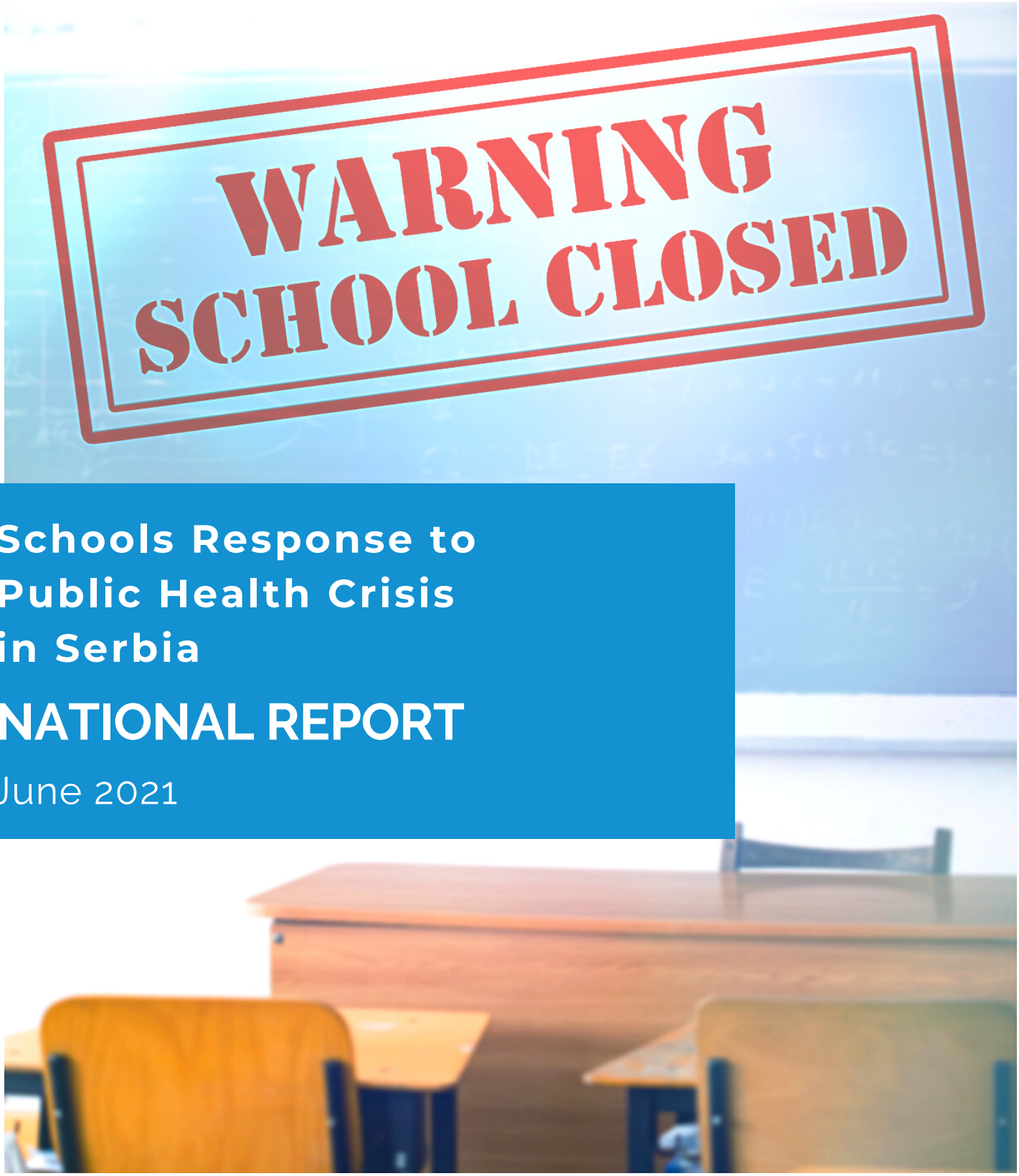


Schools Response to Public Health Crisis in Serbia

NATIONAL REPORT

June 2021

Network of Education Policy Centers

Centar za obrazovne politike
Centre for Education Policy

Impressum

Publisher: Network of Education Policy Centers

For publisher: Raffaella d'Apolito

Authors: 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.

Design: Impresija

2022

Table of Contents

List of Tables

List of Charts

1. INTRODUCTION

The global public health crisis that began in 2020 has caused substantial changes in everyday life, society and the economy. The COVID-19 pandemic has endangered the health of a huge number of people, and the consequences of measures countries adopted to stop the pandemic have resulted in a need to restructure various systems, especially the health care, economic and educational systems. 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 that is 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 is the COVID-19 pandemic. Namely, never before have more than 90% of the global student population been affected by school closures due to such phenomenon (UNESCO, 2020).

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. Consequently, 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).

The same report states that the schools in the most developed countries had the greatest previous experience in the use of online technologies, especially in teaching in secondary education, but that even in the group of economically most developed states, the effects of the pandemic were such that only a few countries could also focus attention on the pedagogical challenges of working online, in addition to technical and infrastructural ones (UNESCO, 2020).

Data for OECD countries show that 15-year-olds usually have Internet access in households via smartphones, computers and tablets, in a ratio of 3:2:1. Such data indicate that the use of mobile phones is the most common source of Internet access. However, it should be noted that not every Internet connection is of sufficient quality to attend distance learning, and that mobile phones are not devices that fully support everything that is required from students to be able to participate in distance learning. In addition, access to the Internet and the availability of devices are preconditions but not sufficient for distance learning. What is also necessary is an adequate environment for both the student and the teacher. According to the OECD, about 9% of 15-year-olds from OECD countries do not have a "quiet" place to study in their homes (OECD, 2020d).

Distance learning and school closures have not only affected education and the process of knowledge acquisition, 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. Therefore, school closures due to the COVID-19 pandemic may contribute to the even greater exclusion of children who are already socially disadvantaged, as well as to 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 Programme and UNHCR, 2020).

When it comes to teachers, the pandemic has affected many aspects of their work – aside from the changed method of delivering instruction, there were inevitable changes in school schedules, professional development, student assessment, and 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 are vital in overcoming obstacles when learning at home and improving the effects of online instruction (OECD, 2020a). As a result, many children whose families were unable to offer them support were exposed to an even greater risk of falling behind in schoolwork and in keeping up with distance learning.

Ultimately, the pandemic-imposed distance learning as the 'least bad solution' to replace 'regular' schooling in emergencies, and to ensure that students do not lag with their lessons in the long run. However, research shows that online teaching does not achieve the same effects as 'traditional' instruction, but rather 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). Also, one of the conclusions based on the PISA 2018 research is that the equipment of schools with digital resources is not necessarily related to student performance (OECD, 2020c).

However, the overall effects of distance learning on students' knowledge are still unknown, although some experts believe that learning loss is inevitable for all students (World Bank, 2020). In the upcoming period, the effects that the pandemic on the students' knowledge, both in the short and long term, will be discovered, and especially for the students from vulnerable groups.

It is expected that the global impact of the pandemic on students' knowledge will be shown through the results of the PISA 2021 research.

When it comes to the economic and social impact of the pandemic on the territory of the Western Balkans, the World Bank predicts negative short-term and long-term consequences for economic growth, human capital growth and education equity (World Bank, 2020), but it encourages countries to use the crisis to improve education systems, in order to make education better and more resistant to change.

In this regard, in the coming period for all countries the focus should be on creating policies that will ensure that this crisis 1) accelerates the resolution of challenges that existed 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.

The Network of Education Policy Centers (NEPC), in cooperation with the Open Society Foundation that provided funding, supported research that was conducted in Serbia, Kazakhstan and Romania with the aim 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. CONTEXT

Before presenting information on the implementation of the teaching process during the COVID-19 pandemic in Serbia (section 2.3.), sections 2.1. and 2.2. introduce the context in which the schools operated, providing the main data that give an overview of the Serbian education system, especially in terms of technological equipment of schools and households in Serbia, as well as the current digitalization policy in the education sector.

2.1. Basic data on the education system and ICT infrastructure in Serbia

The number of schools, students and teachers. Based on the data of the Statistical Office of the Republic of Serbia (SORS), there are 1653 typical primary and secondary schools in Serbia (Table 1), 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.

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 3).

Table 1. Number and type of schools at the beginning of the school year 2019/20

Type of school	Number of schools
Primary schools[1]	1136
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	1653

Source: SORS database

[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.

Table 2. Number of primary and secondary schools by type of ownership

Type of school	Public ownership	Private ownership
Primary schools	1128	8[2]
Secondary schools	453	64

Source: SORS database (beginning of the school year 2019/20); for primary schools in private ownership – MoESTD internal data (2018)

Table 3. 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: SORS database

The total number of students per grade in primary and secondary schools at the beginning of the 2019/20 school year is shown in Table 4.

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).

Information and Communication Technologies (ICT) in schools. In the absence of precise data on technical equipment of schools at the national level, data on the availability of ICT in schools, school infrastructure, and Internet access, are taken from the PISA 2018 database, which was collected in the framework of the PISA 2018 research through a questionnaire for school principals.

Based on this source, 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. The percentage of computers connected to the Internet in schools in Serbia is about 82%, while the average for OECD countries comes to 97% (OECD, 2020c).

In terms of technological infrastructure in schools, PISA 2018 research collected data from school principals on the existence of reliable online platforms, digital devices, software and teacher skills (Table 5).

Based on the responses of Serbian principals, a significantly lower percentage of students attend schools where an effective online learning support platform is available (40%) compared to the OECD average (54%).

[2] Data on the number of private primary schools are not available in SORS database, so this is MoESTD internal data for 2018.

Table 4. Total number of students per grade in primary and secondary schools at the beginning of the 2019/20 school year

Primary education								Secondary education			
I	64.015	III	64.801	V	65.182	VII	65.528	I	67.678	III	62.832
II	62.949	IV	65.526	VI	63.954	VIII	65.871	II	66.544	IV	52.801

Source: SORS database

Table 5. Percentage of students in schools whose principals agree or strongly agree with the following statements on technical infrastructure in schools

	An effective online learning support platform is available	The number of digital devices for instruction is sufficient	The availability of adequate software is sufficient	Teachers have the necessary technical and pedagogical skills to integrate digital devices into instruction
Serbia	40%	43%	49%	71%
OECD average	54%	59%	71%	65%

Source: OECD (2020c). Education in the Western Balkans: Findings from PISA, Paris: OECD

A similar case is with the availability of a sufficient number of digital devices used for instruction (43% in Serbia and 59% in OECD countries on average). The disparity is even greater in the availability of adequate software (in Serbia, there are 49% of schools in which principals estimated that they have sufficient software, compared to the OECD average - 71% of schools). However, the percentage of schools whose principals reported that teachers possess the necessary technical and pedagogical skills needed to integrate digital devices in instruction is higher in Serbia in relation to the OECD average - 71% in Serbia compared to 65% for OECD countries (OECD, 2020c).

ICT in households and digital competencies of the population. The percentage of households with Internet access in Serbia was 81% in 2020, in comparison with 91% in EU countries (EUROSTAT database[3]). When interpreting this data, it should be taken into account that in Serbia the most predominant device for Internet accesses 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 take into account the environment in which households are

[3] https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_in_h/default/table?lang=en - accessed 17 February 2021.

located (urban and other settlements), there is a considerable disparity in the percentage of households that have Internet access and computers, and it stands at around 20% in the favor of households in urban areas. When the level of household income is concerned, 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%). That the mobile phone is the primary device for accessing the Internet in households is confirmed by the fact that even in households with the lowest income (up to EUR 300), a higher percentage of households report having Internet access (59%) than owning a computer (48%) (Table 6).

2.2. Education policy and digital education

In accordance with the priority of the Government of the Republic of Serbia defined as "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 through improvements of the schools' ICT infrastructure, development of teachers' digital skills, use of digital technologies, the introduction of digital textbooks, etc.

One of the first reform efforts in this direction was the introduction of new

Table 6. Internet and computer access in relation to the type of settlement and the household income level

	Type of settlement		Household income level		
	Urban	Other	< 300 EUR	300 – 600 EUR	> 600 EUR
Internet	87%	70%	59%	90%	98%
Computer	81%	61%	48%	83%	96%

Source: SORS database

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 lower than the EU average of 56% (EUROSTAT database[4]).

subjects, Informatics and Computer Science and Technics and Technology, in the second cycle of primary education, which has been implemented since the school year 2017/18. Another result of the curricular reform is that, from the school year 2020/21, the subject called the Digital World has become a compulsory subject for first-cycle primary school students.

[4] https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i/default/table?lang=en – accessed 17 February 2021

From the school year 2017/18, a new curriculum was introduced in general secondary schools for students with special interest in informatics and computer science, and **the number of these specialized IT classes** increased successively, so that in the school year 2020/21, they were available in 49 general secondary schools across Serbia[5].

The introduction of the **tool for self-evaluation and assessment of digital capacities of schools 'Selfie'** was also initiated in 2017 when selected schools participated in the pilot research of this tool[6]. In 2019, the Institute for Education Quality and Evaluation developed and implemented training for primary and secondary schools entitled 'Training of Employees in Primary and Secondary Schools for the Application of the Tool for Self-Evaluation and Assessment of Digital School Capacity - Selfie, which is available to all schools in Serbia.

Digital textbooks have been introduced in 2018, which have not only enabled students to use interactive and modern teaching aids but have also provided easier access to textbooks in the languages of national minorities. Throughout the same year, the schools that expressed interest in applying digital textbooks were provided with 2,000 laptops and projectors.

Another novelty introduced in 2018 is the **electronic grade book** for keeping records of educational work and student performance, which allows parents easier insight into student's achievements. It was implemented in the majority of schools across Serbia from the 2019/20 school year.

To prepare teachers for these changes, different projects have been launched with the aim of **improving the digital competencies** of primary school first-grade class teachers and fifth-grade subject teachers, such as the pilot project 'Digital Classroom', which trained over 23,000 participants[7]. A Digital Competence Framework - Teacher for a Digital Age (2017) was also adopted, and revised in 2019. This framework specifies the knowledge and skills, or digital competencies, required by teachers to be able to keep up with the developments in educational technology and reform processes taking place in the field of digital education in Serbia.

The establishment of a **unified Education Management Information System (EMIS)** is underway, which aims not only to technically connect all data on students but also to keep track of students through the education system from preschool to higher education.

At the same time, projects for **improving the infrastructure in schools** are being implemented. The project 'Development of ICT Infrastructure in Educational, Scientific and Cultural Institutions' has been implemented since 2016 in several phases, and the goal of the first phase was to connect primary and secondary schools to the academic network of Serbia (AMRES), which provides access to secure Internet and IT services intended for the Serbian scientific and research community[8].

[5] https://ec.europa.eu/eurostat/databrowser/view/isoc_sk_dskl_i/default/table?lang=en – accessed 17 February 2021
[6] http://www.mpn.gov.rs/javni-poziv-za-izbor-skola-za-ucesce-u-pilot-istrazivanju-samovrednovanje-elektronske-zrelosti-ustanova/ - accessed 12 February 2021
[7] https://digitalnaucionica.edu.rs - accessed 12 February 2021
[8] https://www.amres.ac.rs/cp/vesti/projekat-povezivanje-osnovnih-srednjih-skola - accessed 12 February 2021

Since 2019, the project's second phase titled "Development of ICT Infrastructure in Educational, Scientific and Cultural Institutions - Connected Schools" has been carried out with the objective to improve the Internet infrastructure in all primary and secondary schools in Serbia.

Also, in 2019, the **Education Technology Center** was established under the Institute for Education Quality and Evaluation (IEQE), which is, among other things, in charge of planning the development of quality of digital education, certification of digital skills and competencies, development of training programs in digital education, etc.

Within the Institute for Improvement of Education (IIE), the **IIE Edu Platform** was set up for conducting training of public interest, i.e. training accredited by a decision of the Minister of Education. Online training seminars for employees in pre-university education are available on the platform, including those aimed at developing digital competencies[9].

At the beginning of 2020, the **Strategy for the Development of Digital Skills in the Republic of Serbia** (2020-2024) was adopted, that defines the improvement of digital competencies of students and teachers in the education system as one of the specific goals (Government of RS, 2020).

The new **Strategy for the Development of Education in the Republic of Serbia until 2030**, adopted in 2021, contains a specific goal related to the development of digital education at the pre-university level.

Since the development of the new strategy coincided with the COVID-19 pandemic, some of the envisioned novelties that the Strategy contains are development the Framework for Assessing the Capacity of Primary and Secondary Schools to Organize Distance Learning, the setting up 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).

2.3. Teaching and learning during the COVID-19 pandemic

The COVID-19 caused crisis in Serbia began in March 2020, when the Government of the Republic of Serbia declared **a 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 at that time about one million and 250 thousand Serbian students across the education system were directly affected by the closure of schools and higher education institutions.

It is important to mention that the regulatory framework envisions the implementation of distance learning in pre-university education but does not fully regulate it. The Law on the Foundations of Education System[10] stipulates that instruction can be realized as home teaching and distance learning (Art. 14), and the Law

[9] E.g. training: Digital classroom/Digitally competent teacher - introduction of electronic textbooks and digital educational materials, Development of digital competencies.
[10] „Official Gazette of RS" No. 88/2017, 27/2018 – state law, 10/2019, 27/2018 – state law and 6/2020.

on Secondary Education[11] defines distance learning somewhat more extensively (Art. 27) as well as the Law on Primary Education (Art. 38a)[12]. However, there are no laws or bylaws that regulate this area more specifically[13].

The Ministry of Education, Science and Technological Development (MoESTD) offered schools several modalities of instruction **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 that are represented in the highest percentage with the primary schools and general secondary education curricula was organized, while for all other subjects, teachers were obliged to independently provide online instructions. More precisely, all teachers were obliged to conduct online classes (regardless of whether there were pre-recorded lessons for their subject), and to provide an additional explanation and review of the lesson content presented in the recorded classes, to assign and correct homework, as well as to have regular communication with students. Vocational secondary schools were in a thankless position given that there are a large number of diverse subjects, especially vocational ones, from different sectors, but also due to the inability to conduct professional practice classes. As the state of emergency continued, the broadcasting of recorded classes for secondary vocational schools was successively organized, covering education profiles within all sectors, and contained parts dedicated to practical classes, i.e. elements of work-based learning.

By the end of the 2019/20 school year, about 1400 classes in total were recorded for primary education and slightly less than 1000 classes for secondary education. In addition, short videos related to physical and health education and psychological support messages were also recorded (MoESTD, 2020a). Simultaneously, the online platform "My School" was established[14] providing learning support to primary education students who follow classes broadcasted on national television in the form of tests and knowledge quizzes. Furthermore, for students attending classes in national minority languages, MoESTD has, in cooperation with national councils of national minorities, 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. Schools were also required to deliver printed materials to students who were unable to attend distance learning.

This organization of distance learning lasted until the state of emergency was lifted (May 2020), namely until the **end of the 2019/20 school year**. What was especially challenging in that period was the assessment of student progress (IIE, 2020). Teachers from schools where the electronic grade book is in use were obliged to keep a record of the classes they held, either on television or online, specifying the types of communication and methods of implementation, while teachers in other schools kept personal notes that would later be entered in the book of records of educational work (MoESTD, 2020a).

[11] "Official Gazette of RS", No. 55/2013, 101/2017, 27/2018 - state law and 6/2020
[12] "Official Gazette of RS", No. 55/2013, 101/2017, 10/2019 i 27/2018 – state law
[13] The only bylaw that regulates schooling outside the school premises is the Rulebook on the manner of organizing classes for students on extended home or hospital care, "Official Gazette RS", No. 66/2018
[14] https://www.mojaskola.gov.rs/ - accessed at 13 February 2021

By adopting amendments to the Rulebook on the Assessment of Students in Primary Education[15] and the Rulebook on the Assessment of Students in Secondary Education[16] before the end of the school year 2019/20, assignment of final grades was facilitated since the required number of grades based on which the final grade is to be determined is decreased. The final exam was organized in schools, in compliance with the prescribed measures on the physical distance between students and other health and safety measures against COVID-19.

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 distance learning approach for the next school year.

One of the **main conclusions** of the research published in May 2020[17] was that the majority of students were covered by distance learning by attending classes broadcasted on television and through online platforms and interactive classes (Table 7) (MoESTD, Institute of Psychology and UNICEF, 2020).

According to the mentioned research, less than 2% of students did not follow the instruction through online platforms and interactive classes with the help of digital tools or via television, but mostly through the delivery of printed material (an alternative type of instruction), and a similar percentage of students were not covered by distance learning at all. It is important to note that, when it comes to students from vulnerable groups, in total 26% of Roma students did not attend distance learning at all, as well as 9% of the low socio-economic background students, and 6% of students with disabilities, which further jeopardizes their education (MoESTD, Institute of Psychology and UNICEF, 2020).

In order to reduce the existing gap, starting

Table 7. Distance learning coverage according to level and modality of education

	Primary schools	Secondary schools
Attending classes on television channels	95%	63,9%
Participating through online platforms and interactive classes with the help of digital tools	84,7%	99,4%
Participating through the alternative types of instruction	1,6%	1,7%
Students not covered by distance learning	0,7%	1%

Source: MoESTD, Institute of Psychology and UNICEF (2020). Monitoring the Manner of Participation and Learning Process of Students from Vulnerable Groups During the Realization of Educational Work by Distance Learning - The First Report Based on Research Findings.

[15] "Official Gazette of RS", No. 59/2020
[16] "Official Gazette of RS", No. 59/2020
[17] A total of 1147 primary schools (97% in relation to the total number of schools in this category), 43 schools for the education of students with disabilities (98%), 95 general secondary schools (89%), 323 secondary vocational schools (95%) and 31 secondary music and ballet schools (94%) participated in the research.

with the school year 2020/21, in cooperation with the EU delegation to Serbia and UNICEF, MoESTD launched the project 'Bridging the Digital Divide in Serbia for the Most Vulnerable Children'[18], which aims, among other things, to equip schools attended by a high number of students from vulnerable groups with a considerable number of devices.

The same research shows that the **main obstacles to attending distance learning**, both for primary and secondary school students, are in the first place the lack of Internet, followed by the lack of appropriate devices, but also the lack of family support for distance learning (Table 8).

The challenge relating to the lack of or inadequate support from family/parents was also identified in another study published in April 2020 that aimed to show **the impact of the COVID-19 pandemic on children** in terms of their concerns and things they lack during a state of emergency and that included a segment dedicated to distance learning for school-age children[19].

According to this research, when it comes to children's satisfaction with online teaching, they are very much satisfied with communication with teachers and moderately satisfied with the quality of support that parents can provide explaining things they have difficulty understanding. Some of the specific challenges identified by children in this study regarding distance learning are: that slides on TV change too quickly and they cannot always read everything, that they have outdated TV sets that prevent them from seeing the contents of the slides, and that if teachers use different applications for online teaching, they do not have sufficient memory space on smartphones (NOCS, 2020).

Survey focusing on **children and youth** (from primary to higher education) conducted in May 2020[20], showed that most of respondents believe that they have successfully organized themselves in attending online classes (87%), of which about half of the respondents think they were mostly successful (48%), and 39% fully successful.

Table 8. Reasons why students do not attend TV classes/online teaching

Reasons	Students of primary schools	Students of secondary schools
Don't have Internet access	40,7%	30,7%
Don't have adequate device	26,3%	22,7%
Don't have family support for distance learning	24%	13,7%

Source: MoESTD, Institute of Psychology and UNICEF (2020). Monitoring the Manner of Participation and Learning Process of Students from Vulnerable Groups During the Realization of Educational Work by Distance Learning - The First Report Based on Research Findings.

