

DISTANCE LEARNING IN SERBIA – THE EXPERIENCE IN PRIMARY EDUCATION DURING THE COVID-19 CRISIS

**Branislav Randjelović^{1,2*}, Elizabeta Karalić³,
Danijela Djukić³, Katarina Aleksić^{3,4}**

¹University of Niš, Faculty of Electronic Engineering, Niš, Serbia

²University of Priština - K.Mitrovica, Faculty of Teachers Education,
Leposavić, Serbia

³Institute for Education Quality and Evaluation, Belgrade, Serbia

⁴Ministry of Education, Science and Technological Development,
Belgrade, Serbia

Abstract

In this paper, we consider the response of the education system of the Republic of Serbia to the COVID-19 epidemiological crisis in relation to the teaching process and distance learning activities in primary schools in Serbia. We examine learning through the televised programs of Serbia's public broadcaster and other related internet services. The aim of this research is to estimate the quality of the teaching process and distance learning in primary schools. In accordance with the purpose of the research, a questionnaire about the educational experience and practices in primary schools during the spring and autumn of 2020 was created. The questionnaire is designed for school principals, teachers, students and parents/legal guardians of students. In total, 28186 people participated in this study conducted in March and April 2021. The results show that most schools used online resources efficiently despite the initially low digital competencies of teachers and students. Limited access to the internet and digital resources, as well as difficulties in engaging students, were gradually overcome during the fall of 2020. Based on the results of this research, we formulated the most important recommendations for the organization of distance learning and its future integration in the hybrid model of teaching and learning in school practice.

Key words: primary school, distance learning, online education, COVID-19

* Corresponding author: Branislav M. Randjelović, University of Niš, Faculty of Electronic Engineering, Aleksandra Medvedeva 14, 18000 Niš, Serbia, bane@elfak.ni.ac.rs

ОБРАЗОВАЊЕ НА ДАЉИНУ У СРБИЈИ – ИСКУСТВА У ОСНОВНОМ ОБРАЗОВАЊУ ТОКОМ КОВИД-19 КРИЗЕ

Апстракт

У овом раду разматрамо реакцију и одговор образовног система Републике Србије на COVID-19 епидемиолошку кризу, у смислу извођења наставе и наставних активности на даљину у основним школама у Србији. Разматрана је настава реализована преко јавног телевизијског сервиса и осталих онлајн интернет сервиса. Предмет истраживања био је утврђивање квалитета процеса наставе и учења на даљину у основним школама у Србији. У складу са сврхом истраживања креиран је упитник о образовном искуству и пракси у основним школама током пролећа и јесени 2020. године. Креирани су упитници за директоре школа, наставнике, ученике и родитеље/законске заступнике ученика. У истраживању спроведеном током марта и априла 2021. године учествовало је укупно 28.186 особа. Резултати истраживања показују да је већина школа ефикасно користила онлајн ресурсе, упркос почетним ниским дигиталним компетенцијама наставника и ученика. Ограничени приступ интернету и дигиталним ресурсима, као и тешкоће у ангажовању ученика, постепено су превазиђени током јесени 2020. године. На основу резултата овог истраживања формулисали смо најважније препоруке за организацију учења на даљину и његову будућу интеграцију у хибридном моделу наставе и учења у школској пракси.

Кључне речи: основна школа, настава на даљину, онлајн настава, КОВИД-19

INTRODUCTION

At the beginning of 2020, as the virus began to spread and the number of COVID-19 cases worldwide increased, it became clear that it would be difficult to complete the teaching process during the current school year. In other words, it became clear that it would not be possible to carry out all activities and finish the school year under regular conditions. In an attempt to contain the spread of the COVID-19 virus, most governments around the world temporarily closed schools and other educational institutions. This decision has affected more than 1.2 billion pupils and students, or almost three-quarters of the learner population (United Nations Sustainable Development Group, 2020: 5-11).

After the *Decision of the Government of the Republic of Serbia on the suspension of teaching in higher educational institutions, primary and secondary schools and regular work of preschool educational institutions* was adopted, in accordance with the *Decision on declaring a state of emergency* and the *Decree on State Emergency Measures*, the Ministry of Education, Science and Technological Development of the Republic of Serbia, and thus the entire education system of the country, had to react quickly. Due to the epidemiological situation in the country, caused by the COVID-19 virus, distance learning was organized in order to ensure uniform acts and treatments in educational institutions (Imel, 1998: 3; Porter, 1997: 152). This has been the dominant teaching model since

March 17, 2020. Immediate work with children in preschool institutions, and the teaching process in all primary and secondary schools, as well as in institutions of higher education, have been temporarily suspended. A complex operational plan of activities, consisting of a large number of different programs and alternative (mostly digital) ways of teaching and learning in preschools, primary and secondary schools was adopted. The focus was on the organization of distance learning (Bates, 1995: 78-93; Moore, et al. 2011: 4-5; Minic, 2017: 52-55; Mandic, et al. 2013: 75-77), which should contribute to the implementation of the curriculum in general education subjects and vocational subjects with the largest number of lectures.

Distance learning is a form of online education. Lectures and learning materials are made accessible through the internet or televised programs of public broadcasters. Students learn at home, not in a classroom. Although some basic definitions of distance learning are given below, it must be emphasized that the area is very dynamic and that the definitions of distance learning are still evolving. Distance education is defined by Moore as “all forms of education in which all or most of the teaching is conducted in a different space than the learning, with the effect that all or most of the communication between teachers and learners is through communication technology” (Moore, et al. 2011: 3). There is an added element of temporal separation between teachers and learners to Moore’s definition (Butcher, Wilson-Strydom 2008: 725-746). There are various types of distance learning: video conferencing, hybrid distance education, open schedule online courses, and fixed-time online courses. There are many excellent benefits of distance learning. Firstly, it is less expensive to support. Secondly, distance learning is not constrained by geography. However, this approach could disadvantage some students. Students with limited computer or internet access may struggle. Those who need extra help with motivation and organization may also struggle once they are removed from a traditional classroom environment. Even if some teachers and certain classes were ready to face the situation, a large majority had to adapt their teaching and learning in a very short time without training, with insufficient bandwidth, and with little preparation. This unexpected and rapid transition to online learning has led to a multiplication of teachers’ strategies for distance learning in lectures, tutorials, project groups, lab works, and assessments (Gajek, 2017: 301-312).

