

EFFECT OF COVID-19 PANDEMIC ON EDUCATION OF SCHOOL STUDENTS

EDUCATIONAL AND ECONOMIC
CONSEQUENCES OF DISRUPTION IN LEARNING

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OVERVIEW

Since the outbreak of Covid-19 pandemic in the spring of 2020, the educational process in kindergartens, schools, higher and vocational educational institutions of Georgia has been disrupted several times. In that situation, a remote learning assumed a function of sort of replacement of ordinary mode of study to continue the educational process. In this regard, Georgia embarked the path chosen by the majority of countries across the world. In Georgia, much like elsewhere, a temporary transfer to this new form of education was prompted by necessity. That move was not preceded by any arrangements for ensuring methodological preparedness, creating or adjusting a material basis of teaching to emerged needs, conducting a relevant campaign to raise awareness and prepare society and students for that shift. According to one opinion, the practice of remote learning has uncovered some future potential in the education sphere. Nevertheless, it seems logical to reckon that the disruption of educational process for quite a long time, especially in Georgia which lacks the material basis as well as competences for the conduct of educational process by modern standards, has inflicted a substantial harm on the students currently studying. This problem is even more troubling when it comes to school students, especially, elementary school students who require direct, lively engagement with their teachers and peers in order to learn, acquire basic skills and socialize.

This paper is an attempt to take first steps towards assessing potential economic and social damage experienced by current students induced by disruptions in the education process.

The paper provides a description of problem as a sort of methodological framework for future, more in-depth studies. The methodological framework itself envisages certain assumptions, largely made by practical considerations to assess the potential damage caused by disruptions in educational process as quickly as practicable by applying relatively simple methods and to take steps for the elimination of that damage. The methodological framework may be revised or even replaced in future, depending on the amount of resources and time that will be available for a broader and in-depth research and project activity.

The paper evaluates the scale of impediment of educational process against the academic year and total number of students; based on international surveys, briefly overviews main trends existing in the school education sphere of Georgia before the outbreak of the pandemic; refers to economic literature exploring the correlation between a quality of education, on the one hand, and labor productivity and economic growth, on the other; presents conclusions and recommendations.

RESERVATION

As noted above, the selection of the methodological framework for this paper is motivated by a desire to take initial steps for the evaluation, first, and then, elimination, of potential damage caused by the disruption in the education process. With this in mind, a relatively simple approach which rests on well-documented empirical studies has been selected for the methodological framework. Clearly, such approach cannot be free from a certain degree of subjectivism, but this subjectivism may be viewed as a price paid for the use of this simple approach. Later the methodological framework and methods may be supplemented, improved or replaced in accordance with new requirements and as new facts are accumulated.

DESCRIPTION OF PROBLEM

The correlation between the length and quality of education, on the one hand, and the labor productivity and economic development, on the other, has been a subject of particular attention from economists for several decades now. The same holds true for the study into correlation of quality of education with the social development, decrease in crime rates,

and in general, for the study into education as the major component of human capital.

Interest towards this subject can also be felt in Georgia as since the time of gaining independence to the day one can hear constant talks about the reforming of the education system and bringing it into line with modern standards. However, the data on the correlation between the level of education and current economic development of Georgia is, unfortunately, very scarce. Surveys conducted time and again suggest that lack of skills of labor force is seen by representatives of business as a major impediment to employment, but deeper studies into causes of this problem are hard to find.

Recent economic studies relevant for Georgia that are available in economic literature, show an increasing importance of exploring the nature of correlation between a formal schooling and cognitive skills, on the one hand, and the economic growth, on the other hand. Furthermore, it becomes more and more clear that the impact of cognitive skills (quality of education) on economic development is much stronger than that of length of education. This observation is more apparent in case of developing countries than countries with advanced economies. It therefore seems suitable to consider potential effects of the disruptions in educational process during the coronavirus pandemic in Georgia from the abovementioned standpoint. Prospects of current students on the labor market will be affected not only by disruptions/temporary interruptions in educational process but also, and to a greater extent, by a potential deterioration of cognitive skills test scores which, in turn, will pose a threat of long-term decline in economic growth rates. This becomes even more apparent considering that the quality of school education in Georgia has been deteriorating in the past few years, that is well before the outbreak of the pandemic, according to several sources (see below).

