Network of Education Policy Centers

Centar za obrazovne politike
Centre for Education Policy

Research on Schools Response to Public Health Crisis in Serbia, Kazakhstan and Romania

COMPARATIVE REPORT

July 2021

Impressum

Publisher: Network of Education Policy Centers

For publisher:

Research team: Ana Vušurović Lazarević (Serbia), Jasminka Čekić Marković (Serbia)

This research is part of the project *Research on Schools Response to Public Health Crisis in Serbia, Kazakhstan and Romania: comparative study* coordinated by Centre for Education Policy, Serbia and Network of Education Policy Centers, Croatia.

Supported by a grant from the Open Society Foundations.

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1. Introduction

The 2020 global public health crisis, declared as a pandemic in early March by the World Health Organization, has caused considerable changes in human life, society and the economies around the world. The COVID-19 pandemic has endangered people's health globally, and with the introduction of anti-pandemic measures, restructuring of various systems such as the health care, economic and educational systems took place.

Bearing this in mind, the research has been designed and conducted in Serbia, Romania and Kazakhstan in order to address the impact of the global pandemic on the education sector in selected countries - a sector traditionally based on instruction, and all other accompanying activities carried out in face-to-face contact. Although there have been situations in the past where schools have been temporarily closed as a result of wars, natural disasters, and contagions (e.g. the Ebola epidemic in Western Africa), the education sector has never been so vulnerable to factors that were difficult to predict and control, such as the COVID-19 pandemic. Namely, more than 90% of the global student population have never been affected by school closures due to such a phenomenon (UNESCO, 2020).

In more concrete terms, in just a few days or weeks from the outbreak of the pandemic, schools around the world have been forced to provide distance learning. Depending on their capabilities, economic circumstances and national policies, schools have implemented distance learning through radio programs, television programs, or digital technologies – i.e. according to the UNESCO report, 64% of low-income countries provided distance learning in primary education through radio programs, 74% of lower-middle-income countries provided distance learning in primary education through television programs, while 93% of upper-middle-income countries used digital technologies in distance learning in primary education (UNESCO, 2020). However, even in the group of economically most developed countries, the effects of the pandemic were such that only few of them focused on the pedagogical challenges of online working, in addition to technical and infrastructural ones (UNESCO, 2020).

Distance learning and school closures have not only affected education but also other aspects of children's and young people's lives such as ensuring a safe environment, guaranteed meals, psycho-social support, which is of particular importance for children from vulnerable groups and it is predicted that school closures might contribute to the greater exclusion of socially disadvantaged children, as well as dropout and early school leaving (UNESCO, 2020). Furthermore, the longer children and young people spend out of school, the bigger are the risks of child labor, early marriages, domestic violence, as well as increased stress and anxiety due to the loss of peer interaction and disrupted routines (UNESCO, UNICEF, World Bank, World Food Program and UNHCR, 2020).

When it comes to teachers, the pandemic has affected many aspects of their work – aside from the different method of delivering instruction, there were inevitable changes in school schedules, professional development, student assessment, while the emphasis has now been placed on digital competencies of teachers. Even in the most economically developed countries (e.g. the USA), teachers have stated that they feel unprepared for distance learning (OECD, 2020a).

Certainly, the support that students receive from both teachers and parents is of great importance in regular schooling, and in conditions when students attend classes from home, emotional and learning support is vital in overcoming obstacles of home learning and improving the effects of online instruction (OECD, 2020). As a result, many children whose families were unable to offer them support were exposed to a greater risk of lagging in schoolwork and in keeping up with distance learning.

Finally, distance learning is an option that is globally used in most education systems as the "least bad solution" used to replace regular schooling in emergencies, although there is a common opinion that it is not ideal and that online teaching does not produce the same effects as traditional instruction. Instead, it is considered that the positive effects of using digital tools are most beneficial to students when used to complement traditional teaching (Fleischer, 2012; Peterson et al., 2018 according to the OECD, 2020a) and that equipping schools with digital resources is not necessarily related to student performance (OECD, 2020c). Therefore, even the overall effects of distance learning on students' knowledge are still unknown, with some experts believing that learning loss is inevitable for all students (World Bank, 2020) which is yet to be confirmed or refuted through the results of the PISA 2021 research.

In this regard, in the coming period, the focus should be placed on creating policies that will ensure that this crisis 1) accelerates the resolution of challenges that were present before the pandemic (e.g. digital and pedagogical skills of teachers, quality of teaching, school equipment, support to students from vulnerable groups, etc.) and 2) defines which policies have given the best results in practice and thus contributes to preventing challenges that may arise in the future.

In order to address the impact of the global pandemic on education in Serbia, Kazakhstan and Romania, the Network of Education Policy Centers (NEPC), in cooperation with the Open Society Foundations that provided funding, supported research that was conducted in the aforementioned countries to show how schools in these countries responded to the COVID-19 pandemic and to contribute to the improvement of educational policies with conclusions and recommendations.

2. Overview of education and information-communication technologies in Serbia, Kazakhstan and Romania

In order to better understand the implementation of the teaching process during the COVID-19 pandemic in Serbia, Kazakhstan and Romania, this study presents the context in which the schools in these countries operate, providing the data on the number of schools, students and teachers, information-communication technologies (ICT) infrastructure in schools, ICT in households and digital competencies of the populations, and it also describes general 'digitalization policies' in the education sector in these three countries.

2.1. Number of schools, students and teachers

The study showcased the numbers related to schools, teachers and students in order to present the basic overview of the education systems as well as the size of the education population affected by the COVID-19 pandemic.

In **Serbia**, the total number of students at the beginning of the 2019/20 school year in primary education was 517,826 students, in secondary education 249,455 students, and the total number of teachers (full-time and part-time teachers) in primary and secondary education at the beginning of the school year 2019/20 was 52,599 in primary and 30,176 in secondary education (Table 1).

Table 1. The total number of students and teachers in primary and secondary education at the beginning of the school year 2019/20

Level of education	Total number of students	Total number of teachers
Primary education	517,826	52,599
Secondary education	249,855	30,176

Source: Statistical Office of the Republic of Serbia

Based on the data of the Statistical Office of the Republic of Serbia, there are 1,653 typical primary and secondary schools in Serbia (Table 2), of which the most numerous are primary schools, followed by secondary vocational schools, general secondary schools, mixed schools (schools offering general and vocational or general and art programs) and secondary art schools. Out of the total, 99% of primary schools and 88% of secondary schools are public schools.

Table 2. Number and type of schools at the beginning of the school year 2019/20

Type of school	Number of schools
Primary schools[1]	1,136
Secondary vocational schools (SVS)	311
General secondary schools (GSS)	110
Secondary art schools (SAS)	40
Mixed schools (SVS and GSS)	52
Mixed schools (SVS and SAS)	4
Total	1,653

Source: Statistical Office of the Republic of Serbia

In **Kazakhstan**, the total number of students based on the data from 2021 in primary education is 1,480,504 students, in secondary education 1,577,109 students (Table 3), and the total number of teachers is around 344,000.

Table 3. The total number of students and teachers in primary and secondary education in Kazakhstan

Level of education	Total number of students	Total number of teachers
Primary education	1,480,504	344,000
Secondary education	1,577,109	

Source: Education System Statistics

Based on the 2021 data, Kazakhstani system has 7,249 schools. As for the types of schools (Table 4), the most numerous are general secondary schools, followed by mixed secondary schools, and then, to a much smaller extent, primary schools, secondary vocational schools and secondary art schools.

Table 4. The number and types of schools in Kazakhstan

Type of school	Number of schools
Primary schools	633
Secondary vocational schools (SVS)	460
General secondary schools (GSS)	5,166

[1] The number of main primary schools - main primary schools are schools that have been established as legal entities and which may have 'satellite' classrooms in separate school facilities. This number does not include main schools for children with disabilities.

Secondary art schools (SAS)	42
Mixed secondary schools	1,134
Total	7,435

Source: Education System Statistics

In **Romania**, in the 2019/2020 school year, the school population in pre-university education was 2,982,900 students - 1.6 million students are enrolled in primary and lower secondary education (54.4%) while 618,300 students are enrolled in upper secondary schools (20.7%), according to the data that the National Institute of Statistics announced at the end of 2020 (Table 5).

Table 5. The total number of students and teachers in primary, lower and upper secondary education in Romania

Level of education	Total number of students	Total number of teachers
Primary and lower secondary education	1,600,000	208,400
Upper secondary education	618,300	

Source: National Institute of Statistics

In the education system of Romania, at the beginning of the 2019/2020 school year, there were 208,400 teachers at the pre-university level. In 2019, there were 5,445 school units covering primary, a lower secondary and upper secondary level of education (Table 6) and 96.2% of the students' population is attending public, while 3.8% go to private school units.

Table 6. The number and types of schools in Romania

Type of school	Number of schools
Primary and lower secondary schools	3,896
Upper secondary schools	1,549
Total	5,445

Source: National Institute of Statistics

Although the number of students and schools depends on the population and characteristics of the country, the number of teachers, therefore, the student-teacher ratio reveals some aspects of the education systems as it is among the determinants of the demand for teachers, along with students' instruction and teachers' working hours and the division of teachers' time between teaching and other responsibilities (OECD, 2019). In Serbia, based on the PISA

2018 research, the average student-teacher ratio is 11:1, which comes to 11 students per teacher, on average (OECD, 2020c). According to the data provided in Research on Schools Response to Public Health Crisis in Serbia, Kazakhstan and Romania - National Report for Romania, in Romania, the average ratio between the school population in pre-university education and the number of teachers was 14:1, meaning 14 students per one teacher, while in **Kazakhstan**, the student-teacher ratio in 2019 was 17:1 in primary education and 8:1 in secondary (World Bank 2019b and 2019c).

2.2. Information and Communication Technologies (ICT) in schools

For **Serbia**, the most precise data on the availability of ICT in schools, school infrastructure, and Internet access are those in the PISA 2018 database collected through a questionnaire for school principals which shows that the computer-student ratio in Serbia is 0.3 computers per student, or approximately three students per computer, which is significantly lower than the OECD average which is slightly above 0.8[2]. In **Romania**, based on the same source (PISA 2018 research), the computer-student ratio is 0.6[3]. In **Kazakhstan**, data on the computer-student ratio is not available in PISA database, however the Report on Completion of State Program (2019) indicates that in 2018 computer-student ratio was 1:10, meaning 10 students to 1 computer.

The percentage of computers connected to the Internet in schools in **Serbia** is about 82%, while the average for OECD countries is 97% (OECD, 2020c). In **Kazakhstan**, National Report by Informational Analytical Centre (2019) states that 92.2% of schools are connected to the Internet with an average speed of 4Mbps. In addition, the electronic government reports that 6,250 schools are connected to broadband Internet with a speed of 4 Mbps and more, while 6,353 schools have access to online resources. These are the results of the 'Digital Kazakhstan' State Program approved by the Government of the Republic of Kazakhstan in 2017. In **Romania**, there are severe infrastructure deficiencies in schools. Out of the total of 9,150 school units (both main and satellite schools) in primary and lower secondary education (including special education), 6,166 of them were connected to the Internet (67%). When it comes to upper secondary education 98% of high schools and independent school groups have internet access (data provided in Romania National Report 'Challenges and Approaches to Online Education During COVID-19 Pandemic').

[2] https://www.oecd-ilibrary.org/sites/2a420765-en/index.html?itemId=/content/component/2a420765-en#sect-56
[3] Ibid.

2.3. Information-communication technologies (ICT) in households and digital competencies of the population

In **Serbia**, the percentage of households with Internet access was 81% in 2020, in comparison to 91% at the EU level (EUROSTAT[4]). When interpreting this data, it should be considered that in Serbia the predominant device for Internet access is a mobile phone, which is owned by 94% of households, while the availability of other devices is much lower - 74% of households in Serbia own a computer, while only 52% of households have laptops (SORS, 2020).

Furthermore, if we consider the environment in which households are located (urban and other settlements), there is a considerable disparity in the percentage of households with internet access and computers, and it stands at around 20% in the favor of households in urban areas. Regarding the level of household income, the gap is even wider, especially when it comes to owning a computer - the availability of computers in households with incomes over 600 EUR (96%) is twice as high as in households with the lowest incomes (48%) (SORS, 2020).

Regarding digital competencies of the Serbian population, according to 2019 data, 46% of people aged 16 to 74 have basic or above basic overall digital skills, which is below the EU average of 56% (EUROSTAT[5]).

In **Kazakhstan**, the Global Information Technology Report 2016 illustrates that 59% of households in Kazakhstan have internet access, and World Bank (World Bank, 2019a) suggests that 82% of individuals in Kazakhstan use the Internet. At the same time, according to the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan, 79.6% of the population in Kazakhstan are digitally literate (Electronic government of the Republic of Kazakhstan, 2021). The electronic government reports the plan to increase the number of digitally literate population to 83% by 2022, which is expected to be achieved based on the renewal of the education system with a focus on 'creative and critical thinking and use of modern technologies in the learning process' (Electronic government of the Republic of Kazakhstan, 2021).

Romania is facing a real paradox - it has one of the world's fastest internet services (the 4th-highest in the world and the 5th in the EU), especially in urban areas, a competitive software industry well positioned in terms of ICT graduates (5.6% of all graduates compared to the EU average that is 3.6%), it ranked fifth in the EU, but its progress is still very limited when it comes to human capital and the digitalization of the economy (European Commission, 2020). Almost a fifth of Romanians have never used the Internet and less than a third have

[4] https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_in_h/default/table?lang=en
[5] https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i/default/table?lang=en

at least basic digital skills - i.e. only 31% of people aged 16 to 74 have basic or above basic digital skills, which is quite lower than the EU average of 56% (EUROSTAT database[6]). The percentage of young people aged 16-19 who assess their digital skills as low is among the highest in the EU (39% compared to the EU average of 15% in 2019). According to the same source, 85% of individuals in Romania use internet[7].

The Romanian National Institute of Statistics data indicate that during 2017-2018 period, the socio-economic disparities were high in Romania, with more than 30% at the national level and more than 40% of households in rural areas not having access to internet and computer at home.

According to the latest EUROSTAT data, the percentage of households with Internet access in Romania was 86% in 2020, compared to the EU average of 91%[8]. However, out of the total number of households with access to the Internet, 93% of urban households had access to it in 2020, 88% in small towns and suburbs and 79% in rural areas.

In addition, the 2020 Digital Economy and Society Index (DESI) ranked Romania the 26th out of 28 EU member states, as a result of slow progress in general, as well as political developments since there have been four different governments in Romania in the last three years (European Commission, 2020).

2.4. Education policy and digital education

In accordance with the priority of the Government of the Republic of Serbia named 'digitalization' which was set in 2017 and which also refers to the digitalization of education, in recent years education policy in **Serbia** has been implemented through programs and projects aimed at modernizing the education system via improvements of the schools' ICT infrastructure, development of teachers' digital skills, use of digital technologies, introduction of digital textbooks, etc. One of the first reform efforts in this direction was the introduction of new teaching subjects such are Digital World Informatics and Computer Science and Technics and Technology in primary education, while a new program for students with a special interest in informatics and computer science in general education was introduced. Digital textbooks have been introduced in 2018, as well as the electronic grade book for keeping records of the teaching process and student performance. Different projects have been launched to prepare teachers for the upcoming changes and improve their digital competencies. The establishment of a unified Education Management Information System (EMIS) is underway with parallel implementation of various projects for improving the ICT infrastructure in schools. At the national level, in 2019, the Education

[6] https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i/default/table?lang=en
[7] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_ci_ifp_iu&lang=en
[8] https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_in_h/default/table?lang=en

Technology Center was established under the Institute for Education Quality and Evaluation and within the Institute for Improvement of Education (IIE) the Edu Platform was set up for conducting training of public interest, i.e. training seminars accredited by a decision of the Minister of Education. Serbia has adopted the Strategy for the Development of Digital Skills in the Republic of Serbia (2020-2024), while the new Strategy for the Development of Education in the Republic of Serbia until 2030 (adopted in 2021) envisions the development of the Framework for Assessing the Capacity of Primary and Secondary Schools to Organize Distance Learning, establishment of the Coordinating Body for Distance Learning, the establishment of public online primary school and online general secondary school, as well as defining a set of indicators for long-term monitoring of digital education in Serbia (Government of the Republic of Serbia, 2021).

In **Kazakhstan**, there are two state programs named 'Informational Kazakhstan 2020' adopted in 2013 and 'Digital Kazakhstan' adopted in 2017. The first state program focused on individuals using internet and digital literacy, as well as the development of an 'e-learning' system that should develop equal access to technologies across schools (including broadband Internet access) and high-quality educational services (development of necessary platforms). The second program defined the goal of connecting households and schools to broadband Internet and connecting online schools to digital education resources, hence the data about ICT in households and schools previously described are the results of this program. In addition, the COVID-19 pandemic has revealed problems associated with the implementation of the abovementioned 'e-learning' system. In fact, due to the underdeveloped e-learning system, it was challenging to involve a large number of students and teachers at the same time (which COVID situation required).

In **Romania**, since 2004, the Ministry of education and research (MER) of the Republic of Romania has been implementing the 'Euro200' National Program which supports pupils and students with insufficient financial resources in purchasing a personal computer, and by now, over 300,000 students have benefited from this program. Apart from equipping students, new policies related to the modernization of the curriculum have been applied. Also, the acquisition of digital skills remains limited. Existing curricula, programs and infrastructure do not sufficiently reflect the need to increase the students' digital skills. The number of highly digitally equipped and connected schools in Romania is significantly below the EU average. As part of the E-Education 2023 strategy, Romania launched two major projects, 'The computer system of Management of schooling' and 'The National Education Platform' that should contribute to the digitization of education in over 4,500 schools.