[18] http://www.mpn.gov.rs/pocetak-projekta-premoscavanje-digitalnog-jaza-za-najugrozeniju-decu/ - accessed 17 February 2021
[19] A total of 1571 children from the entire territory of Serbia, aged 5 to 18, participated in the research.
[20] The research included 1328 respondents, of which 94% of the sample belong to the youth category, of which 74% are in 15-19 age category, 18% are in 20-25 age category, and 3% are in the 26-30 category.

About 14% of respondents think they were less successful or unsuccessful. What is interesting is that students who reported they think they were not well organized (less successful and unsuccessful), generally believe that the problem was mostly in teachers' high expectations and requirements (as many as 45%), and significantly smaller number considered causes to be their mood (16%), lack of work atmosphere (14%), lack of time management skills (10%), and lastly, technical problems (9%) (UNICEF, 2020). Differences in perceived problems in relation to the level of education of the respondents are shown in Table 9.

The **teachers** also found distance learning challenging. According to a survey conducted by the Institute for Improvement of Education[21], for the majority of teachers this was the first time they conducted the educational process through distance learning (55%), or they had very limited previous experience with it (34%). Only a small number of Serbian education professionals had extensive experience in conducting distance learning (8%). Findings show that the lack of experience was not the only challenge for teachers - increased workload and stress when working from home was cited as a challenge by as many as 51% of teachers, immediately after the availability of resources and technology to students (52%), which are the two most common problems faced by teachers in the transition to distance learning (IIE, 2020).

This research showed that the most prevalent tool for communication between teachers and students during the state of emergency was the Viber application (37%)

Table 9. Problems students faced according to the level of education

Level of education	High expectations and requirements	My mood	Lack of work atmosphere at home	I don't know to manage time well	Technical problems with devices	Other
High education	26%	23%	26%	11%	8%	7%
Secondary vocational school	49%	15%	9%	11%	12%	6%
General secondary school	54%	14%	11%	7%	6%	8%
Primary school	50%	12%	12%	14%	8%	4%
Total (average)	45%	16%	14%	10%	9%	6%

Source: UNICEF (2020a). U-Report - Experiences of Young People with Distance Learning During the COVID-19 Epidemic

[21] Survey was conducted in May 2020 and 14,715 teachers participated in the research, of which about 41% were subject teachers; 31% of class teachers; 11% of general education teachers in secondary schools; 10% of vocational subject teachers; 2% of school principals; 2% of subject teachers in both primary and secondary schools; 2% of professional associates.

and that considerable communication (33%) took place within the framework of the learning management systems (e.g. Google Classroom and Edmodo). In terms of teaching platforms, the most popular was Google Classroom, which was used by about 52% of teachers, although it is important to note that as many as 30% of teachers did not make use of learning management systems, but preferred communication tools for instruction (e.g. email, Viber, Zoom, Microsoft Teams) (IIE, 2020).

During the state of emergency, **professional associates** had the task of providing support to teachers in creating teaching materials, communicating with students, selecting teaching methods, designing workshops with an emphasis on support to students, etc. Professional associates in primary schools were also engaged in the implementation of new procedures for enrollment in the first grade of primary school for the school year 2020/21, which were administratively simplified in comparison to the old procedure (MoESTD, 2020a).

Just before the start of the school year 2020/21, The Rulebook on the Special Program of Education[22] was adopted, which defines the program, organization and work of the institution in case of imminent danger of war, state of war, state of emergency, or other contingencies. At the request of MoESTD, the Institute for the Improvement of Education (IIE) has developed Plans for the Realization of Instruction in Situations of Imminent Danger of War, State of War, State of Emergency and Other Contingencies, for Primary School from First to Eighth Grade[23], as a part of the Rulebook.

Based on the Rulebook and following the Professional instructions that MoESTD submitted to schools, schools were obliged to develop an operational plan for the organization and implementation of the teaching process in the school year 2020/21 in the conditions of a pandemic, which is submitted to the Regional school administrations, in order to coordinate the work of the school, but also to inform the institutions in charge.

Additionally, as a part of preparation for the new school year, the Institute for Education Quality and Evaluation (IEQE) has designed a Framework for Assessing the Capacity of Primary and Secondary Schools to Organize Distance Learning in Cases When in-Person Work with Students is Suspended[24] and started the drafting Framework for Monitoring and Evaluation of Distance Learning Systems.

The Rulebook on Specific Conditions for Implementation, Quality Assurance and Evaluation of Distance Learning in Primary School[25] was also adopted, which specifies the goals, tasks, and conditions for implementation, organization and manner of implementation of teaching process, quality assurance, and assessment of students in primary education that is implemented through distance learning.

Based on all the above, for the **beginning of the school year 2020/21**, MoESTD defined and offered schools several modalities of instruction.

For primary schools, implemented modalities are 1) regular classes - teaching that is performed at school through face-to-face

[22] "Official Gazette of RS", No. 110/2020
[23] https://zuov.gov.rs/plan-realizacije-nastave/ - accessed 17 February 2021
[24] http://www.mpn.gov.rs/wp-content/uploads/2020/08/ZVKOV-Okvir-obrazovanje-na-daljinu.pdf - accessed 17 February 2021
[25] "Official Gazette of RS", No. 109/2020

work with students and 2) teaching that is implemented in both ways - in school and through distance learning (so-called combined model) (MoESTD, 2020b). Regular in-school classes are mandatory for students in the first cycle of primary education (from the first to the fourth grade), and also desirable for students in the second cycle of primary education if the school meets the requirements in terms of adequate space and human resources. It is important to note that this teaching process differs from the usual school classes since students are divided into smaller groups (up to 15 students), classes are shortened (to 30 minutes), students have a maximum of five classes per day (in order to have all groups of students attend all classes), and that elective subjects and similar forms of work (e.g. extracurricular activities) are organized at the school premises only if the spatial capacity allows, or online. The combined model is intended for students in the second cycle of primary education, for schools that do not have the human resources or spatial capacity for the implementation of regular classes. This model implies that students, under the same conditions as first-cycle students, come to school for a certain period, and in another period attend distance learning. Distance learning includes, as in the previous school year, following classes on the national Public Broadcasting Service, including the RTS Planet platform, as well as online instruction conducted by teachers using online platforms and learning management systems (MoESTD, 2020b). The decision on when the students come to the classrooms, and when they attend distance learning, is left to the schools in accordance with their needs and capabilities. Thus, for example, in some primary schools, students who attend the combined model come to school every other day and attend distance learning in between, while in other schools, students come to school one week and attend distance learning the other. The assessment of students who attend the combined model is performed when the students are in school.

For secondary schools, the combined model is applied. The combined model of the teaching process for secondary schools is the same as for primary schools and implies that students attend classes at school in a certain period, and attend distance learning during the other period (via television and/or online). The assessment of students who attend the combined model is also performed when the students are in school. What is specific for secondary vocational schools is the organization of professional practice classes, i.e. work based learning for schools that implement dual educational profiles, so MoESTD instructed schools to organize this type of teaching and learning in accordance with the law, namely taking measures to protect students' health in school workshops and measures prescribed by employers at whose premises it takes place (MoESTD, 2020c).

It is important to note that all schools were allowed to conduct complete teaching process through distance learning exclusively for students who, for health and safety reasons, do not want to come to school.

Instruction on Measures to Protect the Health of Students and Employees in Primary and Secondary Schools was distributed to schools prescribing measures such as maintaining physical distance, wearing masks, reducing the use of different classrooms, ceasing activities that contribute to increased aerosol generation (singing, sports, etc.) (MoESTD, 2020d).

Data collected by MoESTD during the **school year 2020/21** indicate that the combined model is most practiced by schools and that

a small number of students attend distance learning exclusively (about 4% at the beginning of the school year, or 2,7% during the first three months of the school year) (MoESTD, internal data).

Due to the deteriorating epidemiological situation throughout the country, from November 2020, all second-cycle primary school students (grades 5 to 8) and secondary school students were referred to distance learning. This decision remained in effect until the end of the first semester of the school year 2020/21.

In the **second semester of the school year 2020/21**, the modalities of implementation of the teaching process that were introduced at the beginning of the school year are still in force.

Due to another deteriorating epidemiological situation, in March 2021 schools were partially closed depending on the type – secondary schools offered only distance learning, from middle March primary schools offered the same for students from higher grades (5th to 8th) while students from lower grades (1st to 4th) kept going to schools. This partial situation lasted until late April 2021, when all schools opened its premises, that is, started working regularly.

From the moment the decision on lifting the state of emergency was made on the territory of the entire country, 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.

3. RESEARCH OBJECTIVES

Bearing in mind that Serbian schools were, for the first time in the last 30 years, forced to close their doors and completely suspend regular classes, that the society encountered a large-scale epidemiological challenge for the first time, and that distance learning has never been applied in long-term and across the entire education system, this research aims to present how schools' reacted to such a situation, and based on the main research findings, to draw conclusions and to propose **recommendations for improvement**. The last one is of particular importance 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 **overview of the situation in primary and secondary schools** is based on those domains that are most important for the functioning of the schools and the implementation of the teaching process in emergencies. The examined domains are:

1) **Information flow**, which includes institutions in charge informing school management, school management informing the employees, as well as school informing students and parents. The objective is 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 the information received was, 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 survey of instruction modalities, used 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 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 manifested, how the principals monitored the quality of teaching and teachers' activities, as well as how teachers monitored student progress and performed student assessment.

Since the research deals with distance learning and online teaching, it is important to define what these forms of teaching and learning imply in Serbian educational context and, consequently, in this research. **Distance education** (or learning) means a form of 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, bearing in mind that the research deals with the implementation of teaching mainly via television and teaching through digital technologies, both terms are used in the research.

4. METHODOLOGY

The research is based on collection and analysis of quantitative and qualitative data.

The research assumed **content analysis** which 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 MoESTD), and data related to schools are gathered via **questionnaire survey**. 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** in Serbia. Two online questionnaires (a principals' questionnaire and a teachers' questionnaire) are used that contained 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) and qualitative data mostly relate to school practices which could not be identified through 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.).

Schools were able to provide their answers via questionnaires during December 2020. 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[26]. Therefore, all research participants were noted that the research refers to the **period before this decision**.

A quota sample was used in the research. First, a total of 100 schools that will potentially participate in the research were identified, based on the type of school (primary, secondary vocational school, general secondary or secondary art school), taking into account their representation in the total number of schools in Serbia (i.e. the representativeness of different types of schools). Therefore, primary schools are the most represented in the sample since they are the most numerous (see Table 1), followed by secondary vocational schools, general secondary schools, and the least represented secondary art schools (Table 10).

Then, the participants in the research were identified - school principals (100), primary school class teachers (50), primary schools subject teachers (50), general secondary schools teachers (15), teachers in secondary vocational schools that are teaching general subjects (30), vocational subjects teachers in

[26] Government Decree of 26 November 2020.

Table 10. Schools identified for participation in the research by type of school

Type of School	Number of schools identified
Primary School (PS)	50
Secondary vocational schools (SVS)	30
General secondary schools	15
Secondary art schools (SAS)	5

secondary vocational school (30), professional practice teachers in secondary vocational schools (30), general subjects teachers in secondary art school (5) and vocational subjects teachers in secondary art school (5), which makes a total of 315 identified research participants.

Achieved sample

Out of the 315 identified participants (100 school principals and 215 teachers) to whom the online questionnaire was sent, a total of 157 responded to the questionnaire, which represents a survey participation rate (questionnaire response) of 52%, or specifically 57% for school principals and 47 % for teachers (Table 11).

When looking at the 100% sample, the ratio of the participation of principals and teachers in research depending on the type of school goes to a very small extent in favor of secondary schools (Chart 1).

In line with the choice of participating schools, and the different representation of the types of schools in the research (Table 10), the representation of teachers also varies (Chart 2). Hence, primary school subject teachers participated in the research the most (22%), while teachers of vocational subjects in secondary art school (SAS) participated the least (1%). No general education teacher at SAS participated in the research.

Most of the schools in the sample are located in urban environments, therefore the vast majority of teachers and principals who participated in the research come from such schools (80%; 84%) (Chart 3).

Teachers who participated in the research mostly teach in only one school (85%) and are class head teachers (78%).

Table 11. The number of identified participants and those answered to questionnaire (research response rate)

Research participants	Number of identified participants	Number of participants who filled out the questionnaires	Questionnaire response rate
Principals	100	57	57%
Teachers	215	100	47%
Total	**315**	**157**	**52%**

Chart 1. The ratio of the participation of principals and teachers in research depending on the type of school

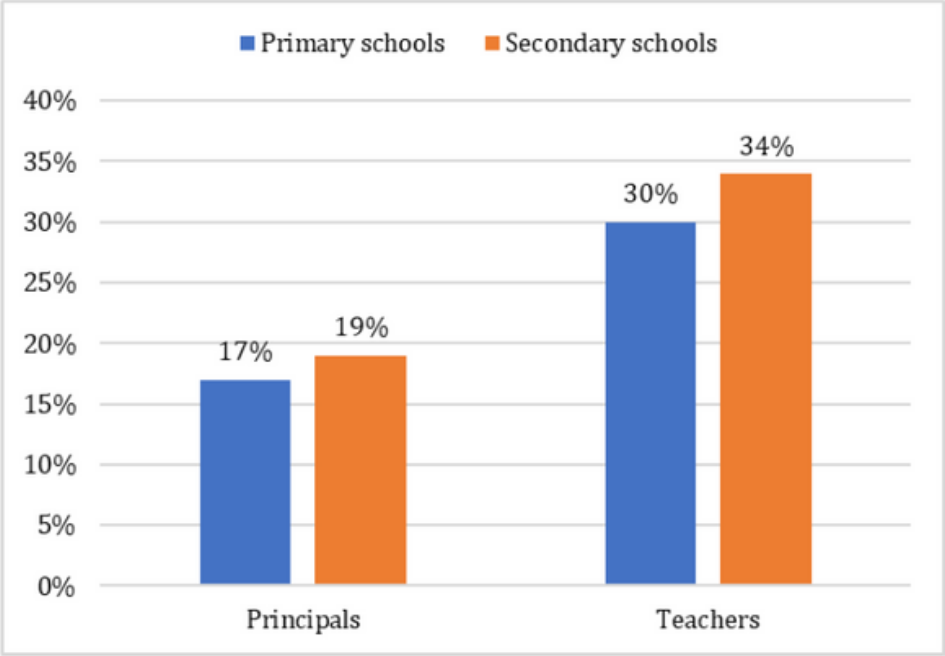


Chart 2. Representation of teachers in research by type of school

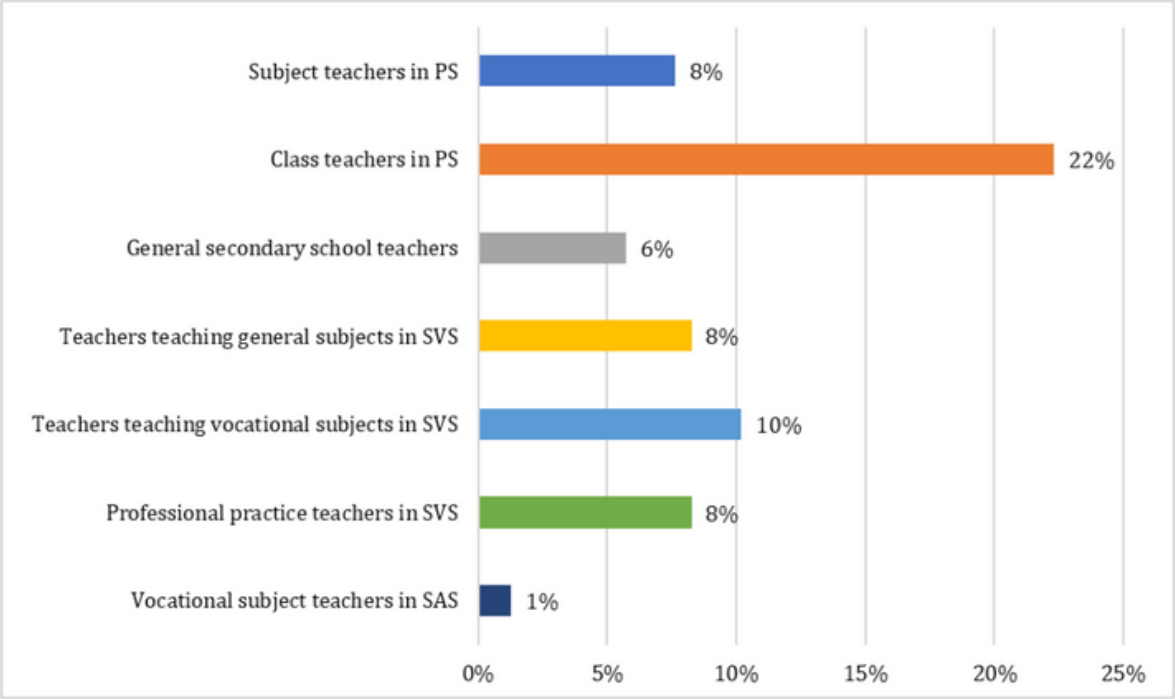
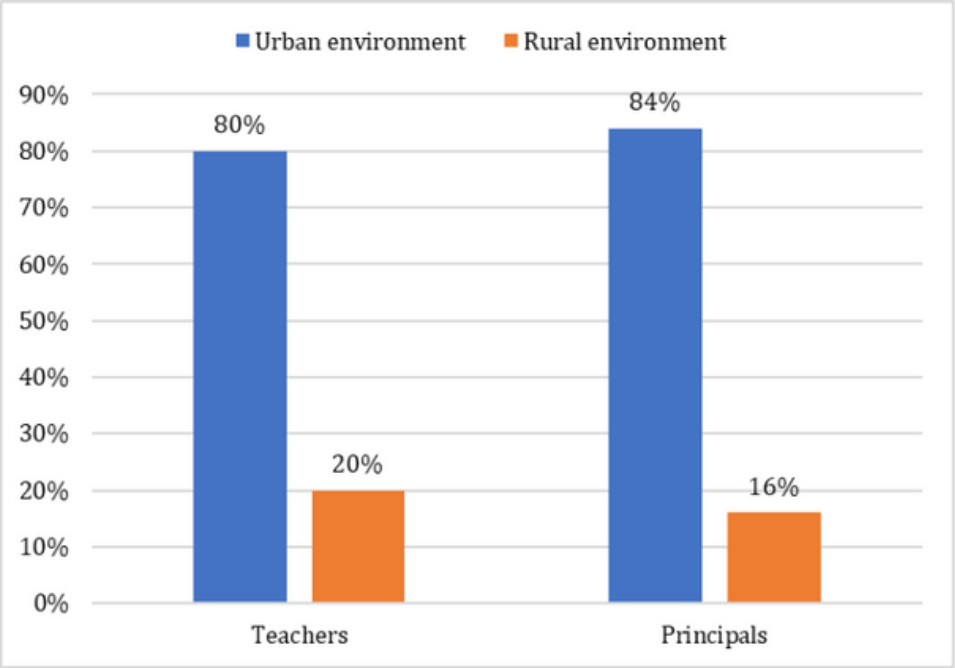


Chart 3. Location of schools where the research participants are employed (urban and rural environment)



Methodological limitations

The main limitation of the methodology used is reflected in the fact that in answering the questions from the questionnaire the respondents reported their perceptions (which are subjective). This limitation should be especially kept in mind when interpreting those questions asking the respondents to roughly estimate the equipment of the school, the competencies of the teachers, the equipment of the students, and the like.

Anonymity and ethics

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

The results of the research are presented in such a way as to follow the research objectives, and are grouped to present the results in the areas of Information flow (Chapter 5.1), Organization of school work, technical equipment and digital competencies of teachers (Chapter 5.2), Organization and implementation of teaching process (Chapter 5.3) and Monitoring and evaluation of teaching and learning (Chapter 5.4). Data collected through qualitative answers of respondents that do not belong to any of the mentioned categories are presented in a separate section (Chapter 5.5).

5.1. Information flow

The main sources of information during the COVID-19 pandemic for school principals were the Ministry of Education, Science and Technological Development (MoESTD) directly, or the regional organizational MoESTD units – Regional school administrations (RSA), while for teachers the main source of information was the school management.

Principals and teachers ranked each source of information on a scale from 0 to 4, where 0 means 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 turn to when they have **doubts about the organization of school work or the educational process**, where 0 means that they did not address them at all, and 4 that they referred to a certain institution/person the most (Charts 4 and 5).

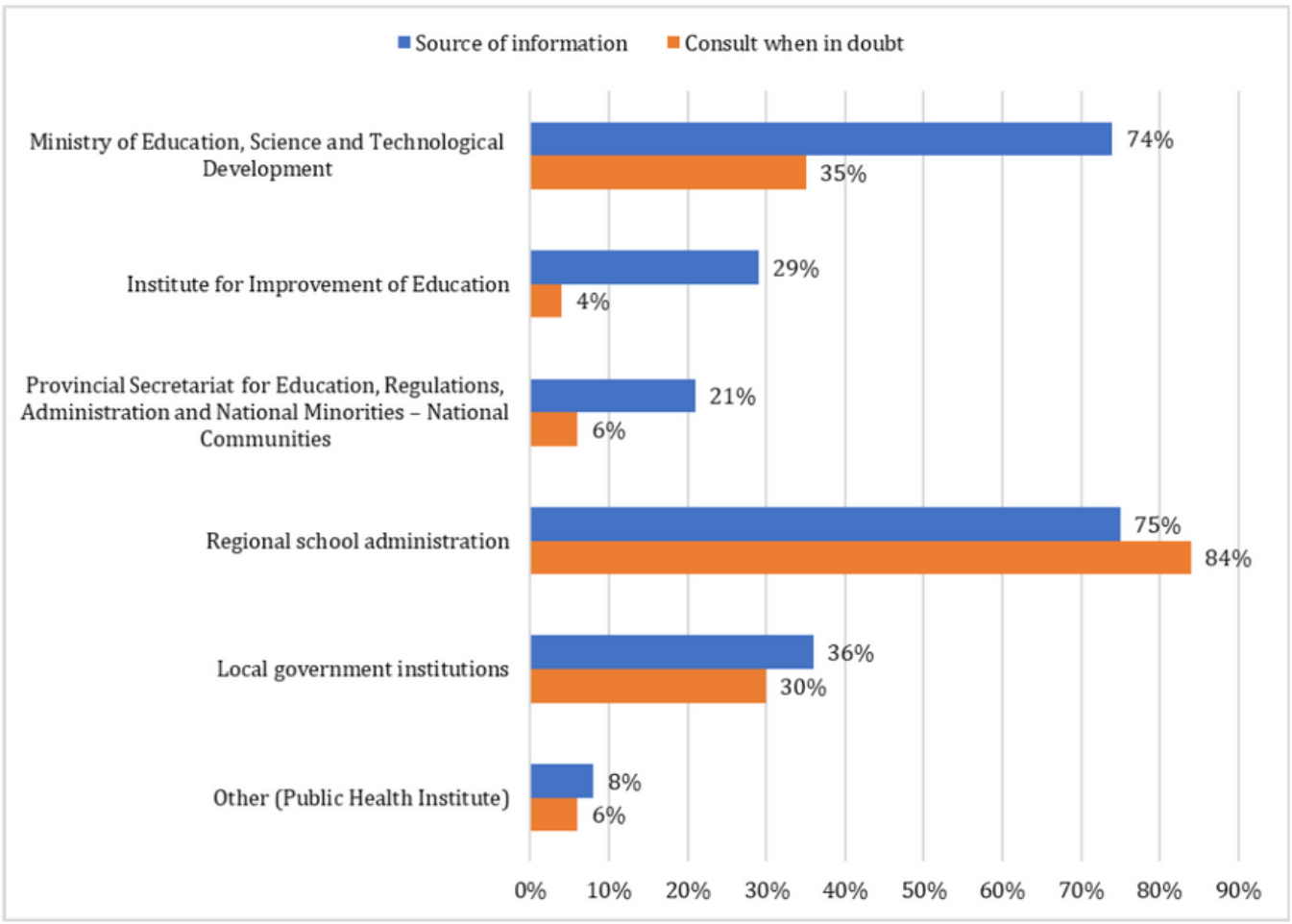
In addition to the institutions in charge that served as the dominant source of information for the vast majority of **principals** (MoESTD - 74% and RSAs -75%, as well as the Provincial Secretariat - 21% in the case of schools located in the Autonomous Province of Vojvodina), about a third of principals used other sources of information to a large extent (local self-government institutions - 36% and the Institute for Improvement of Education - 29%). The Public Health Institute was used as a source of information by 8% of principles.

