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## Post-War Recovery of Ukraine: the Role of Human Resources

**Abstract**

The purpose of the paper is to set out the place of education and human resources in the future development of Ukraine, particularly in the light of the post-war difficulties in rebuilding the country and further prospects. *Methodology.* The study is based on a comparison of PISA 2018 results, with different countries compared to Ukraine. PISA measures the ability of 15-year-old students to use their knowledge and skills in reading, mathematics and science to solve real-life problems. The *results* of the research showed that the Ukrainian education system has two main problems: low levels of mathematical literacy and deep inequalities in access to quality education depending on the place of residence and socio-economic status. Taking into account the PISA measurement system and the requirements of the modern economy, it is necessary to change the Ukrainian education system. *Practical implications.* Ukrainian teachers need to pay more attention to ensuring that students focus on the practical application of knowledge, question established opinions, engage them in open-ended tasks, make them critically analyse all the information they consume and express their opinions constructively. *Value/Originality.* Analysing the results of PISA and comparing them with other countries allows for a better understanding of what steps need to be taken to reform the education sector.

**Keywords**

education economics, educational economics, education, human capital, school education, school productivity, educational policy

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**DOI:** <https://doi.org/10.30525/2500-946X/2023-3-5>**1 Introduction**

According to the Global Partnership for Education (GPE), the largest global foundation dedicated to transforming education in low-income countries, education is one of the most important investments a country can make in its future. Education is a powerful driver of change, improving health and livelihoods, contributing to social stability and long-term economic growth.

The value of education for society and its development is manifested in a variety of forms, due to the complexity and multidimensionality of education's functions in society.

Education is inextricably linked to economic growth, affecting the economic returns to both wages and national gross domestic product. The experience of various countries shows that the overall employment rate in a country with investments in education increases: the more a country invests in its human capital and education system, the higher its economic performance in general. In the author's opinion, the education gap will soon become a technology gap.

Education, as a sphere of economic activity, is primarily productive, capable of generating returns both in the short term in the form of increased income and profit, and especially in the long term,

which makes investments in education particularly important as highly profitable. The study of the mechanism of influence of higher education on economic growth allows to conclude that improving the education system and improving the quality of the educational process should inevitably lead to an increase in labour productivity, given the following:

- training and education make the work of each individual worker more productive by either making that worker ready to do more complex work that he or she would not have been able to do without training, or by helping him or her to do the same work faster and better. The results of such work are of higher value, and therefore such work is paid better than simple unskilled labour;

- education enhances the creative and intellectual potential of all students. Therefore, expanding opportunities for people to receive quality education directly affects the number, value and economic value of new developments and discoveries;

- education develops not only professional knowledge, but also business skills and entrepreneurship. Education increases receptivity to new ideas, economic innovations, and technical developments. In this way, education creates a favourable environment for spreading the achievements of the knowledge economy throughout society.

The role of education in society is determined by the fact that through the transfer of knowledge, skills, and education, it forms not only competent employees, but also socially responsible citizens. Moreover, ethical aspects are of the utmost importance, as well as the embodiment of high moral and cultural values in people's minds. Education is a process of transmitting culturally shaped patterns of behaviour and activity, as well as sustainable forms of social life. Modern democratic processes in Ukraine and the world suffer from false values, apathy of the population and lack of understanding of what is happening in the world, inertia of the electorate and low efficiency of collective democratic representative bodies, which is largely a result of insufficient interaction between the state and education. In this regard, the dependence of the development of individual countries on the level and quality of education, culture and qualifications of their citizens is increasingly clear.

Education is seen as one of the most important factors in ensuring the sustainable development of the world's countries, a development in which meeting the current needs of humanity will not be detrimental to meeting the needs of future generations.

At the same time, it should be noted that education is a necessary but not sufficient condition for economic development. Significant success in engaging the population in education will not be sufficient on its own without the involvement of a wide range of socio-economic factors: government regulation, fighting corruption, promoting entrepreneurship, effective management, etc.

