# Challenges for Education during the Pandemic: An Overview of Literature

N. K. Radina, Ju. V. Balakina

Received in October 2020

**Nadezhda Radina,** Doctor of Sciences in Political Institutes, Processes and Technologies, Candidate of Sciences in Pedagogical Psychology, Professor, Faculty of Social Sciences, National Research University Higher School of Economics. Email: rasv@yandex.ru (Corresponding author)

**Julia Balakina,** PhD, Associate Professor, Department of Literature and Intercultural Communication, National Research University Higher School of Economics. Email: julianaumova@gmail.com

Address: 25/12 Bolshaya Pecherskaya St, 603155 Nizhny Novgorod, Russian Federation.

Abstract

This article overviews studies exploring the COVID-19 pandemic's impact on education systems and their responses to lockdown restrictions, comparing available findings with international statistics based on continuous education system monitoring. Global organizations acknowledge disruption of classical educational processes and emergency transition to distance learning during the pandemic. Scientific literature examines accessibility of online education, alternative forms of distance learning, and the pandemic-induced financial constraints on universities inhibiting new construction, social support for students, scholarship application, professional development of faculty members, and research growth. The pandemic illuminated the issue of inequality in education, which worsened as a result of emergency transition to online studies. In particular, researchers focus on the most vulnerable groups of students, such as children from low-income families, children from migrant backgrounds, and students with disabilities.

Projects aimed at studying the digitalization of education account for the biggest chunk of research inspired by the new pandemic reality. A number of studies discuss not just a formal transition to distance learning but a major technological turn that allows using the unique opportunities provided by digital technologies, which is especially important when teaching medical students.

Theoretical inquiry is a distinctive feature of scientific discourse, as compared to the discourse of international expert and analytical reports on the problems of education in the context of the COVID-19 pandemic. Research on changes to the learning process makes it possible to reconstruct the direct and indirect, as well as latent, threats of the pandemic.

The COVID-19 pandemic changed the social, economic, and cultural aspects of public life, and it certainly could not leave education unaffected. The UNESCO, the OECD, and the World Bank have been continuously monitoring changes in education caused by the pandemic. Based on their findings, they have identified the main tendencies of change, outlined the group of people involved in problematic transformations (students, their parents, teachers, and education stakeholders), and developed global and local practical recommendations for best practices [Department of International and Regional Cooperation of the Accounting Chamber of the Russian Federation 2020].

Two major trends have been common to national education systems worldwide in the context of the pandemic: disruption of classical educational processes and emergency transition to distance learning formats.

Learning disruption increased socioeconomic inequality in education. Among specific threats, international organizations mention interrupted learning, difficulties obtaining the usual economic support (e.g. free or reduced meals at school), child neglect (in case parents went to work) or high economic costs of childcare (if it prevented parents from working outside the home), health system overload (if female health workers had to stay home to look for their children), and problems directly related to schooling: increased workload in schools that remained open, a rise in dropout rates following the reopening of schools, and reduced opportunities for student socialization.

Challenges of the pandemic were multidimensional, affecting the economic, technological, social, and methodological aspects of education. According to international studies, very few education systems were fully prepared for the transition to distance learning due to technological as well as economic factors. Difficulties of integrating distance learning formats could be psychological (unfamiliar format of classes and diminished motivation, which decreased learning effectiveness), socio-psychological (co-responsibility of parents for the organization of distance learning), methodological (difficulty of moving some educational activities online; additional training for teachers to embrace new teaching methods), and policy-related (lack of management models describing the transition to online learning). All these challenges have a common effect of increasing social stratification and inequality during the distance learning period imposed by the pandemic.

The overall picture of education during the COVID-19 pandemic is constructed not only from the monitoring reports of international organizations but also from the relevant scientific publications. Extensive surveys performed by international organizations and research studies focusing on specific problems complement each other in reconstructing the context in which education systems have had to operate during the pandemic.