When having doubts about the organization of school work or teaching process, principles consult MoESTD directly to a lesser extent (35%), and rather refer to the Regional school administrations (84%). As with information sources, about a third of principals predominantly consult local institutions in case of any doubts (30%).

This situation is probably connected with the jurisdiction of the Regional school administrations, since RSAs are the primary regional authority the schools should refer to and it is the result of more direct cooperation that the schools have with the RSAs, but also indicates that principals rely on the support of the RSAs in case of doubts about organizing school work and teaching process during the COVID-19 pandemic.

Regional school administrations were also the most used source of information, namely the source which 77% of principals consult, when having doubts about the organization of the **final exam** at the end of primary education in the conditions of the COVID-19 pandemic.

Chart 4. Sources of information that provide the most information to principals and institutions which principals consult the most when having doubts -% of principals who gave a score of 4, on a scale from 0 to 4



When it comes to **teachers**, in addition to the school management, which is by far their main source of information (89%), the institutions in charge are cited by almost half of teachers as a direct source of information (48%), while a third of teachers rely on their colleagues (34%). About 20% of teachers referred to the media as an often-used information source, while a very small percentage of teachers cited that they use other sources, like the Internet and social networks (3%) (Chart 5).

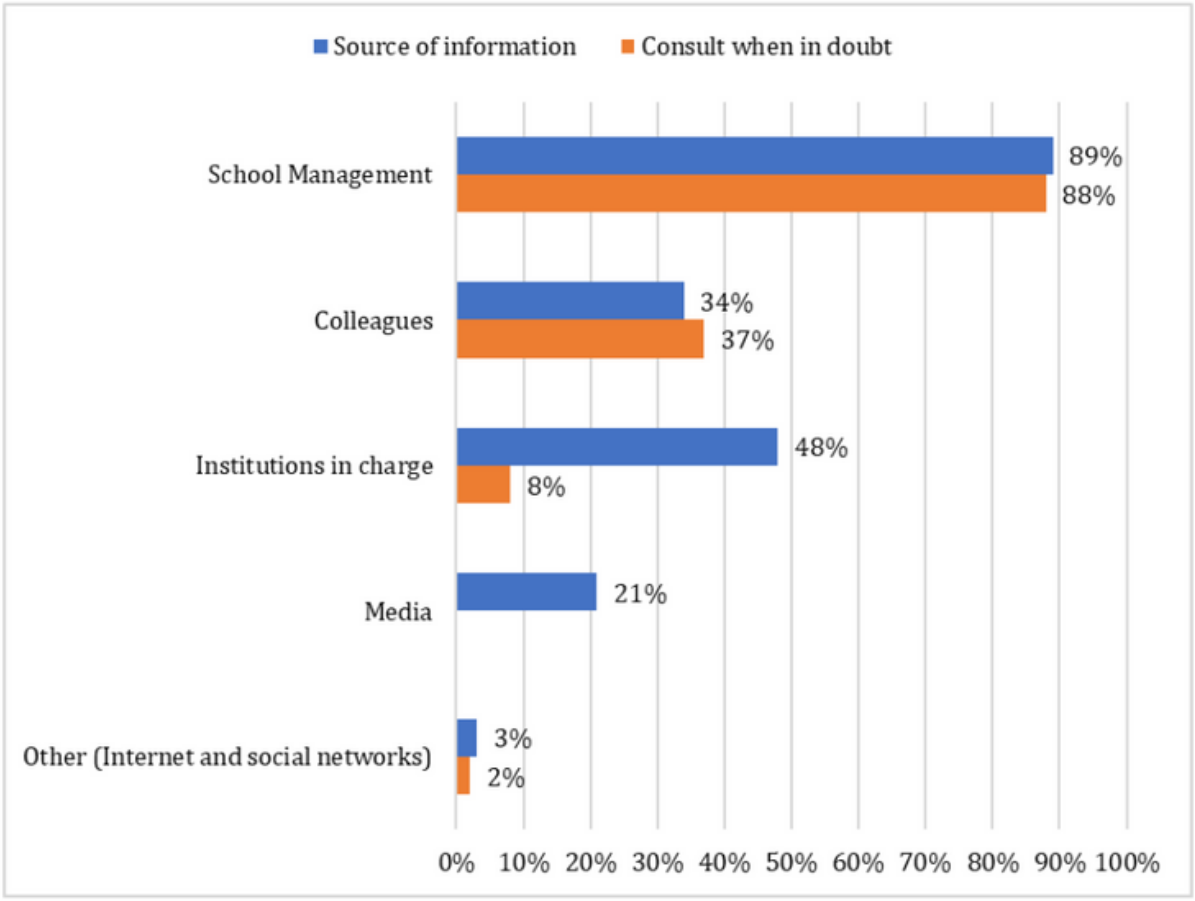
School management is also the main focal point teachers refer to in situations when they have doubts about the implementation of educational work (88%).

Approximately the same percentage of teachers who consider their colleagues to be an important source of information also consult them in situations when they are in doubt (37%). Very few teachers consult institutions in charge in such situations (8%).

How well-informed principals and teachers are and the **degree of clarity of information** provided to them was assessed by principals and teachers on a scale from 1 to 5, where 1 means that they are uninformed and 5 that they are very well informed.

According to the respondents' estimation, the average level of information about the organization of school work and/or the

Chart 5. Sources of information that provide the most information to teachers and institutions/persons they consult the most when having doubts -% of teachers who gave a score of 4, on a scale from 0 to 4



implementation of the educational process during the COVID-19 pandemic, measured on a scale of 1 to 5, is quite high and stands at **4.7** for principals and **4.6** for teachers. As many as 98% of principals and 95% of teachers rated themselves as highly informed (score 5) or well informed (score 4).

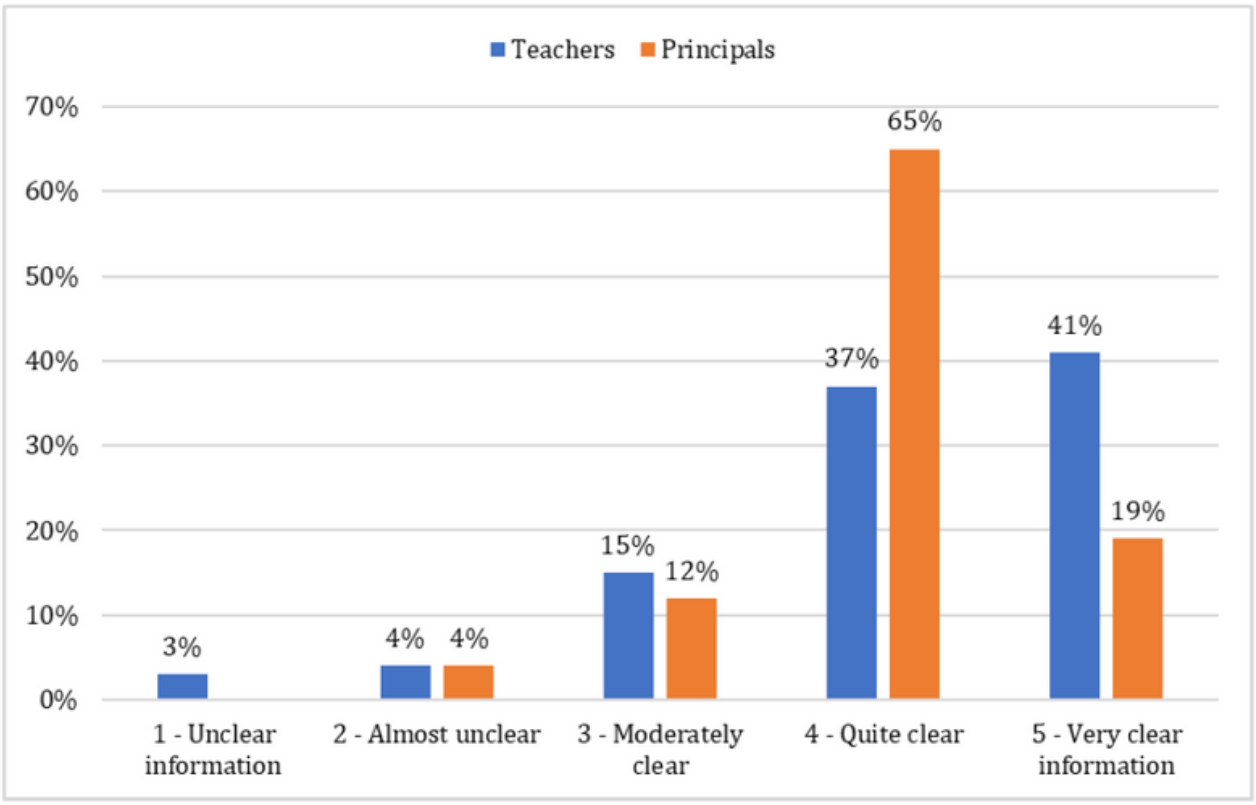
Slightly lower mean values were recorded for the degree of clarity of information received from the institutions in charge during the COVID-19 pandemic for both principals and teachers - the average degree of information clarity, measured on a scale of 1 to 5, is **4.1** for principals and **4.0** for teachers.

However, when looking more closely at the data on the degree of clarity of information, 16% of principals said that the information was almost unclear (score 2 - 4%) or moderately clear (score 3 -12%), while 22% of teachers thought that the information was unclear (score 1 - 3%), almost unclear (score 2 - 4%) or moderately clear (score 3 -15%) (Chart 6).

Both principals and teachers rated different **methods of communicating information** on a scale from 0 to 4, when 0 meaning that they did not use that particular method at all, and 4 that they primarily used that method.

Based on the obtained results, it can be concluded that, when it comes to methods of communicating information to teachers, students and parents **by principals** or to students and parents **by teachers**, all

Chart 6. Assessment of principals and teachers on the degree of clarity of information they receive regarding the organization of school work and the organization and implementation of the teaching process, on a scale from 1 to 5



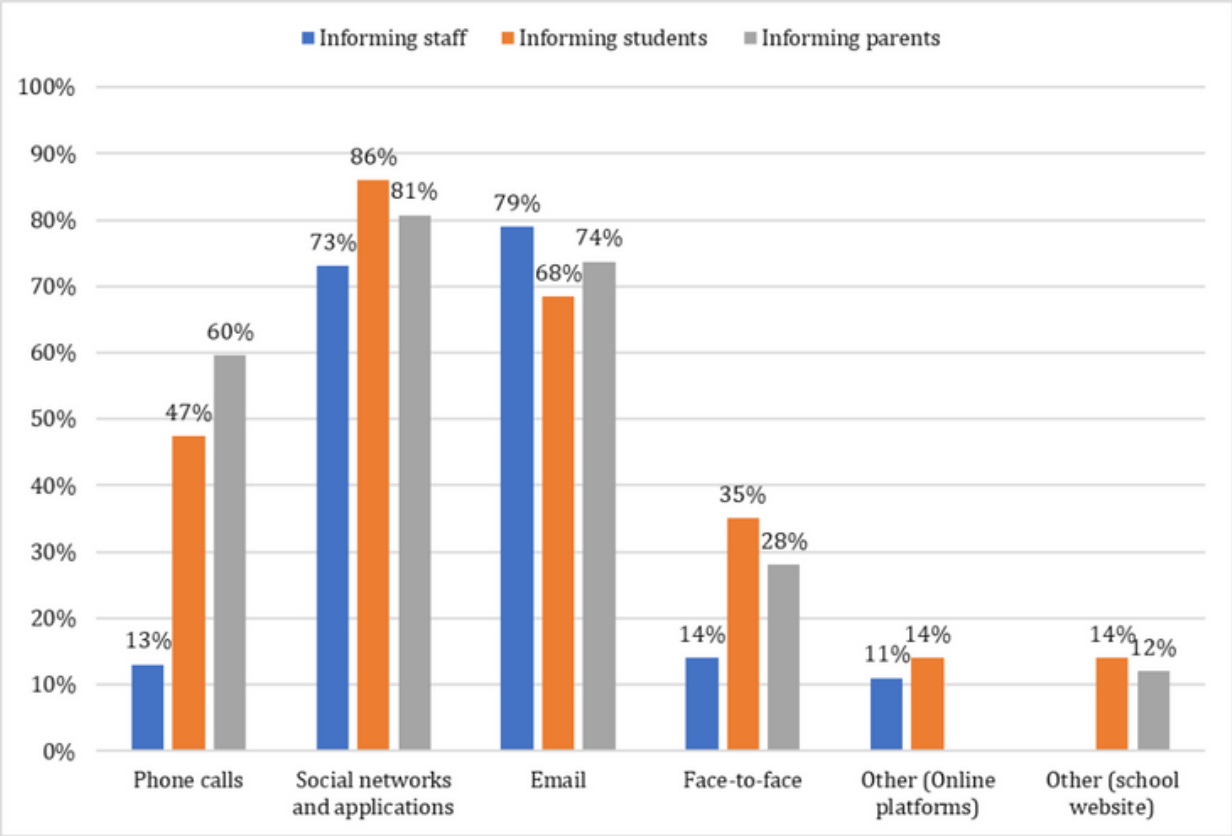
methods of spreading information to target groups were applied to some extent - face-to-face, over the phone, through social networks, applications and online platforms, as well as by sending emails.

The methods most used by principals (a score of 4, on a scale of 0 to 4) to inform the staff, students and parents are mostly the same - the two most used methods are social networks and applications (Viber, WhatsApp or Facebook) and email (Chart 7). Phone calls were widely used by 60% of principals in informing parents, and about half of principals also provided information to students by telephone (47%).

An interesting fact is that the face-to-face method of providing information was mostly used by principals when communicating with students and parents, (about a third of principals (35%; 28%), from all types of schools), however, not when it comes to the employees. This may come as a consequence of the anti-COVID-19 measures to reduce the spread of the virus that prohibits the large gathering of people indoors, so that principals maintained online communication with the staff and sporadically communicated with students and parents when they came to school.

Other methods of communicating information (which were not pre-defined in the questionnaire) include online platforms (mostly Google Classroom, Google Meet, Microsoft Teams) through which 14% of principals passed on information to students and 11% of them to the members of staff, as well as the school website that the principals used to inform students (14%) and parents (12%).

Chart 7. Methods of communicating information to staff, students and parents that the principals used the most -% of principals who gave a score of 4, on a scale from 0 to 4



It is important to note that a certain percentage of principals stated that they do not communicate directly with students (14%), nor with parents (11%), which should certainly include the aforementioned school website as an indirect way of communicating with these target groups.

The methods used most by teachers to inform students and parents differ slightly from the previously mentioned methods used by the principals (Chart 8).

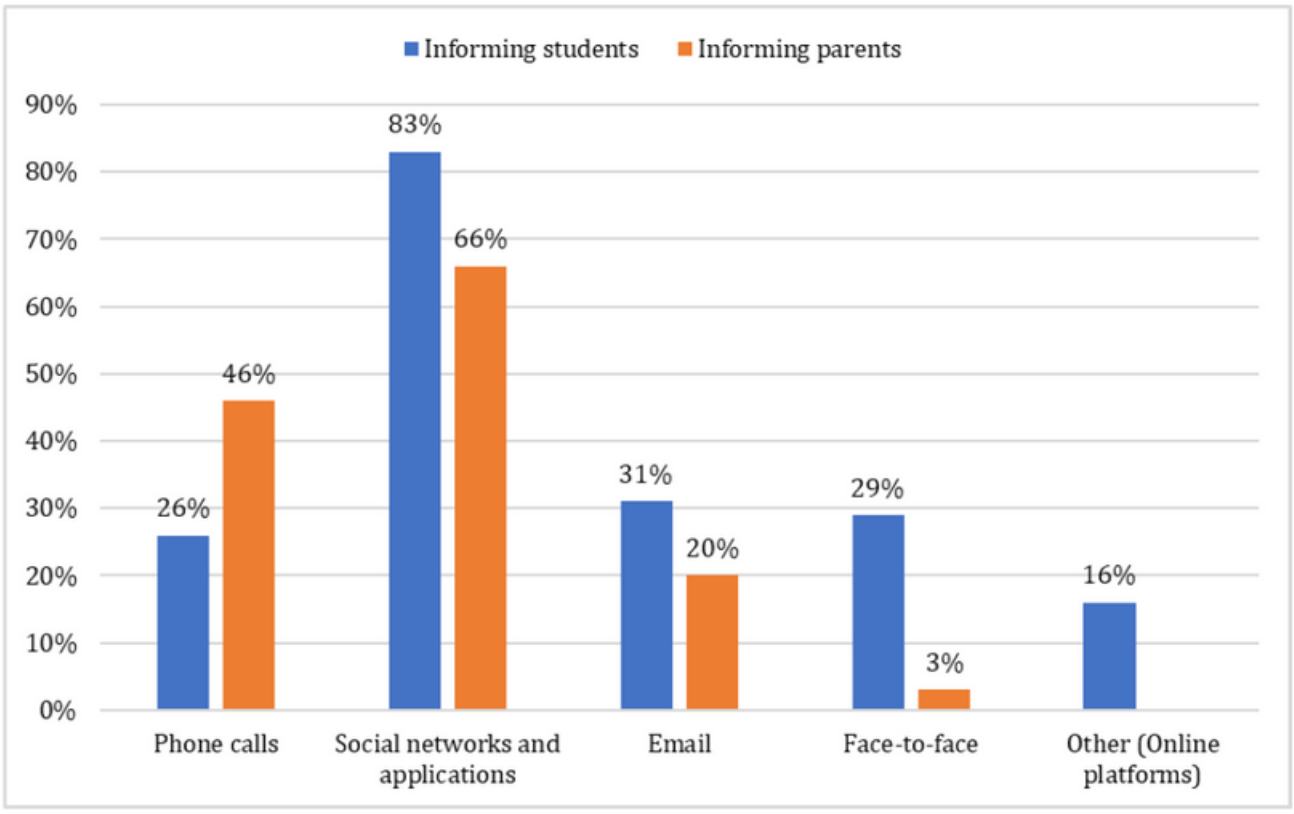
To provide information to students, the vast majority of teachers primarily used social networks and applications, i.e. Viber, WhatsApp, or Facebook (83%), about a third of teachers used email and face-to-face communication (31%; 29%), and to somewhat less extent phone calls (26%).

Of the other sources of information, teachers singled out online platforms, primarily the Google Classroom and Google Meet, as a way of passing on information to students (16%).

When it comes to informing parents, in addition to social networks and applications, for 46% of teachers phone calls were a very common method of communication, while a fifth of teachers largely used email.

Regarding email, it is worth to mention that, although 20% of teachers report they use this method for informing parents very often (score 4), 32% of teachers stated that they have never used email to provide information to parents (score 0). The same applies when it comes to communicating information to students - 31% of teachers use this method very often (score 4), while 26% of teachers state that they have never used email to inform students (score 0).

Chart 8. Methods of communication information to students and parents that the teachers used the most -% of teachers who gave a score of 4, on a scale from 0 to 4



It is important to note that a certain percentage of principals stated that they do not communicate directly with students (14%), nor with parents (11%), which should certainly include the aforementioned school website as an indirect way of communicating with these target groups.

The methods used most by teachers to inform students and parents differ slightly from the previously mentioned methods used by the principals (Chart 8).

To provide information to students, the vast majority of teachers primarily used social networks and applications, i.e. Viber, WhatsApp, or Facebook (83%), about a third of teachers used email and face-to-face communication (31%; 29%), and to somewhat less extent phone calls (26%).

Of the other sources of information, teachers singled out online platforms, primarily the Google Classroom and Google Meet, as a way of passing on information to students (16%).

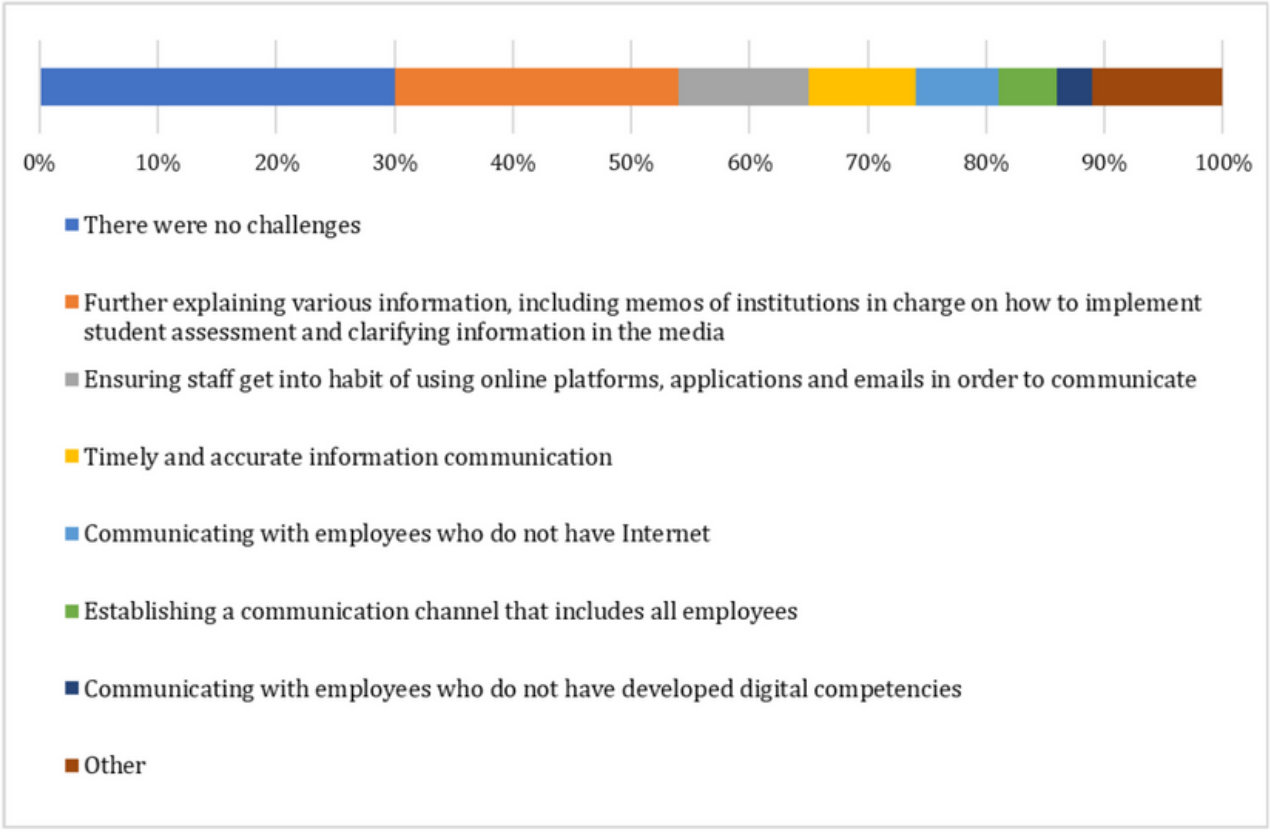
When it comes to informing parents, in addition to social networks and applications, for 46% of teachers phone calls were a very common method of communication, while a fifth of teachers largely used email.