3. Teaching and learning during the COVID-19 pandemic in Serbia, Kazakhstan and Romania

In **Serbia**, the COVID-19 caused crisis began in March 2020, when the Government of the Republic of Serbia declared state of emergency on the territory of the entire country and suspended the regular work of schools. All schools in Serbia needed to organize distance learning a few days after the declaration of the state of emergency, and it is estimated that about one million and 250 thousand Serbian students across the education system were directly affected by the closure of schools and higher education institutions. The Ministry of Education, Science and Technological Development (MoESTD) offered several modalities of instruction to schools at the beginning of the state of emergency - in March 2020. Broadcasting on the national Public Broadcasting Service (RTS) of pre-recorded lessons of subjects was organized[9], while teachers were obliged to independently provide online instructions. Schools were also required to deliver printed materials to students who were unable to attend distance learning. This organization of distance learning continued until the state of emergency was lifted (May 2020), namely until the end of the 2019/20 school year. The period between the end of the school year 2019/20 and the beginning of the new school year 2020/21 enabled decision-makers to review the advantages and disadvantages of the applied modalities of organizing distance learning and, accordingly, to plan a distance learning approach for the next school year. For the beginning of the school year 2020/21, the MoESTD defined and offered schools several modalities of instruction. For primary schools, implemented modalities are 1) regular classes - teaching that is performed at school facilities through face-to-face work with students in small groups and 2) teaching that is implemented in both ways - in school and through distance learning (so-called combined model) (MoESTD, 2020). The combined model was used for secondary schools[10]. All schools were allowed to conduct a complete teaching process through distance learning exclusively for students who, for health and safety reasons, do not want to come to school. In the second semester of the school year 2020/21, the modalities of implementation of the teaching process that was introduced at the beginning of the school year were still in force. The moment the decision on the nationwide lifting the state of emergency was made, local authorities were given the discretion to decide, depending on the local epidemiological situation, whether to introduce exclusively distance learning in primary and secondary schools on their territory.

[9] Furthermore, for students attending classes in national minority languages, in cooperation with national councils of national minorities, the MoESTD organized the broadcasting of pre-recorded classes in national minority languages (Albanian, Bosnian, Bulgarian, Croatian, Hungarian, Romanian, Ruthenian and Slovak language) on Radio Television Vojvodina and local TV stations.

[10] These modalities shift depending on the epidemiological situations, that is, schools switched to working entirely online during November 2020 and March/April 2021.

In **Kazakhstan**, the COVID-19 pandemic has disrupted the normal flow of the education process the same way as it did around the world. In March 2020 almost all schools were shifted to distance learning for all grades, except some remote rural schools and some primary school classes (based on parents' requests) with a condition of rigid sanitary standards. Initially, the government set four ways to support the delivery of distance learning: online platforms, television, radio, and post (for distant communities with no local schools). Later, in August 2020, the government approved the distribution of 500,000 computers for the children from families in need, the creation of electronic versions of textbooks, and the organization of an online national parent meeting, which was held in a format of a press conference for all interested parents across the country.

In **Romania**, the decision on the closure of schools was taken as a protection measure by a majority of EU states. As a result, the Romanian Ministry of Education and Research (MER) encouraged teachers to continue with learning activities utilizing the technology-supported courses for pupils. In March 2020, online teaching and learning were introduced, initially, as a recommendation and in April, such a teaching model became compulsory to ensure continuity of learning during the outbreak. The public television started broadcasting the educational show 'Tele-school' during March 2020, and the lessons were available on two TV channels (TVR 2 and TVR 3), but also Romanian Public Television's YouTube channel and the website www.tvr.ro , where the full schedule was also available. These classes for pupils in the 8th and 12th grades who had to take final exams in respective year were the priority. In accordance with the MER's recommendation, the daily schedule of the online learning activities organized by teachers was decided by the schools' leadership. The MER maintained permanent contact with the pre-university educational institutions through the County school inspectorates, in charge of monitoring students and teachers throughout the course's suspension and for the daily reporting to the MER. Face-to-face learning started again in June 2020 only for students who attended the last year of lower and upper secondary programs to support their preparation for the national exams, including certification exams in VET. For learners with personal or family health problems, attendance was optional and decided by parents.

4. Research objectives

Considering that globally schools were forced to close their doors and completely suspend regular classes, that the society encountered a large-scale epidemiological challenge, and that distance learning thus far has never been applied in long-term and across the entire education systems, this research aims to present how schools in Serbia, Kazakhstan and Romania reacted to such a situation. Also, based on the main research findings and drawn conclusions, the intention was to develop key **recommendations for improvement**, given the uncertainty of the duration of emergency conditions for schools, but also with a view to future contingencies that may lead to this or similar situations.

The research aims to provide an **overview of the situation in primary and secondary schools in Serbia, Kazakhstan and Romania** in the most important domains for the functioning of the school and the implementation of the teaching process in emergencies. The examined domains were:

1) **Information flow**, which includes institutions in charge of informing school management, school management informing the employees, as well as school informing students and parents. The objective was to show to what extent are principals and teachers informed about the organization of school work, namely the organization and implementation of the teaching process in the COVID-19 pandemic, how clear was the received information, and whether there were challenges in communication and information exchange between all relevant actors on school level (principals, teachers, students and parents).
2) **Organization of school work, technical equipment and digital competencies of teachers**, where the objective was to examine how the schools organized work in emergency conditions, what were the main challenges, how many students did not have access to distance learning, how schools procured protective equipment against the COVID-19, how are the schools technically equipped, whether and what kind of equipment the teachers lack, as well as how and to what extent the teachers received in-service training related to the development of digital competencies before the pandemic.
3) **Organization and implementation of the teaching process,** which includes a survey of instruction modalities, used online platforms and performed activities. The objective of this part of the research was to present the most prevalent modalities of instruction in schools, the most commonly used platforms, the use of digital materials, changes in teacher practices, accessibility of distance learning to students, cooperation with parents on issues related to the teaching and learning process, identification of the biggest challenges related to regular classes in the first cycle of primary school, as well as to the combined model in other cycles of education.

4) **Monitoring and evaluation of teaching and learning**, which included monitoring the quality of the teaching process and activities of teachers and students. More specifically, the objective was to show whether there were changes in monitoring and evaluation of teaching and learning and how these changes were displayed, how the principals monitored the quality of teaching and teachers' activities, as well as how teachers monitored student progress and performed students' assessment.

Definitions of terms

- **Distance education** (or learning) in this research means a special formal educational process organized through different media (correspondence school, radio, television, internet) during which the teacher and the student do not share the same physical space (IEQE, 2021).
- **Online teaching** means a type of teaching that is exclusively conducted through digital technologies and the Internet (IEQE, 2021), and as such falls under the concept of distance education. However, considering that the research deals with the implementation of teaching mainly via television and teaching through digital technologies, both terms were used in the research.

5. Methodology

This research included the collection and analysis of both quantitative and qualitative data.

The content analysis included the analysis of all available documents related to the functioning of schools in emergency conditions (regulatory and strategic framework, government decisions, guidelines, and instructions of the education authorities), while data related to schools are gathered via a **questionnaire survey in each of the countries**.

The results of the research are presented descriptively, with analysis, linking of data and drawing conclusions about their connection, where possible.

The research participants were **principals and teachers from primary and secondary schools**. Two online questionnaires (principals' questionnaire and teachers' questionnaire) were used, with mostly closed-ended questions with multiple choice and rating scales and to a lesser extent open-ended questions. Quantitative data are mainly related to the conditions and assessment of the situation in schools (e.g. modality of teaching, the most used sources of information, technical equipment of schools) while qualitative data mostly relate to school practices which could not be identified through the aforementioned content analysis (e.g. the manner of monitoring the activities of students and teachers, challenges in communication with students and parents, changes in the teachers' practice, etc.).

In **Serbia**, questionnaires were sent to schools in December 2020[11]. In **Kazakhstan,** questionnaires were sent to schools in January 2021 and in **Romania**, questionnaires were sent to schools during February and March 2021.

In **Kazakhstan**, bearing in mind that two official languages are used as the main instruction languages in schools (Russian and Kazakh language), principals and teachers were sent questionnaires in the language they use in their schools, which resulted in presenting the research results separately for participants using Russian language (RL) and Kazakh language (KL) schools.

Methodological limitations. When answering the questionnaire questions, the respondents shared their perceptions (which are subjective), thus this limitation is to be considered when interpreting their answers.

Anonymity and ethics. The anonymity of all participants in the research was respected during the data collection and processing, as well as during the presentation of the main results of the research. Before completing the questionnaire, the respondents were

[11] It is important to note that the government's decision on new, more rigorous, anti-COVID measures was in force during this period, which meant that all schools had to switch to distance learning exclusively, except for the first cycle of primary education. Therefore, all research participants were informed that the research refers to the period before this decision.

introduced to the objectives of the research, the topics that the research will cover, the principle of anonymity and the principle of voluntary participation.

5.1. Research sample

Quota sampling was used in the research. Namely, sample schools that participated in the research were identified based on the type of school (primary, secondary vocational school, general secondary and art school), taking into account their representation in the total number of schools in each participating country.

In **Serbia and Kazakhstan**, the research sample involved school principals and teachers from primary schools, general secondary, secondary art schools, and secondary vocational schools. In **Romania**, the research sample involved school principals and teachers of primary and lower secondary schools, high schools and upper secondary colleges, upper secondary VET schools, special schools (primary and gymnasium) and art schools (both lower & upper secondary).

The research included the total of 1,942 research participants, namely, 1,300 teachers and 642 principals from Serbia, Kazakhstan and Romania. The distribution of teachers and principals per country is presented below (Table 7).

Table 7. Total number of participants in the research

Group of participants	Country			
	Serbia	Kazakhstan	Romania	Total
Principals	57	155	430	642
Teachers	100	798	402	1,300
Total	**157**	**953**	**832**	**1,942**

In **Kazakhstan**, the sample size was also defined by the language used as the language of instruction in the school. Hence, it should be mentioned that out of 798 teachers that participated in the research, 38% were from Kazakh language schools, while 62% were from Russian language ones. When it comes to principals, in total 40% of all are employed in KL schools, and 60% in RL schools.

In terms of the participating schools' location, most teachers and principals who participated in the research in **Serbia** and **Kazakhstan** (especially RL schools)[12] come from schools located in urban areas, while in **Romania**, the participation of teachers from urban

[12] The vast majority of both teachers and principals from RL schools are located in urban areas (94%), while more teachers from KL schools in rural environments took part in the research (26%), as well as KL schools principals (13%).

environments is higher, but principals come almost equally from both urban and rural environments (Chart 1).

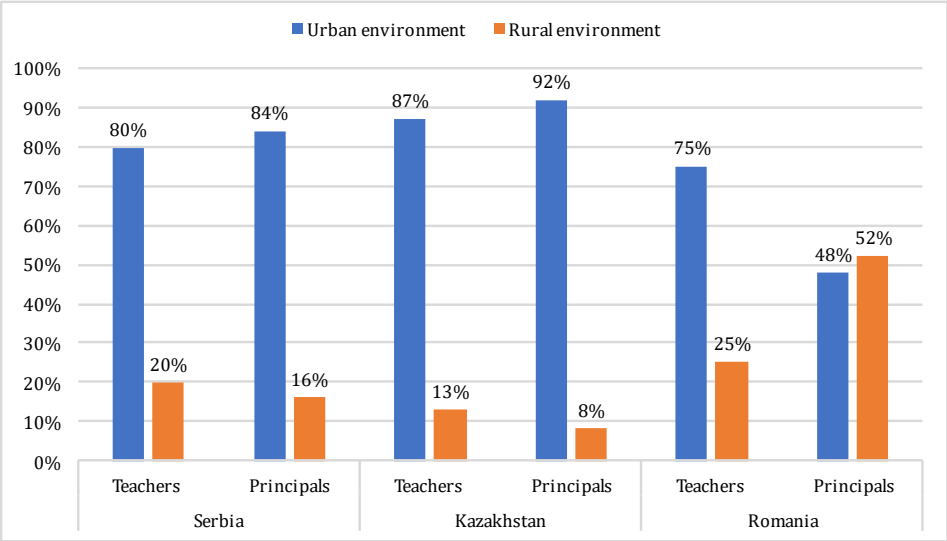

Chart 1. Participants by the environment where the schools are located (urban or rural)

Teachers who participated in the research mostly teach in only one school. In **Serbia** and **Romania**, it is equal - 85% and in **Kazakhstan,** 98% of teachers teach only in one school.

6. Results

The results of the research are presented in line with the research objectives and are grouped as the areas in the questionnaire - Information flow (Chapter 6.1), Organization of school work, technical equipment and digital competencies of teachers (Chapter 6.2), Organization and implementation of teaching process (Chapter 6.3) and Monitoring and evaluation of teaching and learning (Chapter 6.4). Data collected through qualitative answers of respondents that do not belong to any of the mentioned categories are presented in a separate section (Chapter 6.5).

Despite the existence of Kazakh and Russian language schools in Kazakhstan, and considering that the following research results are to be presented comparatively, the research results for Kazakhstan are presented in a way to show the average values for Kazakh and Russian language schools. Nevertheless, if major differences between those two types of schools exist, they are described separately.

6.1. Information flow

Principals and teachers ranked each source of information on a scale from 0 to 4, where 0 meant that the source of information was not used at all and 4 that it was the source that provides principals and teachers with the most information. Likewise, principals and teachers used a scale from 0 to 4 to rank the institutions/persons they consulted when in doubt about the organization of school work or the teaching process, where 0 meant that they did not consult them at all, and 4 that they consulted a certain institution/person the most. Percentages of principals who gave a score of 4 to sources of information and institutions they consulted when they had doubts are presented in Chart 2. Notably, the national level institutions are in fact entities in each county in charge of different aspects of improvement of quality of education, including the teachers' professional development, curriculum design, etc.[13]

The main sources of information in all three countries are regional/local education authorities, namely regional school administration offices in Serbia, the local/regional education departments in Kazakhstan and the Country school inspectorate in Romania. Other local government authorities were an important source of information for about a third of school principals in all countries, while ministries in charge of education were deeply

[13] In Serbia, this institution is the Institute for Improvement of Education, in Kazakhstan it is the "Orleu" training center, while in Romania these are the National Centre for Curriculum and Evaluation and the Teaching Staff House. As for regional/local education authorities, in Serbia it is the Regional school administration, in Kazakhstan it is the regional or local education department and in Romania, it is the County school inspectorate and other agencies subordinated to the Ministry of Education and Research.

involved, especially in Serbia, partially in Kazakhstan, and the least in Romania, comparing the three countries. The least represented sources of information are the national level institutions in charge of the improvement of education, teacher training, etc., especially in Romania. In Serbia, 8% of principals also used the Institute of Public Health as a source of information, while in Romania 7% of principals mentioned other agencies subordinated to the Ministry of Education and Research. Principals from Kazakhstan reported that they did not use other institutions.

The same conclusion applies to consultations regarding doubts about the organization of school work or the teaching process - regional/local education authorities were contacted and consulted the most. Other local authorities are the second most consulted institutions that are almost equally consulted in Kazakhstan[14], Serbia and Romania. Again, the least presented are the national level institutions in charge of the improvement of education, teacher training, etc., especially in Romania and Serbia. When it comes to other institutions principals refer to when having doubt, in Serbia the Institute of Public Health was highly rated by 6% of principles, while in Romania 3% of principals highly rated other agencies subordinated to the Ministry of Education and Research. Principals from Kazakhstan reported no consultation with other institutions when in doubt.

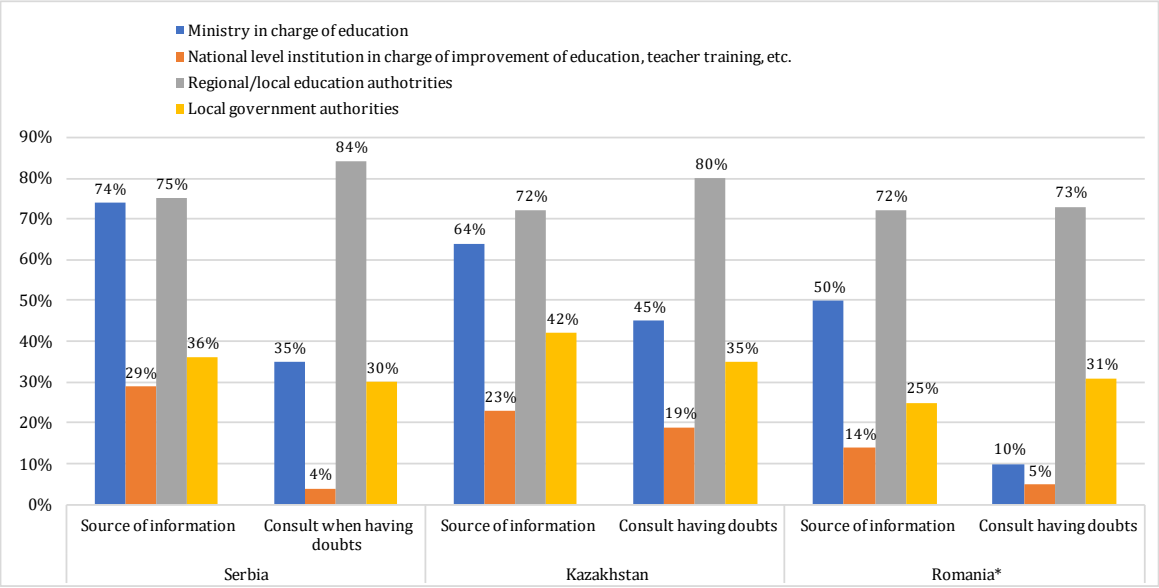

Chart 2. Main sources of information and institutions school principals consulted when having doubts (% of principals who gave a score of 4, on a scale from 0 to 4)

* National level institutions include average value for both National Centre for the Curriculum and Evaluation and the Teaching Staff House.