METHODOLOGICAL FRAMEWORK

The following factors and approaches should be taken into account for evaluating potential economic and social consequences of the disruptions in the educational process during the Covid-19 pandemic:

1. This paper does not pursue the aim of assessing the expediency of disrupting the educational process (for all students and by age groups). It has already happened and is, therefore, an established fact which makes it necessary to objectively evaluate results of this disruption by student age groups and to devise a plan and implement relevant measures to eliminate losses as promptly as possible. The same may be said about future, more in-depth studies;
2. Currently existing social and economic situation is also an already established fact. Therefore, for the sake of simplicity, it seems advisable to start the assessment of the situation that emerged in the education sector in terms of disruptions with abstraction of this context. It is also necessary to make an assumption that the aim of economic, health care or any other government policy is to normalize the situation and return to an ordinary rhythm of activity, which will begin from the next year;

Along with the above factors, there is one more thing that, perhaps, should be considered: a positive correlation between the quality of school education and the economic development, in particular, the correlation of the literacy and basic math skills with the growth is the topic that is most thoroughly explored in the economic literature. This may somewhat simplify the assessment of potential harm of disruption in educational process as well as the planning and implementation of measures necessary to overcome difficulties caused by the disruption. One should also note here that the disruption in learning process may prove more detrimental to high grade students than low grade students because the former will enter the labor market soon and have much less time at their disposal to deal with problems. This paper recognizes such possibility too, but since the goal at this stage is to focus on one of the aspects of the problem, it would be more appropriate, in the conditions of limited resources and time, to place emphasis on the needs of elementary school students. It seems therefore expedient at this stage to operate by applying a relatively simple but already tested model. In particular, this must be done through assessing the academic performance of students and comparing it with the performance before the disruptions, also by dividing students into groups and comparing performance of various groups with one another.

The disruption that occurred in the educational process during the Covid-19 pandemic in Georgia may be viewed as

a sum of two integral components. The first component is the situation before the problem emerged, which shows a systemic lagging of Georgia behind leading world countries. In this sense, the country was already losing its significant potential of economic growth because cognitive skills of students were lower than desired. To evaluate this, this paper uses empirical results of studies conducted by Eric Alan Hanushek and Ludger Woessmann, provided in the article “Schooling, cognitive skills, and the Latin American growth puzzle” published in 2009. It also uses the model of these authors, which was developed through analysis of empirical results of various countries and was published under the aegis of the OECD in the article “The High Cost of Low Educational Performance”¹, also in the article “The Role of Cognitive Skills in Economic Development”².

Furthermore, the view about potential negative results caused by the disruption of learning process during Covid-19 is expressed based on separate expert opinions and conclusions, linking negative results of loss of academic year or disruption in learning to the decline in future salaries and earnings.