## 2 Shortcomings of the Modern Education System

Despite the importance of education, people do not pay enough attention to it. The modern education system was established in 1893. At that time, the goals of education were clearly understood by both entrepreneurs and teachers: to prepare as many people as possible for work in production, to train them so that they could perform routine work in production as efficiently as possible. The purpose of education at that time was to develop not very high creative thinking skills in the youth of that time, to teach them to do routine work quickly and without mistakes without creativity and creative thinking. People are stuck in this outdated education system, while the modern economy requires completely different skills. The world has changed in over 100 years, and routine work is now done by machines and computers. In addition, many people say that old professions will disappear and new ones will emerge, and no one knows exactly what kind of knowledge people will need in the future, but it is definitely not quoting textbooks and knowing all the information available on the Internet. In order to have good prospects, young people need to be creative, capable of innovation, able to analyse

available information, honest, able to work in a team, etc. The nature of modern production requires not only professional skills, but also the realisation of personal abilities, especially the ability to work creatively.

When considering the purpose of education, it is important to realise that schools should first and foremost reveal children's abilities and encourage them to develop their talents, inspire them to work towards achieving their goals, be conscious citizens and work for the betterment of the world. Obviously, people need to have basic knowledge, to be able to write, read and count, to know the basic laws, but the question is how to transform the necessary amount of information from memorisation into understanding and correct use? How to organise learning in a way that allows people to use the knowledge they have gained throughout their lives? Education, especially primary school, should aim to introduce students to a wide range of possibilities and help them find activities that they enjoy. No matter how prestigious a job as a lawyer or economist may be, if one does not enjoy it, it is unlikely that one will succeed in it.

One of the best private schools in the United States conducted an extraordinary experiment in which students who had just returned from summer holidays were asked to take exams in the main subjects they had studied before the holidays. In fact, this exam was even easier, because the extremely difficult questions were removed. The results were impressive: while the average grade in June was B+, after the holidays it was F. Students could not remember important topics from the previous year. Every year it can be seen with one's own eyes: teachers start a new school year by repeating what they learned last year, and students try to recall what they learned. Isn't it time to radically rethink this approach to teaching?

First of all, the main objectives of education should be clarified. They should reflect the realities of the surrounding world, which is constantly changing. The education system should be designed to give every Ukrainian child a chance to survive and succeed.

The modern generation lives in the era of the knowledge economy, where the individual comes first. A person's desire for active participation in his destiny and self-realisation is determined not only by the complexity of the world and a significant increase in its dynamics, but also by the growth of the needs of modern people, who have reached a qualitatively higher stage of their socio-cultural development than previous generations. And this poses the problem of creating such an educational system that would be able to ensure the formation of high personal qualities in an individual, the most important of which are psychological and organisational readiness to focus on one's own strengths in the performance of life tasks and a high level of motivation to achieve success in life. Education should develop a person's

mind and abilities and make him a better citizen and member of society.

An important function of the higher education system at the current stage of social development is the training of specialists and personalities of a new quality. Such education is necessary, first of all, for the formation of a new national elite. They should be specialists who not only reproduce technical experience, but are also able to analyse and design complex systems, find effective strategies for solving complex modern tasks of managing large social systems, coordinate people's activities and manage the necessary resources. But these skills must be formed taking into account universal human values, the latest trends in the development of society and scientific responsibility.

### **3 Education in Ukraine: Advantages, Disadvantages and Prospects**

An extremely challenging task at the current stage of Ukraine's development is how to use all the human and scientific advantages of the Soviet school, applying them to the needs of the present and taking into account the lack of funding and development of education over the 30 years of independence, as well as all the challenges and destruction caused by the war.

The World Bank estimates that as of June 1, 2022, the cost of recovery and reconstruction needs in the education sector alone will reach more than 9.2 billion USD. Recovery needs include rebuilding affected educational facilities to meet new safety, resilience and quality standards, as well as needs related to restoring intermediate and long-term teaching and learning services, such as investments to ensure safe access to face-to-face education where possible (e.g., building bomb shelters for educational facilities, purchasing temporary classrooms, purchasing electronic devices).

Given Ukraine's geopolitical situation and location, the cost of building bomb shelters in educational institutions is likely to become a permanent fixture. Recovery needs also include measures to prevent teachers from leaving the profession and educational programmes, psychological support, etc. At the same time, the reconstruction and revival of the sector should coincide with investments in reforms aimed at improving the quality and efficiency of education.

It is worth noting that Ukraine's social infrastructure is imperfect, schools, kindergartens and universities are outdated and in need of reconstruction and modernisation, as well as energy efficiency improvements. While kindergartens and schools are allocated budgetary funds for heating, many universities, due to high heating costs in winter, switch students to online learning, which does not contribute to the efficiency of learning.

