THE ROLE OF DISTANCE LEARNING DURING THE COVID-19 PANDEMIC

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Abstract: The primary objective of this paper is to present the analysis of the functioning of distance learning in the educational system in Serbia during Covid-19 pandemic, and to draw conclusions on the readiness of the system for such and similar situations. More specific, the objective is to consider the role of distance learning in these circumstances, bearing in mind the fact that only in primary and secondary schools nearly 750,000 students and some 80,000 teachers were forced to use one or the other distance learning method. COVID-19 pandemics has affected educational systems in Serbia and worldwide alike, posing unimaginable logistic and technological challenges, forcing teachers to teach in new and unfamiliar ways. The paper first provides an overview of the most commonly used distance learning platforms and applications, in general and especially during a pandemic. In particular, research was conducted on students' attitudes about distance learning during the pandemic. The data obtained from a survey conducted at the Faculty of Economics, University of Belgrade is also analysed. The paper points out that the impact of the pandemic will clearly be far-reaching and widespread, raising the issue of its possible long-term significance for the education in general, and the educational system in Serbia in particular. The paper also points to the need of generation of new ICT skills in education. Technology has taken roots in education and will continue to play the key role in educating generations to come. With knowledge just a click away, the role of teachers will inevitably change.

Key words: COVID-19 pandemic, education system, distance learning, software tools

INTRODUCTION

The COVID-19 pandemic has affected the entire education system, worldwide and in Serbia alike, putting it in front of unprecedented logistical and technological challenges, forcing teachers and educators to teach in new and unknown ways, and parents to adapt ways of supervising children learning at home. Since World War II, not many countries around the world have been in a situation where schools and educational institutions close at the same time and for the same reason. About 1.2 billion students and youth across the planet, or about 60% of that population, are affected by the closure of schools and universities due to the COVID-19 epidemic (UNESCO, 2020). In Serbia alone, over 750,000 students and 80,000 teachers are forced to use some form of distance learning in primary and secondary schools. It is clear that the impact of this pandemic will be far-reaching and widespread, so the question is what could it mean in the long run for education in general, and for the education system of Serbia in particular?

As teachers and educators face new ways of communicating with students far from their classrooms, it is time to consider the following: how can this devastating crisis help us define what learning should look like for future generations, as well as what needs to be changed in the educational system in order for the system to function smoothly and efficiently in such and other crises, for the transition from the regular state to the state of emergency to be almost imperceptible.

The Global Education Coalition, launched by UNESCO, wants to facilitate learning opportunities for children and youth during this sudden and unprecedented disruption in education. Investing in distance learning should alleviate the immediate disruptions caused by COVID-19 and establish approaches to developing more open and flexible education systems for the future (UNESCO, 2020).

In order to draw conclusions for the future, we analyze how distance learning works during the COVID-19 pandemic on the example of the Serbian education system. In particular, we conduct a survey among students of the Faculty of Economics in Belgrade, about their attitudes towards distance learning in general and during an emergency situation.

1. Distance learning

Distance learning, also known as *distance education, e-learning* and *online learning*, is a form of education in which the main elements include the physical separation of teachers and students during teaching and the use of different technologies to facilitate communication between students and teachers and students with each other (Encyclopedia Britannica, 2020). To use these technologies successfully, teachers need to learn about different design and messaging techniques that are specific to these technologies. Students must learn how to learn and communicate using technology. Administrators in educational and teaching institutions must organize their resources differently than they do for classroom teaching (Moore and Kearsley, 2012. p.3).

E-learning process and content management systems

The Learning Management System (LMS) is a software package that enables the management and delivery of learning content. Most *LMS* systems are created as a Web solution that facilitates content access and administration. *LMS* enables registration, delivery and monitoring of e-learning and content courses, testing, as well as course management and joint learning with an instructor. Most systems are self-service and allow participants to register independently and access

courses. *The Learning Content Management System (LCMS)* facilitates the organization of content and authoring tools, as well as the presentation of this content to participants through the *LMS*. Most systems are developed for commercial use. However, there are also free open-source models.