Learners are probably the largest group to be indirectly affected by the pandemic. Some researchers and organizations (Burgess and Sievertsen, 2020: 2; Education Endowment Foundation [EEF], 2020: 8; Kuhfeld et al., 2020: 220-226) have hypothesised that school closures during the pandemic could have detrimental effects on learning gains and social disparities in learning. To the best of our knowledge, there is no empirical evidence yet on the school closure effect’s actual direction and size (Tomasik, 2020: 566-

576). In an on-line environment, students may feel isolated, parents may have concerns about children's social development, students with language difficulties may experience some disadvantage in a text heavy on-line environment, and subjects requiring physical demonstrations of skill such as music, and physical education may not be practiced in a technology-mediated setting (Nikolov, Nikolova, 2008: 659-674). Working with students with special educational needs is a particular theme in distance education, as is the practice of vocational subjects in secondary education.

This study examines the impact of e-learning and digitalization on primary and secondary schools, on the example of Greensprings School in Lagos State, Nigeria. The case study shows that most students agree that e-learning allows students to have access to unlimited sources of information, reveals connections between subjects, promotes critical thinking, and encourages the students' way of learning. The study further shows that the majority of the teachers agree that e-learning is easier and more effective, helps to further develop teachers' computer skills, and brings out the best in students. Interestingly, the two parties agree that e-learning helps teachers and students share accountability for learning and achievements (Tunmibi, et al. 2013: 53-58).

Many scholars (Davis, 2008: 507-519; Somekh, 2008: 449-460) argue that teachers are key in the implementation of IT in education. In addition, they state that the implementation of IT requires teachers to fundamentally change their beliefs about teaching and the way they teach. These changes are related to the transition from a teacher-centered towards a student-centered approach of teaching and learning. This also holds true for teachers teaching in ICT based distance education environments. But teachers teaching in a distance education setting need additional strategies and tactics to foster the teaching and learning process (Nikolov, Nikolova, 2008: 659-674).

Teaching on National Television and Online Learning Platforms

On the first day of the state of emergency, an important decision was made regarding the recording of video lectures and educational contents, which would be broadcast on channels *RTS 2*, *RTS 3* and *RTS-planet* of Serbia's public broadcaster. The prompt reaction of the educational system was distinct, and so was the courage of a number of teachers who dared to appear in front of the camera and talk to an audience of millions. They started very important work for 700.000 students in Serbia, and also for the future of our nation. Although distance learning is not our invention and has been known worldwide for several decades, some of the footage from state television, starting with the footage aired on March 17, 2020, will go down in history and stay in the annals of our education system.

Distance learning was designed and organized in accordance with the capacities of our education system, taking into account the limited period of available time. However, additional steps and activities were necessary to accelerate the implementation of this process. One of those activities was carried out through the website *www.rasporednastave.gov.rs*, where all RTS class schedules were posted and made available for students in Serbia (Randjelovic, et al. 2020: 203-216). As a result, all students, teachers and parents were informed about each segment of teaching covered by the educational content broadcast on state television.

Teachers were given the opportunity to work directly with children, using some of the other digital media (Randjelovic, et al. 2019: 35-46), e.g., the national platform for online learning *www.mojaskola.gov.rs* or some of the contents from television, and to supplement the teaching process with content insufficiently processed on RTS.

The interactivity of the process was additionally encouraged by the establishment of a national platform for online learning *www.mojaskola.gov.rs*, meant to support the lessons on television. Interactivity was stimulated through tests on the portal, and thus contributed to building the self-regulation process in learning. The portal *www.mojaskola.gov.rs* also contains various recommendations for establishing online communication between teachers and students.

A learning management system *My School*,¹ based on Moodle, was also introduced. Moodle is a free, open source software widely used in both the world and our education system. The functioning of the *My School* portal is managed by the Ministry. From the very beginning of distance learning, the richness of digital content on the portal was contributed to by general education teachers and vocational subject teachers employed in primary and secondary schools, who provided tests on a voluntary basis, without remuneration. These tests were then placed on the platform by a group of teachers who had the appropriate digital skills (Novkovic Cvetkovic, et al. 2020: 1231-1244). Professional societies contributed to this whole process, as they delegated teachers for cooperation and thus contributed to the sustainability of this portal (Randjelovic, et al. 2020: 297-300).

Educational contents were broadcast via TV channels, and they were also made available through the free application *RTS My School*² for mobile phones and tablets.

Additional support for students was provided in the form of a multimedia platform (<https://mojaskola.rtsplaneta.rs>). This platform is a kind of digital archive of all broadcast contents and teaching materials.

¹ Moja škola

² RTS Moja škola

Communication between Teachers, Students and Parents

From the very first days of distance learning, it was necessary for teachers to communicate almost daily with their students and their students' parents. Students had to send homework to their teachers, almost daily, and had to exchange other procedural and technical details necessary for the teaching process to be more efficient. For this purpose, various free web-platforms (Zoom, Scype, Microsoft Teams, Google Meet, Google Classroom etc.), applications and social networks (Facebook, Messenger, Viber, WhatsApp etc.) were used, including e-mail. Now, we can say that Google classroom, e-mail and Viber application were definitely the most frequently used.

The Zoom application is available for free and is designed for online meetings, although it has some functional limitations. But buying some of the licenses on offer (not too expensive, so teachers can afford it) lowers the number of restrictions, and this platform becomes very functional and useful.

Thanks to Viber Media, the use of the Viber application and Viber Community service was enabled, which ensured better group communication and information exchange, and was extremely useful in those specific circumstances.