The present article is aimed at systematizing the available findings on education during the COVID-19 pandemic and comparing them with

the key conclusions drawn by international organizations engaged in continuous monitoring of education systems.

Publications for this review study were sampled using the following keywords:

- "education COVID", "education pandemic", "university COVID", "university pandemic", "school COVID", "school pandemic"—for publications in English; and
- "obrazovanie" (education), "pandemiya" (pandemic), "koronavirus" (coronavirus), COVID—for publications in Russian

Search for and selection of publications were carried out using the official websites of the publishers Elsevier, Wiley, Springer, Sage, Oxford University Press, and Cambridge University Press (available in the National Research University Higher School of Economics' digital library of scientific periodicals). The portal eLIBRARY.RU was used as well, specifically open-access articles. The sample included publications of the types "research article" and "book chapter" for the period from April to November 2020 as well as works to be published in 2021, which usually represented findings from empirical studies.

The logic of publication analysis and classification implied identifying the major trends in research on education during the COVID-19 pandemic and comparing the findings with the key challenges in modern education reported by international expert communities: digitalization of education and disruption of the educational process, which exacerbated the reproduction of socioeconomic inequality during the pandemic [Department of International and Regional Cooperation of the Accounting Chamber of the Russian Federation 2020].

Even research centers that engage in forecasting did not previously qualify the pandemic threat and the following "imposed" digitalization of social life among challenges of the future (see, for instance, [Nestik, Zhuravlev 2018]). A review of recent reports of international organizations and research findings on changes in education caused by the pandemic will allow estimating the possible damage and finding the best possible ways out of the COVID-19 crisis in education.

## Pandemic and Online Education

In reports of international organizations, emergency transition to distance learning is considered to be a major education trend during the pandemic. Two aspects are emphasized in this wording: distance and emergency. Freedom of choosing whether to implement online and blended learning formats has been replaced by emergency, or "imposed", online education.

In research, the emergency of transitioning to online education and distance learning technology is normally represented from a critical perspective, as scholars seek to find out how exactly the quality of education has been affected for students learning from a distance

during the COVID-19 pandemic. For example, distance learning in lockdown is believed to have undermined preparedness of Russian high school students for the Unified State Exam (USE) in advanced mathematics. Despite the increased use of exam coaching services, actual USE scores were lower than expected, which affected students' choice of higher education institution and field of study [Yakobyuk 2020].

A Danish study shows that during the first lockdown phase, children of parents with no college degree decreased their reading activity compared to pre-lockdown [Reimer et al. 2021], and the shift to remote teaching in elementary schools of Malaysia became a challenge for teachers as well as learners and their parents [Jan 2020]. Along with methodological questions about distance learning technologies suitable for elementary school, the article also explores the psychological and psychophysiological aspects of engaging elementary school students in distance learning.

An economic analysis of Russian educational institutions that switched to online education due to the pandemic shows that digitalization has an essentially negative impact on preschool and supplementary education (particularly private for-profit institutions), where in-person classes cannot be replaced fully with distance learning, which leads to reductions in enrollment and in the range of fee-based educational services [Toshchenko 2020].

Even before the COVID-19 pandemic, online education technology had been a priority in university education development in Vietnam, Germany, India, Canada, China, Russia, the United States, Turkey, and a number of other countries. However, it was the emergency of change and the imposed digitalization that moved online education to the top of the agenda [Klyagin et al. 2020; Bao 2020; Ozkaral, Bozyigit 2020; Mishra, Gupta, Shree 2020; Hiep-Hung, Tien-Thi-Hanh 2020; Kerres 2020; Palvia et al. 2018]. The following aspects of online university education during the coronavirus pandemic are covered in scientific literature:

- Methodological and technological support of online learning in the context of emergency transformations [Ladyzhets et al. 2020; Bao 2020]
- Consequences of imposed digitalization and involuntary nonresistance of university administrators against the transition to online learning [Kerres 2020]
- Disappointment of students whose in-class education has been replaced by online learning, whose expectations (e.g. about internships) have not been fulfilled, and who experience technical issues associated with the digitalization of education [Ozkaral, Bozyigit 2020]
- Development of multimodal approaches to course content design to promote critical thinking in students; the need for government

support to ensure high-quality digital academic experience [Mishra, Gupta, Shree 2020]
- Digital technology in education and the need for social mobilization to promote online and blended learning [Hiep-Hung, Tien-Thi-Hanh 2020]
- Rational and well-founded integration of online and offline learning after the pandemic [Osman 2020]
- Post-pandemic changes in some education programs; for instance, the possibility of increasing digitalization of legal education is being considered, given the ongoing "digital transformation" of the legal profession [Osina, Tolstopyatenko, Malinovsky 2021]

As soon as the COVID-19 pandemic broke out, preparedness of Russian universities for distance learning was assessed [Klyagin et al. 2020]. Degrees of adaptation to online learning practices varied across institutions, departments, programs, and fields of study. For this reason, some parts of education programs or entire programs in a number of Russian universities "could only be delivered with the use of online courses provided by other universities" [Ibid.:54].

A large number of studies analyze the role of distance learning and digitalization in medical education, in particular the following:

- Prospective applicants' problems with the residency application process, away rotations, and obtaining letters of recommendation [Hanson et al. 2020]
- Peculiarities of using online learning tools due to the fact that many psychomotor skills are developed in practical sessions only (such as weighing, pipetting, microscope slide making, DNA swabbing, and many other skills) [Thompson et al. 2020]
- Lack of regular communication between students and personal tutors due to the transition to distance learning technology; suspension of clinical placements which may put students at a disadvantage due to missed opportunities [Sani et al. 2020]
- Acquiring, retaining, and improving technical skills in social isolation and online learning; use of telehealth interactions in outpatient care and medical education [Adesoye et al. 2021; Chick, Clifton, Peace 2020]
- Creation of virtual video platforms to implement formal case review "show and tell" sessions [Madrazo 2020]

Analysis of limitations imposed on medical education by distance learning is followed by specifying the ways of mitigating their effects, with a focus on new technology (video platforms and telemedicine) and compensatory teaching strategies to compensate for the limitations.

Analysis of management practices to adapt universities to online learning is especially optimistic in assessing voluntary engagement in the organization of student-faculty interactions [Klyagin et al. 2020].

Researchers recommend using advanced technologies, such as multimodal learning [Skulmowski, Rey 2020], virtual reality, augmented reality, the Internet of things, etc. for the digitalization of university education. In this regard, the COVID-19 crisis becomes an unprecedented accelerator of technological development in higher education.

The study of consequences of the emergency and involuntary integration of online learning during the pandemic catalyzed not only experimental and empirical research but also the search for an adequate theoretical framework to conceptualize the new reality. Speculating on post-pandemic pedagogy, Michael P. A. Murphy draws attention to the rhetoric of emergency transition to online learning, specifically to representations of face-to-face schooling as a threat. The author suggests using securitization theory to analyze the post-pandemic situation in educational institutions [Murphy 2020]. Ryan Burns considers it important to reexamine the role of ethics in post-pandemic pedagogy, refuse the COVID-induced neoliberal transformation of education, and inject online pedagogy with a praxis of care and compassion [Burns 2020].

**Learning Disruption and Reproduction of Inequality in Education**

Reproduction of inequality in education is one of the key areas of research in Russia and abroad [Froumin 2006; Konstantinovskiy 2010; Nieto 2005]. Research on pandemic-induced changes in education is dominated by projects focusing on digitalization as a means of achieving social isolation that is necessary to break the chains of transmission. Publications exploring the effects of emergency digitalization and social isolation through the lens of educational inequality are much less numerous and usually represent pilot studies or programs of research (for example, [Omelchenko 2020]).