Regarding email, it is worth to mention that, although 20% of teachers report they use this method for informing parents very often (score 4), 32% of teachers stated that they have never used email to provide information to parents (score 0). The same applies when it comes to communicating information to students - 31% of teachers use this method very often (score 4), while 26% of teachers state that they have never used email to inform students (score 0).

The percentage of those who reported they do not use email at all to inform parents is almost the same for teachers in both primary and secondary schools, but data show that this is more prevalent among teachers who teach in schools located in rural areas (55%), than with teachers from urban areas schools (24%). Teachers who stated that they do not use email at all to inform students mostly teach in primary schools (72%), and most of them in rural areas (61% rural, 39% urban). This implies that teachers from schools in rural areas use email less as a method of communicating information, especially to students in primary schools, which may be due to less developed ICT infrastructure in non-urban areas (see Table 6), have habit to be in more personal contacts since they belong to smaller communities, but also possibly less developed digital skills of younger students (primary school).

One-third of principals did not face challenges in informing the staff, but for almost a quarter of them, it was challenging to further explain and clarify various information to them, including memos from institutions in charge, especially regarding student assessment, as well as interpreting information from the media (24%). For 11% of principals, it was challenging to make employees get into the habit of using online platforms, applications and email for communication. In a slightly smaller percentage, challenges for the principals include providing information to the employees in a timely and accurate manner (9%), communication with employees who do not have internet (7%), the establishment of a single communication channel that would include all employees (5%) and communication with employees who do not have developed digital competencies (3%). Among other challenges, those that stand out are that teachers could not decide which online platform to use, that principals could not find a replacement for teachers who were on sick leave, and the fact that it was a huge change for the whole school (11%) (Chart 9).

Chart 9. Challenges faced by principals in informing employees



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 (33%). One-fifth of principals did not face any challenges in informing parents (21%). Less common challenges include providing information to the parents in a timely and accurate manner (13%), ensuring that parents get into the habit of using online platforms, applications, and email (8%), and among other challenges (25%) the following issues were highlighted - a large number of incorrect email addresses or telephone numbers of parents, the parents' absence from the place of residence and their full-day work (mostly Roma parents), as well as the low level of parents' interest in their children's education (Chart 10).

While for a third of principals there were no **challenges in informing students** (32%), for the same number of them the biggest challenge was informing students who do not have the technical equipment and/or internet (32%).

For 11% of principals, the challenge was that students were not engaged enough or were not motivated enough to attend distance learning, and for 7% of principals, the challenge was that students did not regularly follow the information provided to them. Other challenges (18%) include the division of classes into groups and the fact that students were late in completing the required tasks (Chart 11).

When asked to give an example of **best practice in communicating information** to any of the aforementioned target groups (employees, parents, students), if they believe that such exists in their schools, 35% of principals responded. Therefore, when it comes to informing students, as an example of best practice opening of personal Microsoft Teams accounts for all students is stated, which, apart from the usual ways of providing information (such as using Viber groups, Google Classrooms, etc.), according to the principals greatly facilitated communication with students.

The highest percentage of **teachers state that there were no challenges in informing parents** (38%).

Chart 10. Challenges faced by principals in informing parents

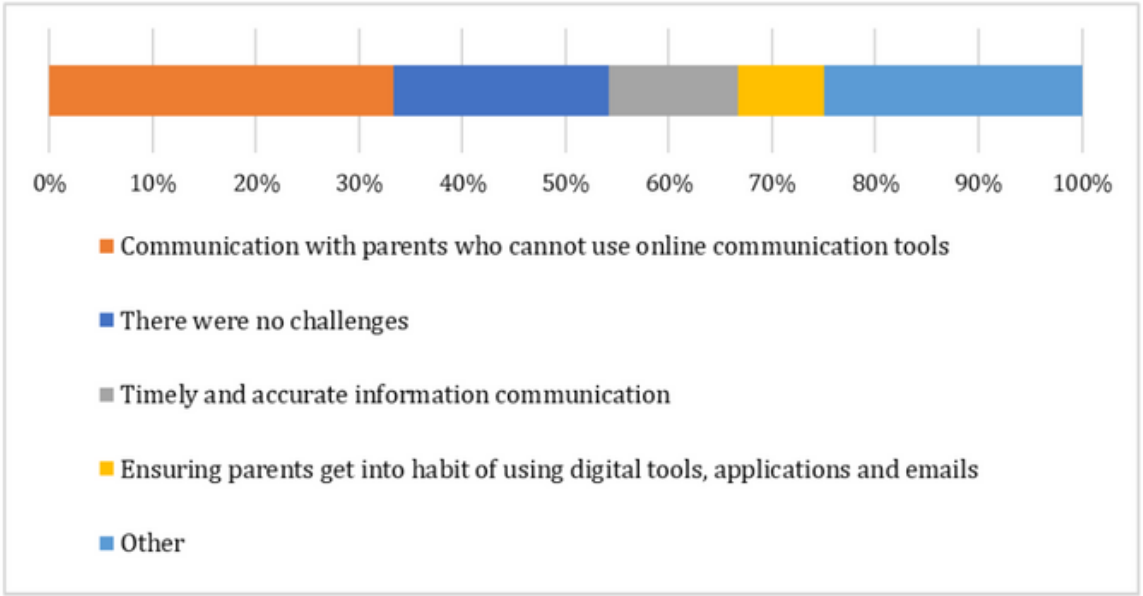
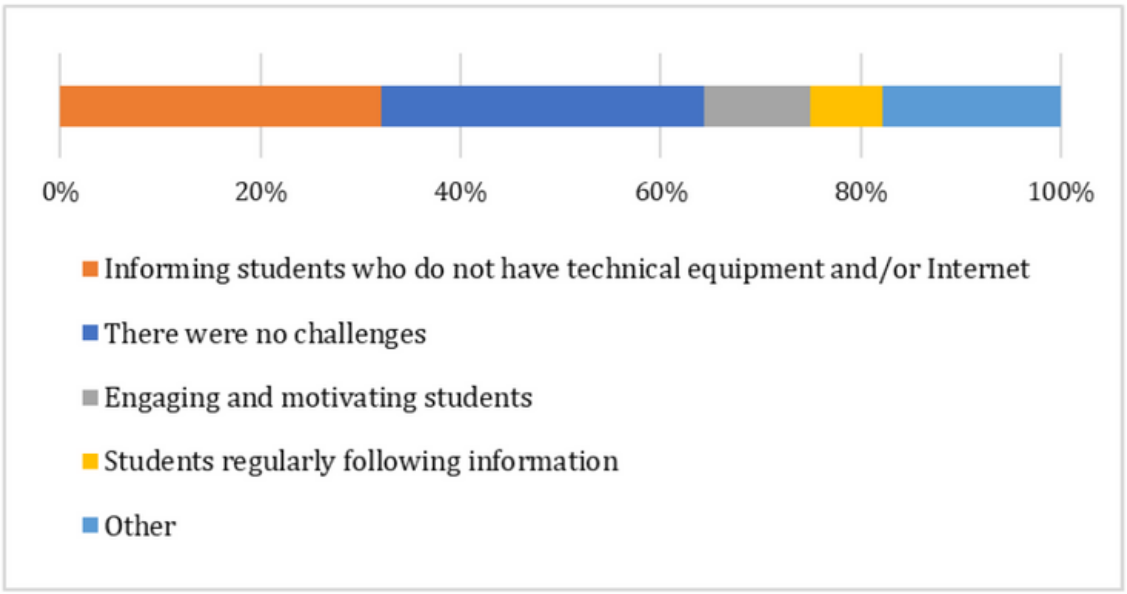


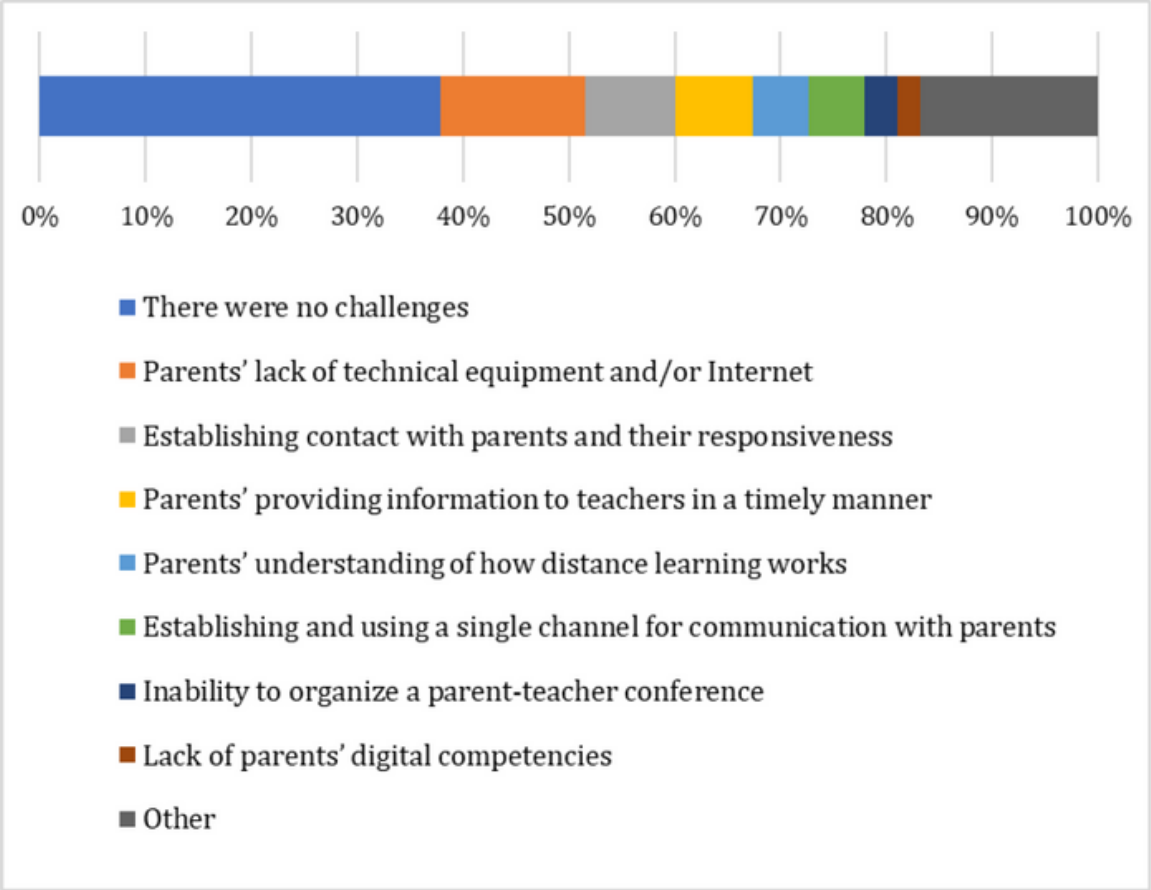
Chart 11. Challenges faced by principals in informing students



For 14% of teachers, the biggest challenge was that they could not communicate with parents who did not have adequate technical equipment or the Internet (largely parents from vulnerable groups). Establishing contact with parents and their responsiveness was a challenge for 8% of teachers, which may be related to the previously mentioned challenge, as well as the challenge of parents' unfamiliarity with online teaching (5%) and lack of their digital competencies (2%). It is possible that parents, due to the lack of technical devices, the Internet and digital skills, found it more challenging to understand the way online teaching works, and were not able to establish regular contact with teachers. Other challenges that teachers reported to a lesser extent are the timely transfer of information from parents to teachers (7%), the establishment and use of a single channel for communication with parents (5%), which is related to the inability to organize the parent-teacher meetings as a way to quickly and simply pass information to a large number of parents (3%). Among other challenges (17%), the most notable are the confusion and dissatisfaction of parents regarding the organization of distance learning, responding to parents' questions regarding claims from the media, as well as the fact that some parents, according to teachers, did not take seriously the measures school implemented for the protection against COVID-19 virus (Chart 12).

A high percentage of teachers also think that **informing students** was not challenging (45%), however, the challenge faced by most teachers is communication with students who lack technical equipment and/or the Internet (18%). For a smaller percentage of teachers, the challenges were responsiveness of students, specifically their activity during classes (10%), lack of students' digital competencies (5%), students failing to regularly follow the information (2%), and challenges that were not directly related to informing, such as student assessment (2%) and explaining lesson content within online classes (2%). Among other challenges (16%) teachers think that students do not have a developed sense of appropriate time to communicate with teachers (e.g. they send messages to teachers at night). Also, teachers reported difficulties in cooperation

Chart 12. Challenges faced by teachers in informing parents



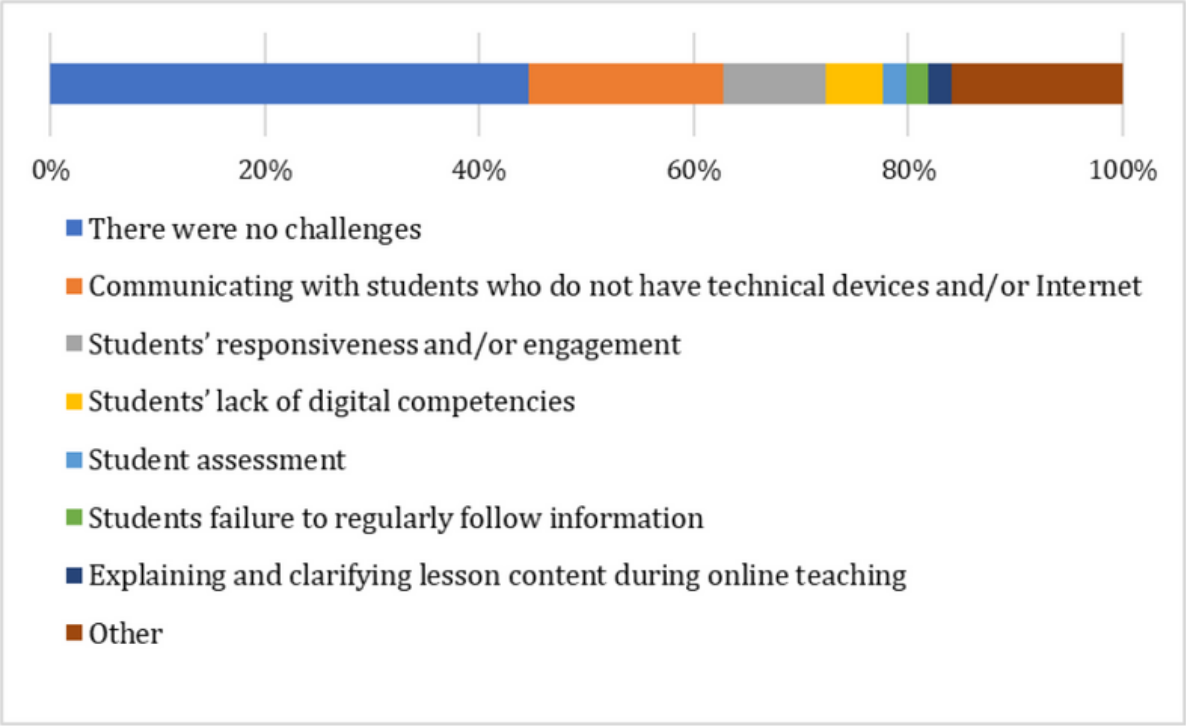
with students and parents whose family members were infected with the COVID-19 virus, as well as students' non-compliance with health protection measures (Chart 13).

When asked to give an example of **best practice in communicating information** to students or parents, 60% of teachers responded, pointing out as an example of best practice the use of Microsoft Teams platform for the purpose of informing and communicating with students in addition to usual means of providing information (Viber groups, Google classroom, etc.), which is an example given by the principals as well.

5.2. Organization of school work, technical equipment and digital competencies of teachers

The organization of work and the management of the school in the COVID-19 pandemic required major changes and adapting to the emerging situation from everyone, including school principals. This situation has produced numerous **challenges that principals have encountered** and which, in their opinion, have impacted their work and the work of the school with varying intensity.

Chart 13. Challenges faced by teachers in informing students



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. Since a high percentage of principals estimated many challenges to be on the higher end of the scale (scores 3 and 4), their impact is presented cumulatively on a chart below (Chart 14).

As many as 81% of principals rated the planning and organization of online teaching as a big or a very big challenge. For more than two-thirds of principals, coordinating the work of employees (73%), as well as monitoring and implementation of health protection measures for students and employees (70%) were big or a very big challenge. For more than half of the principals, communication with parents was a big or a very big challenge (59%), and for a little less than half of the principals, fulfillment of administrative obligations was also intensely challenging to a high or the highest degree (46%).

That the implementation of online teaching was a big or a very big challenge for principals is confirmed also by the data received on **technical equipment of schools or the lack of it** (Chart 15). They reported the lack of computers/laptops (72%), followed by tablets (37%), software for existing equipment (31%), and the Internet (17%) as the biggest issues. A relatively small percentage of principals stated that schools lack nothing (17%). Among other things (2%), they highlighted that the school was unable to provide all teachers with technical working conditions and that teachers, therefore, used personal equipment to conduct online classes.

Teachers assess the technical/infrastructural conditions they lack somewhat differently (Chart 16) - they mostly reported that they lack computers or laptops (54%), the Internet (21%), and to a lesser extent tablets (11%). A significant number of teachers estimate that they lack nothing (38%).

Chart 14. Challenges related to school management encountered by principals -% of principals who gave scores 3 and 4, on a scale from 0 to 4

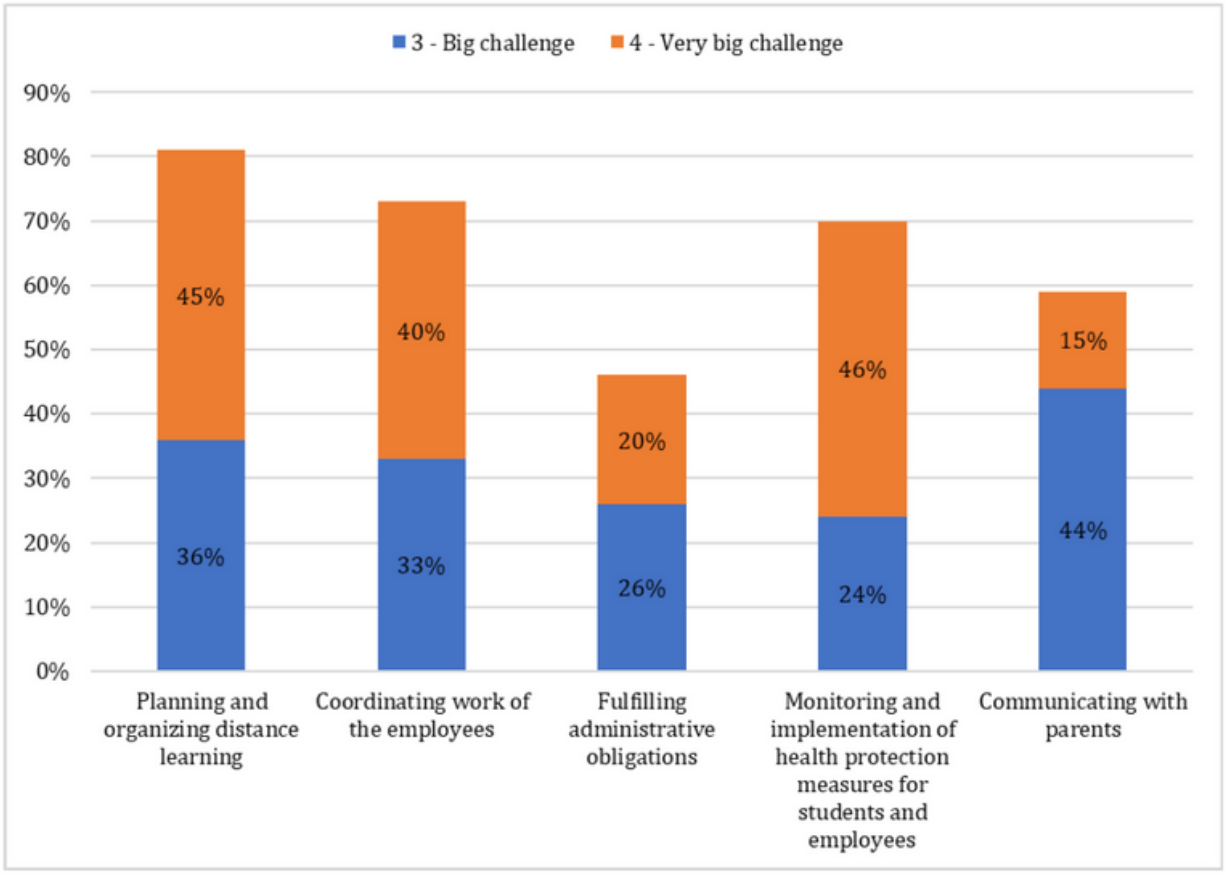


Chart 15. Technical equipment and infrastructure that schools lack according to the principals' estimation