The restoration and revival of our country should be shaped and implemented in a way that not only supports the local economy, but also is as efficient as possible and meets the needs of society, based on the principle of "rebuilding better than before". Before the war, Ukraine's educational achievements were quite high, especially considering the level of income of the population. Although the country has not yet reached the level of achievement seen in the European Union, according to Harmonised Learning Outcomes (HLO) data collected by the World Bank in 2018, Ukraine had achievements that were slightly below the European average but on par with neighbouring countries in the region. However, this figure conceals significant inequalities between urban and rural students, and between students from low- and high-income households.

In addition, the World Bank's Employability and Productivity Skills study shows that higher education in Ukraine does not guarantee the acquisition of basic cognitive skills. The low practical orientation of higher education hinders the successful integration of students into the labour market and creates acute skills gaps in critical sectors. Over the years, Ukraine's education sector has failed to adapt to demographic dynamics and declining student numbers. Every year, the number of students decreases, and the number of teachers does not correspond to these changes.

In 2020, the average student-teacher ratio in secondary schools in Ukraine was 9.6 to 1 (6.4 to 1 in rural schools), compared to the OECD average of 13.1 to 1, indicating significant economic inefficiency. A separate challenge for the education sector is the war, which has caused serious disruption to the normal life of students and teachers. Evidence suggests that Russia's invasion of Ukraine will further deepen the population decline. As of October 2023, 7.6 million Ukrainians have fled the country, while 6.2 million are still living in other countries (UNHCR, 2022). This is equivalent to 12-15% of the country's population. Some of these refugees are likely to become long-term emigrants, and the demographic crisis that Ukraine faced before the war will deepen.

One in three Ukrainian children is abroad. Even if only 15% of refugees and their families remain abroad after the war ends (based on positive estimates), this conservative estimate would imply a severe one-off loss of around 400,000 jobs in Ukraine's rapidly declining workforce.

To estimate the loss of human capital from the Russian invasion of Ukraine, studies on war or civil conflict can be used. A significant reduction in labour supply, both due to the displacement of the working population and civilian casualties after 24 February 2022, will hamper Ukraine's post-war recovery. Large-scale population displacement can also lead to huge losses of human capital, especially if displaced persons of working age are unable to find suitable employment that matches their qualifications and



skills. In addition, disruptions to the education of displaced children, as well as those who remain in areas of active hostilities, can have serious negative consequences for educational outcomes, which subsequently leads to a loss of human capital and lower earnings for young workers.

The results show that only a small percentage of respondents have no intention of returning, over 60% plan to return one day, and 18% are undecided about their future (Figure 1). Naturally, it will largely depend on the conditions in Ukraine after the war, the opportunity to find a job, get a decent education, have a safe and bright future for children, find housing, etc.

The researchers found that Austrian and German children who were ten years old during World War II, or whose parents were involved in the war, received less education than children from non-war countries such as Switzerland and Sweden. Forty years after the war, these people suffered significant income losses of between 3% and 4% per year, which can be attributed to the loss of education caused by the conflict.

In order to understand Ukraine's losses in the education sector after the war, to outline what steps need to be taken to radically improve the situation, to avoid falling into an even deeper social gap that has been widening since independence, and to raise the average level of education, it is necessary to understand what exactly the main problems of Ukraine are. Understanding that it is possible to apply the experience of other countries that are leaders in education, taking into account, of course, the peculiarities of national historical development, mentality and available resources.

These countries are among the top performers in PISA (OECD Programme for International Student Assessment). PISA measures the ability of 15-year-old students to use their knowledge and skills in reading, mathematics and science to solve real-life problems. In 2018, Ukraine took part in the PISA rankings for the first time in its history, and it is possible to compare the results of Ukraine and other countries. Overall, the result is not bad and quite expected. In the ranking, Ukraine is "neighbouring" Luxembourg and Israel.

Ukraine's results revealed a number of problems that need to be addressed. First of all, they revealed a deep social gap in the level of education. The level

of education of urban Ukrainian schoolchildren is in line with the European level, while in rural areas it is 2.5 times lower. At the same time, 9,000 schools out of 15,400 are located in villages.

The country's results in the mathematical sciences have been impressive. Mathematical education, which people have been accustomed to considering traditionally strong since Soviet times, has been confirmed in recent years by the high results of Ukrainian students at European and world competitions, despite the rather low level. Ukraine's result in mathematics is 41-46 (among 79 countries). For example, neighbouring Poland and Estonia, which are reference countries for Ukraine, are significantly ahead of Ukraine in mathematics. Their rankings are 6-9th. Ukraine's result in mathematics means that 36% of Ukrainian teenagers have not achieved basic mathematical literacy. This is a very worrying signal, meaning that exactly the same number of 15-year-old Ukrainians can perform only basic arithmetic, but do not know how to work with fractions or percentages.