The first wave of research on inequality in education during the COVID-19 pandemic (based on data from Russia, the United States, Finland, and other countries) dealt with the most obvious problems of socioeconomic deprivation of children from low-income families, who used to receive support from educational institutions pre-pandemic, and the impossibility for such families to meet the requirements of "digital education". The lockdown shut students off from the publicly-funded resources, including technological infrastructure, increasing parents' responsibility for their children's learning. Families with low socioeconomic status turned out to be extremely unconducive distance learning environments [Iivari, Sharma, Ventä-Olkkonen 2020]. Furthermore, children from low-income families also lost other types of school support, such as free meals [Morgan 2020].

During the pandemic, just as before, the most vulnerable groups in terms of access to education include students from low-income families [Aucejo et al. 2020], children from migrant backgrounds [Omelchenko 2020], and students with disabilities [Meleo-Erwin et al. 2020]. As for developing countries (e. g. Guyana), unavailability of computers, poor Internet connection, and even inconsistent power sup-

ply inhibit the education process completely, especially in rural areas [Oyedotun 2020].

The use of television as an alternative to "inaccessible online education", according to research, equalizes access to educational products in distance learning. In Los-Angeles, a partnership between local PBS stations and schools spawned a remote-learning initiative tied to documentaries and popular science TV programs [Noonoo 2020].

"Collective trauma" inflicted by the COVID-19 pandemic became one of the factors promoting the reproduction of inequality in education. A study conducted in Smolensk Oblast shows that high school graduates of 2020 shifted their strategies of academic mobility toward "local higher education" [Artemenkov, Sukhova 2020]. This can be explained by increased attractiveness of regional universities (extended enrollment quotas for government-funded places), but the authors also assign a lot of significance to the factor of the coronavirus pandemic: the threat of infection radically increased the value of safety for high school graduates. Therefore, refusal from academic mobility (from regions to megalopolises in quest of "high-status education") as a result of the pandemic psychotrauma can be analyzed in the context of the reproduction of educational inequality.

New studies will show whether high school graduates realize the reduction in the range of their post-graduation choices. University students who studied during the pandemic perfectly realize and even describe their losses in sociological surveys. Due to COVID-19, 13% of American students have delayed graduation, 40% have lost a job, internship, or job offer, and 29% expect to earn less at age 35 [Aucejo et al. 2020].

Pandemic-induced disruption of the educational process affects not only students and faculty but also universities as institutions. Financial constraints caused by the pandemic inhibit their activities in various dimensions: construction, institutional support for students, and faculty training [Palvia et al. 2018]. Meanwhile, the most vulnerable groups, such as international students, are badly in need of additional support from host universities during the pandemic [Pletneva, Ochirova 2020].

Research has also been facing huge challenges, mostly due to reduced funding and mandatory social distancing requirements [Rashid, Yadav 2020]. The latter are difficult to meet in a research setting, particularly in the areas requiring physical laboratories and fieldwork, which causes significant losses to research studies. The recruitment of international staff and the exchange of skilled researchers are a huge challenge due to travel restrictions. In addition, the universities and funding bodies will be under financial strain in the coming months, and the non-COVID projects may lose importance and focus from these agencies.

Researchers justify the necessity of providing government support to universities, as the pandemic has undermined the mechanisms of promoting academic mobility and internationalization, thereby wors-

ening the positions of national universities in global rankings [El Masri, Sabzalieva 2020].

**Global Rankings and Academic Research: Specific Aspects of Constructing the Pandemic Context**

Comparative analysis of the discourse on education during the COVID-19 pandemic between scientific literature and reports of international organizations shows that both types of sources emphasize the challenges of digitalization and learning disruption as increasing the reproduction of inequality in education. Emergency transition to distance (online) learning is seen as the greatest challenge for education during the pandemic in international reports and digests [Department of International and Regional Cooperation of the Accounting Chamber of the Russian Federation 2020; Arzhanova et al. 2020], just as in research publications.