E-mail communication was also very effective for sending diversiform files, homework, as well as for other forms of communication within groups with a finite number of users. Many teachers used e-mail groups for communication with students and parents.

Another application which improved communication is the so-called electronic school diary ("EsDnevnik"). It has already been in use for a few years, but has only now taken on a significant role. After the upgrade and improvement of the function for formative monitoring and evaluation of students registered on the "EsDnevnik", parents have been able to follow all the formative grades of students (<https://moj.esdnevnik.rs/>) since April 2, 2020.

METHODOLOGY

The aim of this research was to estimate the quality of the teaching process and distance learning in primary schools during the spring and fall semesters of 2020. The main goal of the research was to examine the experience, opinions and attitudes of principals, teachers, students and parents/legal guardians of primary school students, in relation to the implementation of distance learning.

A questionnaire on the quality of distance learning was constructed and distributed to respondents in all four target groups in primary schools. In accordance with the aim of this research, the following tasks were set:

- estimation of the response of the Serbian education system to the COVID-19 crisis;
- identification of factors that helped the organization and implementation of distance learning;
- identification of factors that hindered the organization and implementation of distance learning;
- estimation of the level of digital maturity of primary schools.

We established following hypotheses:

- The response of the Serbian education system to the COVID-19 crisis was efficient and successful;
- Most of the students had adequate digital resources for distance learning;
- The low digital competence of teachers influenced the implementation of distance learning;
- The use of various online platforms encouraged the realization of distance learning.

The sample includes 28,186 persons from primary schools in Belgrade, divided into four groups - school principals (113), school teachers (2,550), students (10,484) and their parents/legal guardians (15,039). 64.6% Of the total number of surveyed school principals, 64.6% were female and 35.4% male. Of the total number of surveyed teachers, 84.5% were female and 15.5% male. In regard to the student part of the sample, 57.2% of students were female and 42.8% were male. Of the total number of parents/legal guardians, 85.1%, were female and 14.9% were male.

The research instrument was created in the form of anonymous Google questionnaires, one for each of the four groups of participants. The first part of the questionnaire referred to the collection of socio-demographic data about principals, teachers, students and parents/legal guardians of students (gender, age, education, duration of employment). The second part of the questionnaire contained a set of questions about the organization and implementation of distance learning in primary schools. All groups commented on both the factors that made implementing distance learning difficult and factors which contributed to the quality and efficiency of the implementation of distance learning during the spring of 2020 and during the first semester of the 2020/21 school year (autumn 2020). Also, the questionnaires contained a set of questions that referred to the level of the digital capacity of primary schools for conducting distance learning. The questions in the questionnaires are based on the "Selfie" instrument for the self-evaluation of the digital maturity of educational institutions³. This instrument was piloted in the educational system of the Republic of Serbia in 2017, and has been widely adopted and applied since 2019.

³ https://ec.europa.eu/education/schools-go-digital/about-selfie_sr

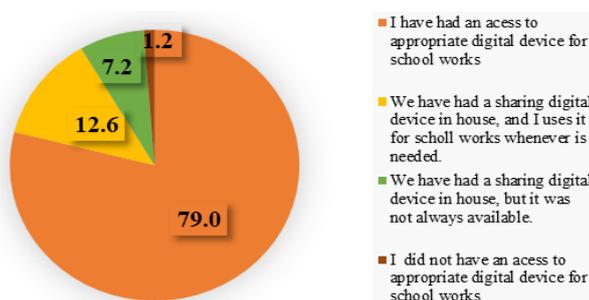
Based on the educational experience and practice in primary schools during the spring and autumn of 2020, all participants answered in relation to the involvement of a particular participant group. The obtained results were compared with each other, in order to get a clear picture of the educational practice in that period.

RESULTS AND DISCUSSION

Participants from all four groups answered questions regarding the factors that hindered or contributed to the educational process during distance learning in two periods: the spring of 2020, when traditional teaching was interrupted for the first time, and the first semester of the 2020/21 school year. In addition, it is important to emphasize that the set of questions in the questionnaire concerned the level of digital capacities of primary schools for the implementation of distance learning. In accordance with that, the results of the research are structured so as to refer to the respondents' assessments and their comparative analyses of all three researched areas: students' resources for working from home, factors influencing the implementation of distance learning and the digital maturity of primary schools.

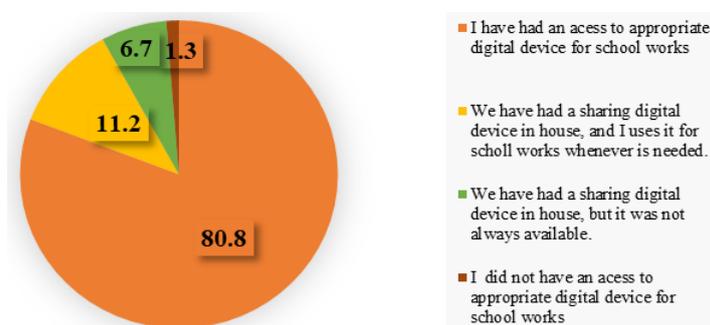
Student Resources for Working from Home

We assessed the data about the availability of digital devices for use in the distance learning process during the spring 2020. The data shows that the largest number of surveyed students always had the device they needed (79%). There were students (12.6%) who shared the device with their family, but they had it at their disposal whenever they needed it. A fewer number of students (7.2%) had a device that they shared with others in the household, but could not use it whenever they needed it. Only 1.2% of surveyed students did not have access to digital devices for performing school tasks (see Graph 1).



Graph 1. Percentage of primary school students depending on the availability of digital devices (computer, laptop, tablet, mobile phone) during the spring of 2020

The availability of digital devices to students during the fall of 2020 was relatively better (see Graph 2). Namely, 80.8% of students always had the device they needed for learning at their disposal. The percentage of students who shared the device with their family members, but had it available whenever they needed it, decreased to 11%. The percentage of those who had a shared device in the household and who could not always use it when they needed it also decreased. The percentage of surveyed students who did not have access to digital devices for performing school tasks remained more or less the same (1.3%).