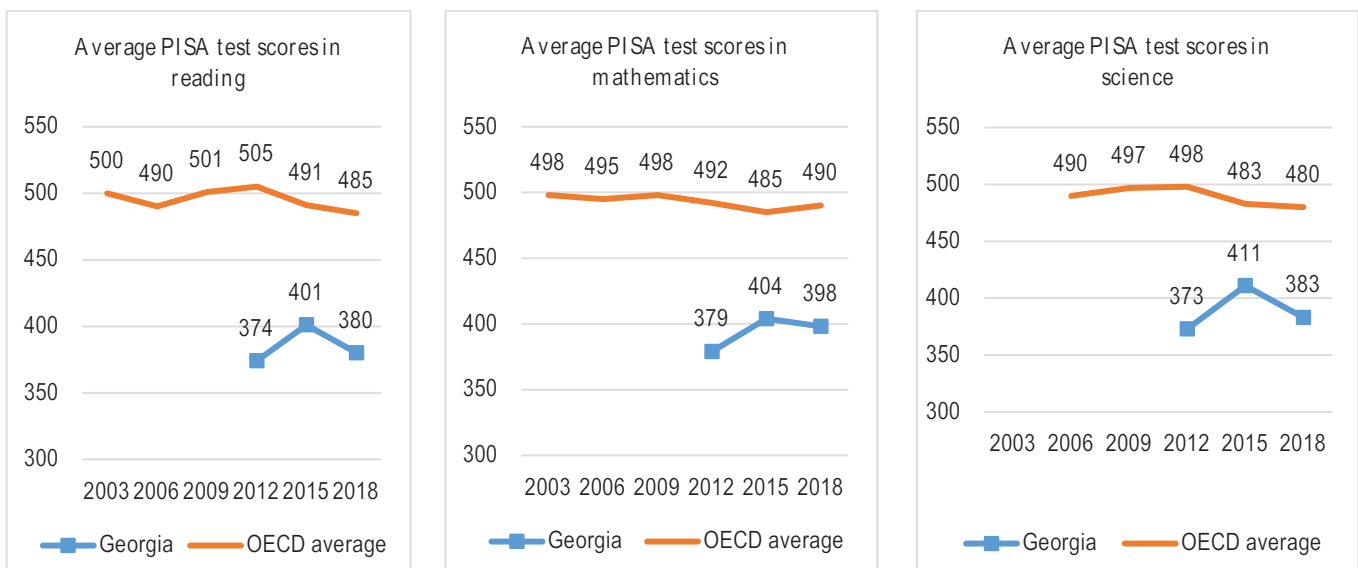
This paper also uses the results of international student assessment for 2018³.

QUALITY AND TRENDS IN THE EDUCATION OF GEORGIA PRIOR TO THE COVID-19 PANDEMIC IN THE CONTEXT OF INTERNATIONAL STUDIES

According to the results of the Program for International Student Assessment (PISA) for 2018, two factors stood out in Georgia’s school education system. The first is that by scores of cognitive skill tests, Georgia falls notably behind the OECD average indicator as well as the majority of other countries participating in the PISA. The second factor is that this low indicator, according to test results, declined further since 2015.

Chart #1 shows the situation in Georgia as against the OECD countries in the past three periods when relevant surveys were conducted.

Chart #1. PISA test scores for Georgia and the OECD countries (2006-2018).



Source: Georgia – Country Note – Pisa 2018 Results.

¹ The High Cost of Low Educational Performance; The long-run economic impact of improving PISA outcomes, OECD 2010

² The Role of Cognitive Skills in Economic Development; Eric A. Hanushek and Ludger Woessmann; Journal of Economic Literature 2008, 46:3, 607–668

³ Loss during the period of 45 years, as % of current GDP

Unfortunately, compared to 2015, the decline is observed in all the three areas of cognitive skills tests in Georgia. Although, the average OECD indicator has also stagnated, Georgia lags so dramatically behind that average indicator that it will take the country at least 50 years, at current rates, to achieve it even if the OECD indicators remain the same. This means that throughout that period Georgia's economy will grow at a rate slower than potential. This worrying trend is further exacerbated by the fact that among 78 countries covered by the PISA survey, Georgia is among those bottom 10 countries whose average result of reading, math and science tests scores is below 400 points. Moreover, Georgia falls behind all former Soviet Union and former socialist camp countries that participate in the survey⁴.

It should be noted that a certain degree of caution needs to be exercised when using PISA test scores because their dynamics may reflect methodological changes as well as other factors. Therefore, Table #1 shows Georgia's lagging behind the OECD countries as a percentage share of the OECD results.

Table #1. Georgia's lagging behind the OECD countries by test scores, OECD =100%

	2012	2015	2018
Reading	25.94%	18.33%	21.65%
Mathematics	22.97%	16.70%	18.78%
Science	25.10%	14.91%	20.21%

Source: Georgia - Country Note - PISA 2018 Results

According to Table #1, Georgia's indicators improved between 2012 and 2015 but thereafter, the trend reversed; this reversal coincided with the period when average OECD indicators deteriorated too. Actually, the 2018 results reflecting the situation in Georgia do not depict a promising picture.