Analytical reports of international organizations provide a thorough and comprehensive analysis of online learning, paying due regard to its impact on students and faculty's health (working on computer, negative psychological aspects of isolation, etc.) and the need for enhancing schools' technological infrastructure (access to portable computers instead of smartphones, which is closely related to the problem of educational inequality) and recommending the development of an integrated portal for all programs, apps, platforms, and materials required for distance learning as well as relevant tutorials for students, their parents, and teachers.

As for the academic discourse, researchers acknowledge that the emergency form of online learning imposed today on all schools and universities meets neither public expectations nor high-quality learning standards [Tishchenko 2020; Yakobyuk 2020; Jan 2020].

Although universities were more prepared for the transition to online technology in education, the pandemic factor complicated the situation of accepting the digitalization, largely due to the negative psychological context [Ozkaral, Bozyigit 2020; Kerres 2020]. At the same time, a number of researchers point to the resources that have become available thanks to the "emergency digitalization" of education. They discuss the need for fundamentally new multimodal approaches to course content design [Bao 2020; Mishra, Gupta, Shree 2020], which is especially critical in areas implying the development of psychomotor skills, such as medicine [Adesoye et al. 2021]. Academics have no doubts that the trend for digitalization of education will persist in post-pandemic reality, yet it will shift toward blended learning formats [Hiep-Hung, Tien-Thi-Hanh 2020; Osman 2020].

International reports provide quite a brief overview of learning disruption and the reproduction of inequality in education during the pandemic, giving the most basic recommendations on providing social and digital support to vulnerable social groups.

Academic researchers investigate the factors spurring the reproduction of educational inequality during the pandemic, paying spe-

cial attention to social isolation of students and the lack of access to government support in this situation [Iivari, Sharma, Ventä-Olkkonen 2020; Morgan 2020]. In publications, vulnerable social groups include children from low-income families, children from migrant backgrounds, students with disabilities, and those from rural areas of developing countries [Omelchenko 2020; Oyedotun 2020].

The pandemic has negative effects on students' behavior and educational/career trajectories [Aucejo et al. 2020]. In addition, researchers raise the problem of possible psychological trauma inflicted on students by the pandemic, its behavioral manifestation being high school graduates refusing from opportunities offered by academic mobility [Artemenkov, Sukhova 2020]. The COVID-19 crisis also affects universities, which suffer from pressure and reduced funding and face limitations in research projects and academic mobility [Pletneva, Ochirova 2020; El Masri, Sabzalieva 2020].

The challenges of education management during the pandemic—in the context of both learning disruption and digitalization—are analyzed from various perspectives in international memoranda as well as academic publications [Palvia et al. 2018; Rashid, Yadav 2020].

Theoretical inquiry is a distinguishing feature of the scientific discourse compared to the discourse of expert and analytical reports of international organizations on the problems of education during the COVID-19 pandemic. Research studies are aimed at not only describing and classifying the empirical facts but also finding a conception—a theory to explain empirical data, a logic of analysis—that will enhance the explanatory and predictive capacity of research. Securitization theory proposed by Garry Gordon Buzan can be a promising theoretical framework for analyzing education during the pandemic, as it explains how education becomes part of the process of constructing a "secure society" [Murphy 2020].

**Conclusions**     A substantial number of publications devoted to education during the first months of the COVID-19 pandemic are based on data from universities, while school education remains less explored in this regard.

Emergency transition to online learning is the overarching theme in international reports and scientific publications on education during the coronavirus pandemic. Researchers suggest making not just a formal transition to distance digital learning but a real technological turn (use of multimodal interaction tools of virtual reality, including augmented reality, the Internet of things, etc.).

Research on disruptive changes to the learning process makes it possible to reconstruct the direct and indirect, as well as latent, threats of the pandemic. Such studies therefore have a predictive value that is crucial for post-pandemic society and education.

Memoranda and digests of international organizations summarize best practices and thus mostly act as a reflection of the reality analyz-

ed. If, however, such analytical reports claim to conceptualize a problem, draw conclusions, or propose solutions and practical recommendations, they may outline areas of research that will be significant in the future.

*Translated from Russian by I. Zhuchkova.*

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