Graph 2. Percentage of primary school students depending on the availability of digital devices (computer, laptop, tablet, mobile phone) during the first semester of 2020/21.

Factors that Hindered the Implementation of Distance Learning

The factors that each separate group of participants considered hindering for the effective implementation of distance learning are listed in the following table. Participants could mark or not mark any of the listed aggravating circumstances. The percentage of participants who noticed the factors that hindered the implementation of distance learning for each subsample and for both periods is given in Table 1.

All four groups agree that the greatest difficulty observed during distance learning is the students' limited access to a stable internet connection and digital devices. About half of the surveyed school principals, during both stages of the survey, believed that the digital competency of students and their family members was low, and that there were difficulties in engaging students and in supporting their families in helping the students with distance learning. A significant percentage of principals and teachers expressed the opinion that, in the spring of 2020, there was a noticeable lack of experience and training of teachers for the implementation of distance learning, while only a few months later the percentage related to that opinion was significantly lower. The results were reduced in percentage from about 60% and 30% to about 11% and 12% in both study groups (Table 1).

Table 1. Percentage of participants who recognized difficulties in implementation of distance learning

Statement	Participants answer							
	Principals		Teachers		Students		Parents	
	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.
	%	%	%	%	%	%	%	%
Students' limited access to digital devices	67,3	48,7	62,4	50,3	25,8	26,6	24,0	20,1
Students' limited access to good internet connection	73,5	61,1	64,5	58,4	63,8	61,8	35,0	33,1
Low level of digital competency of students	36,3	20,4	40,5	31,9	9,3	8,8	15,4	10,9
Low level of digital competency of family members	52,2	34,5	39,9	32,6	6,7	5,4	9,6	7,2
Low level of digital competency of teachers	18,6	8,8	14,3	5,9	12,2	9,6	15,3	10,9
Lack of technical support for teachers	37,2	23,0	41,6	29,7	8,7	7,2	23,1	16,7
Lack of technical support for students	46,9	35,4	42,2	30,9	15,9	12,7	29,4	21,2
Lack of time for teachers to create teaching materials for distance teaching	26,5	19,5	35,3	31,0	16,6	15,1	24,6	19,9
Lack of time for teachers to give feedback to students	15,9	14,2	29,9	27,6	23,9	19,4	27,5	24,6
Unclear procedures and directions for performing distance learning	32,7	10,6	41,7	25,8	19,8	14,9	36,3	28,7
Difficulties in student engagement	44,2	59,3	49,7	47,1	24,0	20,7	29,2	25,1
Difficulties in supporting families in helping students with distance learning	54,9	47,8	35,8	26,9	11,4	8,3	30,3	22,9
Lack of teachers' experience in the implementation of distance learning	61,9	11,5	34,9	12,9	32,1	18,8	28,9	17,1
Lack of training for teachers for the implementation of distance learning	34,5	13,3	23,5	11,8	22,5	14,7	22,5	15,0

Both principals and teachers agreed on many issues which they cited as aggravating factors for the implementation of online teaching. However, most of them were noticed on time, so the results visibly improved in the autumn of 2020. As key aspects, they stated low digital competence and a lack of technical support for teachers, as well as the lack of time to produce materials for distance learning.

A large percentage of students and parents (about two thirds of the students and one third of the parents) said that the biggest problem was limited internet access throughout the school year. In addition to these aggravating circumstances, slightly less than a third of them pointed out difficulties with limited student access to digital devices, the teachers' lack of time to give feedback to students, and difficulties in engaging students throughout the year. In relation to the spring of 2020, the same percentage of students and parents stated that the teachers lacked the experience and training to implement distance learning, and that there were difficulties in providing support for families helping students with their education. This significantly improved distance learning during the second stage of the research (autumn 2020). Less than 15% of them cited the issues of low digital competency of students, teachers and families, the lack of technical support for teachers and time needed for the production of materials for distance education.

Comparing data for the periods of spring and autumn of 2020 has led to the general impression that all four groups noticed improvements in regards to almost all of the potential aggravating circumstances.

Factors that Facilitated the Implementation of Distance Learning

All four groups also commented on the circumstances that positively affected the realization of distance learning. The opinions of the participants are given in Table 2. This table also contains empty cells. This is due to the fact that students and their parents did not answer all the questions answered by the principals and teachers.

Without significant differences between the spring period and autumn periods, principals (over 80%) and teachers (over 50%) primarily emphasized the following mitigating factors: cooperation between teachers, the use of digital technologies, and the creation of additional materials. The facts that schools were well-organized and that there was constant communication with parents were also emphasized. A slightly lower percentage of the surveyed teachers and principals pointed out the following mitigating factors: schools' access to well-organized online resources and the teachers' participation in professional development programs. During both stages of research, less than 40% of participants in these two groups felt that the school had experience in using learning management systems, and that teachers participated in professional networks, and cooperated with other organizations and schools.

The schools' lack of a "Bring Your Own Device" (BYOD) policy was singled out as the most sensitive issue. The help and assistance of the State and municipalities regarding support or guidelines for conducting online classes were also mentioned as mitigating factors (Table 2).