[14] Local/Regional educational departments were the first choice among RL school principals (68%). However, RL principals tended to rely solely on that source, while KL principals almost equally approached Ministry of Education and Science (73%) and Local government authorities (49%).

When having doubts about the organization of the final exam at the end of primary education during COVID-19 pandemic, 77% of principals of the Serbian schools consulted Regional school administration offices, and in **Romania,** 78% of principals consulted the Country school inspectorate. Data for **Kazakhstan** are not clear and might be a subject of discussion since 87% of school principals reported that they consulted school management when having doubts about organizing final exams at the end of primary education. It might mean that a significant number of vice-principals also took the survey and referred to consultations with school principals.

School management is the main point for passing the information to teachers as well as providing consultation when teachers are in doubt in Serbia and Romania, while for teachers from **Kazakhstan**[15] the Ministry of Education and Science is the main source of information, and, compared to the other two countries, they also consult the Ministry the most when having doubts (Chart 3). In Serbia and Romania, ministries in charge of education and regional education authorities (namely Regional school administration in Serbia and Country school inspectorate in Romania) are also assessed as the most frequently used source of information by a significant percentage of teachers, however, when having doubts, teachers from Romania tend to consult those institutions more than the teachers from Serbia. Additionally, in all countries, around a quarter of teachers mentioned colleagues as their consultation point when in doubt. Lastly, around one fifth of teachers stated the media in Kazakhstan and Romania as the frequently used source of information, which is not the case in Serbia where teachers use the media as the least source of informing themselves.

[15] As for the differences between KL and RL schools in Kazakhstan, when it comes to teachers there are no major differences in sources of informing, however in case when teachers have doubts about organizing teaching process i.e. when they face obstacles. Teachers in both KL and RL schools tended to approach school management and colleagues, but KL school teachers are more eager to consider other options.

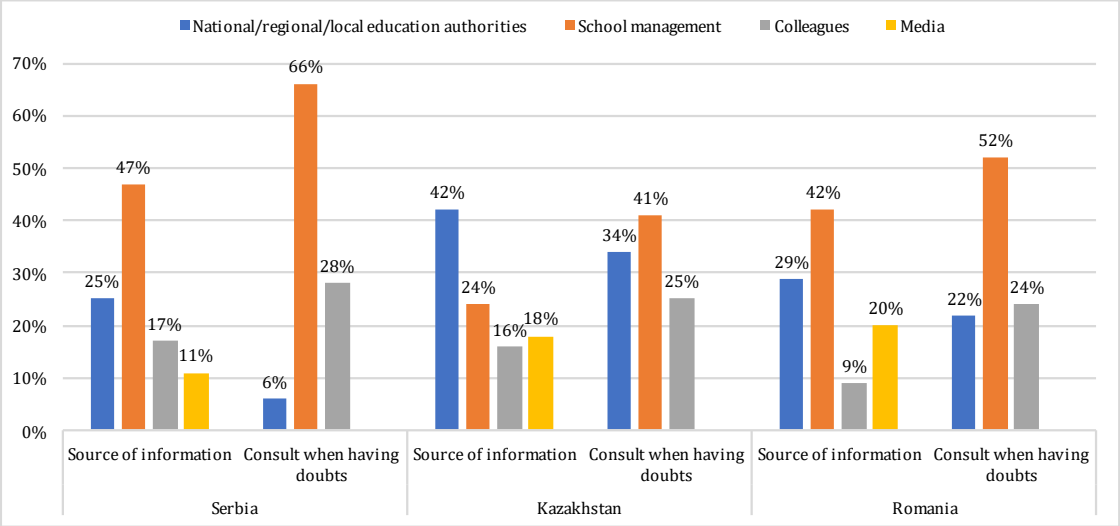

Chart 3. Main sources of information and institutions/persons teachers consult when having doubts (distribution of awarded score of 4, on a scale from 0 to 4)

School principals in all countries assessed the level of information on the organization of school work and organization and implementation of teaching process during the COVID-19 pandemic quite high (on a scale from 1 to 5, where 1 means not informed at all and 5 means very informed) – in **Serbia**, the average level of being informed is 4.7, in **Kazakhstan** and **Romania** it is 4.5. In fact, in each of the countries relatively high number of school principals assessed the level of being informed with the highest score (5) or one score below (4) – in Serbia almost all school principals assessed themselves as being very well or well informed (98%), while in Romania and Kazakhstan the percentages are around 94%.

Teachers also assess quite high their level of being informed on organization and implementation of teaching process during the COVID-19 pandemic using the same scale – in **Serbia**, teachers assess their level of being informed with an average value of 4.6, in **Kazakhstan,** it is 4.5 while in **Romania** it is somewhat lower – 4.2. As in the case of school principals, majority of teachers in each of the countries assessed their level of being informed with two highest scores (4 and 5) – in Serbia, 95% of teachers assessed themselves as being very well or well informed, in Kazakhstan[16] that is the case with around 92% of teachers and in Romania 86% of teachers assessed themselves being very well or well informed.

Participants used the scale from 1 to 5 to rank **the clarity of information provided to school principals and teachers during the COVID-19 pandemic**, where 1 means unclear information and 5 means very clear information. The average assessment of clarity of

[16] However, in Kazakhstan, the proportion between those who assessed being very well informed (score of 5) and well informed (score of 4) is quite different when comparing KL to RL schools – less teachers from KL schools assessed themselves as very well-informed comparing to RL school teachers (53% of KL school teachers vs. 75% of RL school teachers who gave a score of 5 on a scale from 1 to 5).

information provided by relevant institutions during the COVID-19 pandemic is relatively high – in **Serbia** and **Romania**, school principals assessed the clarity of information with an average value of 4.1, while in **Kazakhstan**, school principals assessed it with an average value of 4.5[17].

However, when compared to the principals' responses, teachers from two participating countries provided slightly different assessment when it comes to the clarity of information provided by relevant institutions during the COVID-19 pandemic to schools - in **Serbia**, teachers assessed the clarity of information with the average value of 4.0, while in **Kazakhstan**, teachers assessed it with an average value of 4.5[18] which is the same value that principals provided. In **Romania,** teachers assessed the clarity of information with an average value of 3.8, which is below the score principals awarded, and it is also the lowest score among the three countries.

Further analysis of the results related to the clarity of information (Chart 4), for both principals and teachers, shows that some of them assess the clarity of information rather lower than the average values are. For instance, school principals in **Serbia** assessed the clarity of information with an average value of 4.1, and, although being generally high, 16% of them assessed information as almost unclear (score of 2– 4%) or almost clear (score of 3 – 12%), while 22% of teachers assessed clarity of information as either unclear (score of 1 – 3%), almost unclear (score of 2 – 4%) or almost clear (score of 3 – 15%). In **Kazakhstan**, around 10% of school principals assessed the information as almost clear (score of 3) and around 8% of teachers assessed the information as almost clear (score of 3 - around 7%) or almost unclear (score of 2 - around 1%). In **Romania**, 23% of teachers and 13% of principals assessed the information as almost clear (score of 3), and 7% of teachers assessed the information as almost unclear (score of 2 - around 6%) or unclear (score of 1 - around 1%).

[17] There is a slightly difference between KL and RL schools - RL school principals believe information are clear to a lesser extent than KL school principals (4,35 vs. 4,60)
[18] There is a small difference between KL and RL school teachers - 4,43 vs. 4,63.

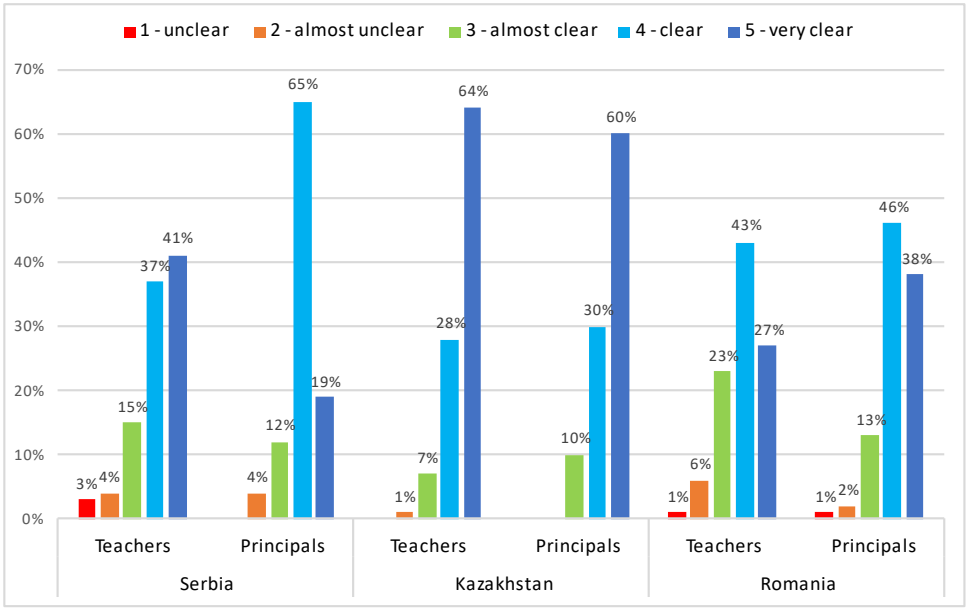

Chart 4. Clarity of information (%)

In all participating countries, school principals have used a variety of approaches to inform school staff, parents and students during the COVID-19 pandemic.

In **Serbia** and **Kazakhstan**, both principals and teachers rated different methods of sharing information on the scale from 0 to 4 (0 meaning that they did not use that particular method at all, and 4 that they primarily used that method), while in **Romania** principals answered to a single-option question (meaning they could choose only one answer to the questions related to informing students and parents). This difference should be kept in mind when interpreting results and differences between the countries.

In all participating countries, social media and mobile applications, followed by email communication, were the most common way of informing school staff (Chart 5). In **Serbia**, phone calls were not used significantly to inform school staff but were very much used in informing parents, and about half of teachers also provided information to students by telephone (Chart 6). In **Kazakhstan**[19], informing all target groups by phone calls was more present, especially informing school staff and email communication with students and parents was present to a smaller extent, comparing to Serbia. Live (face-to-face) communication was also present in all three countries, but to various extents depending on

[19] There are, however, some differences between KL and RL schools in Kazakhstan that should be mentioned. Principals from KL schools frequently used all mentioned methods to inform school staff while RL school principals dominantly used social media and mobile applications (93%) and to a smaller extent phone calls and email (58%; 56%). When informing students, RL school principals also dominantly used social media and mobile applications (91%), while KL school principals did so to a smaller extent (60%). In informing parents, RL school principals dominantly used social media and mobile applications (93%), while KL school principals used it to a smaller extent (69%).

the target group. Namely, in Serbia this method was mostly used by principals when communicating with students and parents (about a third of principals), but not when communicating with school staff, while in Kazakhstan it was the opposite – principals provided face-to-face information mostly to school staff. In **Romania**, live communication was mostly used when informing school staff, and to a certain extent, students and, the least, with parents.

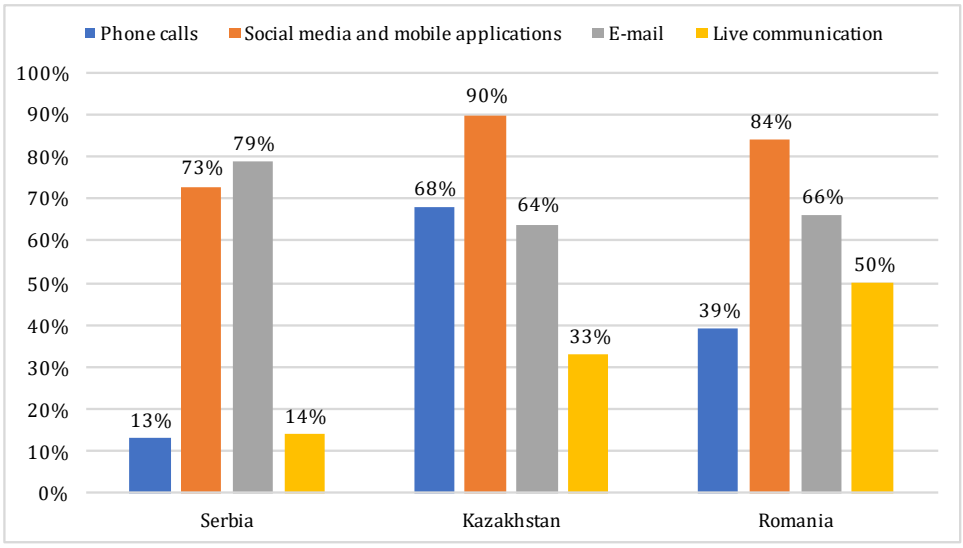

Chart 5. Most common ways of informing school staff by school principals (% of principals who gave a score of 4, on a scale from 0 to 4)

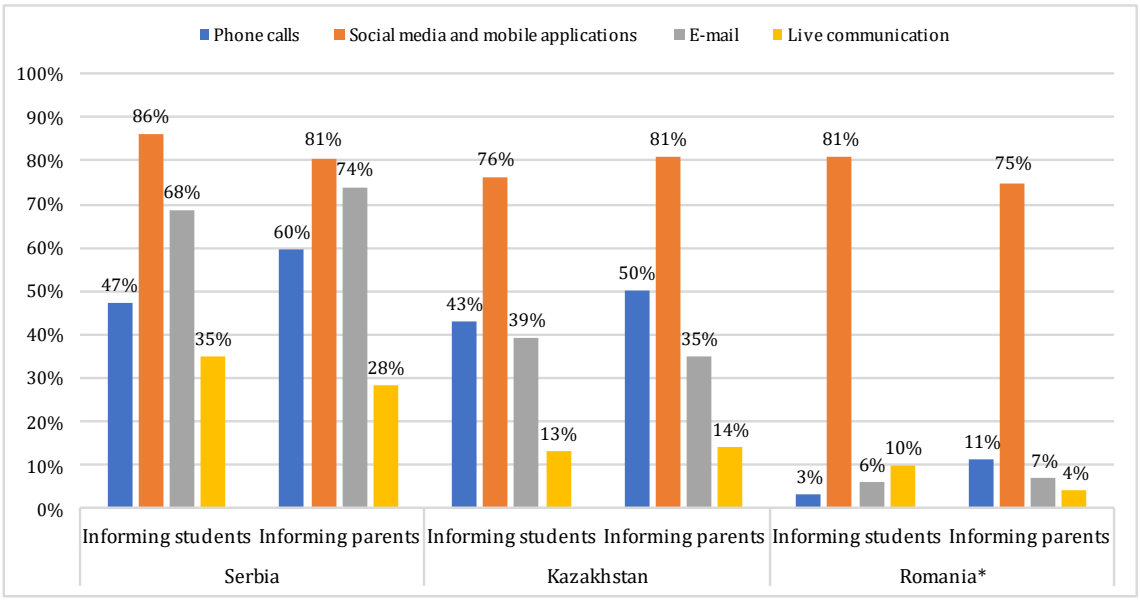

Chart 6. Most common ways of informing students and parents by school principals

* Results related to using different ways/manners of informing parents and students in Romania should be interpreted differently because of different types of questions that the Romanian questionnaire for school principals contained, compared to other countries (Serbian and Kazakh questionnaire contained multiple-

choice question related to informing students and parents and Romanian questionnaire contained the single-answer question).

Although **teachers from all three counties dominantly used social media and mobile applications to inform both parents and students** (Chart 7), teachers in **Serbia** and **Romania** used phone calls to a much smaller extent to inform parents and students, than teachers in **Kazakhstan** did. Email and live communication as a way of informing students has been recognized by a third of teachers in Kazakhstan and Serbia, while in Romania, teachers used it slightly less. Email and live communication were almost equally present when informing parents in Kazakhstan, while in Serbia there was very little face-to-face communication with parents. In Romania, email communication with students and parents was present the least.