Such a state of affairs poses a clear threat of economic slowdown over a long run. A matter of concern also is that if, in conditions of increased globalizations and international competition, Georgia does not start to speedily overcome its lagging in international education rankings in the foreseeable future, it will become increasingly difficult to succeed in this objective.

Comparison of former Soviet countries by 2018 results provides a picture that is a matter of concern (see Table #2).

Table #2. Georgia and separate former Soviet countries by PISA tests scores, 2018

	Mathematics	Science	Reading	Average
Azerbaijan	420	398	389	402.3
Belarus	472	471	474	472.3
Georgia	398	383	380	387
Kazakhstan	423	397	387	402.3
Moldova	421	428	424	424.3
Russian Federation	488	478	479	481.7
Ukraine	453	469	466	462.7

Source: <https://factsmaps.com/pisa-2018-worldwide-ranking-average-score-of-mathematics-science-reading/>

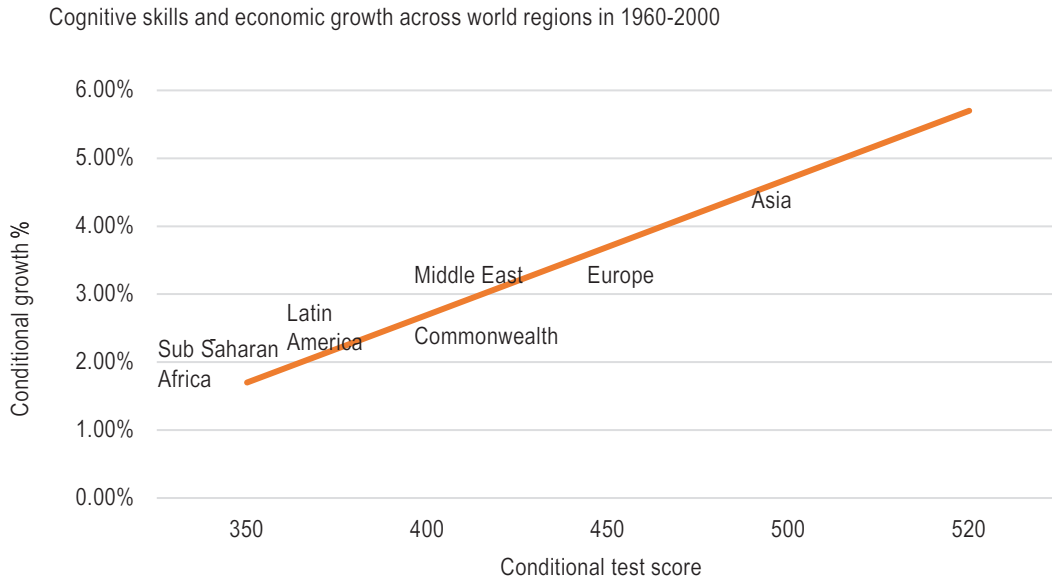
From the above table one can distinguish two groups of countries and a single country which stands somewhere in the middle. The Russian Federation, Belarus and Ukraine starkly differ from the lagging four countries in all the three

⁴ <https://factsmaps.com/pisa-2018-worldwide-ranking-average-score-of-mathematics-science-reading/>

components of cognitive skills tests. Moldova occupies a somewhat middle place while two Caucasus countries and Kazakhstan lag dramatically behind the top three countries. Yet another matter of concern is that Georgia falls notably behind Azerbaijan (although the survey covered only Baku, not the entire country) and Kazakhstan. In the entire set of these countries, Georgia is the only one with scores below 400 in any of the areas and lagging especially sharply other countries in mathematics and science.

The article “Schooling, cognitive skills, and the Latin American growth puzzle” by Eric Alan Hanushek and Ludger Woessmann provides the results of correlation between the economic growth and cognitive test skills of large world regions over the period between 1986 and 2000 (see Chart #2 below).