Table 2. Percentage of participants who recognized a certain circumstances that positively influenced the implementation of distance learning

Statement	Participants answer							
	Principals		Teachers		Students		Parents	
	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.	Spring 2020.	Fall 2020.
	%	%	%	%	%	%	%	%
Students' limited access to digital devices	67,3	48,7	62,4	50,3	25,8	26,6	24,0	20,1
Students' limited access to good internet connection	73,5	61,1	64,5	58,4	63,8	61,8	35,0	33,1
School already had some experience in using a school-level learning platform	22,1	69,9	25,7	57,5	13,6	20,6	19,9	35,7
School had access to well-organized online resources	52,20	68,1	30,1	45,3	46,3	46,4	24,1	25,4
School implements „Bring Your Own Device (BYOD)“ policy	8,80	7,1	16,7	13,7	8,7	9,3	10,1	8,9
Teachers participated in professional networks	36,30	48,7	23,5	33,3	33,8	30,9		
Teachers participated in programs of professional development	65,50	63,7	46,0	52,1				
Teachers in school cooperated regarding the use of digital technologies and creation of resources	89,80	85,0	55,7	71,7			25,1	22,2
School cooperates with other schools and organizations	39,8	41,6	16,7	19,6	6,9	6,8	3,9	4,4
School uses "Selfi" instrument to assess the use of digital technology	23,9	22,1	6,9	6,8				
School had a digital segment in the School Development Plan	31,9	33,6	14,5	18,8				
State and municipality provided support and directions	19,5	23,9	5,8	9,0			4,6	4,6
School had well-organized, constant communication with parents	86,7	85,8	49,3	49,3	40,6	34,8	51,1	42,6

In addition to principals and teachers, a significant percentage of surveyed students and parents felt that the school had access to well-organized online resources (up to 40%) and that communication with parents was well-organized and constant (about 40 - 50%). These two groups of participants marked any of the offered claims as a mitigating factor, in a much smaller percentage, compared to principals and teachers. About 30% of students felt that teachers participated in professional networks, and teachers commented on these issues as well (Table 2). Few students and parents confirmed that the school had a “Bring Your Own Device” (BYOD) policy and experience in use of a learning management system.

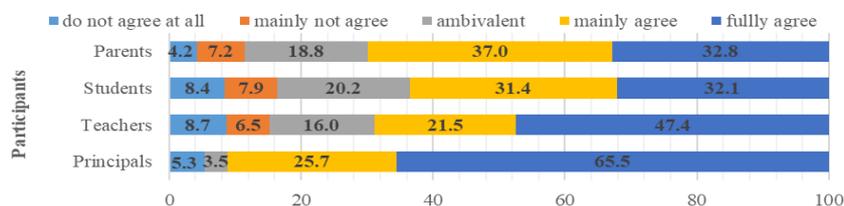
The participants thought that the school did not cooperate well with other organizations and schools, and that the State did not provide support and guidelines for this type of teaching. This implies that schools did not use the mechanisms offered to them, and this could be helpful on our path to digital transformation.

In general, all participants estimated that, within the span of a few months, the school gained experience in using a learning management system.

The Digital Maturity of the School in Relation to the Organization and Implementation of Distance Learning

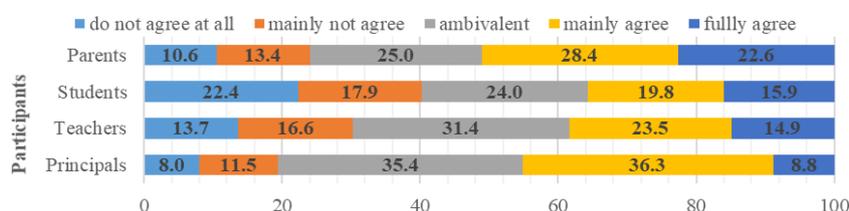
The questionnaires contained a set of questions related to the degree of the digital maturity of schools regarding the implementation of distance learning. The participants were given a chance to agree with these claims using a five-point Likert scale. The results of the assessment are shown in the following graphs.

A significant number of the surveyed principals (over 90%) fully agreed that the school had a unique learning management system within which students can communicate with their teachers and find tasks, activities, schedules and resources (Graph 3). The discrepancy observed while comparing the answers of principals with the answers of teachers, students and parents implies that principals would like to use one platform for online learning, but that there were more platforms in educational practice. A large percentage of undecided participants in these three categories, however, indicates a certain degree of misunderstanding regarding learning platforms.



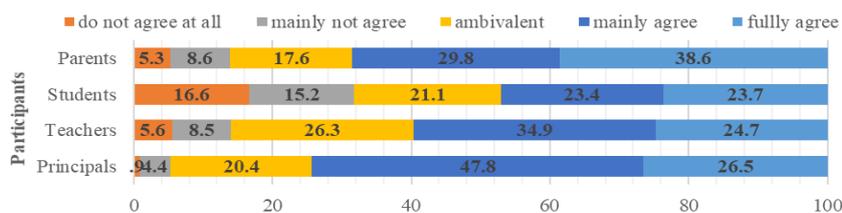
Graph 3. The response of the participants to the statement: “There is a unique learning management system in the school where students can communicate with their teachers and find tasks, activities, schedules and resources.”

Graph 4 shows the differences between the students' answers and the answers of all other participant groups regarding the manner in which students manage their time in school, the manner in which they use digital technologies, and the manner in which they plan their work schedule and time for rest. Namely, about 23% of the surveyed students marked 'not agree at all', while about 18% of them marked 'mainly not agree'. This data indicates the absence of designed learning activities and educational communication taking place within the school platform for online learning which is characterized by asynchronicity (each student is allowed to learn and do tasks at their own pace, until the deadline defined by the teacher). The majority of the surveyed principals, teachers and parents agreed about this or were undecided (Graph 4).



Graph 4. The response of the participants to the statement: "In our school, students learn how to manage their time using digital technologies, shared calendars or other planning tools to set work schedules and time for rest."

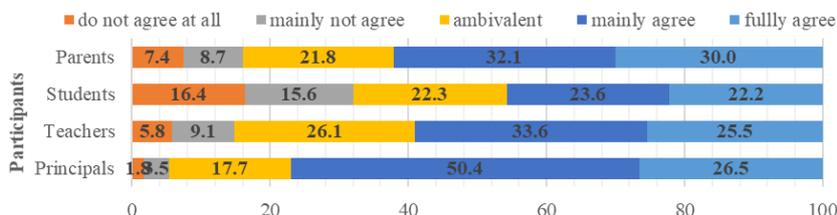
Most respondents partially or completely agreed with the statement regarding the use of technologies in seeking help in cases of learning difficulties (see Graph 5). As was the case with the previous questions, fewer students expressed a positive attitude in comparison to other participant groups.