The PISA results revealed two major problems: low levels of mathematical literacy and deep inequalities in access to better education based on place of residence and socioeconomic status.

Another surprise was the fact that about 20% of children are truant or absent from school at least once a week. This is a negative trend that requires a separate study. Another surprise was that Ukraine is among the five countries with the happiest students: 50% of Ukrainian teenagers who took part in the survey are satisfied with their lives. The most interesting thing is that children from rural areas feel happier than children from cities. But this is hardly related to the issue of education, because happiness is a delicate matter that is difficult to measure, and it varies from country to country and society to society.

Teachers in Ukraine are trying to build a solid foundation despite extremely low funding, but in addition to the financial component, the problem is an outdated education system that is aimed at reproducing information, while in a modern economy and with the current development of science, this is not the key. The biggest challenge for Ukrainian teachers is to move away from the system of reciting the content of the subject, because Ukrainian students currently learn too much school material, and move towards understanding. Not just memorising a lot

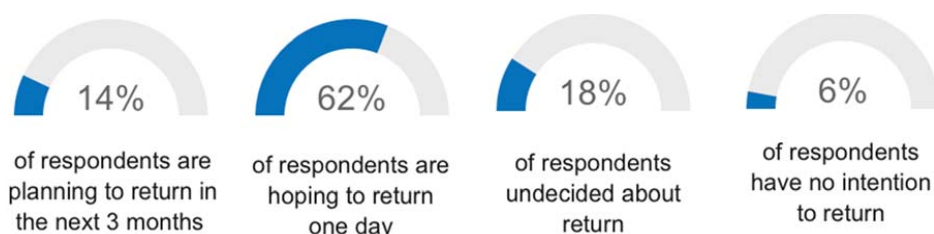
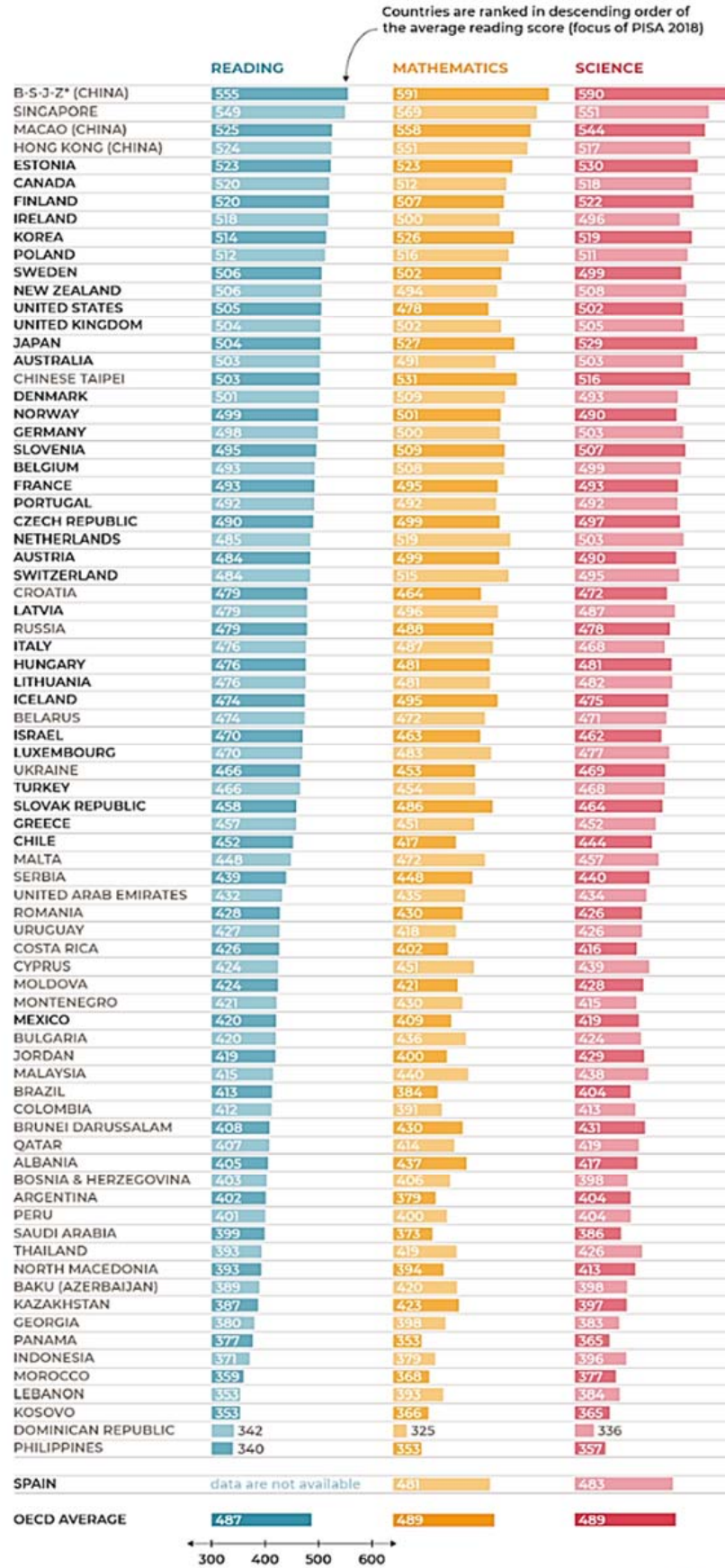