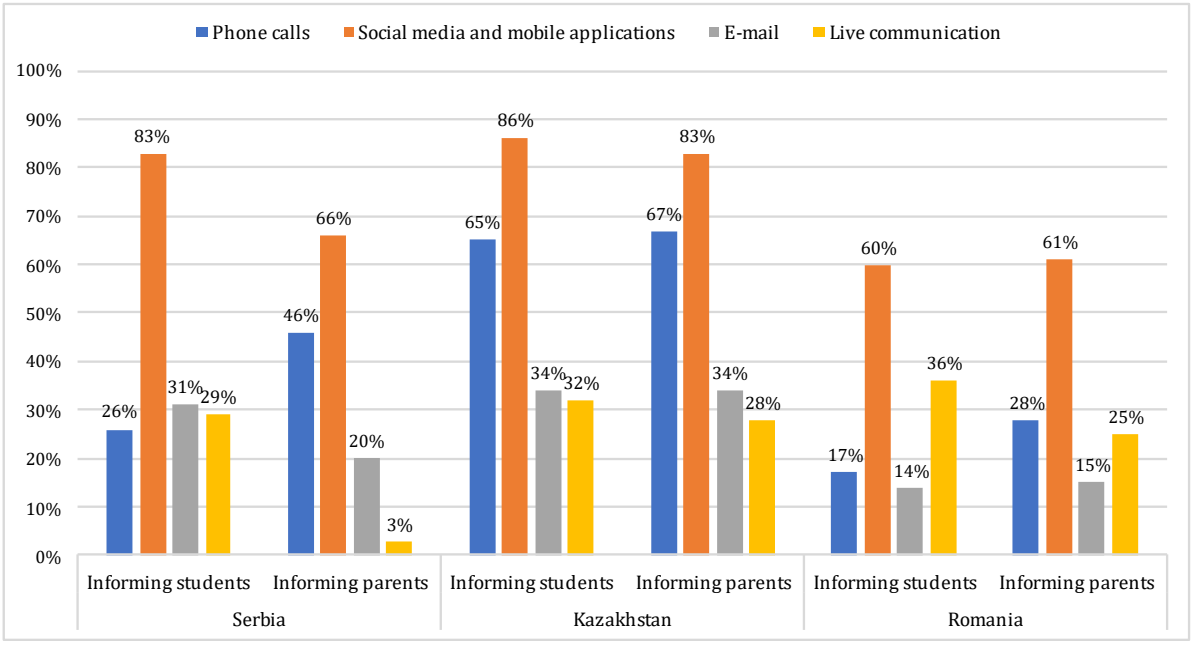

Chart 7. Most common ways of informing students and parents by teachers (% of teachers who gave a score of 4, on a scale from 0 to 4)

Challenges in informing school staff reported by principals are somewhat different in three countries (Table 8)**.** Namely, in **Serbia**, about one-third of principals and in **Romania** about one-fifth of principals did not face challenges in informing the staff**.** In Serbia, however**,** for almost a quarter of principals, it was challenging to further explain and clarify various information to them, including these from competent institutions, especially regarding student assessment, as well as interpreting information from the media. In **Romania** collecting and recording information using multiple channels (meaning the work had to be done both electronically and in writing) was a challenge principals reported, as well as improving the digital competencies of the school staff, especially those related to using online platforms, which is recognized by the principals from **Kazakhstan**. In Kazakhstan,

principals also reported that one of the challenges was the overload of social networks used by school staff.

Challenges in informing parents reported by principals are quite similar in three countries (Table 8)**.** One-fifth of principals from **Serbia** and **Romania** did not face any challenges in informing parents but the biggest challenge for principals in Serbia in informing parents was to share information with parents who don't use online communication, which are mostly parents from vulnerable groups who lack digital devices, internet or do not have accounts on social networks. The same challenge is reported by principals from **Romania** and **Kazakhstan -** they reported that the challenge was informing parents from families that have no technical equipment or internet (mostly in rural areas).

Challenges in informing students reported by principals are quite similar in three countries (Table 8) **–** it was challenging to inform students who do not have the technical equipment and/or internet, as well as to communicate with students who lack responsiveness, or motivation to attend distance learning. In Serbia, a third of principals stated that there were no challenges in informing students and in Romania about one-fifth of principals reported the same.

Teachers in all countries reported communication with students who lack technical equipment and/or the internet as one of the main challenges (Table 9)**.** Challenges in informing parents reported by teachers in all three countries are also related to establishing contact with parents and their responsiveness and communication with digitally illiterate parents, while challenges in informing students that are common in three countries are mostly those connected to the lack of responsiveness of students, their engagement and motivation during online teaching.

In **Kazakhstan** and **Romania**, teachers reported that one of the main challenges was students' adaptation to software used, and in **Serbia**, teachers reported lack of students' digital competencies, as well as students not being able to regularly follow the information.

In **Serbia**, more than a third of teachers stated that there were no challenges in informing parents (38%) and almost half of the teachers also reported that informing students was not challenging (45%). In **Romania**, around a fifth of teachers reported not having challenges in informing parents nor students.

When asked to give an example of **best practice in communicating information** to any of the aforementioned target groups (school staff, parents, students) or describing **successful ways in overcoming the abovementioned challenges**, principals from three participating countries responded differently.

In **Serbia**, principals reported that an example of best practice in communicating information to students is opening personal Microsoft Teams accounts for all students. In **Kazakhstan**, principals reported the establishment of a virtual teacher lounge (e.g. by using

the Padlet.com platform) while in **Romania,** most principals believe that the best way in communicating information to all target groups is using the available online platforms and mobile applications (preferably WhatsApp, Zoom, Google classroom and Google Meet). In **Serbia**, teachers also believe that Microsoft Teams is the platform that gives the best results when communicating with students. In **Kazakhstan**, teachers believe that creating school pages on different platforms (e.g. YouTube/Instagram/Telegram channel) and refreshing them regularly is the key to overcoming challenges related to communication. In **Romania,** teachers think that the best way in communicating information to parents and students is using the available online platforms and mobile applications, combined with timely information.

Table 8. Challenges in informing school staff, parents and student reported by principals

Group	Serbia	Kazakhstan	Romania
School staff	– Further explanation and clarification of various information – Ensuring employees get into the habit of using online platforms – Providing information in a timely and accurate manner – Communication with employees who have internet issues (do not have internet or low speed) – Establishment of a single communication channel that would include all employees – Lack of digital competencies of employees	– Low internet speed of employees – Difficulty in teachers' adaptation to software – Receiving instant feedback from school staff – Initial lack of equipment among school staff – Overload of social networks used by school staff	– Providing information to the employees in a timely and accurate manner – Communication with school staff who lack devices – Difficulties in teachers' adaptation to software – Improving the digital competencies of the school staff, especially those related to using online platforms – Ensuring employees get into the habit of using online platforms – Collecting and recording information using multiple channels (all work has been done both electronically and in writing)
Parents	– Passing on information to parents who don't use online communication due to the lack of technical equipment and/or Internet access – Providing information to the parents in a timely and accurate manner – Ensuring that parents get into the habit of using online platforms, applications, and email	– No internet access or low internet speed (mostly in rural areas) – Digital illiteracy among parents – Lack of parents' responsiveness – Lack of technical equipment in families – Restrictions of platforms on the number of simultaneous participants (inability to access large groups of parents at once)	– Lack of technical equipment and or/internet in families (mainly in rural areas) – Lack of parents' digital competencies – Changing the school operation scenario – Providing information to the parents in an accurate manner – Establishing online communication with parents and their responsiveness
Students	– Informing students who do not have the technical equipment and/or internet – Students were not engaged enough or were not motivated enough to attend distance learning	– Communication with students with no internet access or adequate internet speed (mainly in rural areas) – Lack of equipment among students – Lack of students' responsiveness	– Informing students who do not have the technical equipment and/or internet – Lack of digital competencies of students – Students were not engaged enough or were not motivated enough to attend distance learning

Legend: - Challenges that appear in other countries.

Table 9. Challenges in informing parents and students reported by teachers

Group	Serbia	Kazakhstan	Romania
Parents	– Communication with parents who did not have adequate technical equipment or the Internet (largely parents from vulnerable groups) – Establishing contact with parents and their responsiveness – Timely transfer of information from parents to teachers – Parents' unfamiliarity with online teaching – Establishment and use of a single channel for communication with parents – Inability to organize group parent-teacher meetings – Digital illiteracy of some parents	– Communication with parents with no Internet access or adequate Internet speed (mainly in rural areas) – Organizing individual meetings with parents – Parents' desire that children attend regular classes despite health concerns – Digital illiteracy of some parents – Lack of equipment among parents, hence the need to call/visit – Parents' lack of responsiveness – Complete absence of live communication	– Communication with parents who did not have adequate technical equipment and/or internet – Digital illiteracy of some parents – Availability of parents – Lack of parents' interest and their responsiveness
Students	– Communication with students who lack technical equipment and/or the Internet – Lack of responsiveness of students, and their engagement/motivation during online teaching – Lack of students' digital competencies – Communication with students failing to regularly follow the information	– Communication with students with no Internet access or adequate Internet speed (mainly in rural areas) – Lack of equipment among students – Difficulties in students' adaptation to software – Issues with communication and getting to know new students – The need to remind about attendance/low motivation among students – Lack of students' responsiveness	– Communication with students who lack technical equipment and/or the Internet – Lack of responsiveness of students, and their engagement/motivation – Student assessment – Difficulty in students' adaptation to software

Legend:  - Challenges that appear in other countries.

6.2. School work organization, school equipment and teachers' digital competencies

The COVID-19 pandemic created numerous **challenges principals needed to overcome** in the organization of work and the management of the school.

In **Serbia** and **Kazakhstan**, principals ranked school management challenges on a scale of 0 to 4, where 0 means it is a minor challenge and 4 meaning it is a huge one, while in **Romania** principals answered to a single-answer question (meaning they could choose only one answer to the question related to school management challenges). This difference should be kept in mind when interpreting results and differences between the countries.

In all three countries, the two greatest challenges perceived by most school principals are monitoring and implementation of health protection measures for students and school staff and planning and organizing distance learning (Chart 8). Coordination of the work of the employees was also the challenge many of the school principals experienced in Serbia, Kazakhstan and Romania. Meeting administrative obligations was also intensely challenging for principals from Kazakhstan[20], who also had a great challenge in establishing communication with parents.

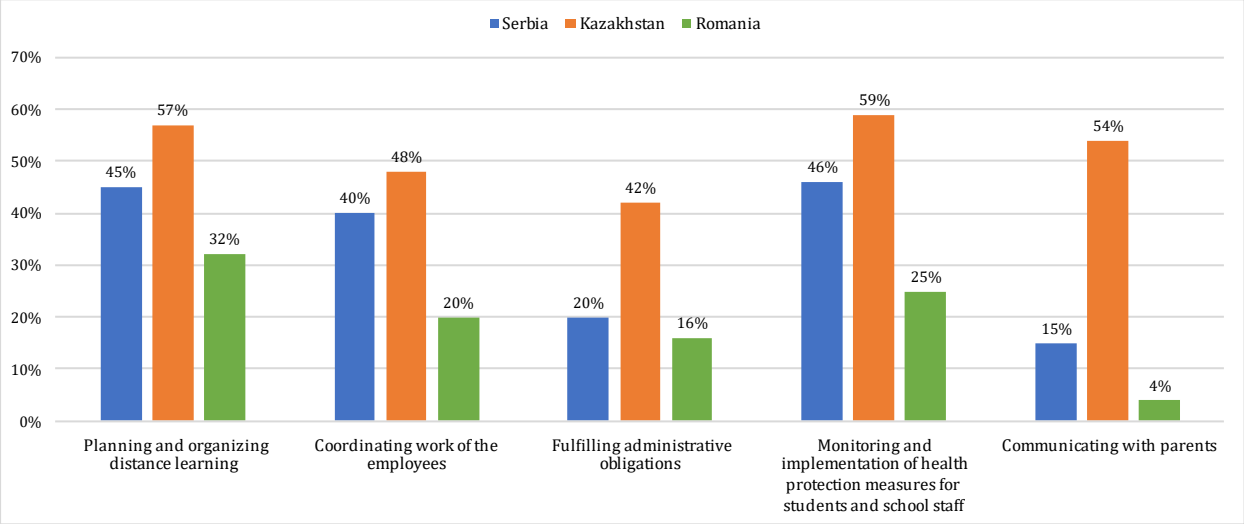

Chart 8. Challenges related to school management encountered by principals

A large challenge that the planning and organization of distance learning was, especially online teaching, was confirmed by the data on technical equipment of schools, based on the estimate of principals, especially **in Serbia and Romania where most principals reported having insufficient computers and/or laptops** (Chart 9). In Kazakhstan, principals lack

[20] It is important to mention that there are great differences in perceiving challenges related to school management encountered by principals from KL and RL schools. RL school principals to a much lesser extent gave a score of 4 to all listed challenges, that is, the challenges they were exposed to were not perceived as very big.

tablets the most, as well as the internet, while in Serbia and Romania internet was the least of concern, according to principals' estimation. In Romania, the lack of software for the existing equipment is reported by a great percentage of principals. Additionally, in Serbia and Romania, a small percentage of school principals stated that they lack nothing (17% in Serbia, 13% in Romania).

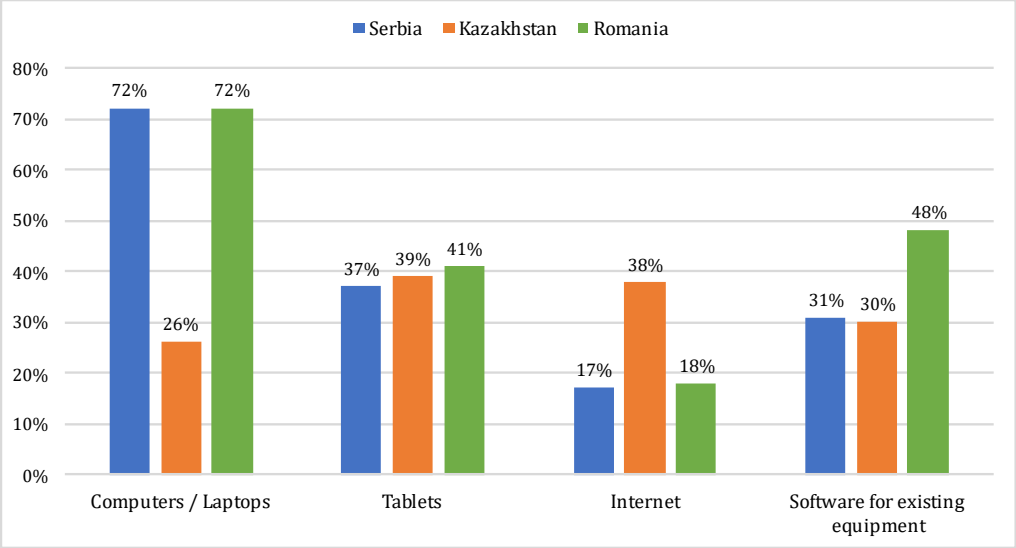

Chart 9. Technical equipment and infrastructure schools are lacking

In **Serbia** and **Romania,** a significant percentage of teachers estimated that they lack nothing (38% in Serbia and 53% in Romania). In those two countries**,** the rest of teachers mostly reported they lack computers or laptops. In **Kazakhstan**, teachers assess the technical equipment slightly better – only a small percentage of teachers reported they lack computers or laptops, a quarter of teachers reported lacking tablets and a fifth of teachers reported lacking internet (Chart 10).

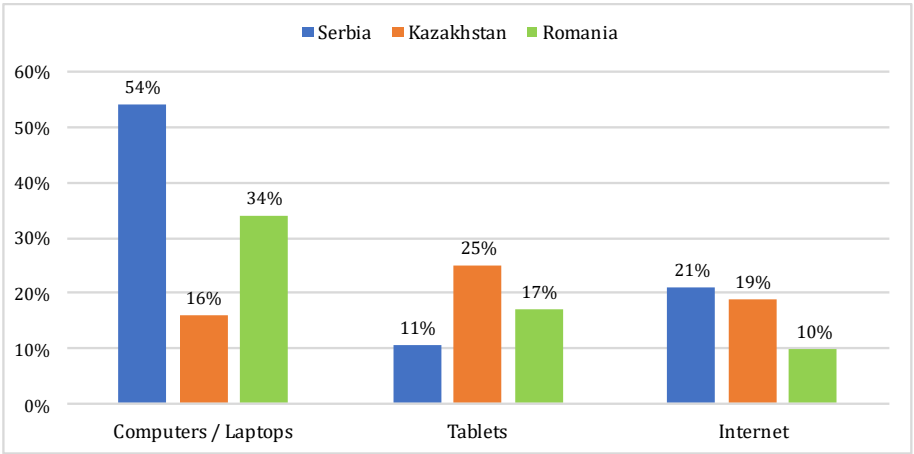

Chart 10. Technical equipment and infrastructure teachers are lacking

As for the equipment and the fact that students need to participate in online teaching, **teachers and principals from Serbia estimated to a larger extent that students lack technical equipment and infrastructure than teachers and principals from Romania and Kazakhstan**[21] **do** (Chart 11). In Serbia, more than two thirds of teachers and principals estimate that computers/laptops and the Internet are something that students are lacking, which is also the case in Romania but reported by a smaller percentage of teachers and principals. Tablets are least assessed as the equipment that students lack in all three countries. Principals and teachers from Kazakhstan assessed relatively well the technical equipment and infrastructure that students lack.

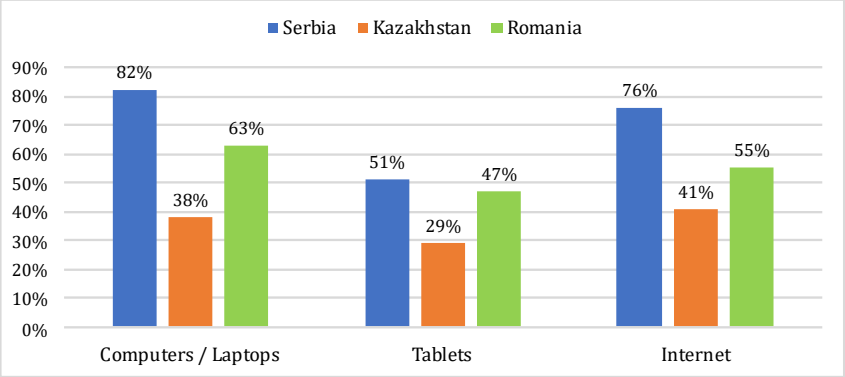

Chart 11. Technical equipment and infrastructure students are lacking

Whenever direct work with students is not possible, the digital competencies of teachers are crucial for all education-related processes. Since the aim of the research was to examine how schools reacted and how ready they were to conduct online teaching, data on teachers' professional development activities intended to develop teachers' digital competencies before the COVID-19 pandemic was also collected. Participation in at least one digital competencies development training in the last two years was defined as the minimum of training needed to acquire the necessary competencies.