Graph 5. The response of the participants to the statement: "In our school, students learn how to use technologies to seek help when they have learning difficulties."

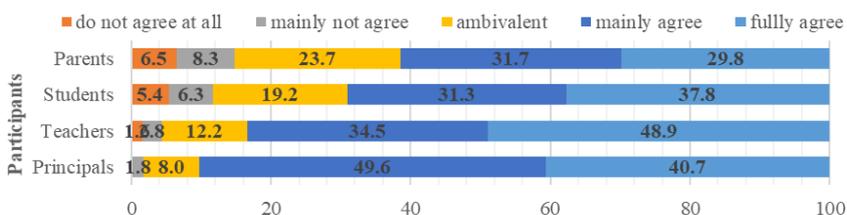
About two-thirds of the surveyed parents and teachers, and half of the surveyed students marked 'fully agree' or 'mainly agree' in regards to the statement that students learn how to use help-seeking technologies when they have difficulties using the software/applications recommended

by their teachers, while almost 80% of the total number of surveyed principals had a positive attitude about this issue (Graph 6).



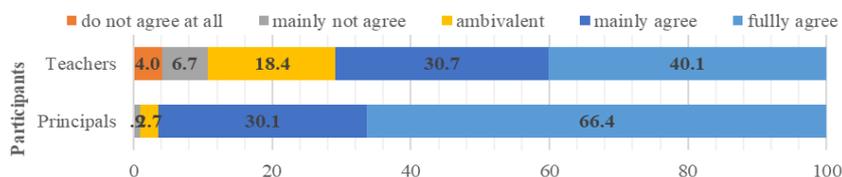
Graph 6. The response of the participants to the statement: “In our school, students learn how to use help-seeking technologies when they have difficulty using software/applications recommended by their teachers.”

All participants agreed that teachers provided their students the opportunity to access teaching content online, although the assessments of principals and teachers were more positive than the assessments of students and parents (Graph 7).



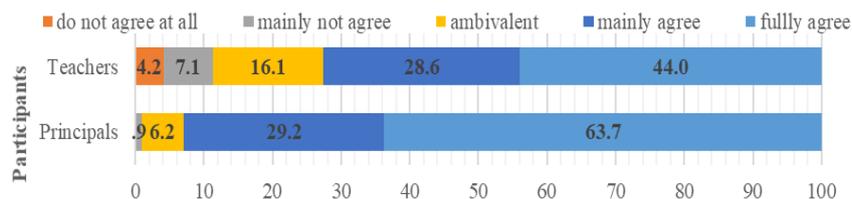
Graph 7. The response of the participants to the statement: “In our school, teachers provide students with the opportunity to access new teaching content online in order to use school classes for interactive activities.”

Almost all principals marked ‘fully agree’ or ‘mainly agree’ for the statement that teachers were supported and empowered in solving basic technical problems when using digital technologies. Just over 70% of the surveyed teachers agreed with them, but it is indicative that 18% remained undecided on this issue (Graph 8).



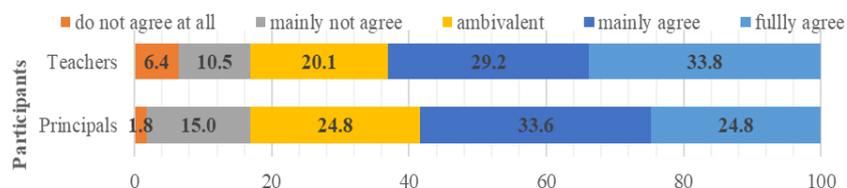
Graph 8. The response of the participants to the statement: “We support teachers in learning how to solve basic technical problems when using digital technologies.”

Over 40% of the surveyed teachers and over 60% of the surveyed principals fully agreed that teachers were provided training, organized in schools, regarding online teaching, distance learning and hybrid teaching (Graph 9).



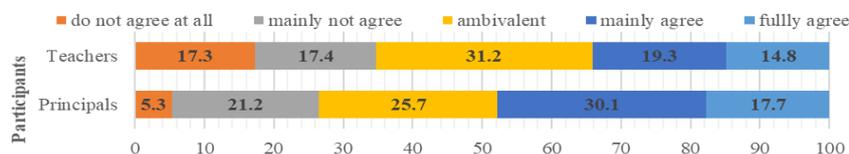
Graph 9. The response of the participants to the statement: "In our school, we organize training for teachers about technology for support distance learning (including distance education, online teaching and hybrid teaching)."

Graph 10 demonstrates that about two-thirds of the surveyed teachers and principals believe that the teachers in the school collaborated on creating a repository of shared online resources. Almost 25% of the surveyed principals and 20% of the surveyed teachers are undecided on this issue. Given that this activity is conducted by the school's teaching staff, the fact that a significant number of the surveyed participants remained undecided on the issue gives one the impression that those same participants are not at all familiar with this type of activity.



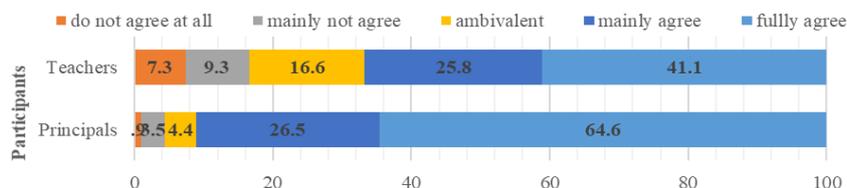
Graph 10. The response of the participants to the statement: "In our school, teachers cooperate in creating a repository of shared online resources."

Graph 10 clearly demonstrates that there is a significant number of indifferent responses (I am ambivalent) to the statement regarding the existence of a repository of online resources in the school. This indicates that teachers and principals are not familiar with the concept of a school's "bank of digital teaching resources" which can be used in the implementation of online teaching. However, it is encouraging that almost half of the surveyed principals and a third of the surveyed teachers reported the existence, and thus the use, of such repositories (see Graph 11).