2. Distance learning platforms and applications used during the COVID-19 pandemic in the Serbian education system

Due to the pandemic caused by the COVID-19 virus, the Republic of Serbia declared a state of emergency on 15 March 2020, temporarily suspending direct classes in schools. In order to exercise students' right to education, the Ministry of Education, Science and Technological Development of Serbia prepared an operational plan for the continuation of schools' work in difficult conditions (https://www.rasporednastave.gov.rs). This plan took into account a large number of different teaching and learning programs in all grades of primary and secondary school and had a focus on organized distance learning that helps realize program contents of general education subjects and vocational subjects with the largest number of classes.

The Ministry envisaged and supported the implementation of educational activities through various channels and forms of communication: by broadcasting specially prepared and adapted educational content for primary and secondary school students on RTS2 and RTS3 TV channels of the Public Media Service of Serbia:
- By establishing a repository of educational video content for primary and secondary school students on the free "RTS My School" mobile phone application, on the RTS website and on the RTS Planet multimedia internet platform;
- By making available a set of tools for online communication between students and teachers;
- By creating conditions for digital solidarity – sharing authors' teaching materials among practitioners.

For those who do not have Internet access, free access was provided through all three mobile operators.

"My school" Portal

In order to use the digital resources at its disposal in a pedagogically responsible way, the Ministry of Education, Science and Technological Development of Serbia provided additional support to students through the "My School" portal (https://www.mojaskola.gov.rs).

"My classroom TeslaEDU" online platform

Comtrade, in cooperation with the Office for Information Technology and eGovernment and the Ministry of Education, Science and Technological Development, provided a distance learning system that is localized in Serbian, adapted to an efficient education system and located on resources within the state "data center". The platform is provided for all students and teachers in primary and secondary schools (https://www.mojaucionica.gov.rs). "My classroom TeslaEDU" is a portal and mobile application for the m-Learning platform. It is a unified package of functional modules, based on the Moodle LMS platform, which are carefully selected and integrated in order to optimally manage the entire learning experience, in each of the formal education process phases. The platform covers the areas of course writing, course enrollment and attendance, course teaching, online assessment, progress monitoring, course evaluation and reporting. "My TeslaEDU classroom" allows students to access it from their own computers, tablets, or from their smartphones. From their computers, students can study materials, take quizzes, collaborate through discussions in online lectures, receive and teach assignments, and use calendar reminders related to the material. The platform is accessed through user accounts provided by the Ministry of Education, Science and Technological Development. Support is provided on the https://www.mojaucionica.gov.rs portal. Illustrative courses have been prepared within the portal for teachers and students, as well as detailed guidelines with video materials for training in the use of the teaching platform.

Microsoft Teams

During the crisis period, Microsoft provided free use of the Office 365 platform, within which a version of the Teams application adapted for education is available (https://www.microsoft.com). The platform will be available to schools and faculties free of charge now and later and will allow all teachers, pupils, professors and students to organize remote teaching via the Internet through a group video call in which the teacher can share the content of their screen with students and record the whole course of the class and make it available to all pupils/students from the appropriate group. Access to the platform is first provided for all students and teachers in primary and secondary schools. The platform can be accessed from computers and mobile devices. For those who do not have Internet access, free access to the platform is provided via mobile networks. In order to better prepare teachers to use the platform, Microsoft has organized free online training for teachers.

ZOOM

ZOOM is much simpler, it works great, but its free version has two important limitations: up to 100 participants (students) and duration of up to 40 minutes (https://zoom.us). This application is intended for online meetings. For those who do not have Internet access, free access to the application is provided via mobile networks. The use of this application does not require special support from the ministry, but each institution creates an account for itself and manages it. This platform was successfully used at all levels in the education system of Serbia, during the COVID-19 pandemic.