Half of the principals from **Serbia** estimated that about 60-90% of teachers have attended at least one in-service training dedicated to teachers' digital competencies development in the last two years, while in **Kazakhstan**[22] almost two thirds of principals estimated that almost all teachers have participated in such training events. In **Romania**, 39% estimated that a small percentage of teachers attended at least one in-service training dedicated to teachers' digital competencies development in the last two years. It is interesting to note that the same percentage of principals said the same for a large percentage of teachers. According to the principals from Serbia, there are no teachers who have not attended in-service training in

[21] KL and RL school principals and teachers estimate lacking equipment quite the same, with major difference being the lack of internet, which is estimated more from KL school principals and teachers, than the ones from RL schools.
[22] The only major difference between KL and RL schools is the estimate about all teachers – 38% of KL school principals and 54% of RL school principals estimate so.

this area, while a small percentage of principals from Kazakhstan and Romania estimated that teachers did not attend in-service training at all.

Table 10. Percentage of teachers who participated in the in-service training activities related to the development of digital competencies before the COVID-19 pandemic

Principals' estimation on the teachers' professional development related to digital competences	**Serbia**	**Kazakhstan**	**Romania***
Teachers did not attend in-service training	0%	4%	4%
Only teachers of Informatics	2%	1%	1%
About 10% of teachers	11%	5%	39%
About 20-30% of teachers	13%	7%	
About 40-50% of teachers	13%	7%	39%
About 60-70% of teachers	**26%**	5%	
About 80-90% of teachers	**24%**	**23%**	
All teachers	11%	**45%**	17%

* When compared to other countries, the Romanian questionnaire for school principals offered different answers to the question related to teachers who participated in in-service training activities – they were offered the following answers: 1) did not attend, 2) only teachers of Informatics, 3) small percentage of teachers, 4) a large percentage of teachers and 5) all teachers. Therefore, in the research, data collected from principals from Romania are interpreted subjectively in a way that a small percentage of teachers means from 10-30% of teachers, while a large percentage of teachers means from 40-90% of teachers.

When asked about the participation in the in-service training activities related to the development of digital competencies before the COVID-19 pandemic, teachers in some countries provided answers similar to principals', while in other countries that was not the case (Chart 12). Namely, in **Serbia and Romania**, before the COVID-19 pandemic, most teachers frequently attended training seminars for the development of digital competencies, while slightly less than a third of teachers from **Kazakhstan**[23] did so. However, a similar percentage of teachers from Kazakhstan reported not being involved in training activities that develop digital competencies at all, which is quite opposite to the estimation of the principals from Kazakhstan (see Table 10).

[23] Teachers from KL schools reported attending trainings more rarely than often, comparing to RL school teachers.

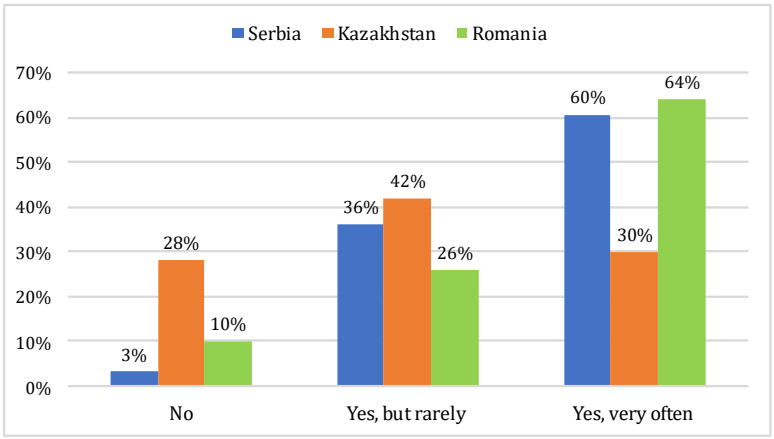

Chart 12. Attendance of training seminars related to development of teachers' digital competencies before the COVID-19 pandemic

An important aspect of organizing the work of the school for principals was the enforcement of measures to protect the health of students and employees.

On a scale from 0 to 4, the principals ranked the sources school used to procure the necessary protective equipment (masks, gloves, disinfectants, etc.), where 0 means that the source was not used at all, and 4 that the source was most frequently used.

Principals from all three countries reported that the most frequently used were local self-government funds (Chart 13), especially in Serbia, followed by the school funds. The fewest percentage of principals rated private and project funds as the most used, while in Serbia almost a fifth of principals reported that they obtained the equipment through donations.

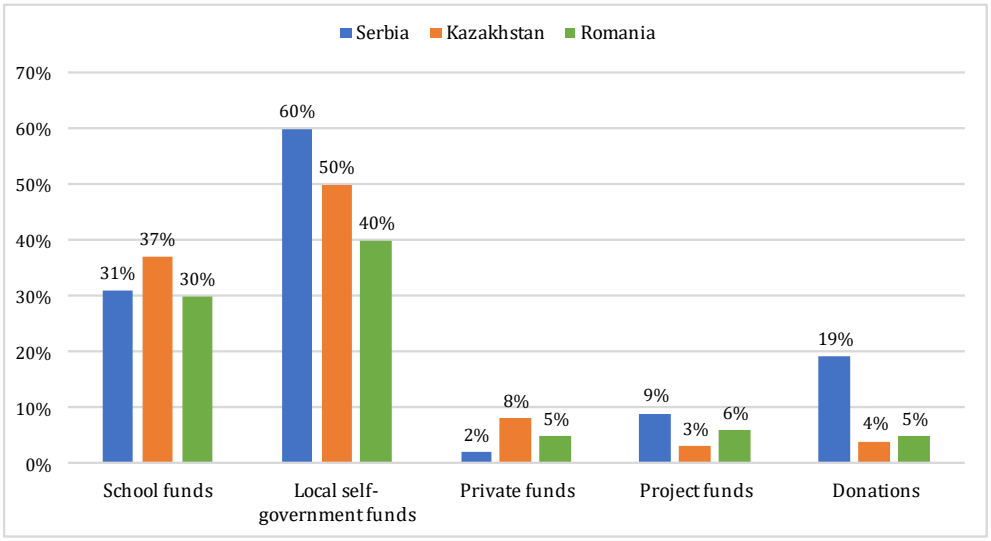

Chart 13. Sources used for procurement of protective equipment

6.3. Organization and implementation of the teaching process

In Serbia and Kazakhstan combined model was the most dominant way of organization and implementation of school work. This means that students had a combination of direct work in schools and distance learning/online teaching. Data on the organization and implementation of school work during the COVID-19 pandemic was not collected from the principals and teachers from Romania.

In **Serbia**, the most prevalent way of organization and implementation of the teaching process was the combined model (Chart 14).

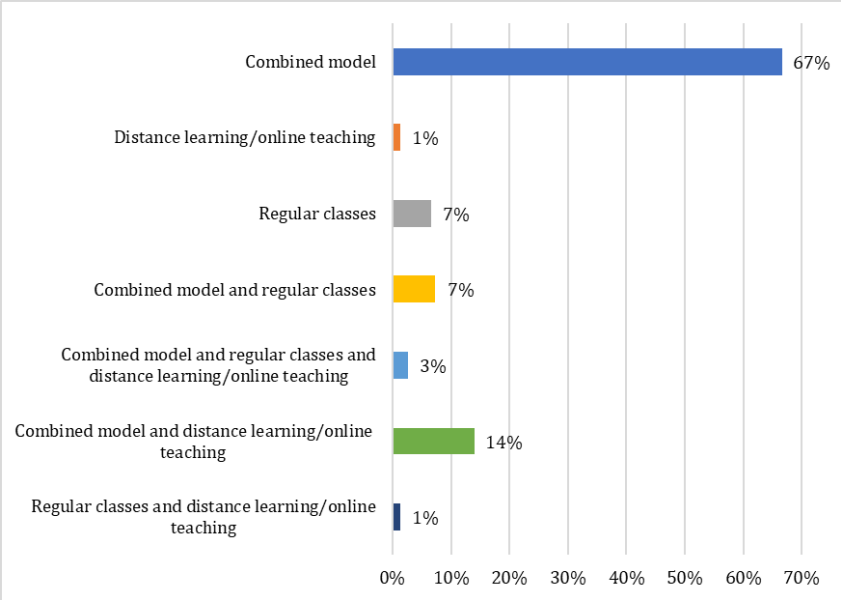

Chart 14. Models of the teaching process during the COVID-19 pandemic in Serbia (average value collected from principals and teachers)

In **Kazakhstan,** distance learning/online teaching is also the most common model of education process implementation (Chart 15).

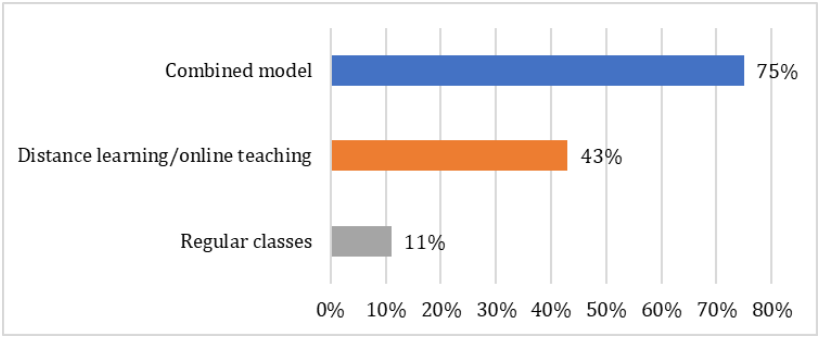

Chart 15. Models of teaching process during the COVID-19 pandemic in Kazakhstan (average value collected from principals and teachers from KL and RL schools)

As for the students' attendance, in **Serbia**, the majority of principals estimated that in schools, the lowest number of students (1-5% per school) attended exclusively distance learning/online teaching, while in **Kazakhstan**, the greatest percentage of principals estimated that more than 15% of students per school attended exclusively distance learning/online teaching (Table 11). Data on students' attendance of the distant learning/online teaching was not collected from the principals from Romania.

Table 11. Students who attended only online teaching during the COVID-19 pandemic in Serbia and Kazakhstan

Students who attend only distance learning/online teaching per school	**Serbia**	**Kazakhstan**
None	2%	1%
1 - 5%	**71%**	5%
6 - 10%	16%	4%
11 - 15%	4%	6%
Over 15%	4%	**82%**

When it comes to access to distance learning/online teaching done via the Internet or television (Table 12), in **Serbia and Kazakhstan**, significant number of teachers estimated that a small percentage of students (1-5%) do not have access to this type of education, and the greatest number of teachers estimated that there are no students without access to distance learning conducted via television. In **Romania,** the majority of teachers estimated that a small percentage of students (1-5%) do not have access to teaching that is conducted via the internet and especially via television. However, in this country, a significant percentage of teachers estimated that over 30% of students do not have access to teaching that is conducted via the internet, which is not the case in Serbia and Kazakhstan.

Table 12. Students who have no access to distance learning/online teaching conducted via the internet or television

Students who have no access to distance learning/online teaching that is conducted via the Internet or television per school	**Serbia**		**Kazakhstan**		**Romania***	
	Via internet	Via television	Via internet	Via television	Via internet	Via television
None	4%	**42%**	**25%**	**51%**	**/**	**/**
1 - 5%	**39%**	**44%**	**29%**	**21%**	**31%**	**54%**

6 - 10%	**29%**	6%	11%	7%	12%	12%
11 - 15%	8%	2%	9%	5%	10%	8%
16- 20%	12%	1%	8%	3%	13%	12%
21 – 30%	4%	1%	6%	3%	10%	5%
Over 30%	5%	4%	10%	9%	**24%**	9%

* Romanian questionnaire for teachers did not offer answer "None" to the question related to students not having access to distance learning/online teaching that is conducted via the internet or television, compared to the other two countries. Therefore, in the research, the result showing 1-5% of students per school could reflect also the data on having no students with no access to distance learning/online teaching.

For online instruction, Serbian and Romanian teachers predominantly used the Google Classroom while in Kazakhstan, it was Zoom (Chart 16). Viber ranked second in terms of representation in **Serbia**. In communication and in delivering online teaching, email was highly used in **Kazakhstan**, but also the Google classroom. In **Romania**, Zoom was the second most rated platform by teachers and principals. Other online platforms (not pre-defined in the questionnaire) identified by teachers and principals in Serbia are Google Meet and Edmodo, in Kazakhstan those are OnlineMektep, Bilimland and iMektep, while in Romania those are WhatsApp, Google Meet and Adservio.

Generally, the selection of online platforms and means of communication teachers used to conduct online teaching was made based on the recommendation of the authorities (Chart 17). However, the perceptions of principals and teachers differ to some extent in **Serbia** since principals mostly suggest that teachers made a choice based on their previous experience in use, while a third of teachers agree with that, that is, teachers from Serbia mostly stated they selected online platforms, tools or means of communication based on the recommendation of the authorities. In **Kazakhstan**, principals and teachers mostly reported that the choice of online platforms, tools or means of communication was made based on the recommendation of the authorities or that it was chosen at the school level. In **Romania,** teachers and principals agree that the choice of online platforms and means of communication through which teachers conducted online teaching was made based on the recommendation of the authorities in the first place, but also based on their previous experience.

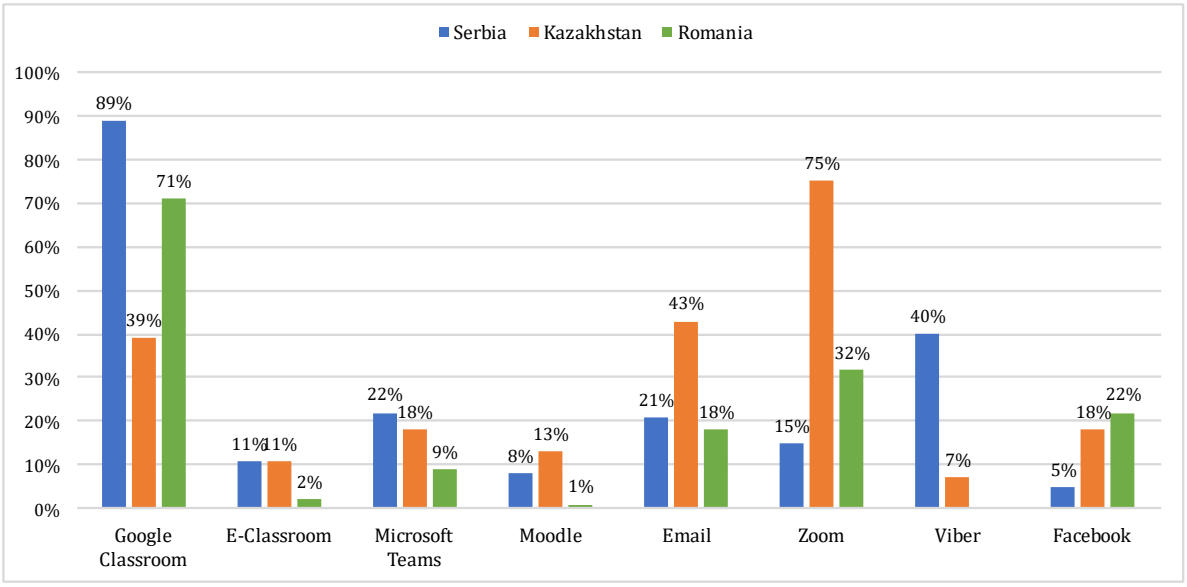

Chart 16. Online platforms and means of communication teachers used to conduct online teaching

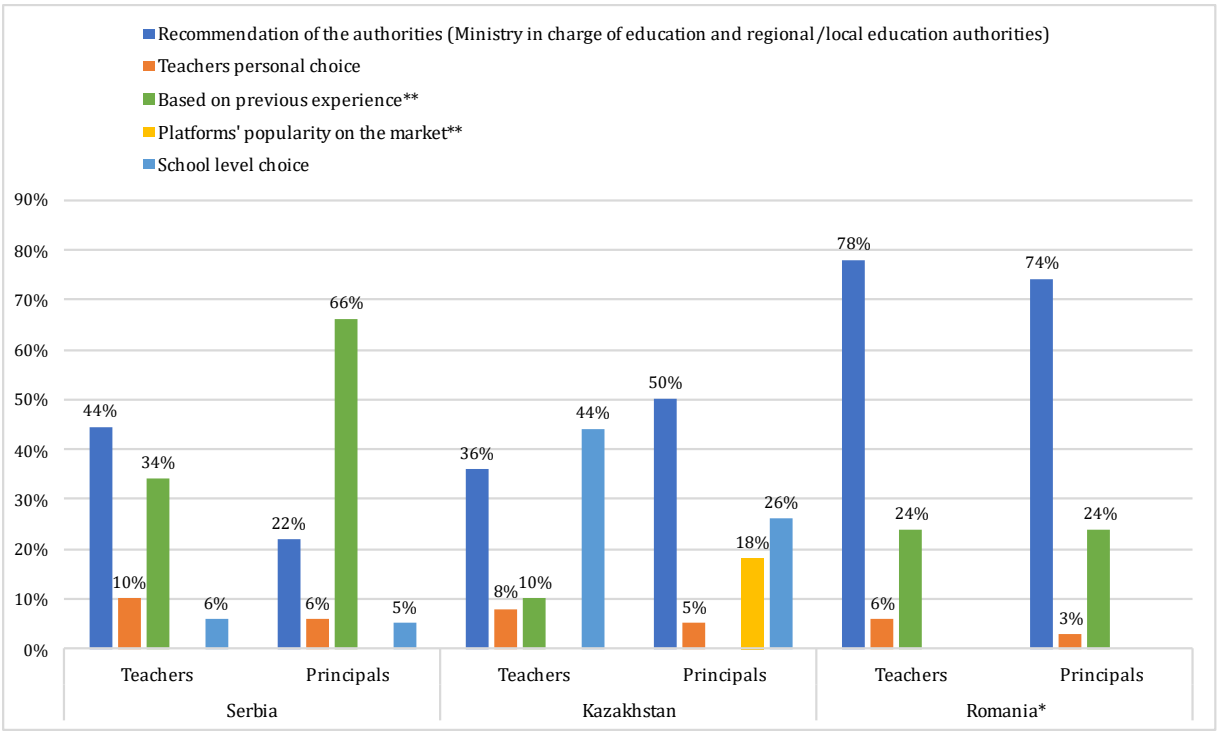

Chart 17. Manners used for selection of online platforms, tools and means of communication for online teaching

* In Serbia and Kazakhstan, it was a single-answer question while in Romania it was a multiple-choice question, so differences between countries should be interpreted in this regard.