Chart #2.



წყარო: Schooling, cognitive skills, and the Latin American growth puzzle, 2009.

Looking at Chart #2 as a sort of scheme for a rough estimation of prospects of Georgia’s economic development in correlation with cognitive test scores, we will see that with its current scores Georgia, like Latin American countries, will grow at a much slower rate than the world’s leading regions over the next several decades. Such a prospect is clearly unacceptable in any case, especially considering a rather grave demographic situation in the country.

Using the model in the article “Schooling, cognitive skills, and the Latin American growth puzzle” by Eric Alan Hanushek and Ludger Woessmann, which builds on earlier papers, the authors conclude that the increase of an average test score by 25 points during six years, like it happened in Poland, will increase earnings of the students, who have been affected by this improvement, at the end of their labor activity by 25% even without a further increase in the average score. A faster improvement of cognitive skills tests scores correlates with a faster increase in growth. According to the authors’ estimates, the elimination of 100 scores of 20-year-long lagging in cognitive tests during 20 years means for current students who will later enter the labor market an increase in earnings by 80%, compared to the base indicator, at the end of their working age life. Consequently, a decline in cognitive skills test scores, if this happens, may translate into proportional decline in earnings and economic growth.

True, the above reasoning is a sort of abstraction because a long-term growth depends on a complex interaction of multiple economic, social, political and other factors. Nevertheless, it is justified to opine that the disruption of learning process during the Covid-19 pandemic may create a real danger of stagnation in the education sector, which may translate into a serious and long-term slowdown of economic development.

Georgia has not yet identified a degree of negative effect of the pandemic-induced disruption on academic performance of students. Nevertheless, it seems expedient to conduct a relevant assessment as fast as practicable in order to enable the state to get better prepared to deal with potential problems caused by the disruptions.

ASSESSMENT OF QUANTITATIVE ASPECT OF DISRUPTION OF EDUCATIONAL PROCESS IN THE CONTEXT OF INTERNATIONAL STUDIES

Formal assessment of the impact of disruption in education during the Covid-19 pandemic has not been conducted in Georgia yet. The same holds true for many countries across the world, which face the same acute problem. In this regard, it is interesting to review assessments of teachers, parents and experts. On 29 December 2020, an article “Future of remote learning in the Georgian education system, existing problems and created opportunities” was published on the educational portal, edu.aris.ge. According to the article, the conduct of the entire first semester of the 2020-2021 academic year online did not bring any tangible positive results. The majority of surveyed teachers believes that the remote learning has future in Georgia only in exceptional situations and that Georgia is not ready for the introduction of this mode of education either materially and morally or in terms of competences. Furthermore, teachers observe exhaustion among students, decline in motivation among high grade students and other problems. Parents share the opinion of teachers and note that despite efforts undertaken by parents, children and teachers they would wish that the need for learning in such emergency never arose in future.

Expert in education issues, Simon Janashia, believes that the new method of teaching is impeded by the absence of relevant material base and methodology as well as inconsistency in approaches applied by the state. In Mr. Janashia’s view, remote learning creates opportunities of embedding new technologies and approaches in educational processes, which is expressed in introducing-improving remote learning methods for students in mountainous and remote villages also for children who, for some reason, do not have teachers. The expert believes that the introduction of remote learning has somewhat accelerated the process of mastering new technologies among teachers and at the same time, enabled parents to get a better idea of how their children study. Opportunities described by Mr. Janashia look rather logical and attractive; however, the expert adds that, at the end of the day, it is likely that the performance of students as well as the educational process will deteriorate. The deterioration of educational process, however, creates a real threat of widening the gap between Georgia and developed countries further. It is clear even for outsiders that the move of the entire educational process online has minimized an element of socialization which is a significant element of education resulting from interactions between teachers and students as well as between students. It is apparent that students lack a possibility of sharing knowledge and whatever they have learned, also a possibility to observe first-hand the experience and results of students who are doing well. It should also be said that in certain cases the online learning has led to a sort of leveling of students, which has undermined the motivation.. All in all, opportunities of acquiring and deepening knowledge through social mechanisms, direct relations, including so called tacit knowledge, have lost a lot. This has not been formally proved yet, but it is clear that it has become an important negative factor and requires a serious attention.