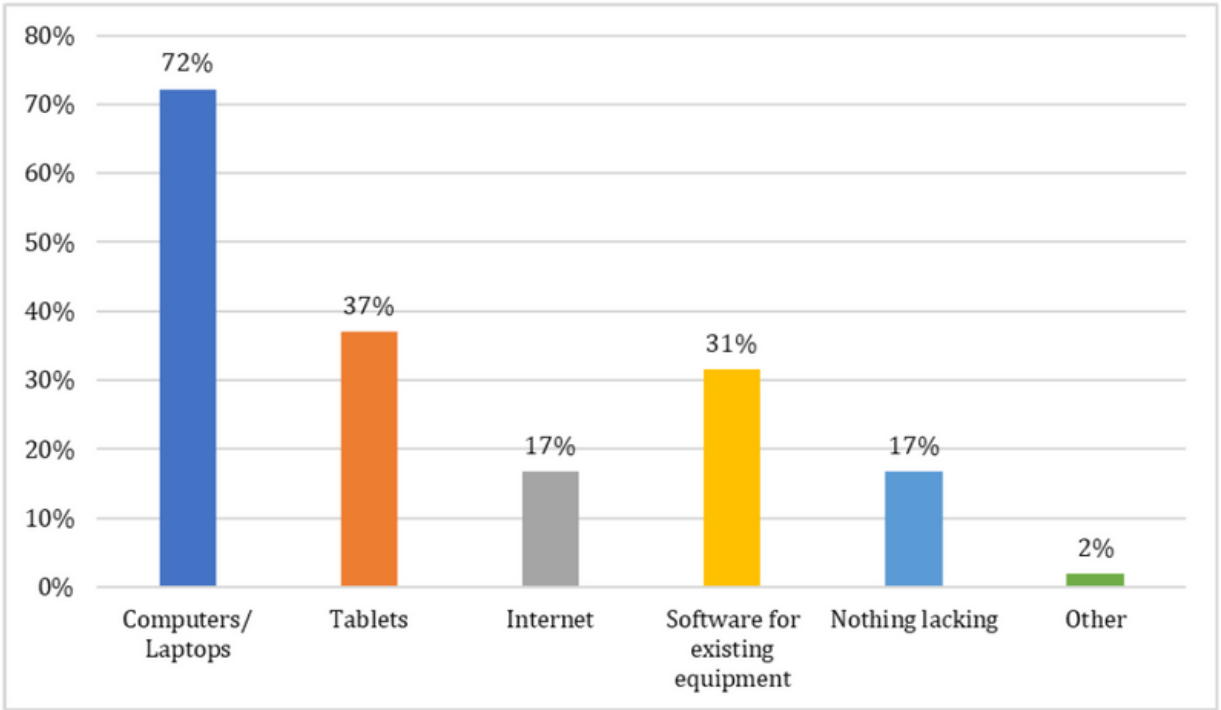
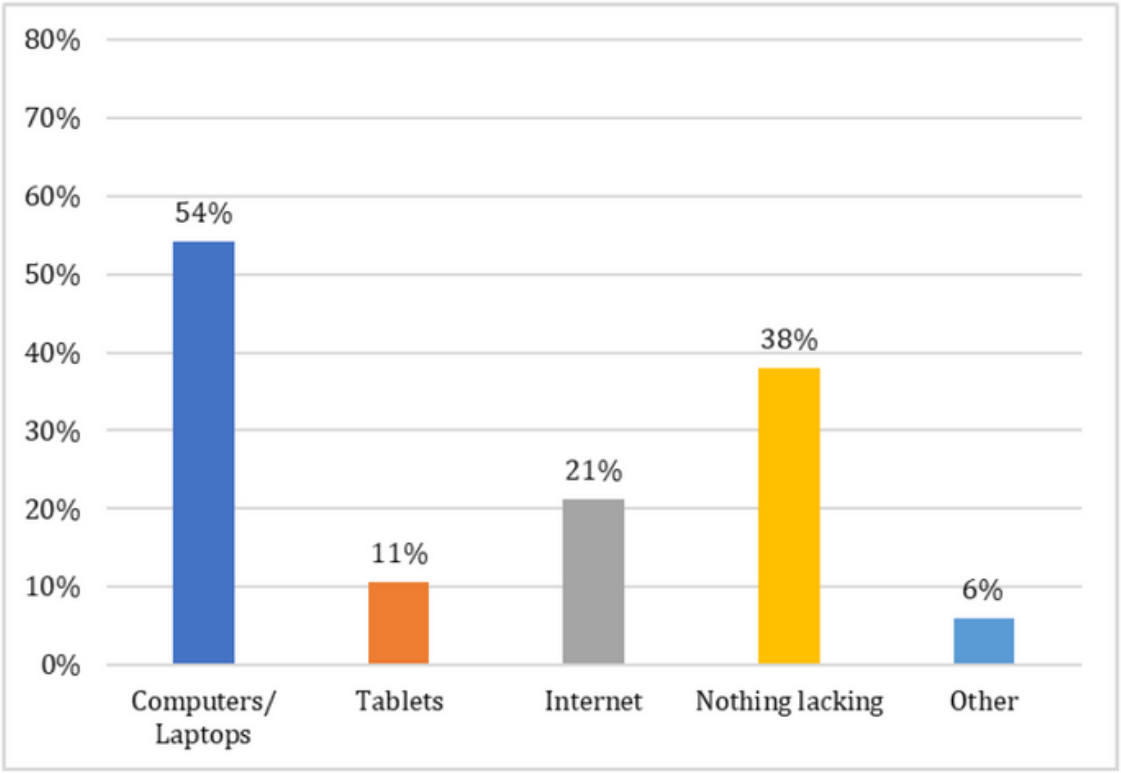


Chart 16. Technical equipment and infrastructure that teachers lack according to their estimation



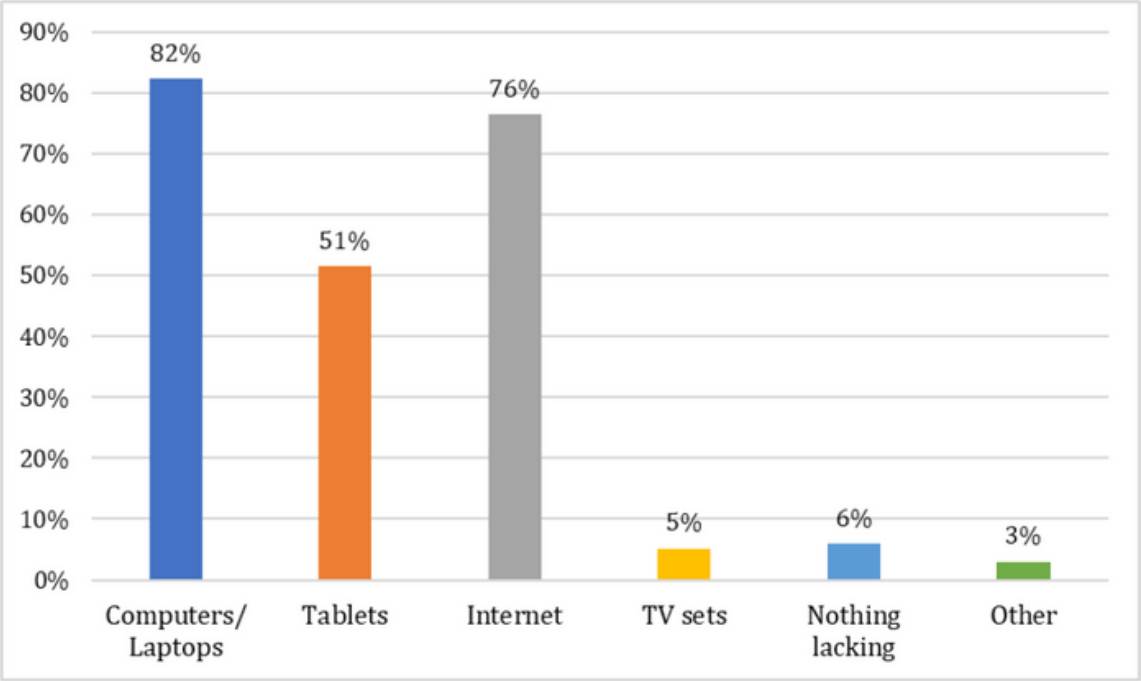
Among other issues (6%), teachers reported that they have problems with obsolete computers/laptops, which often break down, that they use personal technical equipment for teaching purposes, and that they often have only one computer/laptop in their household that other members need to use.

When it comes to **equipment students need** to participate in distance learning/online teaching (Chart 17), teachers and principals estimate that the lack of computers or laptops is the most common issue (82%), and that the lack of Internet is much more of a problem for students (76%) than the teachers or the school. Tablets are also what principals and teachers have estimated that the students lack to a significant extent (51%). Principals and teachers reported that a lack of TV sets is a minor issue for students (5%), and only 6% of principals and teachers estimate that students lack nothing.

Among other disadvantages (3%) they noted that, although students mostly have smartphones that can be used to access the Internet, those are not devices that enable them to attend and participate in online teaching in the best way.

In times of the COVID-19 pandemic, the **digital competencies of teachers** are crucial for the organization and implementation of teaching. Since the aim of the research is to examine how schools reacted and how ready they were to conduct online teaching, data related to teachers who participated in professional development activities intended to develop their digital competencies before the COVID-19 pandemic was also collected. Participation in at least one training event dedicated to teachers' digital competencies development in the last two years was defined as the minimum of training needed to acquire the necessary competencies.

Chart 17. Technical equipment and infrastructure that students lack according to the estimate of principals and teachers



A quarter of principals estimate that about 60-70% of teachers at the school level have attended at least one in-service training event dedicated to teachers' digital competencies development in the last two years, and the same percentage of them reported that 80-90% of teachers at the school level participated in such training events before COVID-19 pandemic.

According to the principals, there are no teachers in any school who have not attended in-service training events in this area, and 11% of principals estimate that all teachers have attended training events for developing digital competencies of teachers in the set timeframe (Table 12).

Table 12. Percentage of teachers who participated in in-service training activities related to the development of digital competencies before the outbreak of the COVID-19 pandemic, according to the principals' estimate

Professional development of teachers in the field of digital competencies	Principals' estimation
Teachers did not attend in-service training	0%
Only teachers of Informatics	2%
About 10% of teachers	11%
About 20-30% of teachers	13%
About 40-50% of teachers	13%
About 60-70% of teachers	**26%**
About 80-90% of teachers	**24%**
All teachers	11%

Teachers provided similar answers (Chart 18). Before the COVID-19 pandemic, most teachers frequently attended training events that develop their digital competencies (60%), slightly more than a third of teachers also attended such training events but rarely (36%), and only 3% of teachers did not attend any training event for developing digital competencies of teachers before the outbreak of 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 that the 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.

The data obtained from the principals show that the most frequently used sources are local self-government funds (60%) (Chart 19). About a third of the principals stated that they used the school funds to a large extent (31%), and a fifth that they obtained the equipment through donations (19%). The fewest number of principals rated private and project funds as the most used (2%; 9%).

Chart 18. Attendance of training events that develop digital competencies of teachers before the outbreak of COVID-19 pandemic, according to their assessment

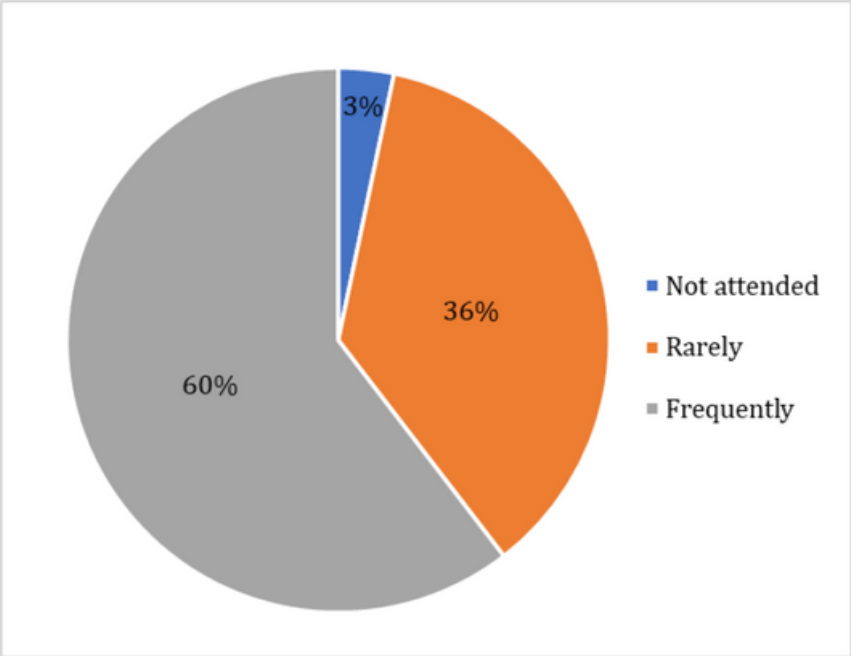
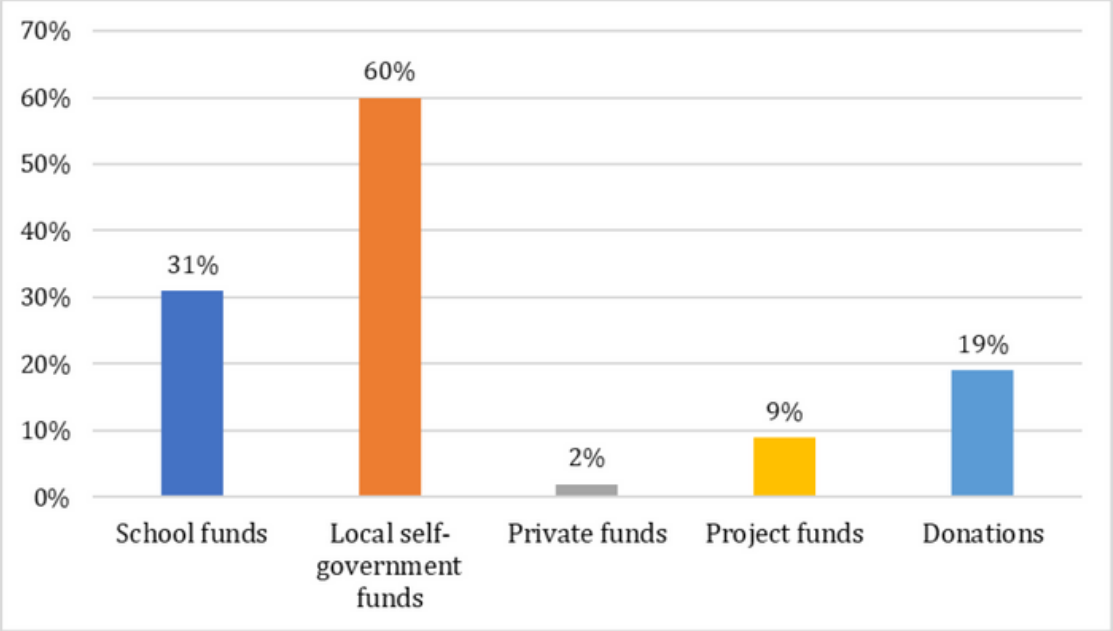


Chart 19. Sources most used to procure protective equipment against of COVID-19 -% of the principals who gave a score of 4, on a scale from 0 to 4



5.3. Organization and implementation of the teaching process

Based on the data collected from principals and teachers, the conclusion is that the most **prevalent way of organization and implementation of teaching process** was the combined model (67%), while in second place, but much less represented, is the blend of combined model and attending distance learning/online teaching (14%) (Chart 20). Under the blend of the combined model and distance learning/online teaching, principals and teachers meant a situation in their schools when, in addition to the combined model, there was a certain, higher than average, percentage of students who attended only distance learning/online teaching.

As regards instruction modalities concerning the type of school - the combined model is again predominant (Chart 21).

The blend of combined model and distance learning/online teaching is most prevalent in secondary vocational schools (8%), less in primary schools (4%) and even less when it comes to general secondary schools (2%). Primary schools used a various combination of ways of organizing the teaching process during the COVID-19 pandemic.

The data in the table below support the previous statements[27].

Principals estimated that in schools, in the majority of cases, 1-5% of students per school attended **exclusively distance learning/online teaching** (71% of principals). When it comes to the type of school in which principals are employed, those employed in primary schools (PS) and secondary vocational schools (SVS) are more likely to estimate that a higher percentage of students (6-10% and 11-15%) attend only distance learning/online teaching (11%; 7%), comparing to general secondary schools (GSS) and secondary art schools (SAS).

[27] As schools do not have precise data, and since the situation often changes, in this case the conclusions were based on the perception of principals and teachers, and not on precise and official records.

Chart 20. General representation of various ways of organizing teaching process during the COVID-19 pandemic

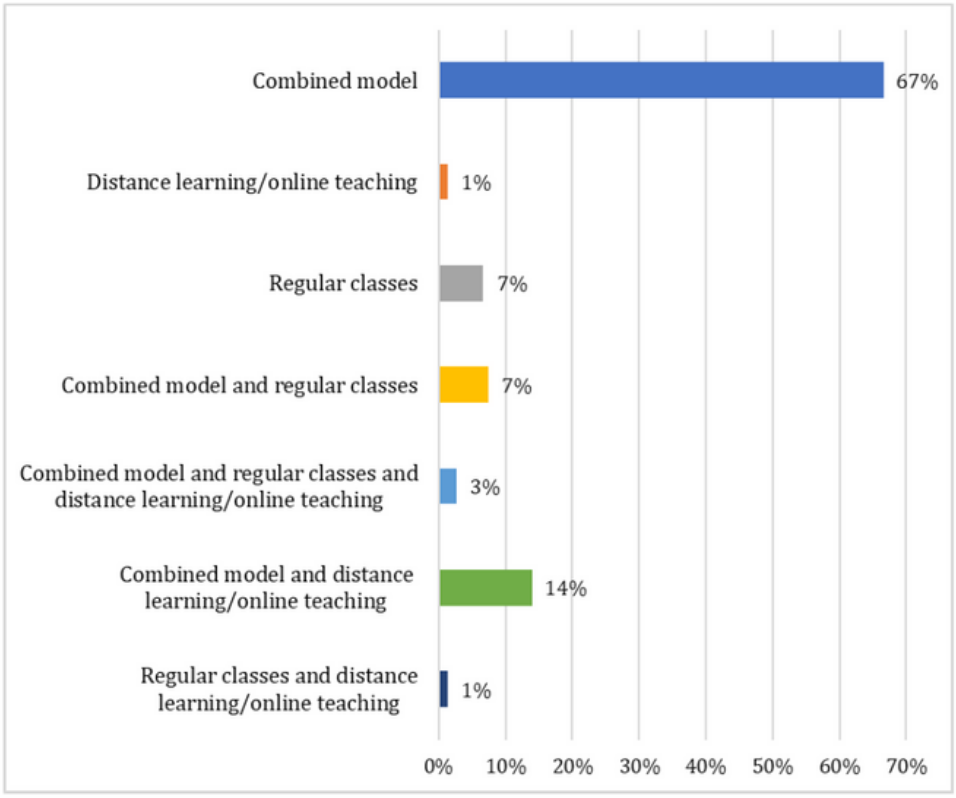


Chart 21. Representation of different ways of organizing teaching process during the COVID-19 pandemic in relation to the type of schools

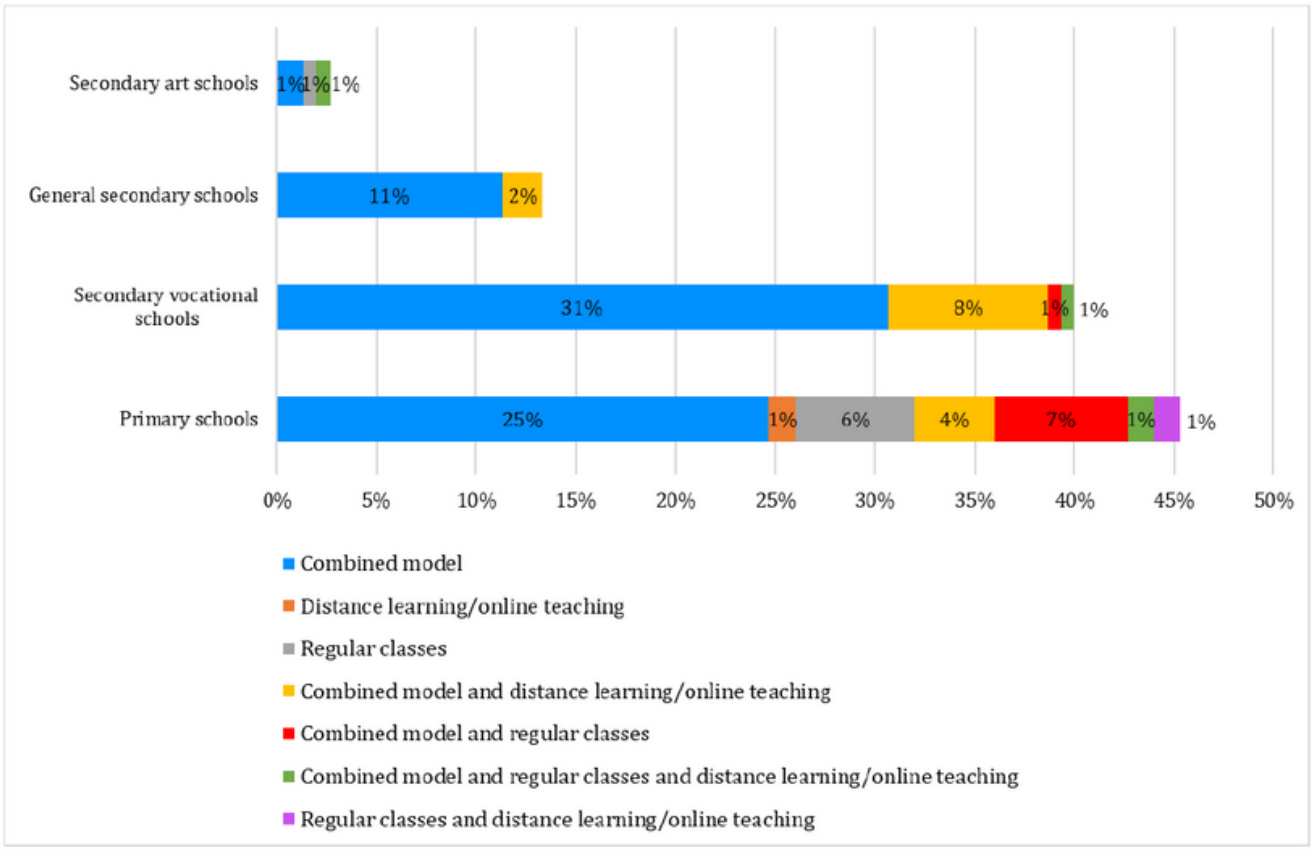


Table 13. Approximate percentage of students who attended only online teaching during the COVID-19 pandemic, according to the principals' estimation and the type of schools

Percentage of students who attend only distance learning/online teaching	Principals' estimation			
	PS	SVS	GSS	SAS
0%	2%			
1 - 5%	**28%**	**22%**	**19%**	2%
6 - 10%	**7%**	**7%**	2%	
11 - 15%	**4%**			
Over 15%	2%		2%	

When it comes to **access to distance learning/online teaching that is conducted via the Internet or television**, the significant percentage of teachers (38%) estimated that a small percentage of students (1-5%) do not have access to teaching that is conducted via the Internet and these are primarily primary school and secondary vocational school teachers (Table 14) from both environments (rural and urban). Also, teachers from the same schools estimate that a higher percentage of students (6-10%, 11-15%, 16-20%) do not have access to online teaching conducted via Internet (25%; 8%; 12%). Primary school teachers who estimated that a higher percentage of students do not have access to online instruction mostly work in schools located in rural areas (70%). When it comes to distance teaching that is accessed through television, also primary school teachers, almost half of whom work in schools from rural areas, and secondary vocational school teachers from both areas estimate that 1 - 5% of students does not have access to distance teaching which is conducted via television (23%; 21%).

The conclusion is that primary school students from rural areas and secondary vocational school students had less access to teaching that is conducted via the Internet and television, according to teachers.