Graph 11. The response of the participants to the statement: "In our school there is a repository of online resources that teachers can use, add resources, share and reuse."

Graph 12 shows that there are differences between the answers of teachers and the answers of principals regarding the digital devices and internet access provided for teachers. Almost all principals marked 'fully agree' and 'mainly agree' for this statement, while about two thirds of the surveyed teachers provided the same answers (Graph 12).



Graph 12. The response of the participants to the statement: "Our school provides infrastructure to teachers (digital devices, internet connection) that teachers can use when they need it."

CONCLUSION

The analysis of data gathered during this research resulted in several important conclusions and recommendations for the organization of distance learning and the future integration of the hybrid model of teaching and learning into school practice:

- During the implementation of distance learning, it is necessary to provide digital resources (devices and internet connection) for teachers and students. Teachers have suggested borrowing the equipment they need for work during distance learning from the school which employs them. Given that only 1% of the students who participated in this study did not have the conditions to take part in this type of teaching, wider social action that would include partners from the IT industry, mobile operators and other stakeholders could result in the establishment of digital libraries in the schools and thus ensure that digital resources for distance learning are made available to all students.
- Schools should be obligated to use only one school-level learning platform. Although this measure is already listed in the instructions and recommendations for distance learning provided by the

Ministry of Education, there are still cases of schools using multiple learning platforms, which makes distance learning difficult to implement and its effects hard to monitor;

- The educational system should introduce systematic measures (large scale training) to empower and support teachers in implementing and monitoring the online teaching process within the school's online learning platform. Engaging students in the distance learning process was assessed as a challenge which all teachers face and in which they need urgent and strong support. The school-online learning platform should be a specialized learning management software that contains mechanisms for monitoring student engagement and assessing their learning success. The full use of the functions of the school platform could provide the necessary base for the proper design of learning activities and written educational communication, and timely provision of student feedback and formative and consistent summative assessment.
- Schools should provide any student who is not currently in school the opportunity to be engaged in the educational process through hybrid teaching within the school's online learning platform. Through interaction with carefully prepared teaching materials, participation in well-designed learning activities, and written communication, schools should ensure that students who are not in school are not excluded from any part of the teaching process and are given the opportunity to actively construct knowledge in the online space.
- Schools should be encouraged to introduce systemic measures such as the "Selfie" instrument, used to estimate the level of current digital maturity, to define the digital segment of the Institutional Development Plan and to create a medium-term action plan for implementing digital transformation. Research has shown that some schools do not use the available instruments or recommendations of the Ministry of Education, Science and Technological Development, the Institute for the Improvement of Education and the Institute for Education Quality and Evaluation, closely enough to improve their digital maturity, and the quality of distance learning more efficiently.
- Schools should systematically encourage cooperation between teachers in a process of horizontal learning. The cooperation between teachers working in the same school, but also between teachers working in different schools, has proven to be a factor that significantly contributes to the successful realization of online teaching. The cooperation of teachers encourages all participants in the educational process to work better and to achieve the desired results.

The increasingly rapid development of information and communication technologies, growing environmental problems, and potential future epidemics, lead us to the conclusion that distance learning is becoming a reality, not just a necessity. Teachers are the key to quality education, so it is necessary to empower teachers to work in the online environment, just as it is necessary to invest in digital materials and online resources.

REFERENCES

- Bates, T., (1995). *Technology: Open learning and distance education*. New York: Routledge.
- Burgess, S., Sievertsen, H. H., (2020). Schools, skills, and learning: The impact of COVID-19 on education. *VoxEU*. <https://voxeu.org/article/impact-covid-19-education> (April, 2020).
- Butcher, N., Wilson-Strydom, M., (2008). *Technology and Open Learning: The Potential of Open Education Resources for K-12 Education*. In: Knezek, G., Voogt, J. (Eds.). *International Handbook for IT in Secondary Education (725-746)*. , New York: Springer.
- Davis, N., (2008). *How May Teacher Learning Be Promoted for Educational Renewal with IT*, In: Knezek, G., Voodgt, J. (Eds.). *International Handbook for IT in Secondary Education (507-519)*. New York: Springer.
- Education Endowment Foundation, (2020). *Impact of school closures on the attainment gap: Rapid evidence assessment*. London: EEF.
- Gajek, E., (2017). *Curriculum Integration in Distance Learning at Primary and Secondary Educational Levels on the Example of eTwinning Projects (301-312)*. Warsaw: University of Warsaw, Institute of Applied Linguistics.
- Government of Serbia (2020). *Decision of the Government of the Republic of Serbia on the suspension of teaching in higher education institutions, secondary and primary schools and the regular work of preschool education institutions [Одлука о обустави извођења наставе у високошколским установама, средњим и основним школама и редовног рада предшколског васпитања и образовања]*, Official Gazette of RS, No. 30/2020 (in Serbian).
- Government of Serbia (2020). *Decree on measures during a state of emergency [Одлука о мерама за време ванредног стања]*, Official Gazette of RS, No. 31/2020 (in Serbian).
- Imel, S., (1998). *Myths and realities of distance learning*. Columbus, Ohio: ERIC Clearinghouse on Adult, Career, and Vocational Education. Ohio State University. (Eric Document Reproduction Service No. ED 414 446).
- Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., Liu, J., (2020). *Projecting the potential impacts of COVID-19 school closures on academic achievement (EdWorkingPaper No. 220-226)*. Providence, RI: Annenberg Institute.
- Mandić, D., Mandić A., (2013). *Innovations in Modern Education and Teachers Competences*. *Asian Journal of Education and e-Learning*, 1(1), 70-88.
- Minić, S., (2017). *Tablet technology in Education*. *Zbornik radova Uciteljskog fakulteta u Prizrenu-Leposavicu*, 11, 49-57.
- Ministry of Education, Science and Technological Development of Republic of Serbia (2020). *Report about distance education in Republic of Serbia during emergency state [Извештај о настави на даљину у Републици Србији током ванредног стања]*. (in Serbian).