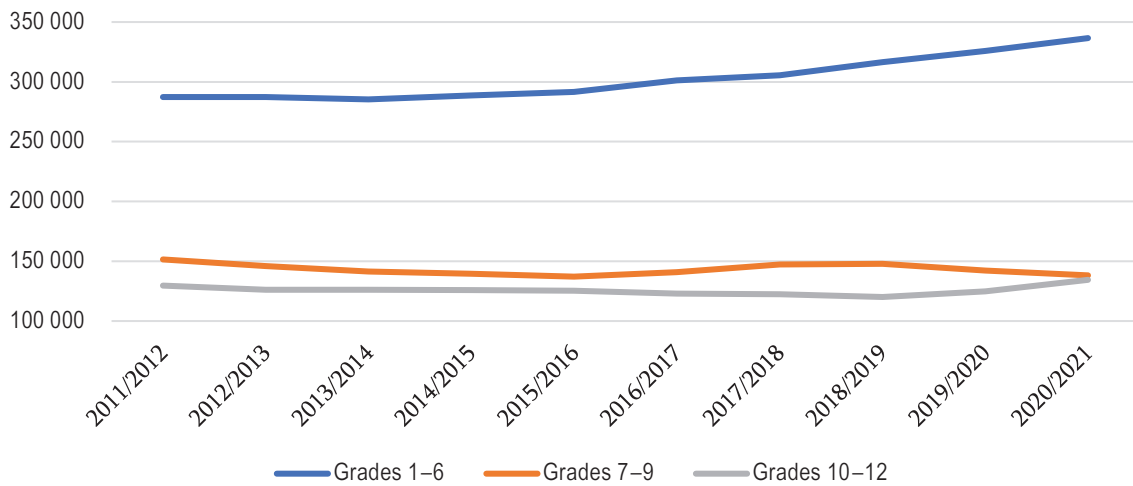
In Georgia, disruptions in the educational process began from 1 March last year. According to the data of the Ministry Education and Science, disruptions made up 65 days of 172 school days in the 2019-2020 academic year, which comprises one third of the year. During the 2020-2021 academic year, low graders (I – VI grades) were allowed to resume learning process in classes during only less than half of the first semester. This opportunity was not actually provided for students of other grades. The disruption of educational process more or less affected all students. At present one may only make certain assumption as to how much of formal school year has been “lost.” Considering many objective and subjective factors, it is extremely difficult to determine a size of such loss, but separate preliminary estimates may be made based on tested models and studies.

Chart #3 shows the dynamics of number of students in schools (both public and private) by age groups. Interestingly, the number of students with complete school education has been decreasing over time. This must be resulting from long-term demographic trends but it is worrying in a sense that the anticipated decrease in and aging of population will further add to the importance of human capital and hence, the cost of “lost” part of academic year will increase.

In an article “The COVID-19 cost of school closures”⁵, the team of authors makes an assumption that every additional year of schooling equates to 10 percent of labor earnings. In fact, by calculating the length of school closure and disruption in education in terms of the number of days or months, it is possible to estimate the resulting economic loss which will serve as a sort of reference point for future in-depth studies.

⁵ <https://www.brookings.edu/blog/education-plus-development/2020/04/29/the-covid-19-cost-of-school-closures/>

Chart #3. Number of school students in Georgia



წყარო: Geostat

According to Chart #3, around 600 000 students of grades 1-12 were affected by difficulties caused by disruptions in the educational process. Table #3 shows hypothetical assumptions: nominal annual salary of hired employees by initial data of GDP for 2020, also a hypothetical annual increase in salaries, a discount factor and the number of school students affected by disruptions.