** Difference between questionnaires in different countries. Teachers and principals in Serbia and Romania were offered answer "based on previous experience", while teachers and principals in Kazakhstan were offered answer "platforms popularity on the market".

In all three countries, teachers mostly used the aforementioned online platforms, tools, and means of communication to provide various information to students, followed by assigning homework in Serbia and Kazakhstan, and respectively, providing additional explanations to students about the subject content (Chart 18). In Kazakhstan, all these activities are represented more equally than in Serbia, while in Romania a smaller percentage of teachers reported those, comparing to the other two countries. Also, in Kazakhstan teachers used online platforms, tools and means of communication to a great extent for formative assessment, as well as for activities of a class head teacher and the preparation or implementation of extracurricular activities, more than teachers from Serbia and Romania did.

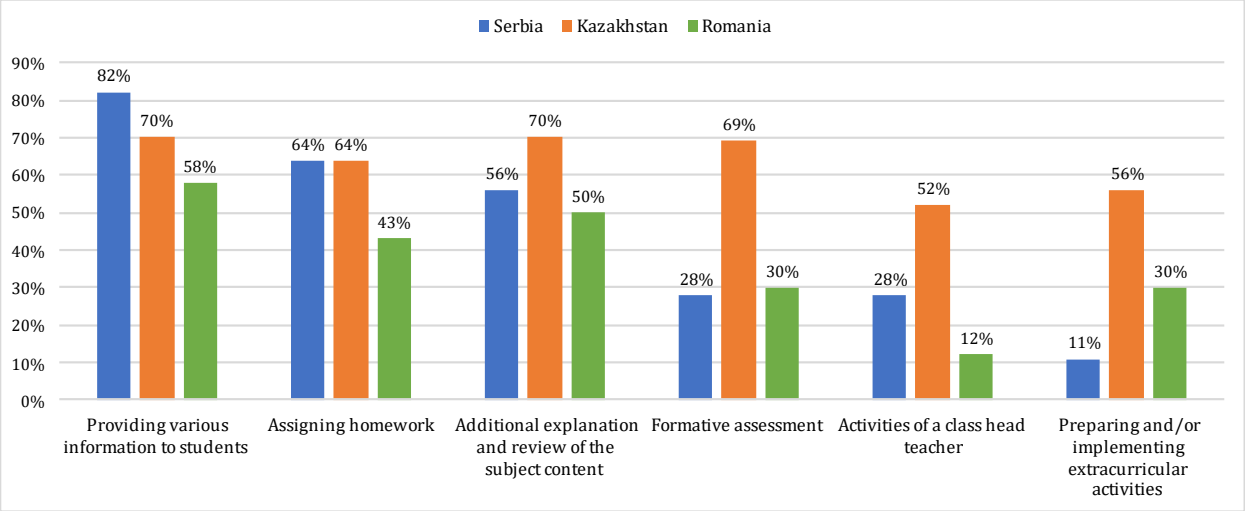

Chart 18. Activities conducted by teachers using online platforms, tools and means of communication

In the context of conducting regular classes (when students go to school premises), the use of ICT was widespread in all three countries (Chart 19). In **Kazakhstan and Romania**, the majority of teachers stated that they frequently used ICT for different purposes and in **Serbia,** more than half of the teachers often used online platforms, tools or means of communication when conducting regular classes. In Kazakhstan[24] and Romania, a small percentage of teachers stated that they never use ICT within regular classes, however, in Serbia, a quarter of teachers do not use ICT when conducting regular classes.

[24] The situation is somewhat similar in KL and RL school, with the major difference being the percentage of teachers who do not use ICT in regular classes – in RL schools, more teachers stated that they do not use ICT (10%), comparing to KL school teachers (2%).

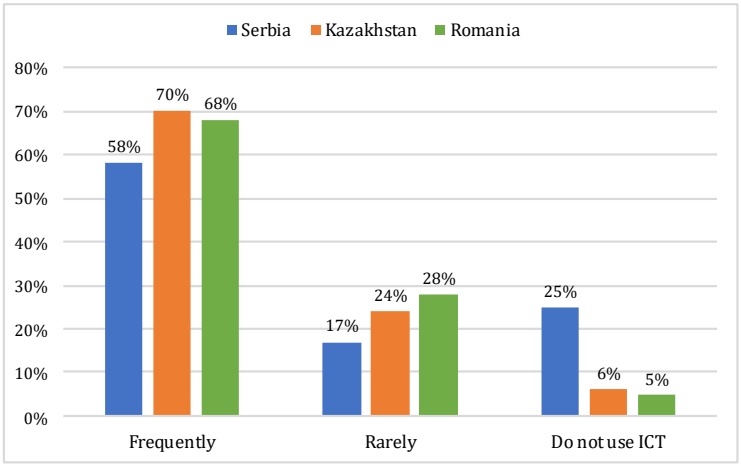

Chart 19. ICT use during regular classes

In addition to using online platforms, tools and means of communication, **teachers in all three countries largely created and used digital materials**. In **Romania** and **Serbia**, the vast majority of teachers often used and created digital materials for distance teaching, significantly fewer teachers rarely did so, especially in Romania, and only 1% never did so. In **Kazakhstan**, more than half of teachers reported that they frequently create, use and exchange digital materials, but a higher percentage of teachers, compared to Romania and Serbia, never create and use digital materials. When it comes to the exchange of digital materials, teachers from **Romania** and **Serbia** were less engaged in this activity than in creating and using digital materials - roughly, half of the teachers often exchanged digital materials with other teachers, and slightly less than a half of the teachers rarely did so, while teachers from **Kazakhstan** almost equally created, used and exchanged digital materials with their colleagues.

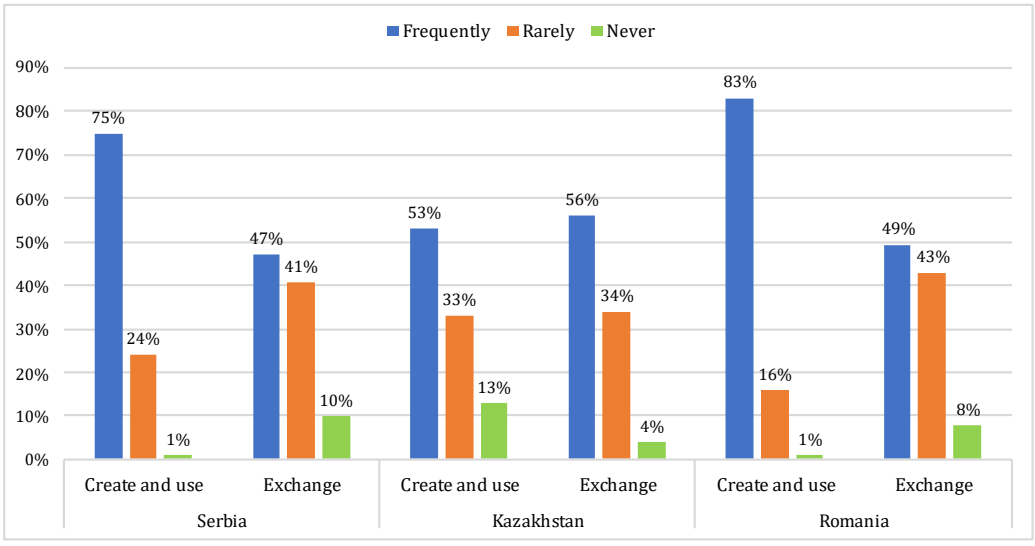

Chart 20. Use, creation and exchange of digital materials by teachers

The extent to which the **activities carried out by teachers have changed** due to the switch to distance learning is shown in the table below (Table 13). **What is common for the three countries is that teachers used written tests more and students' group work less**. In **Serbia,** the two biggest changes were related to group work and homework assignments - almost half of the teachers in Serbia estimated that students' group work is **less** practiced in distance classes and slightly fewer teachers reported giving **more** homework assignments. In **Kazakhstan**, the majority of teachers started implementing more written and oral tests, while reducing the amount of homework and group work. Some changes reported by teachers from different countries are in fact opposite to the changes in other countries – for instance, in Serbia, teachers assigned more homework, while in Kazakhstan they did it less. In **Romania,** assigning group work is present for some teachers to a greater and some to a lesser extent and teachers also use more online tests and online platforms and apply different teaching methods, while having fewer extra-curricular activities and practical work.

Table 13. Activities conducted by teachers to a greater and lesser extent due to the COVID-19 pandemic

Country	Greater extent	Lesser extent
Serbia	– Assigning homework (40% of teachers) – Use of digital content (35%) – Written tests (23% of teachers) – Student independent research (16%)	– Students' group work (46% of teachers) – Oral tests (27% of teachers) – Practical work (12%) – Extra-curricular activities (5%)
Kazakhstan	– Written tests (80% of teachers) – Oral tests (70% of teachers)	– Assigning homework (85% of teachers) – Students' group work (80% of teachers)
Romania*	– Assigning homework – Using online tests – Written tests – Use of online platforms – Use of different teaching methods	– Students' group work – Assigning homework – Extra-curricular activities – Practical work

* No information on the percentage of the teachers who reported the change.

Legend:

In green: Same change reported in another country;

In red: Opposite change reported in at least one country.

Teachers from all three countries reported increased cooperation with parents during the COVID-19 pandemic. In **Serbia,** 91% of teachers said that they cooperate with parents either by phone or Viber groups and this communication is usually related to students' progress, including discussion on the reasons why students have poor performance, to determine the reasons why students do not attend classes, but also to give students praise. In **Kazakhstan**, around 78% of teachers confirmed that they contacted parents regularly, mostly via WhatsApp and Zoom, as a way to support student learning. In **Romania**, around 95% of teachers said that they cooperate with parents, either by phone or using online platforms, usually for informing them but also for providing explanations and offering advice related to teaching content.

Considering **practical teaching/work-based learning in VET**, in **Serbia** it was mostly implemented regularly - in school workshops/cabinets (27%) and at social partners' premises (35%), observing the prescribed measures for students' health protection. Only a small number of teachers stated that professional practice classes were conducted online (12%), mainly by video recording of classes held in companies. On the other hand, in **Kazakhstan**, a vast majority of teachers reported having online classes related to practical teaching (around 80%), while a much smaller percentage of teachers stated having work-based learning organized online (around 20%). In **Romania** around a third of teachers stated having practical teaching organized online, but when it comes to work-based learning conducted in companies only around 8% of teachers reported having organized the work-based learning online, while 28% of teachers stated that they did not cooperate with the companies during the pandemic.

Principals from Serbia and Kazakhstan and teachers from all three countries ranked the challenges related to organization and implementation of the teaching process on a scale of 0 to 4, where 0 means the challenge was minor and 4 means it was a very big challenge.

Principals from **Serbia** reported experiencing challenges that were perceived as very big more frequently than the principals from **Kazakhstan** did (Chart 21). Almost a third of principals from Serbia stated that the lack of devices students can use at home for distance learning is a very big challenge for them, comparing to the 12% of principals from Kazakhstan. Subsequently, the second biggest challenge for principals from Serbia is supporting students who do not have an option to attend distance learning/online teaching, that is, students who lack devices, internet or for other reasons cannot attend such teaching. In Kazakhstan, this challenge (supporting students) is the challenge experienced by the biggest percentage of principals, followed by monitoring of the work of the school staff.

Teachers from all three countries differently assessed the challenges they faced, although some similarities between teachers from Serbia and Romania are apparent (Charts 22 and 23). In **Serbia** and **Romania**, a great percentage of teachers reported challenges related to a lack of their own devices but also a lack of devices students can use

as a very big challenge, along with the challenge of covering the content within the shortened class time, which was not reported by teachers from **Kazakhstan** to a great amount. The greatest percentage of teachers from Kazakhstan reported the challenge of technical problems, that is, problems with the functioning of the existing equipment, which was reported by a great percentage of teachers from Serbia and Romania, too. Other challenges that almost equally appear in all three counties are supporting students who do not have an option to attend distance learning/online teaching, communication with parents and students, organizing students into groups and students' assessment.

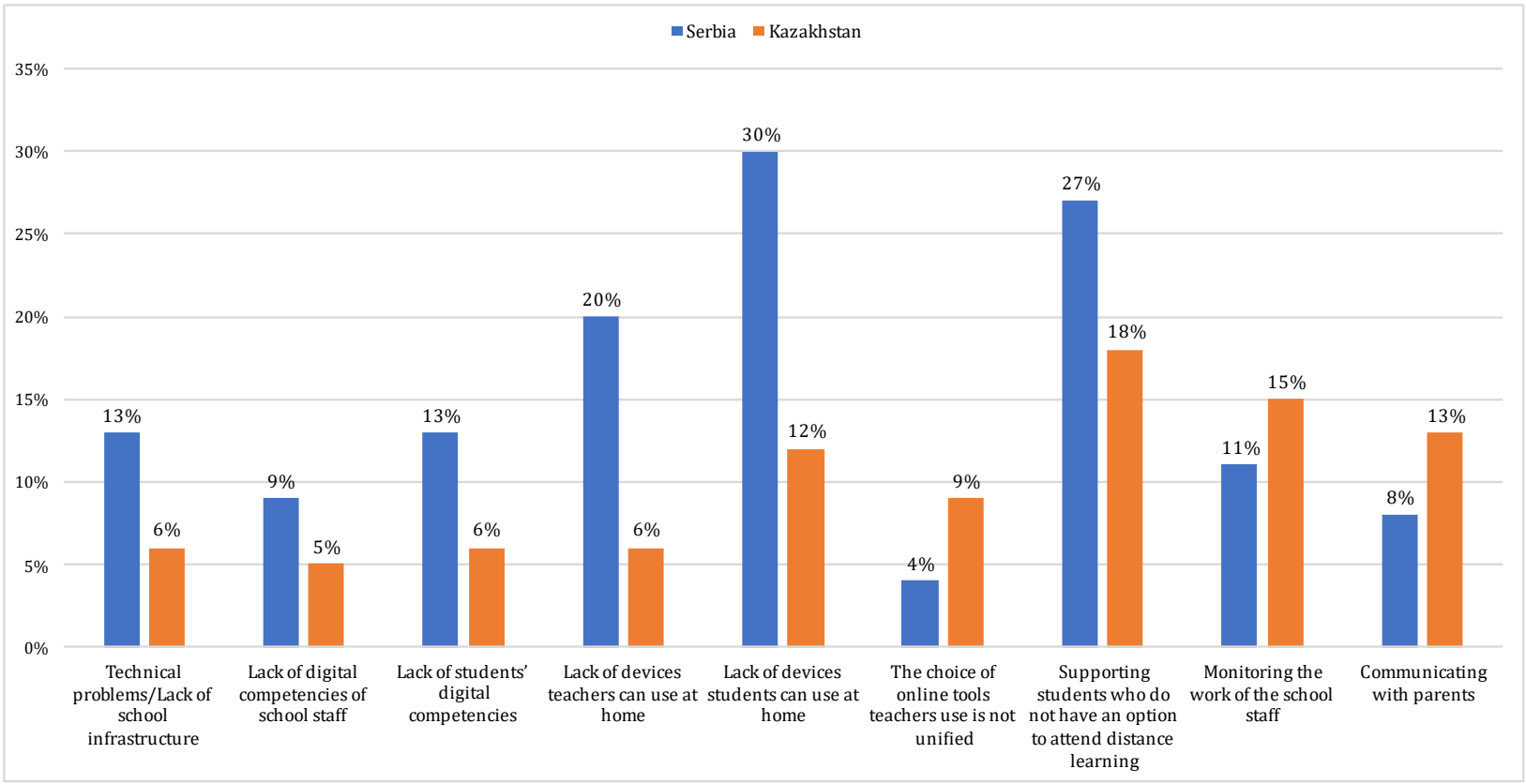

Chart 21. Challenges faced by principals during distance learning/online teaching in Serbia and Kazakhstan (% of principals who gave a score of 4, on a scale from 0 to 4)