- Moore, J. L., Dickson-Deane, C., Galyen, K., (2011). E-learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education*, 14(2), 129-135.
- Nikolov, R., Nikolova, I., (2008). Distance Education In Schools: Realities and Perspectives. *International Handbook of Information Technology in Primary and Secondary Education* (pp. 659-674)
- Novković Cvetković, B., Stanojević, D., Milanović, A., (2020). Application of Computers in Teaching and Learning From Teacher's Point of View, *Teme*, XLIV (4), 1231-1244.
- Porter, L. R., (1997). *Creating the Virtual Classroom: Distance Learning with the internet*. John Wiley & Sons.
- Randelović, B., Stanojević, D., Minić, S., (2019). Analysis of framework of digital competences for teachers in Serbia and teachers in European Union. In: Paunović, Lj., Vidosavljević, S. (Eds.) *Inovative approach to education: situation, dilemmas and perspectives* (35-43). Leposavić: University of Kosovska Mitrovica, Faculty of Teachers Education.
- Randelović, B., Karalić, E., Đukić, D., (2020). The Digitalization of the Learning Process in Serbia During COVID-19 Crisis, In: *International Scientific Conference "Science and Teaching in pedagogical-educational context [Nauka i nastava u vaspitno-obrazovnom kontekstu]* (203-216). Užice: Pedagoski fakultet.
- Randelović, B., Aleksić, K., Stanojević, D., (2020). Online self-assessment as preparation for final exam in primary schools – experience from COVID19 crisis, In: Dobrilović, D., Cherkashin, E., Bocevska, A. (Eds.) *X International Conference on Applied Internet and Information Technologies AIIT* (297-300). Zrenjanin: Technical faculty, Mihajlo Pupin.
- Somekh, B., (2008). Factors Affecting Teacher's Pedagogical Adoption of ICT, In: Knezek, G., Voogt, J. (Eds.). *International Hanbook for IT in Secondary Education* (449-460), Springer.
- Tomasik, M. J., (2020). Educational Gains of In-Person vs. Distance Learning in Primary and Secondary Schools: A Natural Experiment During the COVID-19 Pandemic School Closures in Switzerland. *International Journal of Psychology*. 56(4), 566–576. doi:10.1002/ijop.12728
- Tunmibi, S., Aregbesola, A., Adejobi, P., Ibrahim, O., (2013). Impact of E-Learning and Digitalization in Primary and Secondary Schools. *Journal of Education and Practice*, 6 (17), 53-58.
- United Nations Sustainable Development Group, (2020). *Policy brief: Education during COVID-19 and beyond*. New York: United Nations.

ОБРАЗОВАЊЕ НА ДАЉИНУ У СРБИЈИ – ИСКУСТВА У ОСНОВНОМ ОБРАЗОВАЊУ ТОКОМ КОВИД-19 КРИЗЕ

Бранислав Ранђеловић^{1,2}, Елизабета Каралић³,
Данијела Ђукић³, Катарина Алексић^{3,4}

¹Универзитет у Нишу, Електронски факултет, Ниш, Србија

²Универзитет у Приштини - Косовској Митровици, Учитељски факултет,
Лепосавић, Србија

³Завод за вредновање квалитета образовања и васпитања Републике Србије,
Београд, Србија

⁴Министарство просвете, науке и технолошког развоја, Београд, Србија

Резиме

У овом раду разматрамо реакцију и одговор образовног система Републике Србије на ковид-19 епидемиолошку кризу, у смислу извођења наставе и наставних активности на даљину, у основним школама у Србији. Разматрана је настава реализована преко јавног телевизијског сервиса и осталих онлајн сервиса. Предмет истраживања био је утврђивање квалитета процеса наставе и учења на даљину у основним школама у Србији. У складу са сврхом истраживања креиран је упитник о образовном искуству и пракси у основним школама током пролећа 2020. године и јесени 2020. године за директоре школа, наставнике, ученике и родитеље/законске заступнике ученика. У истраживању спроведеном током марта и априла 2021. године, учествовало је укупно 28.186 особа - 113 директора, 2550 наставника, 10484 ученика и 15039 родитеља/законских заступника. Свака група испитаника изјашњавала се о томе који су фактори отежавали, а који доприносили квалитету и ефикасности реализације наставе на даљину током пролећа 2020. године и у првом полугодишту школске 2020/21. године (јесен 2020. године). Такође, упитници су садржали изјаве/тврдње које су се односиле на степен дигиталног капацитета основних школа за спровођење наставе на даљину у тренутку спровођења истраживања (март/април 2021. године). Резултати истраживања показују да је већина школа ефикасно користила онлајн ресурсе, упркос почетним ниским дигиталним компетенцијама наставника и ученика. Највећи проценат ученика и родитеља сматрао је да су најизраженији проблеми били у вези са ограниченим приступом интернету током целе школске године, ограниченим приступом ученика дигиталним уређајима, недостатком времена наставника за давање повратних информација ученицима, као и потешкоћама у ангажовању ученика током целе године. На основу резултата истраживања формулисале су најважније препоруке за организацију наставе на даљину и будућу интеграцију хибридног модела наставе и учења у школску праксу: а) обезбедити дигиталне ресурсе (уређаје и интернет конекцију) за рад наставника током реализације наставе на даљину, али и ученицима којима је то неопходно; б) обавезати школе да користе само једну платформу за учење на нивоу школе; в) припремити системске мере (масовне обуке) којима би се оснажили наставници за спровођење и праћење онлајн наставе у оквиру школске платформе за онлајн учење; г) осигурати да током хибридне наставе, у оквиру школске платформе за онлајн учење, ученици који нису тренутно у школи буду образовно ангажовани; д) подстаћи школе да користе системске мере попут „Селфи“ инструмента како би процениле ниво тренутне дигиталне зрелости, дефинисале дигитални сегмент Развојног плана установе и креирале средњорочни акциони план за спровођење дигиталне трансформације; њ) системски подстицати сарадњу наставника и хоризонтално учење.