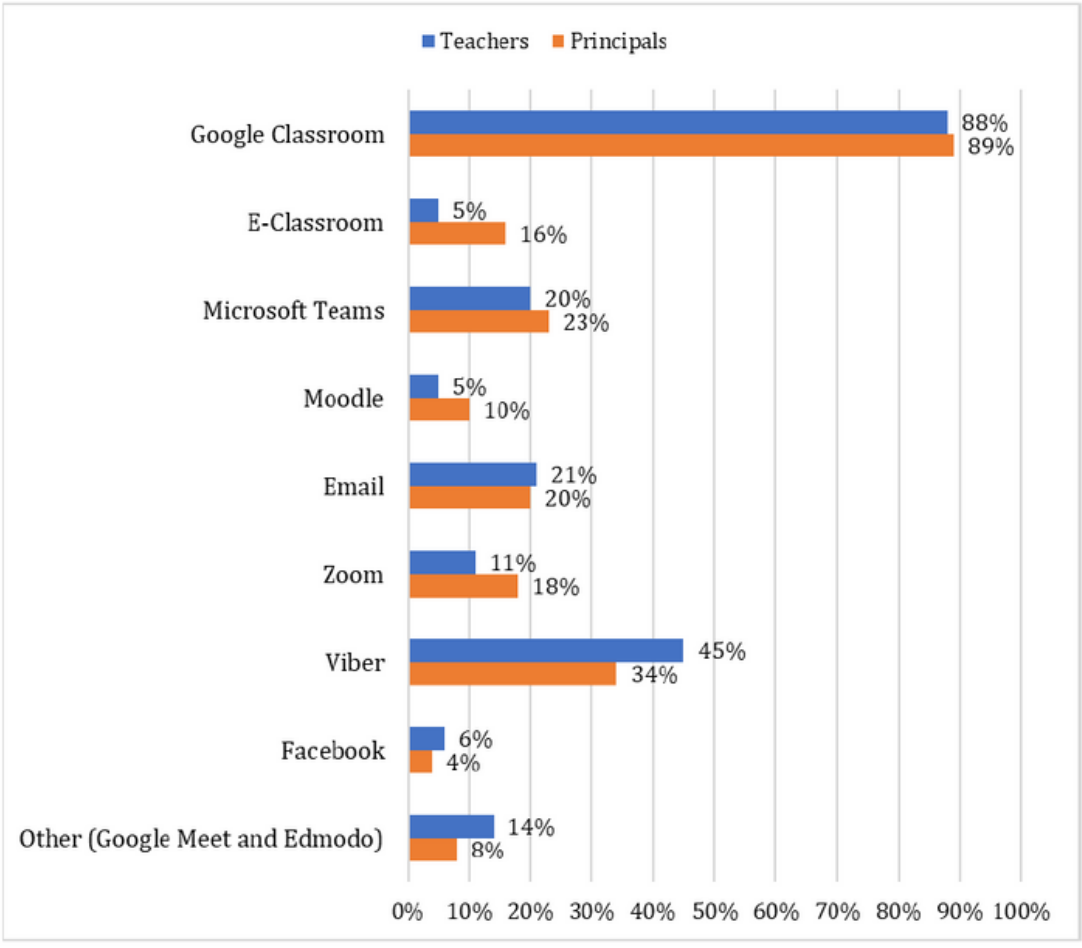
The assumption is that in rural areas there is a less developed infrastructure that prevents access to online teaching via the Internet, and that access to distance teaching that is conducted via television depends on the socio-economic conditions of families. In this regard, the situation regarding the percentage of secondary vocational school students attending only online teaching and the percentage of secondary vocational school students not having access to online teaching should be the subject of some future research and deeper analysis because a large number of students who attended secondary vocational schools tend to come from disadvantaged families and vulnerable groups (Videnović and Čaprić, 2020).

To **conduct online instruction**, teachers predominantly used the Google Classroom (Chart 22). In second place in terms of representation is Viber, which although intended to be used as a means of communication but also served teachers for online teaching. Such findings are in line with the results of a survey conducted by the Institute for Improvement of Education in May 2020, which shows that teachers' practices have not changed significantly in the meantime.

Table 14. Approximate percentage of students who have no access to distance learning/online teaching that is conducted via the Internet or television, according to teachers estimate and the type of schools

Percentage of students who have no access to distance learning/online teaching that is conducted via the Internet or television	Via the Internet				Via television			
	PS	SVS	GSS	SAS	PS	SVS	GSS	SAS
0%	1%	1%	1%		11%	24%	7%	1%
1 - 5%	**12%**	**24%**	1%	1%	**23%**	**21%**		
6 - 10%	**12%**	**13%**			4%	2%		
11 - 15%	2%	**6%**			2%			
16 - 20%	7%	5%						
21 – 30%	2%	1%			1%			
Over 30%	5%				1%	1%		

Chart 22. Online platforms and means of communication through which teachers conducted online teaching, according to the principals' and teachers' estimates



When it comes to **how teachers have selected** online platforms, tools or means of communication to use, the perceptions of principals and teachers differ to some extent (Chart 23). Principals mostly suggest that teachers made a choice based on previous experience in use (66%), while a third of teachers (34%) agree with that. Teachers mostly state that they selected online platforms, tools or means of communication based on the recommendation of the authorities (44%), while a fifth of principals (22%) agree. An interesting fact is that in the opinion of both - principals and teachers, teachers made their choice based on personal affinities the least (6%; 10%), which may be the result of an attempt to use as few different ways of conducting online instruction as possible. Asked about other ways of selection, both principals and teachers point out that the choice was made based on decisions at the school level (at teachers' or professional assemblies) (5%, 6%).

Since most schools have implemented the combined teaching model, which means that students were divided into groups and took turns attending classes in school and online, data were collected on **which activities teachers carried out using the aforementioned online platforms, tools, and means of communications**. Teachers mostly used them to provide various information to students (82%), to assign homework (64%), and to offer additional explanations to students about the subjects' content (56%). To a lesser extent, they used online platforms, tools and means of communication for formative assessment (28%), class head teacher activities (28%), and least of all for the preparation or implementation of extracurricular activities (11%) (Chart 24).

It is important to highlight that, even in the **context of conducting regular classes (in primary schools**), the use of ICT was very widespread (Chart 25) - more than half of

Chart 23. The manner used by teachers for selection of online platforms, tools and means of communication for online teaching

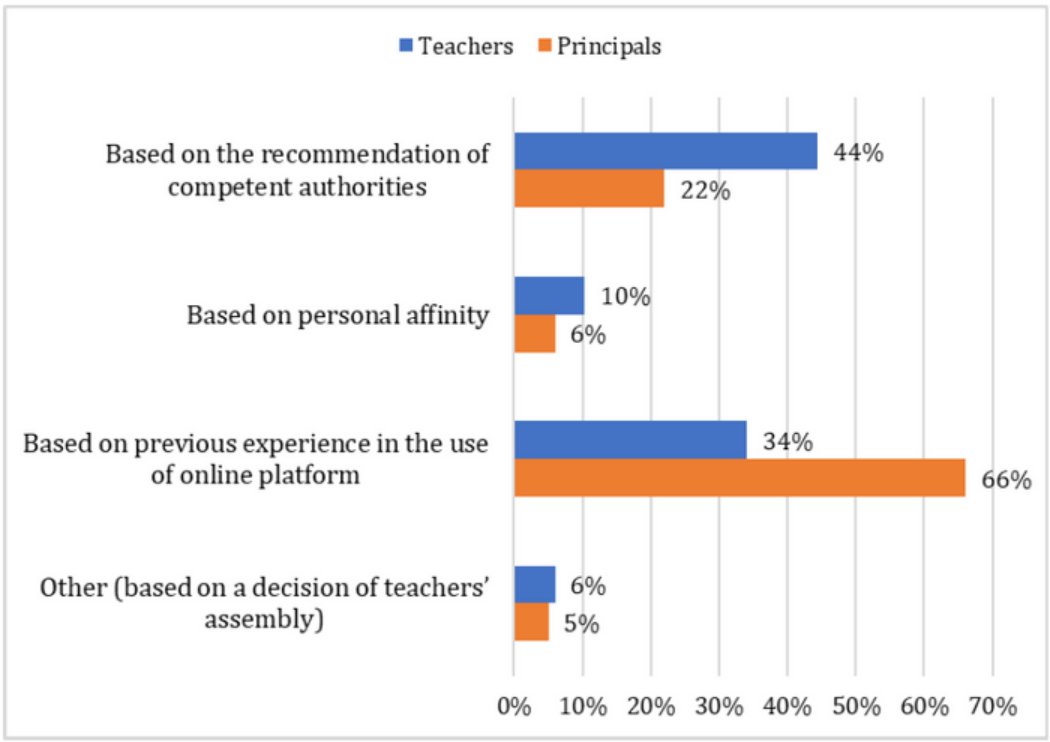
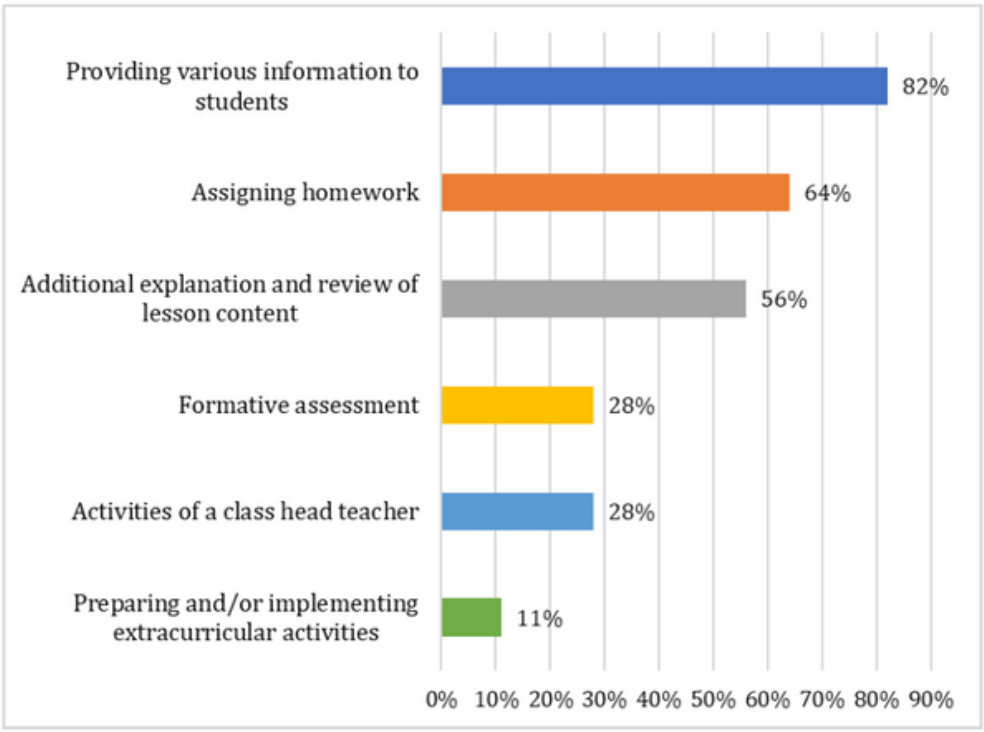
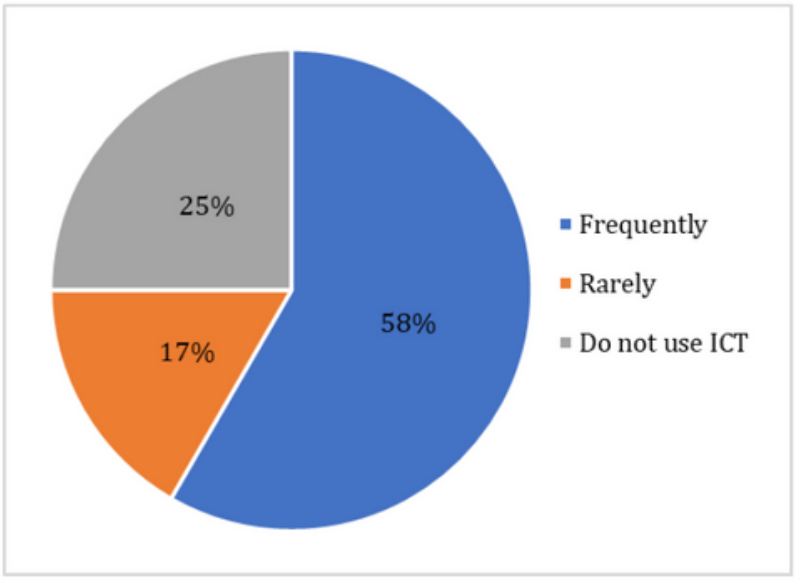


Chart 24. Activities conducted by teachers using online platforms, tools and means of communication, in implementing the combined model



teachers of primary schools that students regularly attended during the COVID-19 pandemic often used online platforms, tools or means of communication in order to give feedback to students, assign homework, and he like (58%). A considerably smaller number of teachers stated this was rare (17%), while 25% of teachers did not use ICT in regular classes.

Chart 25. Representation of ICT use among teachers of primary school in which classes were conducted regularly



In addition to using the mentioned online platforms, tools and means of communication, teachers largely **created and used digital materials** (Chart 26). The vast majority of teachers (75%) often used and created digital materials for distance teaching, significantly fewer teachers rarely did so (24%), and only 1% never did so. When it comes to the mutual exchange of digital materials, teachers were less engaged in this regard, and, roughly, half of the teachers often exchanged digital materials with other teachers (47%), slightly less than half of the teachers rarely did so (41%), while 10% of teachers never exchanged digital materials with other teachers.

The extent to which the **activities carried out by teachers have changed** due to the switch to distance learning is shown below (Chart 27). In short, the two biggest changes are related to practicing group work and homework assignments. Almost half of the teachers estimated that students' group work is **less** practiced in distance classes (46%), and slightly fewer teachers reported giving **more** homework assignments for the same reasons (40%).

An interesting fact is that with a small number of teachers, these two particular changes were represented differently - 3% of teachers assigned fewer tasks, and 4% of teachers used group work more. What less than a third of teachers agree on is that they conducted less oral testing, compared to the period before the COVID-19 pandemic (27%), which resulted in giving more written tests (23%). For a small number of teachers, the written test was less represented (5%). What was also conducted to a much lesser extent was practical work (12%) and extracurricular activities (5%). A third of teachers used digital content in teaching more than before (35%), and for a certain number of teachers, the independent research work of students increased (16%).

When it comes to **teachers cooperation with parents aimed at providing support to students** during the COVID-19 pandemic, 91% of teachers said that they cooperate with parents either by phone or Viber groups and usually related to students' progress, including discussion on the reasons why students have poor performance but also to give students praise.

Chart 26. Representation of the use, creation and exchange of digital materials among teachers

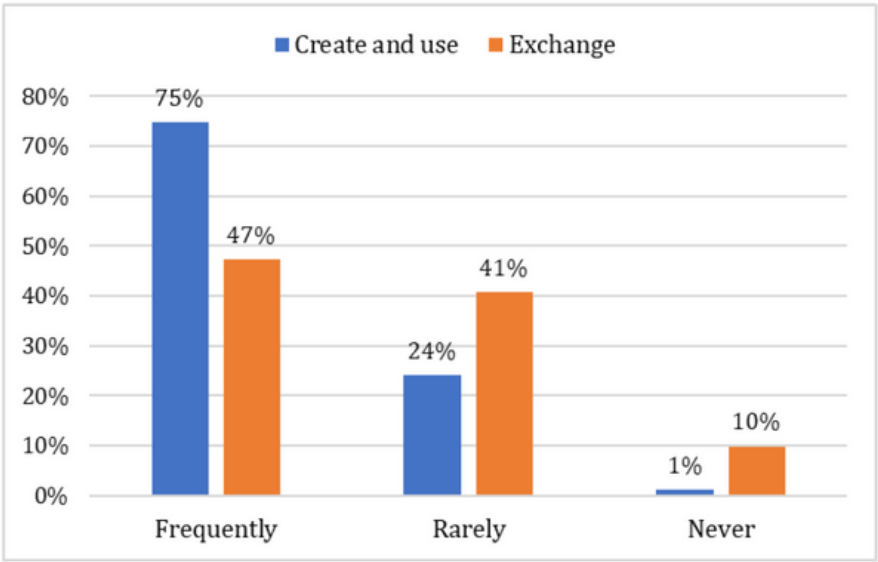
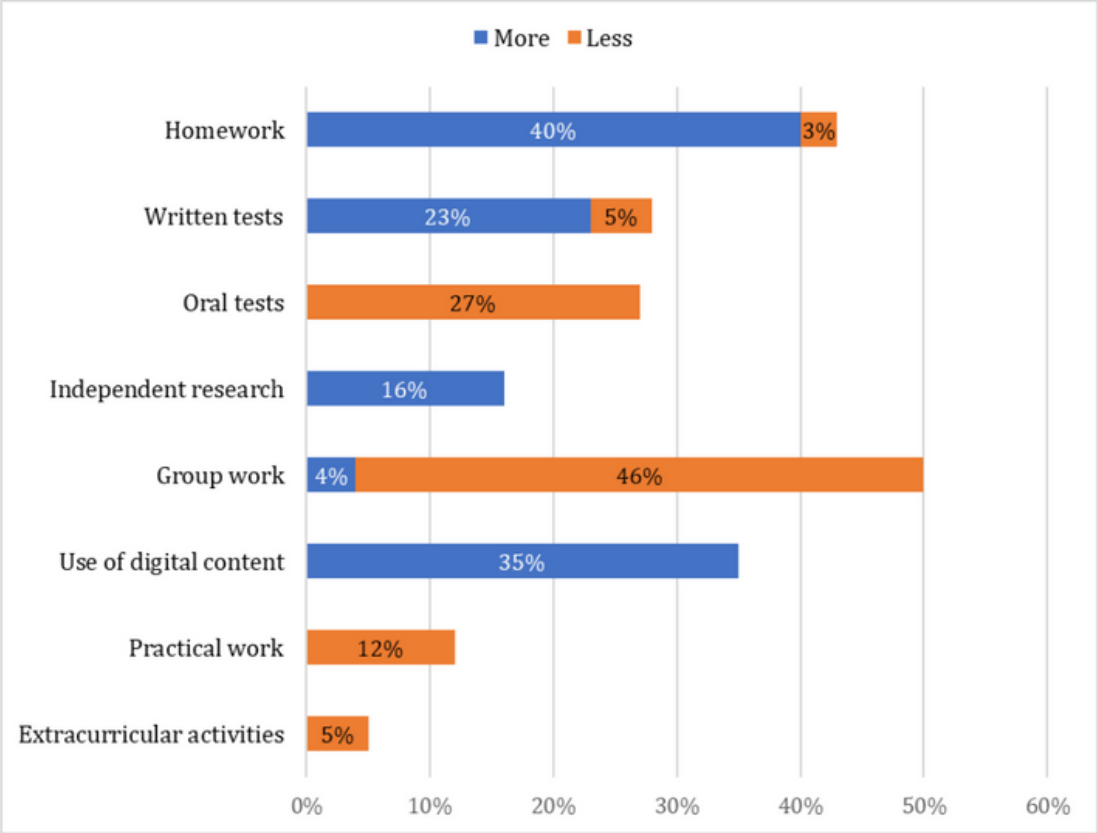


Chart 27. Activities conducted by teachers to a greater and lesser extent due to the COVID-19 pandemic



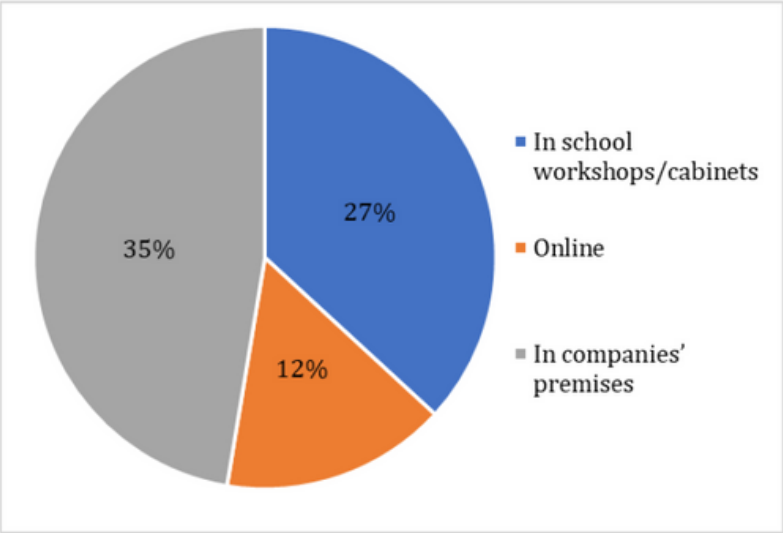
Another reason why teachers collaborate with parents is to determine the reasons why students do not attend classes and to provide support to parents whose children cannot attend distance learning in a way to encourage parents to freely express their needs so that the school might provide support.

Considering the specificity of **practical teaching/work-based learning**, which is an integral part of secondary vocational education (SVS) curriculum, teachers from those schools were asked to estimate how was it implemented during pandemic (Chart 28). The conclusion is that practical teaching/work-based learning for most secondary vocational schools was implemented regularly, in school workshops/cabinets and at companies' premises, observing the prescribed measures for students' health protection (27%, 35%).

Only a small number of teachers stated that practical teaching/work-based learning was conducted online (12%), mainly by video recording of classes held in companies, which was also identified as a type of change in schools resulting from the COVID-19 pandemic (Chart 27). This situation may be a consequence of the fact that practical teaching/work-based learning is conducted with smaller groups of students even in regular conditions, so there was no need for students to be further divided and to form new groups due to the pandemic.

Presented below are **the challenges faced by principals and teachers during the organization and implementation of the teaching process** and their intensity (either in case of distance learning or regular classes) during the COVID-19 pandemic (Charts 29, 30 and 31).

Chart 28. Ways of conducting practical teaching/work-based learning during the COVID-19 pandemic



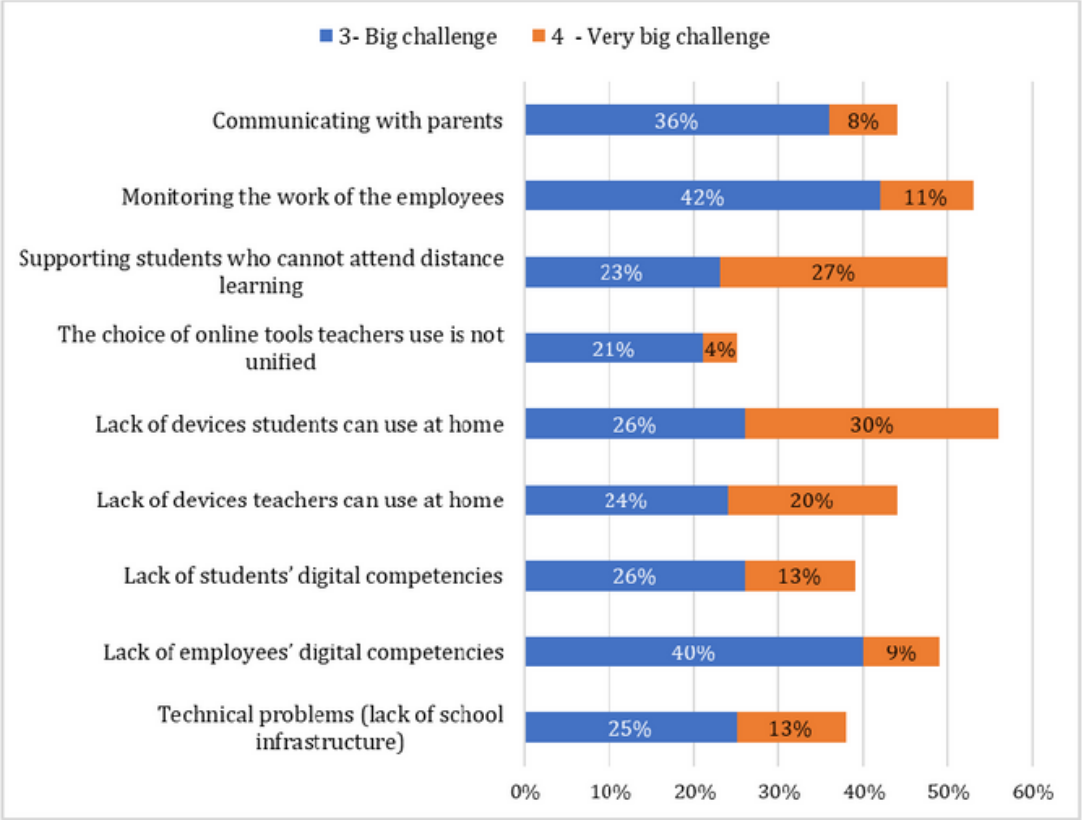
Principals and teachers ranked the challenges on a scale of 0 to 4, where 0 means the challenge was minor and 4 means it was a very big challenge. Since a high percentage of principals assessed many challenges to be on the higher end of the scale (scores 3 and 4), their impact is presented cumulatively on a chart below (Chart 29).