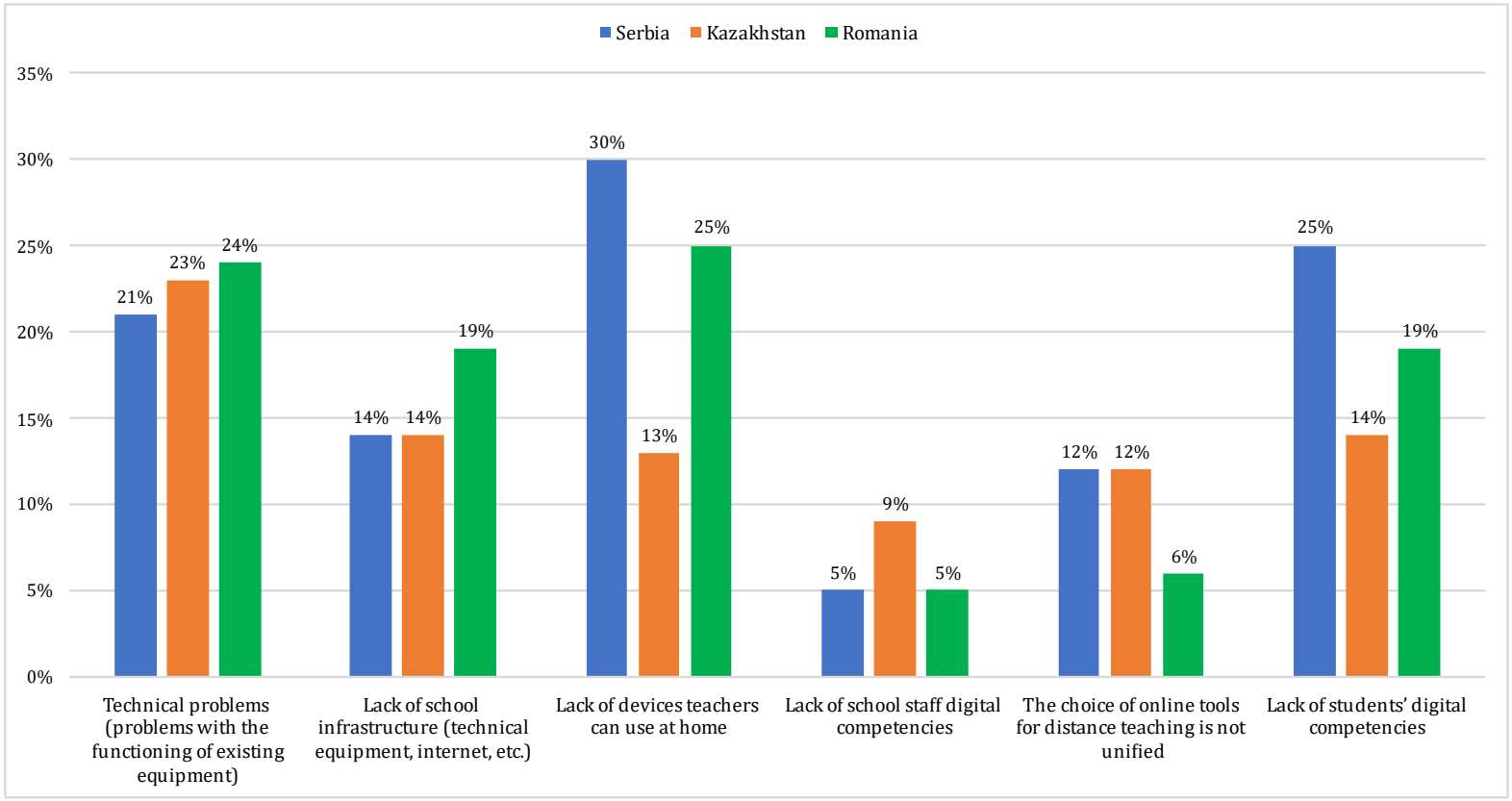

Chart 22. Challenges faced by teachers during distance learning/online teaching (% of teachers who gave a score of, 4 on a scale from 0 to 4) - (Part I)

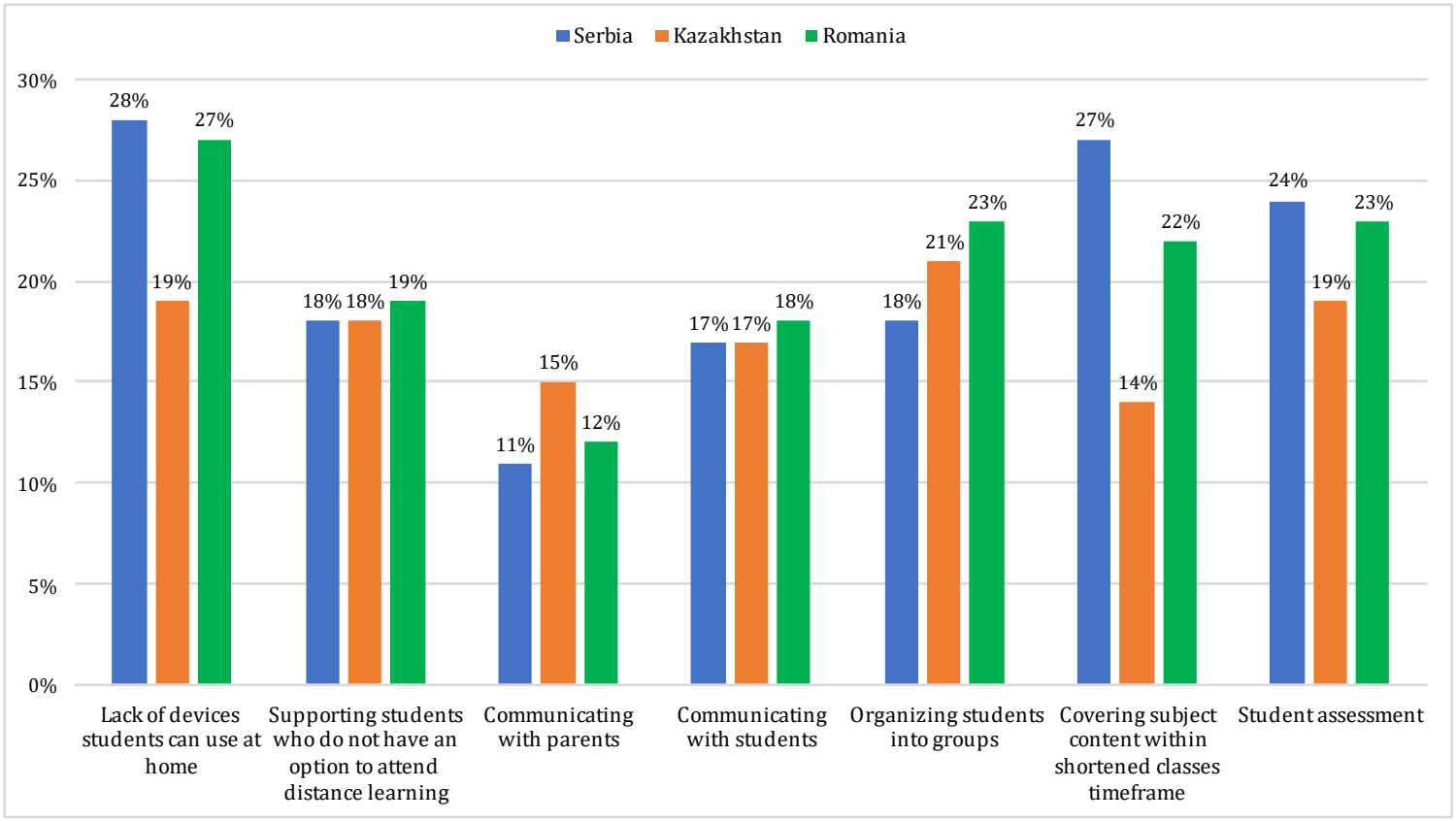

Chart 23. Challenges faced by teachers during distance learning/online teaching (% of teachers who gave a score of 4 on a scale from 0 to 4) - (Part II)

6.4. Monitoring and evaluation of teaching and learning

Changes in monitoring the quality of the teaching process during the COVID-19 pandemic were identified by 75% of principals in **Serbia**, and by around 70% of principals in **Kazakhstan** and **Romania.** However, a significant percentage of principals in all countries believe that the usual methods have not changed despite the circumstances.

Ways of **monitoring the quality of the teaching process** during the COVID-19 pandemic applied by principals in all three countries are presented in Table 14.

Table 14. Principals' ways of monitoring the quality of the teaching process

Country	Identified change in the monitoring of the quality of the teaching process
Serbia	– Principals join online classes held on Google Classroom (85%) – Principals analyze digital materials of teachers (9%) – Principals monitor the implementation of the school Operational plan of organization and implementation of the teaching process (6%)
Kazakhstan	– Principals join online classes using the same platform that teachers used for teaching purposes (e.g., Zoom, WhatsApp) (around 68%)
Romania	– Principals use the online class assistance (around 30%)

When it comes to **students' assessment**, in **Serbia and Kazakhstan**, a third of teachers believe that there have been no changes and that the usual methods still apply, and in **Romania**, around 18% of teachers think so. **In all three countries, teachers stated that during the COVID-19 pandemic they used formative assessment more than they did before -** 45% of teachers in Serbia, 61% of teachers in Kazakhstan, and 42% of teachers in Romania. Nevertheless, more than half of teachers in Serbia and Romania believe that they used formative assessment to the same extent as before the pandemic (54% in Serbia and 55% in Romania). In Kazakhstan, 27% of teachers stated that they used formative assessment to the same extent as before.

Teachers reported that the **students' assessment during the implementation of distance learning/online teaching was quite demanding**, bearing in mind that the average score given by teachers in **Serbia** was 4.2 and in **Romania** 4.6, on a scale from 1 to 5. Half of the teachers from Serbia thought that the assessment was very challenging (score 5), and a third thought that it was challenging (score 4). In **Romania,** one third of the teachers thought that the assessment was very challenging (score 5), and another third thought that it was challenging (score 4). The questionnaire for teachers from Kazakhstan did not contain the question related to the scaling of how demanding the process of students' assessment was.

Table 15. Changes in students' assessment identified by teachers

Country	Identified change in the evaluation of students' performance
Serbia*	– The assessment criteria have been reduced (19%) – The scope of learning content and teachers' demands on students have been reduced (13%) – Various activities and products of students are valued more (9%) – Formative assessment is applied more (8%) – Written work of students is valued more (6%) – Teachers are more tolerant (4%) – Assessment is done through more short tests (3%)
Kazakhstan	– Applying formative assessment – Changed assessment criteria
Romania	– Assessment is done by using online tests – Assessment is not entirely objective – Applying formative assessment – Assessment of various activities and products of students (especially projects)

* Percentage of teachers who reported the change available only for teachers from Serbia.

When it comes to the existence of a **school document that specifies the method and criteria for assessment of the performance of students who attend distance learning,** in **Serbia**, principals and teachers almost equally estimate its (non-)representation - about a third of teachers and principals report that such a document exists and the same percentage states that there is no such document[25]. The smaller percentage of teachers reports that the recommendations of the Ministry of Education, Science and Technological Development (14%) are applied at the school level, as confirmed by the principals (22%). In **Kazakhstan** around 14% of principals[26] and 9% of teachers said no school document specifies the method and criteria for assessment of the performance of students who attend distance learning, meaning that the vast majority of them reported having such document (86%; 91%). The situation in **Romania** is more similar to Serbia - around 45% of principals and 40% of teachers reported having such document, while 20% of principals and 32% of teachers stated that they don't have such document, while the rest reported that they applied instruction from documents such are the Framework regulation for the organization and functioning of pre-university education units and Evaluation and quality assurance commission procedures.

[25] This situation may be due to varying levels of distance learning representation in schools in Serbia, i.e. the percentage of students attending only distance learning/online teaching, implying that the need for adoption of a school document specifying students' assessment is more pronounced in schools with higher percentage of students who attend distance learning/online teaching exclusively.
[26] More principals from KL schools (18%) than the principals from RL schools (9%).

Teachers kept records of **attendance of distance learning/online teaching** using several tools, as presented in the table below (Table 16), and the one that is common in all three countries is keeping records using options on online platforms. In **Serbia**, teachers used different combinations of several tools. The prevailing combination is the use of a pedagogical notebook and entering data into an electronic grade book (28%), while a certain percentage of teachers used only a pedagogical notebook (19%) or only an electronic grade book (14%). About 10% of teachers used the options available on Google Classroom for recording attendance, and 7% of teachers used all the previously mentioned methods. Around 7% of teachers did not strictly keep records of students' attendance during distance learning/online teaching but they instead made records of students based on their responses to homework assignments. In **Kazakhstan**, the vast majority of teachers kept records using either mobile applications such as WhatsApp, online platforms or electronic journals. In **Romania**, teachers report using available options on platforms, as well as the personal and digital catalogue.

Table 16. Ways of keeping records of students attendance of distance learning/online teaching

Country	Ways of keeping records of attendance of distance learning/online teaching
Serbia	– Using a pedagogical notebook and entering data into an electronic grade book (28%); – Using a pedagogical notebook (19%) – Using an electronic grade book (14%) – Using options available on the Google Classroom (10%) – Using a pedagogical notebook, entering data into an electronic grade book and the Google classroom (7%) – Did not strictly keep records of students' attendance (7%)
Kazakhstan	– Using messengers (e.g., WhatsApp) and/or online platforms (e.g., OnlineMektep and Zoom) and electronic journals (e.g., Kundelik.kz) (92%)
Romania*	– Using options on online platforms – Using personal catalogue/grade book – Using digital catalogue/grade book

* No information on the percentage of teachers.

When it comes to **monitoring students' progress** during distance learning/online teaching (Table 17), in **Serbia** and **Romania**, teachers used different methods to evaluate the progress of students. They evaluated the activities of students during classes, their homework assignments, used (online) tests as well as written or oral testing. However, it is possible that, for example, a teacher who uses online tests also evaluates student activities during classes. In **Serbia**, students' response to homework assignments that represents the most prevalent form of monitoring for almost a third of teachers and approximately the same percentage of teachers monitor student progress through the evaluation of student activities

during the class. In Kazakhstan, teachers did not answer the question related to the monitoring of students' progress.

Table 17. Ways of monitoring student progress during distance learning/online teaching

Country	Ways of monitoring student progress during distance learning/online teaching
Serbia	– By analyzing the response to homework assignments (29%) – Through the evaluation of student activities during the class (25%) – Using quick short tests (12%) – Using written or oral testing (11%)
Romania*	– Through the evaluation of student activities during class – Keeping progress sheets – By analyzing the response to homework assignments – Using the formative assessment – Using online test – Using written or oral testing

* No information on the percentage of teachers.

6.5. Other remarks of the respondents

At the end of the questionnaire, the respondents in all three countries had the opportunity to express their opinions, attitudes and experiences that they consider important, so the additional remarks of teachers and principals are summarized below (Table 18).

Table 18. Other remarks (issues reported)

Country/Respondents	Serbia	Kazakhstan	Romania
Teachers pointed out:	– Working much longer hours and having the workload that was significantly higher than it was before the COVID-19 pandemic; – Inability to ensure the quality of activities conducted while working from home in a situation when there is a school-age child or children in their family, due to the lack of a	– Being exposed to stress related to the implementation of online/combined model, which has affected the mental health of teachers; – Working much longer and having the workload that was significantly higher than it was	– Online schooling is an emotional and mental challenge for teachers that is difficult to manage.

	sufficient number of home computers/laptops; – Specific challenges such as monitoring the progress of students who live in student dormitories or delivering teaching and monitoring the progress of students who attend school according to individual educational plans; – Being exposed to huge stress and pressure to conduct a teaching process that they previously did not have any or had minimal experience with, which has affected the mental health of teachers.	before the COVID-19 pandemic and that should be supported with possible salary increase; – Being exposed to prolonged screen time when implementing an online/combined model of teaching, which has affected the physical health of teachers (e.g. eye strain).	
Principals pointed out:	– Being exposed to huge stress due to the general confusion of both teachers and students; – Despite all their efforts, not all teachers have the capacity to deliver quality online teaching, and not all students adapt to online learning the same way; – Noticeably shaken mental health of students; – Teachers worked significantly longer than the usual forty-hour workweek;	– Being exposed to prolonged screen time when implementing an online/combined model of teaching, which has affected the physical health of teachers (e.g. eye strain).	– The stress is too great and there is a lot of information to process. Both teachers and students are overwhelmed; – There is too much administrative work to do (all the time counting and listing vaccinations, by personnel categories, by age

	– Increased teachers' stress and reduced opportunities for quality planning and realization of the teaching process due to different challenges.		categories, etc.) which makes principals lose sight of the important things.

Legend: - Remarks reported in other countries.

7. Conclusions

The main conclusions are summarized in a way that follows the findings of the research - Information flow (Chapter 7.1.), Organization of school work, technical equipment and digital competencies of teachers (7.2.), Organization and implementation of teaching process (Chapter 7.3.), Monitoring and evaluation of teaching and learning (7.4.) and Additional research findings (7.5.).

7.1. Information flow

The main source of information in all three countries is the regional/local education authority, namely Regional school administration in Serbia, the local/regional education department in Kazakhstan and the Country school inspectorate in Romania, while Ministries in charge of education also stand out, especially in Serbia and partially in Kazakhstan, as a source that informs school principals. About a third of school principals in all schools reported local government authorities as the source of information. The least represented are national level institutions in charge of the improvement of education, teacher training, etc., especially in Romania.

When they were having doubts about the organization of school work or the teaching process, **principles from all countries consulted ministries in charge of education directly to a lesser extent but referred to the regional/local education authorities**, mentioned above. Local government authorities are entities that school principals refer to when having doubts about the organization of school work or the teaching process, almost equally in Kazakhstan, Serbia and Romania (around a third of principals). The least presented are national level institutions in charge of the improvement of education, teacher training, etc., especially in Romania and Serbia.

When having doubts about the **organization of the final exam at the end of primary education**, which was conducted in the conditions of the COVID-19 pandemic, more than two thirds of principals from Serbia and Romania consulted regional/local education authorities - In **Serbia**, Regional school administrations, and in **Romania,** Country school inspectorate.

School management is the main point of contact for passing the information to teachers as well as providing consultation when teachers are in doubt in Serbia and Romania, while for teachers from Kazakhstan the Ministry of Education and Science is the major source of information, and they also consult the Ministry the most when having doubts, comparing to other two countries. In Serbia and Romania, ministries in charge of education and regional education authorities (namely Regional school administration in

Serbia and Country school inspectorate in Romania) are also assessed as the most used source of information by a significant percentage of teachers, however, when having doubts, teachers from Romania tend to consult those institutions more than the teachers from Serbia. Additionally, in all countries, colleagues are relatively highly assessed by teachers as the persons they consult when having doubts.