FIGURE 1 Intention of returning to Ukraine

# PISA 2018 results

Snapshot of students' performance in reading, mathematics and science



Source: OECD, PISA 2018 Database || \*B-S-J-Z refers to Beijing, Shanghai, Jiangsu and Zhejiang



of knowledge, but giving them the opportunity to try it out in practice, to question it, to think like a philosopher, like a scientist. And this requires a completely different teaching method, which would not be about reproducing knowledge, but about engaging students in an active learning process where they would be able to show creativity, cooperation skills, and problem-solving skills.

#### 4. Conclusions

PISA focuses on the practical application of all the knowledge acquired by students. According to PISA developer Andreas Schleicher, the education sector will face the following challenges in the near future:

- Economic inequality is growing, with some becoming too rich and others too poor, almost destroying the middle class. This phenomenon can have a negative impact on education.
- It is predicted that Asian countries will now have the most educated populations.
- The increase in the number of migrants will be a challenge for schools, which will have to adapt to students from different cultural backgrounds.
- The issue of financing will have to be addressed strategically, especially the problem of who should finance educational institutions.
- Digital technologies can have an impact on the information sphere, which can create one-sided coverage of certain events. Schools will have to develop new teaching methods to expose students to different points of view and ideas.
- People's abilities must be developed in such a way that they can compete with the capabilities of machines.
- Education for adults in need of retraining is less accessible. However, this needs to change if the adult population is to be competitive on the labour market.
- Today's teenagers admit that it is quite difficult for them to function without an Internet connection. Education systems will have to take this into account and learn how to use online technologies in their teaching.
- Schools are supposed to instil life values in children, but in an increasingly polarised world, it is

difficult to determine who sets these values, and there are already doubts about what should be considered a value at all.

- For children in some parts of the world, these trends may not be relevant, as their problems are even more serious: educational facilities are difficult to access and the quality of education is poor.

Most of these challenges will apply to Ukraine, and some of them already do, so the question is not about getting to the top of the ranking, but about adapting to modern challenges, changing the education system so that it meets the modern requirements of the new global economy and contributes to the development of Ukraine.

Ukrainian teachers need to pay more attention to ensuring that students focus on the practical application of knowledge, question conventional wisdom, engage in open-ended tasks, and make them critically analyse all the information they consume and constructively express their opinions.

In an era of huge amounts of diverse information and easy and quick access to it, it is important to be able to analyse information, perceive it critically and correctly. The algorithms behind social media and television unite individuals into groups of like-minded people, creating virtual worlds around us that are isolated from other perspectives. Schools of the future should not focus on memorising and storing large amounts of data; computers and artificial intelligence exist for that. They should help students to form their own positions and understand other views and perspectives. They should teach them to distinguish between right and wrong and to recognise manipulation. Given the global nature of the world, people need to understand how people from other cultures and traditions live, how they think and why.

For those with the right knowledge and skills, the emergence of supercomputers and artificial intelligence opens up unprecedented opportunities, but for people doing routine work that will eventually be replaced by machines, it spells disaster.

The global economy is moving towards regional centres of production based on the widespread use of the latest technologies. The distribution of knowledge and wealth will play a major role in the economies of countries and is closely linked to the distribution of educational opportunities.

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