other regions or countries could not immediately find work in their field due to differences in educational standards or lack of demand.

This led to the need for retraining or remote work for Ukrainian schools. In addition to forced migration, teachers faced psychological difficulties associated with the war, loss of homes, and forced lifestyle changes. These factors could reduce the quality of teaching and increase the need for teacher support.

Discussion

From 2014 to 2022, public spending on education in Ukraine varied within 5-6% of GDP. The maximum expenditures were recorded in 2014 (5.8%) and 2022 (6%). The minimum level - 5% - was observed in 2016. Periods of increased funding (in particular, 2022) may be associated with the need to restore the destroyed school infrastructure and an increased need for distance learning, which requires costs for technical support and Internet communications.

Until 2019, higher education coverage had a positive trend, with a maximum level of 84.48%. However, in 2022, this figure fell to 70.72%, which may be due to military action, population migration, and difficulties in collecting data. The most alarming trend is the decline in school enrollment, which reflects a decline in access to education caused by the unstable political and economic situation and risks to students' safety.

The number of primary school students was highest in 2015 (1.68 million), then decreased until 2016, after which a slow increase began until 2021, when a peak of 1.72 million students was recorded. However, a decrease was noted again in 2022 (1.69 million), which can be explained by the same factor - war and population migration. The number of secondary school teachers has been steadily declining since 2014, reaching a minimum in 2016, after which it remained relatively stable until 2022. The gradual decrease in teachers can be associated with demographic changes, forced emigration, and declining students in some regions.

The impact of the war on the education sector is reflected in a decrease in the number of students, a reduction in the number of teachers, and a decrease in the coverage of higher education. Military actions have led to the destruction of infrastructure, forced migration of the population, and lack of access to safe learning conditions. Schools use Zoom, Teams, Classroom, Google Meet, and other platforms to ensure uninterrupted education. However, access to the Internet is not always stable. Problems with connecting to the student's office in rural areas and schoolchildren and teachers living in the combat zone.

Internet connection is not the only problem in education. Monitoring of attendance and academic performance is also not consistently implemented. An increase in the share of GDP allocated to education in 2022 is due to the need to restore the education system in war conditions and ensure the transition to distance learning. The educational system of Ukraine has undergone significant changes in recent years due to economic factors and military actions. Restoration and support of education remain priority areas for the state, but the consequences of the conflict and migration require additional efforts to stabilize the situation in the sector.

Conclusions

In the context of the crisis, it is necessary to continue reforms to improve education quality and modernize educational standards. Reforms in the context of the New Ukrainian School Standard (NUS) and adapting the education system to European standards should remain a priority. This will help maintain the competitiveness of Ukrainian graduates in the international labor market and strengthen human capital.

The importance of inclusive education is growing, which will allow the integration of children from the most vulnerable groups, including displaced persons, children with disabilities, and war victims. The system should provide psychological and social support, help students adapt to new learning conditions, and overcome the effects of stress.

For many students and teachers, the forced transition to distance learning has become one of the critical strategies for ensuring the educational process. However, the challenges of insufficient technical infrastructure and lack of equipment, especially in rural areas, require our collective efforts.

The government, international organizations, and civil society must work together to stabilize the education sector. Priority areas should include infrastructure restoration, support for displaced students and teachers, and the development of distance education and the assurance of accessibility.

It is necessary to create programs to support displaced students and teachers. This may include financial assistance, psychological support, and assistance with adaptation to new learning and teaching conditions. Expanding schools, creating new classrooms, and purchasing equipment are necessary in regions that have received many displaced persons. The development of distance learning should also be a priority. To provide teachers with work in new places of residence, retraining and integrating teachers into new educational environments, including through remote work or online courses, is necessary.

Thus, to solve these problems, we are committed to a long-term strategy for developing school education. This strategy will consider regional differences and needs to promote equal opportunities for all students, regardless of their socio-economic status and place of residence. While the effects of war-related displacement will be felt in Ukraine's education system for a long time, our concerted efforts to restore the education system can minimize long-term negative consequences and create a foundation for its future development.