In all counties, **school principals assess their level of being informed on the organization of school work and organization and implementation of teaching process during the COVID-19 pandemic as quite high** on a scale from 1 to 5,– in **Serbia**, school principals assessed the level of being informed by giving an average value of 4.7, in **Kazakhstan** it is 4.5 and in **Romania**, school principals also assessed it with the average value of 4.5. When it comes to **teachers, they also assess their level of information as quite high** when it comes to organization and implementation of teaching process during the COVID-19 pandemic using the same scale – in **Serbia**, teachers assess their level of being informed with an average value of 4.6, in **Kazakhstan,** it is 4.5 while in **Romania** it is somewhat lower – 4.2.

When talking about the **clarity of information provided by relevant institutions during the COVID-19 pandemic to schools' principals and teachers,** for some countries the average assessment of clarity of information is somewhat lower than the assessment of school principals and teachers level of being informed and for others somewhat higher. In **Serbia**, school principals assess the clarity of information with the average value of 4.1, while in **Kazakhstan**, school principals assessed it with an average value of 4.5. In **Romania** school principals, as in the case of Serbia, assess the clarity of information with an average value of 4.1. Teachers from two participating countries, when comparing to principals, assessed clarity of information slightly differently - in **Serbia**, teachers assess the clarity of information with an average value of 4.0, while in **Kazakhstan**, teachers assessed it with an average value of 4.5 which is the same value that principals assessed. In **Romania,** teachers assess the clarity of information with an average value of 3.8, which is the lowest score awarded in the three countries.

In all participating countries, school principals have used a variety of ways to inform school staff, parents and students during the COVID-19 pandemic. However, in all participating countries, **social media and mobile applications, followed by email communication, is the most common method of communication between the school staff and the school**. In **Serbia**, phone calls were not frequently used to inform school staff but were very much used in informing parents, and about half of teachers also provided information to students by telephone. In **Kazakhstan**, informing all target groups by phone calls is somewhat more present, especially informing school staff, but email communication with students and parents is present to a smaller extent, comparing to Serbia. Live (face-to-face) communication was also present in all three countries but applied differently depending on the target group.

When it comes to informing students and parents by teachers, although **teachers from all three counties dominantly use social media to inform both parents and students**, there are significant differences in using the phone calls– for instance, in **Serbia** and **Romania**, teachers use phone calls to a much smaller extent to inform parents and especially students, than teachers in **Kazakhstan** do.

Challenges in informing school staff reported by principals are slightly different in three countries. In **Serbia** for almost a quarter of principals, it was challenging to further explain and clarify various information to them, including memos from competent institutions, especially regarding student assessment, as well as interpreting information from the media. In **Romania** collecting and recording information using multiple channels (meaning the work had to be done both electronically and in writing) was a challenge principals reported, as well as improving the digital competencies of the school staff, especially those related to using online platforms, which is recognized by the principals from **Kazakhstan** too.

Challenges in informing parents reported by principals are similar in three countries. In Serbia, the biggest challenge for principals in informing parents was to pass on information to parents who are unable to use online communication, which are mostly parents from vulnerable groups who lack digital devices, internet or do not have accounts on social networks, which is the challenge reported by principals from **Kazakhstan** too. In **Romania**, the same challenge of lacking devices and/or internet is present, and these are mostly families from rural areas.

Challenges in informing students reported by principals are quite similar in three countries. In all countries, principals report that the challenge they faced was informing students who do not have the technical equipment and/or internet, as well as communication with students who lack responsiveness, or motivation to attend distance learning.

In all countries, teachers reported that the biggest challenge in informing parents was communication with parents who did not have adequate technical equipment or the internet (largely parents from vulnerable groups and/or rural areas), **which is the case also in informing students** – teachers in all countries reported communication with students who lack technical equipment and/or the internet as one of the challenges. Challenges in informing parents reported by teachers in all three countries are also related to establishing contact with parents and their responsiveness and communication with digitally illiterate parents, while challenges in informing students that are common in three countries are the lack of responsiveness of students, specifically their engagement/motivation during online teaching.

When asked to give an example of the **best practice in communicating information** to any of the aforementioned target groups (school staff, parents, students) or describing

successful ways in overcoming the abovementioned challenges, principals from three participating countries responded differently. In **Serbia**, principals reported that an example of best practice in communicating information to students is opening personal Microsoft Teams accounts for all students, which greatly facilitated communication with students. In **Kazakhstan**, principals reported that organizing a virtual teacher lounge (e.g. by using the Padlet.com platform) can be successful in overcoming challenges related to communication with teachers. In **Romania,** data provided by principals is quite diverse but most of them believe that the best way in communicating information to all target groups is using the available online platforms and mobile applications (preferably WhatsApp, Zoom, Google classroom and Google Meet).

Teachers were also asked to give examples of best practices or suggest ways to overcome challenges in informing parents and students. In **Serbia**, teachers also believe that Microsoft Teams is the platform that gives the best results when communicating with students. In **Kazakhstan**, teachers believe that creating school pages on different platforms (e.g. YouTube/Instagram/School website/Telegram channel) and updating them regularly is the key to overcoming challenges related to communication with parents and teachers. In **Romania,** teachers also think that the best way in communicating information to parents and students is using the available online platforms and mobile applications, combined with timely informing.

7.2. School work organization, school equipment and teachers' digital competences

In all three countries, the two greatest challenges perceived by most school principals are monitoring and implementation of health protection measures for students and school staff and planning and organizing distance learning. Coordination of the employees' work is also a challenge that many of the school principals experienced in Serbia, Kazakhstan and Romania.

Regarding the technical equipment of the schools, **in Serbia and Romania, most principals reported having a lack of computers and/or laptops**. **In Kazakhstan, principals reported a lack of tablets the most, as well as the internet,** while in Serbia and Romania internet is the least of concern, according to principals' estimation. In Romania, the lack of software for the existing equipment is perceived by a great percentage of principals. In **Kazakhstan**, teachers assess the technical equipment slightly better –small percentage of teachers reported they lack computers or laptops, compared to Serbia and Romania.

As for the equipment that students need in order to participate in online teaching, teachers and **principals from Serbia estimate to a larger extent that students lack technical equipment and infrastructure, compared to the responses of teachers and principals**

from Romania and Kazakhstan. In Serbia, large number of teachers and principals estimate that computers/laptops and Internet are almost equally lacking among students, which is also the case in **Romania**, but a smaller percentage of teachers and principals think so. Tablets are the least assessed as the equipment that students lack in all three countries.

When it comes to digital competencies of teachers, half of the principals from **Serbia** estimate that about 60-90% of teachers at the school level have attended at least one in-service training dedicated to teachers' digital competencies development in the last two years, while in **Kazakhstan** almost two thirds of principals estimate that almost all teachers have participated in such training events. In **Romania**, more than a third of principals estimated that a small percentage and a large percentage of teachers attended at least one in-service training dedicated to teachers' digital competencies development in the last two years. **In Serbia and Romania, according to teachers, before the COVID-19 pandemic, most teachers frequently attended training seminars that develop digital competencies, while slightly less than a third of teachers from Kazakhstan did so**.

The data obtained from the **principals from all three countries show that the local self-government funds are most frequently used** for procurement of the COVID-19 protective equipment, especially in Serbia, followed by the school funds as about a third of the principals from three countries stated that they used the school funds to a large extent.

7.3. Organization and implementation of the teaching process

In Serbia and Kazakhstan combined model was the most dominant way of organization and implementation of school work. This means that students mostly went to schools and attended distance learning/online teaching.

As for students' attendance, in Serbia, the majority of principals estimated that 1-5% of students per school attended exclusively distance learning/online teaching, while in Kazakhstan, the greatest number of principals estimated that more than 15% of students per school attended exclusively distance learning/online teaching. Data on students' attendance was not collected from the principals from Romania.

In Serbia and Kazakhstan, around a third of teachers estimated that a small percentage of students (1-5%) do not have access to teaching that is conducted via the internet. **In Romania, the majority of teachers estimated that a small percentage of students (1-5%) do not have access to teaching** that is conducted via the internet and especially via television. Also, a significant percentage of teachers from Romania estimated that over 30% of students per school do not have access to teaching that is conducted via the internet, which is not the case in Serbia and Kazakhstan.

To conduct online instruction, in Serbia and Romania teachers predominantly used Google Classroom and in Kazakhstan it was Zoom. Viber is in the second place in terms of representation in Serbia, while in Romania it was Zoom. Email as a mean of communication which was used to deliver online teaching was highly used in Kazakhstan, as well as Google classroom. Other online platforms (not pre-defined) identified by teachers and principals in Serbia are Google Meet and Edmodo, in Kazakhstan those are OnlineMektep, Bilimland and iMektep, while in Romania those are WhatsApp, Google Meet and Adservio.

Generally, the **selection of online platforms and means of communication teachers used to conduct online teaching was made based on the recommendations of the authorities in all three countries.** In **Serbia**, principals mostly suggested that teachers made a choice based on their previous experience in use, while a third of teachers agree with that, that is, teachers from Serbia mostly state that they selected online platforms, tools or means of communication based on the recommendations of the authorities as well as their own previous experience. **In all three countries, teachers mostly used online platforms and means of communication to provide various information to students**, followed by assigning homework in Serbia and Kazakhstan, and respectively, providing additional explanations to students about the subject content.

Even in the context of conducting regular classes, the use of ICT was very widespread in all countries. In **Kazakhstan and Romania**, the great majority of teachers who implemented regular classes stated that they frequently use ICT for different purposes and in **Serbia** more than half of the teachers of primary schools that students regularly attended during the COVID-19 pandemic often used online platforms, tools or means of communication.

Teachers also largely created and used digital materials in all three countries. In **Romania** and **Serbia**, the vast majority of teachers often used and created digital materials for distance teaching, significantly fewer teachers rarely did so, especially in Romania, and only 1% never did so. In **Kazakhstan**, more than half of teachers reported that they frequently create, use and exchange digital materials, but a higher percentage of teachers, compared to Romania and Serbia, never create and use digital materials. When it comes to the exchange of digital materials, teachers from **Romania** and **Serbia** were less engaged in this regard than in creating and using digital materials - roughly, half of the teachers often exchanged digital materials with other teachers, and slightly less than a half of the teachers rarely did so, while teaches from **Kazakhstan** almost equally created, used and exchanged digital materials with their colleagues.

What is common for the three countries is that teachers report using written tests more and students' group work less, due to the COVID-19 pandemic, that is, due to the implementation of distance learning/online teaching.

Teachers from all three countries reported having cooperated with parents to a large extent during the COVID-19 pandemic to provide support to students during instruction.

When it comes to practical teaching/work-based learning, the situation was quite different in the three counties. In Serbia, it was organized mostly regularly (in school premises or companies) and to a smaller extent online, while in **Kazakhstan**, a vast majority of teachers reported having online classes related to practical teaching and in **Romania** around a third of teachers stated having practical teaching organized online, but when it comes to work-based learning slightly less than a third of teachers stated that they did not cooperate with the companies during the pandemic.

Principals from Serbia and Kazakhstan (except Romania) and teachers in all three countries reported the challenges related to the organization and implementation of the teaching process. Principals from **Serbia** reported experiencing challenges that were perceived as very big to a greater extent than the principals from **Kazakhstan** did, since a third of principals from Serbia stated that the lack of devices that students can use at home for distance teaching is a very big challenge for them, comparing to the 12% of principals from Kazakhstan. **Teachers from all three countries have differently assessed the challenges they faced, although there are some similarities**. In **Serbia** and **Romania**, a great percentage of teachers reported having experienced a lack of their own devices but also lack of devices for students as a very big challenge, while the challenge the greatest percentage of teachers from Kazakhstan reported is having technical problems, that is, problems with the functioning of the existing equipment. Other challenges that almost equally appear in all three counties are supporting students who do not have an option to attend distance learning/online teaching, communication with parents and students, organizing students into groups and students assessment.

7.4. Monitoring and evaluation of teaching and learning

Changes in the implementation of monitoring the quality of the teaching process during the COVID-19 pandemic were identified by around two thirds of principals in all three countries, although it is surprising that a significant percentage of principals believe that the usual methods have not changed, considering the changed circumstances. **The biggest novelty in monitoring the quality of the teaching process during the COVID-19 pandemic is principals joining online classes held through online platforms**.

Also, in all three countries teachers state that during the COVID-19 pandemic they used formative assessment more than they did before.

Generally speaking, **teachers from Serbia and Romania reported that the students' assessment during the implementation of distance learning/online teaching was quite demanding,** bearing in mind that the average score given by teachers in **Serbia** is 4.2 and in **Romania** is 4.6, on a scale from 1 to 5.

When it comes to the existence of a **school document that specifies the method and criteria for performance assessment of students who attend distance learning, in all countries principals reported of having such documents, but to a different extent.** In **Serbia and Romania**, principals and teachers almost equally estimate its (non-) representation – a significant percentage of teachers and principals report that such a document exists and at the same time others state that there is no such document. In **Kazakhstan,** the vast majority of teachers and principals reported that they have such document.

Teachers kept records of attendance of distance learning/online teaching using several tools, and the one that is common for all three countries is keeping records using options on online platforms. In **Serbia**, teachers used several tools in different combinations and the prevailing combination is the use of a pedagogical notebook and entering data into an electronic grade book. In **Kazakhstan**, the vast majority of teachers kept records using either message (mobile applications such as WhatsApp), online platforms or electronic journals. In **Romania**, teachers reported using available options on platforms, as well as personal and digital grade books.

When it comes to monitoring students' progress during distance learning/online teaching, in Serbia and Romania, teachers used different ways to evaluate the progress of students. They evaluated the activities of students during classes, their homework assignments, used (online) tests as well as written or oral testing.

7.5. Additional conclusions

The research showed that certain aspects of teachers' work during instruction delivery, which were not the subject of this research, turned out to be important for understanding the conditions in which principals and teachers organized and conducted the teaching process during the COVID-19 pandemic.

The conclusion is that **when it comes to teachers and principals,** in order to assure the quality of the implementation of the teaching process, **the workload of teachers and their effectiveness in cases of work overload is very important, as well as the specific circumstances in which teachers conduct teaching during the pandemic, local conditions and particular characteristics of individual schools** that further hinder

teaching process and student assessment, as well as the mental, but also physical health of teachers and students.

8. Recommendations

The following recommendations are summarized to follow the main conclusions of the research – information flow, organization of school work, technical equipment and digital competencies of teachers, organization and implementation of the teaching process, monitoring and evaluation of teaching and learning, and other recommendations.

Information flow

1. Establish a unit within the ministry in charge of education that would oversee the coordination of activities related to the work of schools in the conditions of the COVID-19 pandemic, that is, in emergencies, which will improve the process of communicating information to schools and ensure a greater degree of clarity of information distributed to schools;
2. Continue the process of improving the ICT infrastructure in schools in all three countries, especially in rural areas, not only for the sake of the information process but also for improving the quality of teaching;
3. Set up the information flow protocols to improve the efficiency of information exchange and communication between all relevant actors at the school level (e.g. communication time, rules, instructions for use, skipping multiple means etc.);
4. Establish a mechanism for communication with students and parents who do not have means of online communication, especially in cases of telephone communication failure (e.g. establishing plans for periodic visits, involvement of local civil society organizations, etc.);

School work organization, school equipment and teachers' digital competences

5. Provide support to schools in monitoring and implementing health protection measures for students and employees in cooperation with local institutions;
6. Consider the adoption of 'bring your own device' policy to improve the availability of digital devices in schools;
7. Continue the process of equipping schools with ICT, especially schools in rural areas, along with improving the ICT infrastructure;
8. Establish a school level protocol for borrowing ICT equipment to students, if there is a surplus (e.g. determining the period of use, borrow receipt, etc.);
9. Continue developing digital competencies of teachers, including the creation of digital materials, to develop basic skills but also to advance already developed skills to the highest level.

Organization and implementation of the teaching process

10. Provide support to schools in order to ensure that all schools use some form of learning management systems for online teaching (e.g. by providing free training for teachers);
11. Establish a national plan for the return of students to schools in order to make up for the missed learning content, which would cover all the specific characteristics of schools (e.g. conducting practical teaching in secondary vocational schools);
12. Develop a handbook with examples of activities that teachers can implement in online teaching, starting from techniques for reviewing the learning content to assessment, including examples of activities that are less represented in this type of instruction delivery (e.g. group work within online teaching, etc.);
13. Develop a school plan and specific measures for providing support to students who missed the most learning content, especially to students from vulnerable groups, in line with characteristics of local communities.
14. Set up a place in school or the local community to provide devices and/or internet to those students who are not able to attend distance learning due to the lack of technical conditions but also an appropriate learning environment.

Monitoring and evaluation of teaching and learning

15. Develop a framework for monitoring the quality of teaching and learning when implementing distance learning, including improving the ways that principals predominantly use (joining classes conducted through online platforms);
16. Develop a handbook on methods of student evaluation that contains examples of best practices identified in schools, with an emphasis on formative assessment;
17. Exchange examples of developed school documents that determine the methods and criteria for evaluation of the achievement of students who attend distance learning/online teaching, which would be included in the abovementioned handbook.

Additional recommendations

18. Conduct research in line with the additional findings of the respondents, which would collect data on the workload of teachers, work efficiency, local conditions and specifics that affect the teaching process, as well as the mental and physical health of teachers and students in Serbia, Romania and Kazakhstan.

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