In more concrete terms, the data show that **principals** were exposed to a large number of challenges that were assessed as big or very big. The highest percentage of principals assessed as a big or very big challenge that students do not have devices that they can use at home, so they can attend distance learning/online teaching (26%; 30%), and that it was challenging to provide support to students who cannot attend such teaching (23%, 27%). Monitoring the work of employees was also a big challenge for 42% of principals, and a very big challenge for 11% of principals. Also, the lack of digital competencies of employees was a big challenge for 40% of principals, and for 9% a very big challenge.

Other challenges include the lack of devices that teachers can use at home, which is a big and a very big challenge for principals to almost an equal measure (24%, 20%), followed by technical problems or lack of infrastructure in the school, which 25% of principals rated as a big challenge, and 13% as a very big challenge. The lowest rated challenge as either big or very big is that the choice of online platforms/tools/means of communication used by employees was not unified (21%, 4%).

Furthermore, it is important to note that the principals of primary schools stated that for them the organization of the final exam was a big (27%) or very big challenge (18%), while for the principals of secondary vocational schools a particular challenge was organizing practical teaching/work-based learning, which was assessed as a big challenge by 24% of vocational schools' principals and as a very big by 38% of them. This is an interesting result since most secondary vocational schools reported that practical teaching/work-based learning is regularly conducted for students of their schools (see Graph 28).

Chart 29. Challenges faced by principals regarding the organization of classes during the COVID-19 pandemic

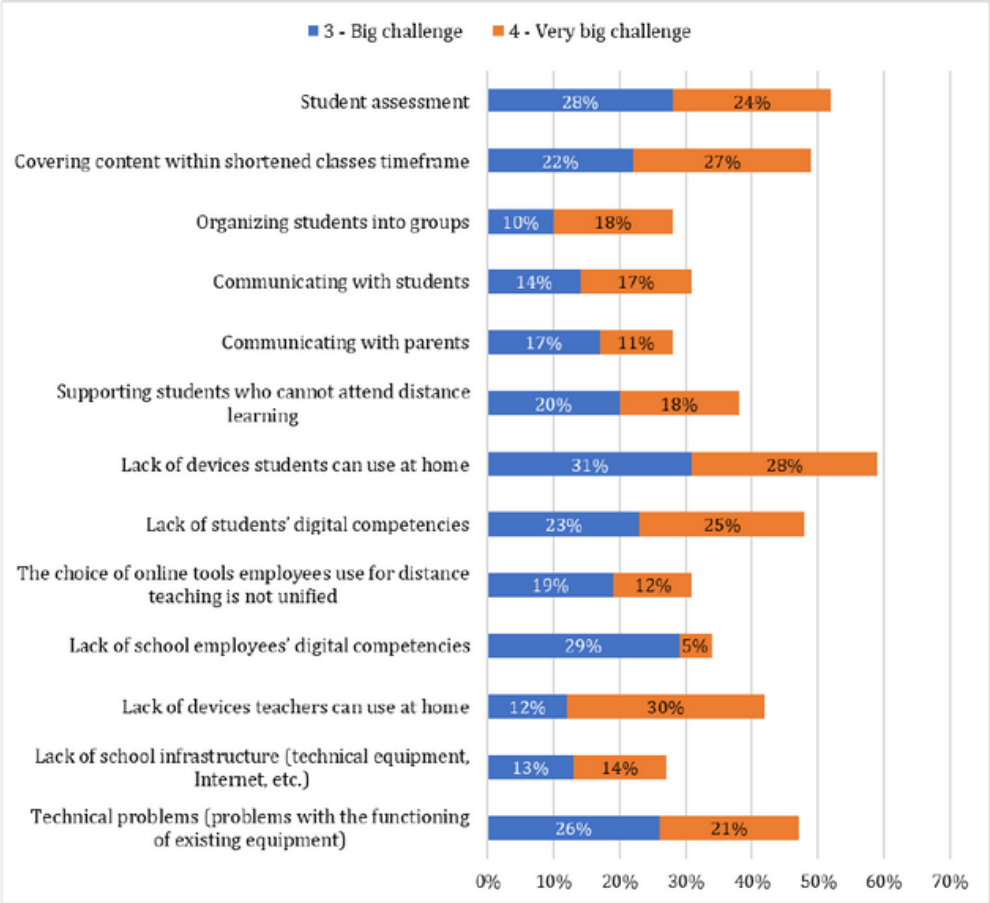


This situation may be the result of a variety of circumstances that principals needed to take into account - challenges may arise from ensuring compliance with health measures at school and companies, or economic challenges that affect companies (e.g. disruption or reduced operations due to COVID- 19 pandemics) which make it, all together, difficult to organize practical teaching/work-based learning.

Similarly, for **teachers who have conducted online teaching** the challenge they have encountered the most was the lack of devices that students can use at home, but also the lack of devices at teachers' disposal (Graph 30). As many as a third of teachers consider the lack of devices that teachers can use as very big (30%) and the lack of devices that students can use as big (31%) or a very big challenge (28%).

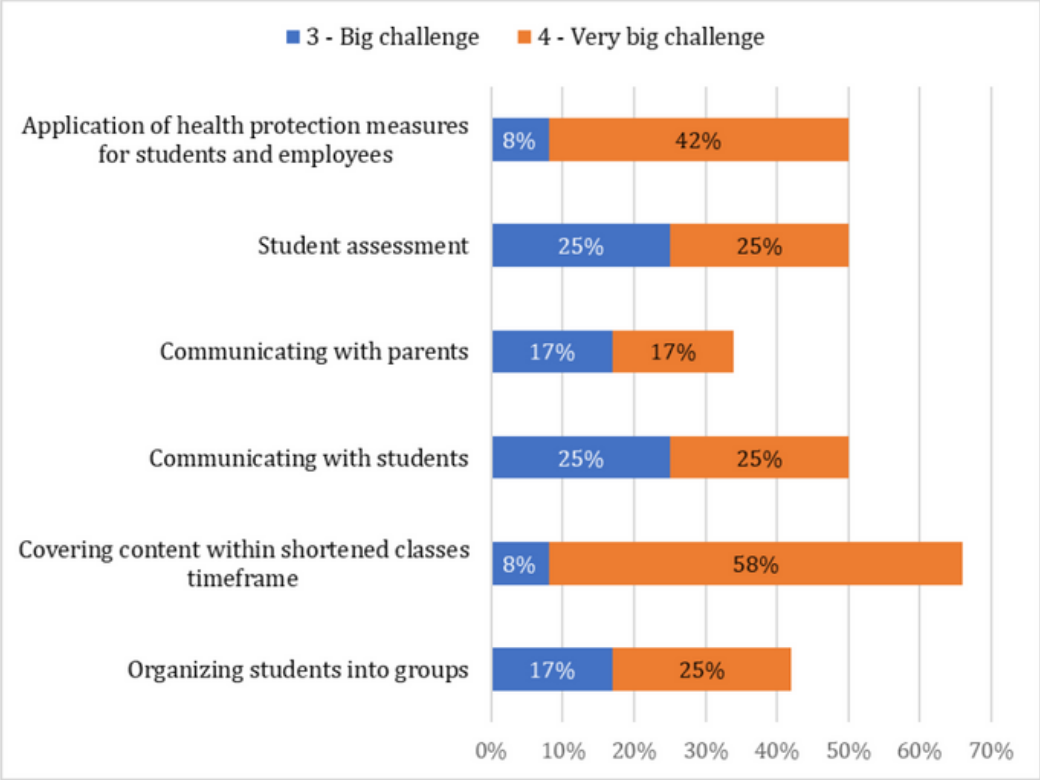
Approximately the same percentage of teachers (about a third of them) reported that a big or very big challenge was students' assessment (28%; 24%), covering planned subject content due to shortened classes (22%; 27%) and lack of students' digital skills (23%; 25%). Somewhat less prevalent challenges were providing support to students unable to attend distance learning/online teaching, which was reported by 20% or 18% of teachers, followed by the lack of digital competencies of employees (29%; 5%), lack of uniformity in the choice of tools used by teachers (19%; 12%), communication with students (14%, 17%) and parents (17%; 11%), organizing students into groups (10%, 18%) and lack of digital infrastructure at school (13%; 14%). The conclusion is that, on average, about a third of teachers were exposed to a large number of challenges that were rated as big or very big while implementing distance learning/online teaching.

Chart 30. Challenges faced by teachers during distance learning/online teaching



As to be expected, **the teachers who taught regular classes** during the COVID-19 pandemic (primary school teachers), faced quite different challenges (Chart 31). Covering learning content in shortened classes time was assessed as a big and a very big challenge by the majority of teachers (8%; 58%), followed by the implementation of health protection measures for students and employees (8%: 42%). Some teachers reported that the students fully respected the measures at first, but their commitment to the application of protective measures dwindled over time. Student assessment and communication with students are challenges reported by half of teachers as big or very big (25%; 25%). This is interesting considering that students came to school to attend regular classes, therefore it is possible that the challenge of assessment and communication may be related to the first identified challenge (covering content in the short timeframe), since teachers think that 30 minutes class duration does not provide enough opportunity to conduct both student assessment activities and to cover learning content. Organizing students into groups is recognized as a very big challenge by 25% of teachers, half of whom are teachers who teach in schools placed in rural areas, which may be related to school capacity - it can be assumed that schools that have smaller spatial capacity had greater challenges in organizing students into more groups. Communication with parents is the lowest ranked but still present challenge in schools (17%; 17%), which may be due to compliance with health measures that do not permit large numbers of people to gather indoors, including school premises, which can make communication with parents difficult.

Chart 31. Challenges faced by primary school teachers in conducting regular classes



5.4. Monitoring and evaluation of teaching and learning

The method of monitoring and evaluation of teaching and learning in schools during the COVID-19 pandemic has changed significantly for the vast majority of principals and teachers.

Changes in the application of **methods for monitoring the quality of the teaching process** were identified by 75% of principals, although it is surprising that a quarter of principals believe that the usual methods have not changed (25%).

Principals have identified several methods they use to monitor the quality of the teaching process (Chart 32), and by far the most prevalent one is to join online classes held on Google Classroom (85%). Other methods are represented to a very small extent and include - analysis of digital materials of teachers (9%) and monitoring the implementation of the operational plan of organization and implementation of the teaching process (6%).

Accordingly, within monitoring the quality of the teaching process, **principals use the same methods to monitor the activities of teachers within online teaching** (Chart 33). The most prevalent way to monitor teachers' activities is to join classes held on online platforms (88%), significantly less used methods are the use of electronic grade book (14%) or insight into teachers' digital materials (9%), and some principals monitor teachers' activities through teachers' reports (5%).

When it comes to **assessment of students**, one-third of teachers believe that there have been no changes, and that the usual methods still apply (33%), which is surprising even for schools with regular classes, if we consider, for example, shortened classes, smaller groups of students, reduced learning content,

Chart 32. Methods of monitoring the quality of teaching process during the COVID-19 pandemic

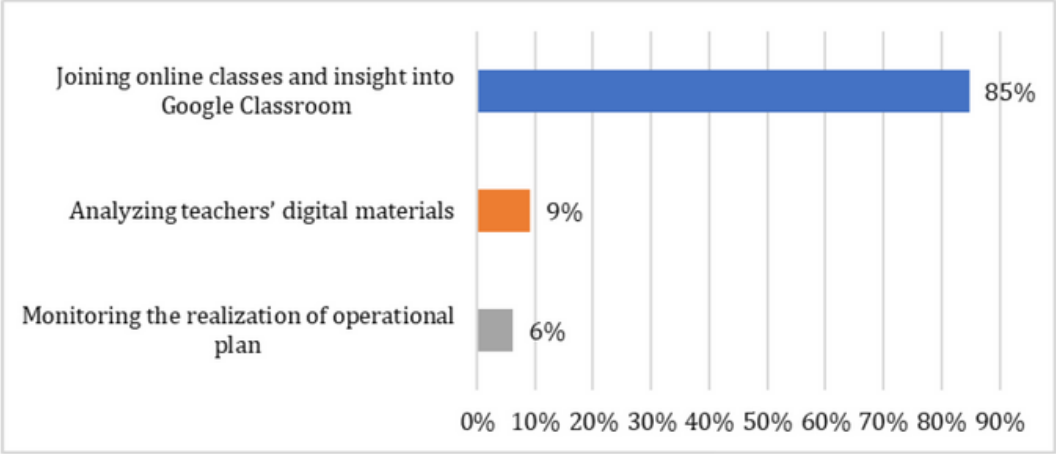
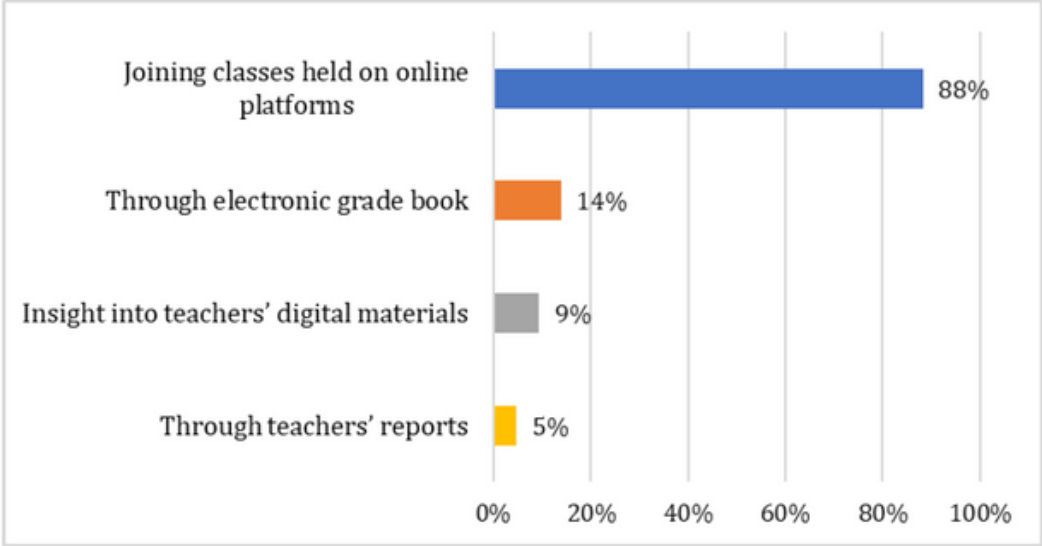


Chart 33. Principals' methods of monitoring teachers' activities within online teaching

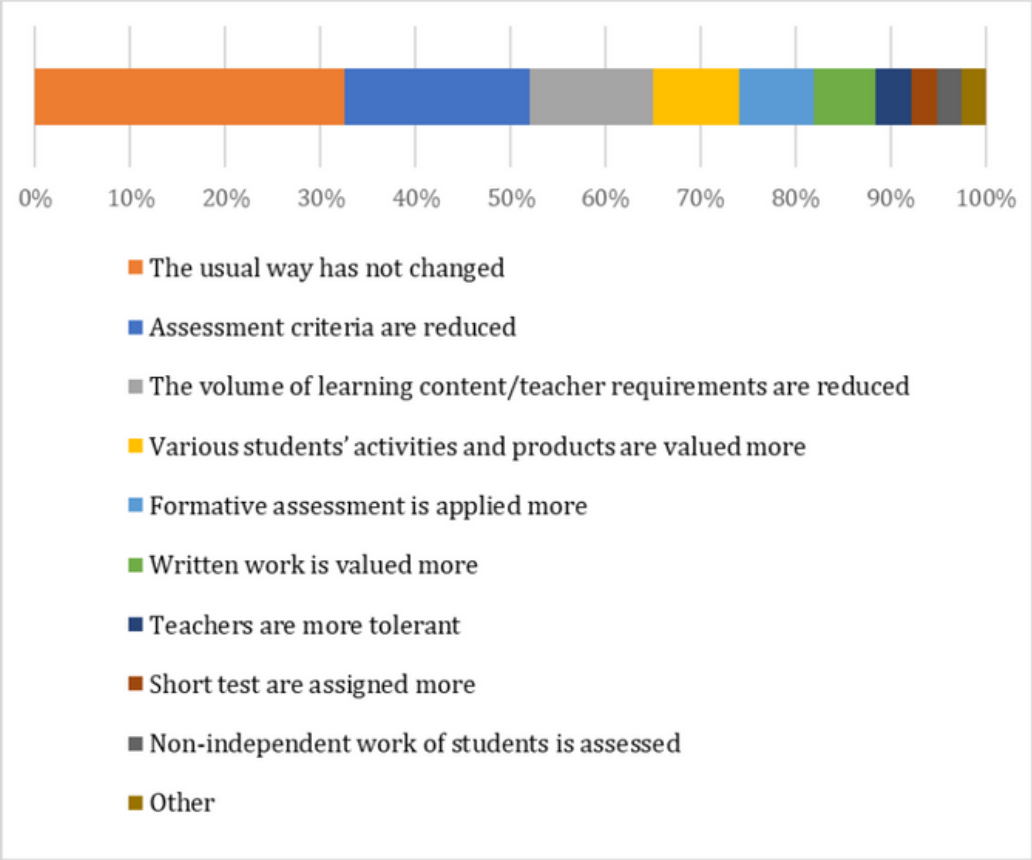


and overall change of the conditions in which classes were delivered (Chart 34).

However, two-thirds of teachers believe that the way of evaluating students' progress has changed, whereby, in the opinion of the majority of teachers, the assessment criteria has been lowered (19%), as well as the scope of learning content and teachers' demands on students (13%). Some teachers believe that various activities and products of students are valued more (9%), and that formative assessment is applied more (8%).

A smaller percentage of teachers believe that the written work of students is valued more (6%), that teachers are more tolerant (4%), not only in terms of the mentioned reduced demands, but also in terms of the time they give students to fulfill their obligations, as well as that the evaluation is done by giving more short tests (3%). A small number of teachers report that there is a change in evaluating students' progress in the sense that, in their opinion, they evaluate the non-independent work of students (3%). What stands out among other things reported by

Chart 34. Changes in the student assessment during the COVID-19 pandemic



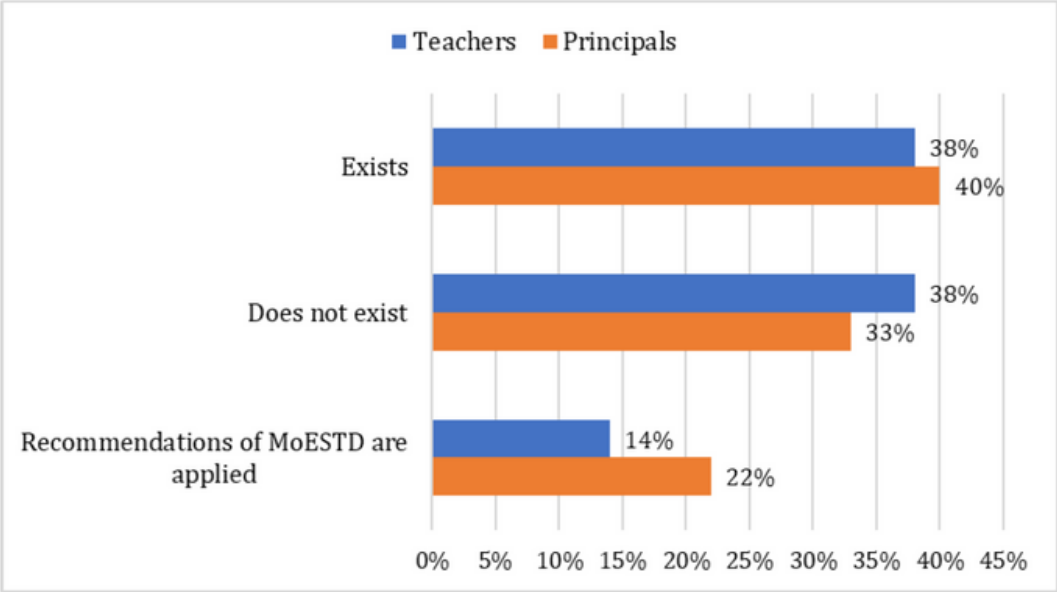
teachers (3%), is that the evaluation of the students' progress is biased, and that it does not represent a realistic picture of students' achievement.

As shown several times before, teachers state that during the COVID-19 pandemic they used **formative assessment** more than they did before. This is confirmed by 45% of teachers, while 54% of them believe that they used formative assessment to the same extent as before the onset of the pandemic.

Teachers report that the **student assessment during implementation of distance learning/online teaching** was quite challenging, and the average score given by teachers is **4.18**. In fact, half of the teachers reported that the assessment was very challenging (score 5), and a third that it was challenging (score 4).

When it comes to the existence of a **school document that specifies the method and criteria for evaluating the achievement of students who attend distance learning/online teaching**, principals and teachers almost equally estimate its (non-)representation (Chart 35). About a third of teachers and principals report that such a document exists (38%; 40%) and the same number states that there is no such document (38%; 33%). The smaller number 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%). This situation may be due to varying levels of distance learning representation in schools, i.e. the percentage of students attending only distance learning/online teaching (see Table 13), implying that the need for adoption of a school document is

Chart 35. Existence of a school document that specifies the manner and criteria for evaluating the achievement of students attending distance learning/online teaching



more pronounced in schools where a higher percentage of students (6-10%; 11-15%) attend distance learning/online teaching exclusively.

Teachers kept records of **distance learning/online teaching attendance** using several tools, in different combinations (Graph 36). The prevailing combination is the use of a pedagogical notebook and entering data into an electronic grade book (28%); a certain number of teachers used only a pedagogical notebook (19%) or only an electronic grade book (14%). About 10% of teachers used the options available on the Google Classroom for recording attendance, and 7% of teachers used all the previously mentioned methods, while 4% of teachers combined the Google Classroom and the pedagogical notebook. The remaining teachers kept attendance records through other online platforms such are Microsoft Teams (4%) and Google Meet (3%). However, 7% of teachers did not strictly keep records of students' attendance during distance learning/online teaching but made records of students based on their responses to homework assignments.

The quality of students' homework assignments represents the most prevalent form of **monitoring students' progress** during distance learning/online teaching (Chart 37), used by slightly less than a third of teachers (29%). Approximately the same number of teachers monitor student progress through the evaluation of student activities during the actual teaching process (25%), a smaller number of teachers keeps pedagogical records of all students' activities (20%), and a small number of teachers use quick short tests (12%), or written or oral testing (11%).

It should be kept in mind that these methods are not exclusive, i.e. that it is very possible that, for example, a teacher who uses quick short tests also evaluates student activities during classes, which is consistent with the finding that 20% of teachers keep pedagogical records for monitoring students' progress, which may include all the methods of monitoring listed by teachers.