References

1. Vakaliuk T. A., Antoniuk D. S. The use of digital technology in general secondary education in Ukraine: current state and future prospects //3L-Person. – 2023. – P. 17-31.
2. Havrylenko T., Doroshenko T., Vykhreshch V., Hurkova T., Bykov I., Zenchenko T. Primary Education in Ukraine. History and European Priorities //Revista Romaneasca pentru Educatie Multidimensionala. – 2021. – Vol. 13. – №. 4. – P. 652-668.
3. Zaporozhchenko T., Fonariuk O., Popadych O., Kliuieva S., Ashikhmina N., Kanibolotska, O. Distance education on the basis of innovative technologies. Problems of the primary school teacher training in Ukraine. – 2022. – Vol. 14. – №. 2. – P. 102-117. <https://doi.org/10.18662/rrem/14.2/569>
4. Lokshyna O. I., Dzhurylo A. P., Glushko O. Z., Shparyk O. M. Secondary education reform priorities under globalisation: the case of Ukraine in comparison with China, Germany and Poland //SHS Web of Conferences. EDP Sciences. – 2021. – №. 104. – P. 1-15. <https://doi.org/10.1051/shsconf/202110401004>
5. Lokshyna O., Topuzov O. COVID-19 and education in Ukraine: Responses from the authorities and opinions of educators //Perspectives in Education. – 2021. – Vol. 39. – №. 1. – P. 207-230.
6. Kasatkin O. S. Formation of the school literary education system of Ukraine (90s of the XX century) //Publishing House “Baltija Publishing”. – 2024. – P. 1-12.
7. Londar S., Bakhrushyn V., Gapon V., Londar L., Pron N., Dmytriieva M. Assessment of the efficiency of budgetary funding of general secondary education in Ukraine //Financial & Credit Activity: Problems of Theory & Practice. – 2024. – Vol. 1. – №. 54. – P. 564-577.
8. Zayachuk Y. Ensuring quality higher education in Ukraine in times of war //Journal of Adult and Continuing Education. – 2024. Vol. 4. – P. 153-162. <https://doi.org/10.1177/14779714241270254>

9. Kotina G., Stepura M., Matviychuk D., Meister A. Sustainability of local public finance and regional development: challenges and opportunities in times of crisis in Ukraine //Financial and credit activity problems of theory and practice. – 2024. – Vol. 2. – №. 55. – P. 144-160. <https://doi.org/10.55643/fcaptp.2.55.2024.4314>
10. Sedochenko A., Shyyan O. Crisis in higher education—Ukrainian realities //The Palgrave Handbook of Crisis Leadership in Higher Education. – Cham: Springer Nature Switzerland, 2024. – P. 155-174. https://doi.org/10.1007/978-3-031-54509-2_9
11. Siegień W. War and Modernization in Ukraine: A Comparative Study of Systemic Education Reforms //Global Agendas and Education Reforms: A Comparative Study. – Singapore: Springer Nature Singapore, 2024. – P. 115-132. <https://doi.org/10.1007/978-981-97-3068-1>
12. Udych Z., Shulha I., Chepurna L., Rudenko L., & Dzhus O. Inclusive education in Ukraine: challenges, conditions and implementation strategies //Conhecimento & Diversidade. – 2024. – Vol. 16. – №. 41. – P. 419-445. <https://doi.org/10.18316/rcd.v16i41.11506>
13. Bykov I. Financing inclusive education in Ukraine //Three Seas Economic Journal. – 2023. – Vol. 4. – №. 2. – P. 1-5. <https://doi.org/10.30525/2661-5150/2023-2-1>
14. Bader S., Oleksienko A., Mereniuk K. Digitalization of future education: analysis of risks on the way and selection of mechanisms to overcome barriers (Ukrainian experience) //Futurity Education. – 2022. – Vol. 2. – №. 2. – P. 23-35. <https://doi.org/10.57125/FED/2022.10.11.26>
15. Marhasova V., Kholiavko N., Popelo O., Krylov D., Zhavoronok A., Biliaze O. The Impact of digitalization on the sustainable development of Ukraine: COVID-19 and war challenges for higher education //Revista de la Universidad del Zulia. – 2023. – Vol. 14. – №. 40. – P. 422-439.
16. Cheromukhina O. War and the labor market in Ukraine //Economics & Education. – 2022. – Vol. 7. – №. 4. – P. 41-46. <https://doi.org/10.30525/2500-946X/2022-4-6>
17. Hrynevych L., Linnik O., Herczyński J. The new Ukrainian school reform: Achievements, developments and challenges //European Journal of Education. – 2023. – Vol. 58. – №. 4. – P. 542-560.
18. Nazukova N. Funding vocational education and training in Ukraine: wartime and after-the-war perspectives //Věda a perspektivy. – 2022. – Vol. 12. – №. 19.
19. World Bank Database. Retrieved from: <https://data.worldbank.org/>

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