Table #3. Assumptions

Annual average salary of hired employees in 2020 (GEL)	14, 640
Hypothetical annual increase in nominal salary	5%
Length of working career (year)	45
Discount factor	3%
Estimated number of school students affected by disruption in education	600,000
Current nominal GDP (000) GEL	49,400,000

წყარო: Geostat

Table #4 shows hypothetical loss against the current nominal GDP based on assumptions provided in table #3.

Table # 4. Model estimates

	Loss of entire academic year	Loss of half of academic year	Loss of third of academic year
Annual salary loss	10%	5%	3%
Total discounted loss for all school students (000)	61,979,288	30,989,644	18,593,786
Loss during the period of 45 years, as % of current GDP	125.36%	62.73%	37.64%

At a glance, the loss by these hypothetical estimates is not large, but we should bear in mind that the assumption made for an annual increase in salary is quite conservative. Furthermore, one should take into account that the estimates provided here concern a quantitative loss of academic year alone and do not take into account a potential deterioration of cognitive skills which is a more serious problem. More importantly, these estimates disregard results of potential long-term deterioration in the quality of education and the analysis concerns only those students who have been currently affected by the disruption in schooling. At the same time, the above estimates create some idea of how studies into potential losses should be conducted in future and how they should better be visualized.

CONCLUSION

The economic literature has already accumulated sufficient material to suggest that the loss caused by the pandemic in the education system and especially at the stage of school education will be rather noticeable. This paper reviews only two aspects of this loss, namely, the quantitative and qualitative aspects of the disruption which are expressed, respectively, in the length of disruptions and a potential decline in academic performance and cognitive skills of school students (based on international models and results of surveys). The paper does not touch upon an increase of inequality in the access to education, the necessity of teacher retraining and other issues that require additional studies. Even the incomplete information shows that losses in the education sector will be tangible and a response is required.

The quantitative aspect of disruptions in education since March 2020 is large and realistic enough to pose a threat of losing more than half of academic year to each cohort of school students. This loss will probably be more conspicuous for a younger segment of school students because a marginal cost of every year is higher for them than for high grade students (although this assumption is somewhat disputable). Qualitative losses, by applying international assessments and experience of other countries to Georgia as well as expert assessments, may also prove rather serious.

The combination of only two above discussed factors creates a threat of further deterioration of shortage in skilled manpower on the labor market. According to the data of Harvard University's Atlas of Economic Complexity, Georgia has speedily improved its ranking in the past decade and its economic structure has become more complex. Nevertheless, the Georgian economy still remains at the stage of so-called factorial growth and will need to diversify the economic structure and exports further in order to achieve a high economic growth rates. These objectives, however, increasingly require skilled labor force which, for its part, cannot be achieved without a properly functioning education system. As suggested in this paper, it will be unjustifiable to disregard the blow that has been delivered by the disruptions in the education process in previous and current calendar years. There is a need to identify the scale of this blow and to get a proper idea about the degree of its severity as soon as possible in order to avoid/mitigate the threat of long-term economic slowdown and stagnation in Georgia.

RECOMMENDATIONS

To avoid such threat, the following steps should be taken in the following directions:

1. To estimate accurately a quantitative aspect of the disruption in education by applying a relevant methodology that will consider the length of disruptions as well as peculiarities of schools (location in remote and mountainous areas, degree of technical equipment, ethnic groups, other factors);
2. To start assessment of cognitive skills of school students by age groups and to evaluate the lagging of school students by adopted criteria;
3. To conduct a survey of parents, teachers and school students for the aim of obtaining a somewhat comprehensive description of quantitative and qualitative aspects of disruption in education. Assessment of cognitive skills is not sufficient for analyzing the created situation because there might be changes in many cultural, social or economic factors which will affect future academic performance;

4. To devise specific schemes or plans for ensuring more or less equal access to digital technologies for the majority of school children. To identify underperforming regions or social groups who need assistance;
5. To launch a special discussion about what could be done for the improvement of academic performance of those school students whose prospects have been harmed by the disruption in education.

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