Chart 36. Ways of keeping records of attendance of distance learning/online teaching by teachers

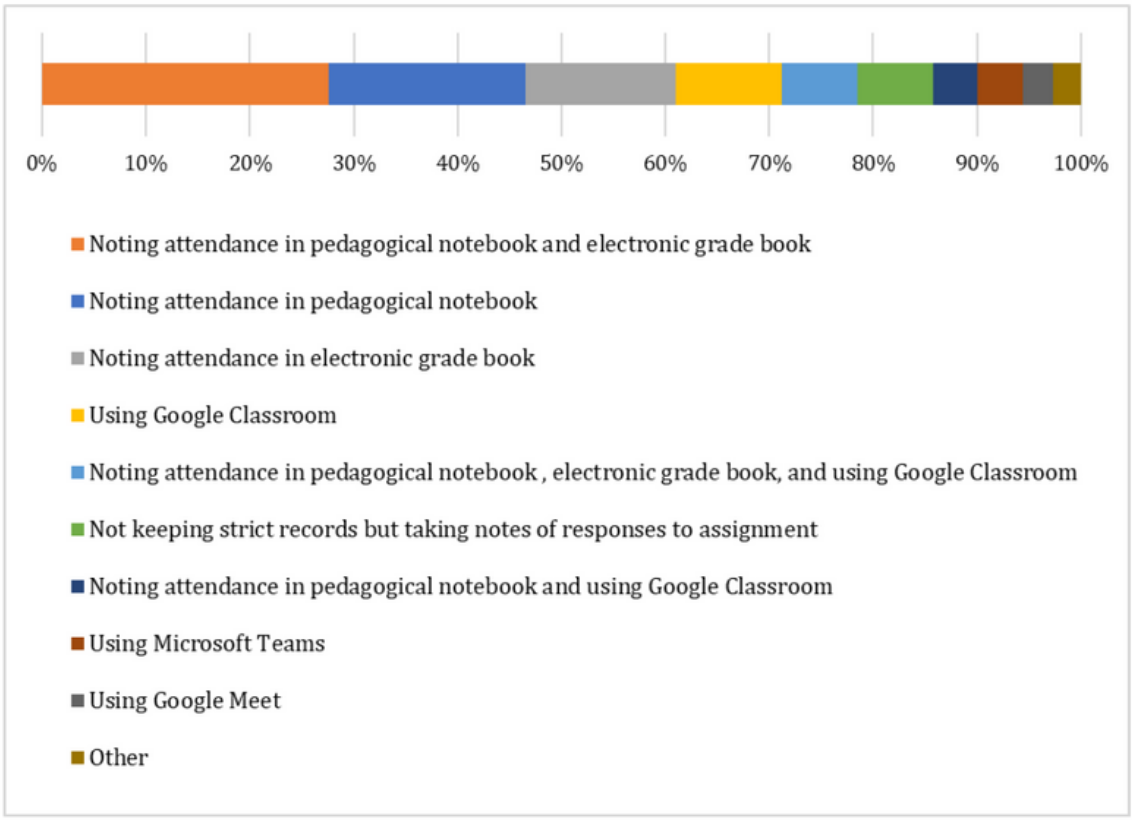
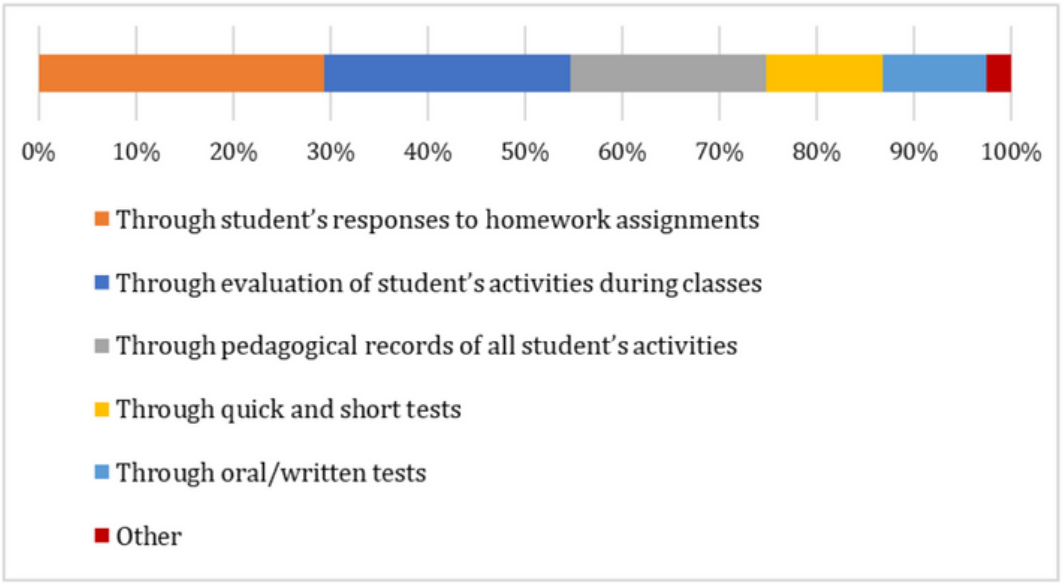


Chart 37. Methods of monitoring student progress during distance learning/online teaching



5.5. Other remarks of the respondents

At the end of the questionnaire, the respondents were asked to express their opinions, attitudes and experiences that they consider important to point out, so the additional remarks of teachers and principals are summarized below.

Teachers pointed out that at the time of the COVID-19 pandemic:

• They worked much longer than the forty-hour working week, and that the workload was significantly higher than it was before the pandemic;

• They were unable to ensure the quality of all the planned 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 sufficient number of home computers/laptops;

• They faced the challenges such as monitoring the progress of students who live in student dormitories and who had to leave them due to prescribed measures;

• They were exposed to the challenges of delivering teaching and monitoring the progress of students who attend school according to individual educational plans;

• They were 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.

Principals pointed out that at the time of the COVID-19 pandemic:

• They were exposed to huge stress due to the general confusion of both teachers and students;

• They made great efforts to implement online classes, but 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, which is an additional challenge;

• They are concerned about the noticeably shaken mental health of students, which in their opinion may have lasting repercussions on the proper development of children and youth;

• Teachers worked significantly longer than usually, which included monitoring educational broadcasts on television, giving assignments, reviewing them, communicating with students who cannot attend distance learning, which increased teachers' stress and reduced opportunities for quality planning and realization of the teaching process.

6. CONCLUSIONS

The main conclusions are summarized in such a way as to follow the findings of the research - 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.), Monitoring and evaluation of teaching and learning (Chapter 6.4.) and Additional research findings (Chapter 6.5.).

6.1. Information flow

During the COVID-19 pandemic, school principals were, as expected, mostly informed about the organization of work and the organization and implementation of the teaching process by the institutions in charge, namely the Ministry of Education, Science and Technological Development (MoESTD) and the Regional school administrations (RSAs) equally. This complies with the vertical information flow (from the institutions in charge to school principals and teachers), while for **teachers the main source of information was the school management**.

When they had doubts about the organization of work or the teaching process, the principals mostly relied on the support of the RSAs. For the vast majority of teachers, the school management was the prime source of information as well as focal point in situations when they had any doubts about the implementation of the teaching process.

The average level of principals and teachers being informed about the organization of school work, i.e. the organization and implementation of the teaching process during the COVID-19 pandemic, measured on a scale from 1 to 5, is **very high** and amounts to about 4.65. As many as 98% of principals and 95% of teachers estimated that they were very well informed or well informed. **The level of clarity of information that principals and teachers received from the institutions in charge during the COVID-19 pandemic is somewhat lower** and amounts to 4.05.

Principals predominantly used mobile applications (mostly Viber) and email to inform employees, students and parents, but they also informed students and parents by phone. **A third of principals provided information to students and parents face-to-face, but not to employees.**

The methods that teachers used the most to inform students and parents are very similar, as the vast majority of teachers primarily used social networks and mobile applications, and about a third of teachers also used email and face-to-face communication. When it comes to **sending information to parents, in addition to using mobile applications (usually Viber), phone calls were very much used to provide information** for about half of teachers, while a fifth of them largely used email. **Teachers from schools in rural areas used email less as a form of providing information** to both students and parents, and especially so for informing students in primary schools.

Although one-third of principals did not have challenges in informing employees, for almost a quarter of them the challenge was that they had to further explain and interpret various information to employees, including memos from institutions in charge, especially concerning student assessment, and to clarify information from the media. **There were more challenges in informing parents, since for a third of principals the biggest challenge in informing them was that parents could not communicate online** due to lack of adequate devices, Internet access, the lack of social network accounts, and those were mostly parents from vulnerable groups. The same challenge was recognized in the process of informing students, although for a third of principals no challenges existed in the process of informing students.

For a majority of teachers, there were no challenges in informing parents nor students, and in cases where challenges occurred, they are mostly related to communication with students and parents who lack technical equipment and/or the Internet.

Although a large number of principals and teachers believe that the process of communicating information went smoothly when they used Viber or Google Classroom, some **principals and teachers who had experience using the Microsoft Teams platform consider this to be the best way in providing information to students**.

6.2. Organization of school work, technical equipment and digital competencies of teachers

The challenges the principals encountered the most were planning and organization of online teaching, coordination of the work of employees, and monitoring and implementation of measures to protect the health of students and employees. For more than half of the principals, communication with parents was a big or very big challenge, and for a little less than half of the principals, fulfilling administrative obligations was also a challenge.

The procurement of the necessary protective equipment against COVID-19 was most often carried out through the funds of the local self-government, although one-third of the principals reported using school funds to a large extent for this purpose. The least number of principals used private and project funds, and donations do not stand out as a significant source of funds for procurement of protective equipment.

A considerable number of principals report the lack of computers or laptops as the main issue and a third of principals consider it to be the lack of tablets and the Internet. A very small number of principals stated that schools lack nothing. **Teachers also lack computers and laptops, although they rate the availability of technical equipment much better**, since more than a third of teachers believe that they lack nothing.

Both teachers and principals estimate that students mostly lack computers or laptops and the Internet. About half of teachers and principals estimate that students lack tablets to a much lesser extent.

Half of the principals estimate that about 60-90% of teachers from their school have attended at least one training event related to digital competencies development in the last two years. According to the principals' assessment, there are no teachers in any school who have not attended professional development training in this area. According to teachers, the **vast majority of them participated in digital competencies development training events before the**

onset of the COVID-19 pandemic, and more of them reported doing it frequently in comparison to the number of teachers who stated that they attended such in-service training events rarely.

6.3. Organization and implementation of the teaching process

Regarding the modalities of organizing the teaching process in Serbian schools during the COVID-19 pandemic, **certainly, the most prevalent way of organizing and conducting the teaching process in schools is by far the combined model.**

In the majority of cases, according to the principals, exclusively distance learning/online teaching was attended by 1-5% of students per school. A higher percentage of students per school (6-10% and 11-15%) who attend exclusively distance learning/online teaching are assessed by the principals of primary and secondary vocational schools.

When it comes to access to distance learning/online teaching that is conducted via television, i.e. the Internet, **primary school teachers, especially those from rural areas, and secondary vocational school teachers mostly estimate that 1-5% of students per school had no access to teaching that is conducted via the Internet and television.**

Teachers mostly used the Google Classroom to conduct online teaching, with Viber being in the second place. Principals mostly estimate that the teachers have made a choice of platforms/digital tools/means based on their previous experience in use, but only a third of teachers agree with that. Teachers mostly report that they chose online platforms, tools or means of communication based on the recommendation of the educational authorities.

Teachers who implemented the combined model used online platforms, tools and means of communication mostly to provide various information to students and to assign homework, and more than half of teachers used them to further explain or review the lesson content. **Teachers have created and used digital materials to a large extent.**

Even in the conditions of regular classes delivery (in primary schools), the use of ICT was very widespread - more than half of teachers often used online platforms, tools or means of communication to give feedback to students, assign homework, etc.

Almost half of the teachers estimated that group work was less represented as a result of the implementation of the teaching process in the conditions of the COVID-19 pandemic, and a slightly smaller number of teachers estimated that they assign more homework for the same reasons. What slightly less than a third of teachers agree on is that they conducted fewer oral tests, compared to the period before the pandemic, which resulted in increasing the number of written tests.

Teachers collaborated with parents mostly concerning students' progress, which included consideration of reasons why students performed poorly, but also for giving students praise.

Practical teaching/work-based learning classes in most secondary vocational schools were carried out regularly - in school workshops/cabinets and companies, in compliance with the prescribed measures to protect the health of students.

More than half of the principals estimated as a big or very big challenge the fact that students do not have appropriate devices so that they can attend distance learning/online teaching from home, and the related challenge was providing support to students who cannot attend distance learning/online teaching. Monitoring the work of employees is also a major challenge, as there is the lack of digital competencies of employees. **For slightly less than half of the primary school principals, the organization of the final exam was a big or a very big challenge, while for more than half of the secondary vocational school principals, a particular challenge was organizing practical teaching/work-based learning.**

For teachers who have delivered distance learning/online teaching, the challenge they have encountered the most is the lack of devices that students can use at home, while for as much as a third of teachers the lack of devices that teachers can use was a very big challenge. Other prevalent challenges are student assessment, covering lesson content in a shortened timeframe and a lack of students' digital skills. When it comes to **primary school teachers who taught regular classes during the COVID-19 pandemic, the highest rated challenge was covering lesson content within shortened time for classes**, which is a very big challenge for more than half of teachers. Another challenge that most teachers estimated as very big is the application of measures to protect the health of students and employees.

6.4. Monitoring and evaluation of teaching and learning

For the principals, the most prevalent way of monitoring the quality of the teaching process and the activities of teachers was to join online classes held on the Google classroom platform.

When it comes to **student assessment**, although one-third of teachers believe that there have been no changes, two-thirds of them believe that the approach to the **assessment** has changed by lowering the evaluation criteria, or more specifically reducing the volume of learning content and the teacher's requirements for students.

Student assessment was a rather demanding for teachers - half of the teachers thought that the assessment was very challenging, and a third thought that it was challenging. The research also shows that **teachers used formative assessment more than they did before**, although about half of the teachers state that they use formative assessment to the same extent as they used it before the pandemic.

With regard to the existence of a **school document that specifies the method and criteria for evaluating the achievement of students who attend distance learning/online teaching**, about a third of teachers and principals report that such document exists, while the same number believes that there is no such document. A smaller number of teachers and principals report that the recommendations of the Ministry of Education, Science and Technological Development are applied at the school level. This situation may be the result of different representation of distance learning in schools, i.e. the percentage of students who attend such classes exclusively, which implies that the need to adopt a school document that specifies student assessment is more pronounced in schools with a higher percentage of students who attend distance learning/online teaching exclusively.

Teachers kept records of students' attendance by using several tools, and the prevailing combination was the use of a pedagogical notebook and entering data into an electronic grade book.

When it comes to monitoring of student progress, teachers mostly used the response to homework as an indicator of students' progress, as well as the level of student activity during the classes.

6.5. Additional research findings

The research showed that **certain aspects of teachers' work during instruction delivery**, which were not the subject of 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 for 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 (family) circumstances in which teachers conduct teaching during the pandemic, local conditions and particular characteristics of schools that further hinder teaching process and student assessment, and the mental health of teachers and students.

7. 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

National level

1. Establish in MoESTD a unit in charge of coordinating activities related to the work of schools in the conditions of the COVID-19 pandemic, which will improve the process of communicating information to schools and ensure a greater degree of clarity of information distributed to schools;

2. Prevent the disclosure of information to the media without prior notification of schools, which would reduce the challenges in communication between principals and employees, schools and parents;

3. Continue the process of improving the ICT infrastructure in schools, especially in rural areas, not only for the sake of the information process, but also for improving the quality of teaching.

School level

4. Establish a protocol for communication that takes place via mobile applications or online platforms in order to improve the efficiency of information flow between all relevant actors (e.g. communication time, communication rules, instructions for use, etc.);

5. Establish a mechanism for communication with students and parents who do not have means of online communication in cases of telephone communication failure (e.g. establishing plans for periodic visits, involvement of local civil society organizations, etc.);

6. Determine more specifically the advantages of using the Microsoft Teams platform as a way of communicating with students in schools that have experience in using this platform, and exchange examples of best practice with other schools.

Organization of school work, technical equipment and digital competencies of teachers

National level

7. Ensure timely distribution of information on the organization of school work, which would allow adequate time for the implementation of necessary measures;

8. Provide support to schools in monitoring and implementing health protection measures for students and employees in cooperation with local institutions;

9. Consider the adoption of 'bring your own device' policy in order to improve the availability of digital devices in schools;

10. Continue the process of equipping schools with ICT.

School level

11. Establish a protocol for school ICT equipment to be taken by students, if there is a surplus (e.g. determining the period of use, borrow receipt, etc.);

12. Initiate cooperation with local institutions and organizations in providing the Internet for students;

13. Continue developing digital competencies of teachers, including the creation of digital materials, with an aim to advance their skills to the highest level.

Organization and implementation of the teaching process

National level

14. Provide support to ensure that all schools use some form of learning management systems for online teaching (e.g. by providing free training for teachers);

15. 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 learning within online teaching, etc.);

16. 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 SVS);

17. Improve the process and timely communicate information to the primary school principals about the organization and implementation of the final exam, based on the experience from 2020.

School level

18. Consider introducing a 'bring your own device' school policy in order to improve the availability of digital devices in schools for students and teachers;

19. Determine a 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 community, and cooperation with the professional associates.

Monitoring and evaluation of teaching and learning

National level

20. Develop a framework for monitoring the quality of teaching and learning in the conditions of implementation of distance learning, including improving the methods that principals predominantly use (joining classes conducted through online platforms);

21. Develop a handbook on methods of evaluation of student's achievement and progress that contains examples of best practices identified in schools, with an emphasis on formative assessment;

School level

22. 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

23. 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 health of teachers and students.

Bibliography

- EUROSTAT Database - https://ec.europa.eu/eurostat/data/database
- Government of the Republic of Serbia (2018). Third national report on social inclusion and poverty reduction in the Republic of Serbia: http://socijalnoukljucivanje.gov.rs/wp-content/uploads/2019/02/Treci_nacionalni_izvestaj_o_socijalnom_ukljucivanju_i_smanjenju_siromastva_2014–2017.pdf
- Government of the Republic of Serbia (2020). Digital skills development strategy in the Republic of Serbia, "Official Gazette of RS" no. 21/2020
- Government of the Republic of Serbia (2021). Strategy for the Development of Education in the Republic of Serbia until 2030: https://www.srbija.gov.rs/dokument/45678/strategije-programi-planovi-.php
- Institute for Education Quality and Evaluation (2021). Online teaching and hybrid learning – Long-term aspirations and short-term recommendations: https://ceo.edu.rs/wp-content/uploads/2021/03/SMERNICE-%D0%9EnlajnHibridnaPripremnaNastava.pdf
- Institute for Improvement of Education (2020). The results of the survey on the realization of the educational process through distance learning: https://zuov.gov.rs/rezultati-ankete-sta-15-000-prosvetnih-radnika-misli-o-ostvarivanju-obrazovno-vaspitnog-procesa-putem-ucenja-na-daljinu/
- Law on Primary Education, "Official Gazette of RS", No. 55/2013, 101/2017, 10/2019 and 27/2018 - state law
- Law on Secondary Education, "Official Gazette of RS", No. 55/2013, 101/2017, 27/2018 - state law and 6/2020
- Law on the Fundamentals of the Education System, "Official Gazette of RS", No. 88/2017, 27/2018 - state law, 10/2019, 27/2018 - state law and 6/2020
- Ministry of Education, Science and Technological Development (2020a). Report of the Ministry of Education, Science and Technological Development on the work and activities during the epidemic caused by COVID-19
- Ministry of Education, Science and Technological Development (2020b). Professional instructions for the organization and implementation of education in primary schools in the school year 2020/21
- Ministry of Education, Science and Technological Development (2020c). Professional instructions for organizing and delivering teaching on-site and through distance learning for high schools in the school year 2020/21
- Ministry of Education, Science and Technological Development (2020d). Instruction on health protection measures for students and employees for primary and secondary schools.
- Ministry of Education, Science and Technological Development (2020e). Instructions for organizing the work of high schools until the end of the first semester of the school year 2020/21
- Ministry of Education, Science and Technological Development (2020f). New measures for the organization of work and changes in the school calendar in education for primary and secondary schools in the school year 2020/21
- Ministry of Education, Science and Technological Development, Institute of Psychology and UNICEF (2020). Monitoring the manner of participation and learning process of students from vulnerable groups during the realization of education by distance learning - The first report based on research findings: http://www.mpn.gov.rs/wp-content/uploads/2020/06/4.b-Prvi-izveštaj-osetljive-grupe-učenje-na-daljinu.pdf

- OECD (2020a). Strengthening online learning when schools are closed: The role of families and teachers in supporting students during the COVID-19 crisis: https://read.oecd-ilibrary.org/view/?ref=136_136615-o13x4bkowa&title=Strengthening-online-learning-when-schools-are-closed
- OECD (2020b). Coronavirus special edition: Back to school: http://www.oecd.org/education/coronavirus-special-edition-339780fd-en.htm
- OECD (2020c). Education in the Western Balkans: Findings from PISA: https://www.oecd-ilibrary.org/education/education-in-the-western-balkans_764847ff-en
- OECD (2020d). PISA 2018 Results - Effective Policies, Successful Schools: http://www.oecd.org/education/pisa-2018-results-volume-v-ca768d40-en.htm
- PISA 2018 Database – https://www.oecd.org/pisa/data/2018database/
- Rulebook on assessment of students in primary education, "Official Gazette of RS", No. 59/2020
- Rulebook on assessment of students in secondary education, "Official Gazette of RS ", No. 59/2020
- Statistical Office of the Republic of Serbia Database - https://www.stat.gov.rs/en-us/oblasti/obrazovanje/
- The Network of Organizations for Children of Serbia (2020). Being a child during the COVID-19 pandemic: Analysis of a study of the impact of emergency measures on children during the COVID-19 outbreak in Serbia: http://zadecu.org/wp-content/uploads/2020/04/Analiza_biti_dete_cov_19.pdf
- UNESCO (2020). Global Education Monitor Report – Inclusion and Education: All means all: https://unesdoc.unesco.org/ark:/48223/pf0000373718?fbclid=IwAR2L8j0jjrRBoLGFDf65VEjdGnt_nTMtHOT1yb-ZFco_Z57Iobr8HO5-WXI
- UNESCO, UNICEF, World Bank, World Food Programme and UNHCR (2020). Framework for reopening schools: https://www.unicef.org/documents/framework-reopening-schools
- UNICEF (2020a). U-Report - Experiences of young people with distance learning during the COVID-19 epidemic: https://serbia.ureport.in/opinion/1726/
- UNICEF (2020b). Building Resilient Education Systems beyond the COVID-19 Pandemic: Considerations for decision- makers at national, local and school levels: https://www.unicef.org/ukraine/en/documents/building-resilient-education-systems-beyond-covid-19-pandemic
- Videnović, M. and Čaprić G. (2020). PISA 2018 Report for the Republic of Serbia, Belgrade: Ministry of Education, Science and Technological Development: https://www.obrazovanje.org/rs/uploaded/dokumenta/PISA-2018_Izvestaj-za-Republiku-Srbiju_ceo.pdf
- World Bank (2020). The Economic and Social Impact of COVID-19 – Western Balkans Outlook: http://pubdocs.worldbank.org/en/486361588146392647/WB-RER17-The-Economic-and-Social-Impact-of-COVID-19-Outlook-Hard-Times-Require-Good-Economics-Bosnian.pdf