Viber Community

In cooperation with Viber, the use of both the Viber application and the Viber Community service is enabled, which enables efficient group communication and information exchange, which can be useful in given conditions (https://www.viber.com/en/communities). For those who do not have Internet access, free access is provided through mobile networks. No special support is required for the application.

The "Digital Solidarity" portal

The *Digital Solidarity* portal (https://www.digitalnasolidarnost.gov.rs) is intended for everyone who had to be in their homes due to the coronavirus pandemic. All information on free platforms for distance learning, work from home, free online books, courses and other contents during the COVID-19 pandemic is given in one place.

The MOODLE platform

The *Moodle* platform is widespread in the education system, though not generally accepted. *Moodle* provides teachers with full computer support in organizing and conducting online education. Some of the more important features of *Moodle* are: course planning – activity schedule, calendar, user management, user roles and user groups on the course, knowledge testing and user evaluation, monitoring user activities, system management, content protection by backing up, keeping statistics and report creation (http://www.moodle.org, 2020). RCUB *Moodle* is open to all members of the University of Belgrade, but also other universities and colleges. The Moodle platform has been used in teaching at many faculties at the University of Belgrade for more than 10 years. The open source conferencing system *BigBlueButton* is often used in addition to this platform. The new version of the *BigBlueButton* version allows you to record sessions, vote and save the attendance list.

In addition to the described platforms, other platforms were used in the Serbian education system during the COVID-19 pandemic: Cisco Webex Teams, G-Suite for Education, Google Classroom and others.

3. Research results on students' attitudes towards distance learning

For the purposes of this paper, a special research was prepared, based on the results of a survey conducted among students of the Faculty of Economics in Belgrade, after the experience they had in a state of emergency caused by the COVID-19 virus pandemic. 114 students participated in the survey. The aim of the research was to get the general attitudes of students towards distance learning, as well as their opinion on the quality of online teaching during the COVID-19 pandemic. In that sense, the questions in the survey are divided into two parts. The first part presented questions about the general attitudes of students towards online learning, such as:
- What is your attitude towards the relationship between online learning and traditional learning?
- What do you think are the advantages of online learning?
- What do you think are the disadvantages of online learning?
- In your opinion, what are the most suitable forms for presenting materials within online learning?

The second set of questions referred to the students' attitudes towards the immediate experience they had during the two months, when they followed the classes solely through online platforms.

Regarding the attitude of students towards online and traditional learning, it is noted that the largest number of students (78.07% of surveyed students) believe that online learning can be combined, as an additional form, with traditional learning. This indicates that traditional learning is still one of the most reliable forms of learning, and that the opportunities provided by online learning are additional benefits that traditional learning lacks. The following table shows the structure of students' responses (at the sample level) to the question of whether they prefer traditional or online learning.

Table 1. Attitudes of students towards online and traditional learning

Answers	Share (%)
Online learning in addition to	78.07%
Online learning only	15.79%
I'm not at all interested in online	6.14%
Total:	100.00%

Source: Author survey, June 2020

Regarding the advantages and disadvantages of online learning, the obtained results lead us to the following conclusions: students see the possibility of their own organization of learning time, learning from home and easy access to information as the main advantage of online learning (see Table 2).

Table 2. Advantages of online learning

Answers	Share by number of answers (%)
Learning from home	25%
Everything is organized in one place	19%
Easy access to information	25%
Own organization of time for learning	28%
No advantages	2%
Other responses	1%
Total:	100%

Source: Author survey, June 2020

Regarding the disadvantages of online learning, the results of the survey lead us to the conclusion that the biggest disadvantage of online learning is the fact that there is no direct communication and interaction of students with professors, which 66.7% of surveyed students stated. The next significant disadvantage of online learning, which students stated, is the lack of motivation to learn (22% of surveyed students), as well as the lack of direct interaction among students (19% of surveyed students).

Table 3. Disadvantages of online learning

Answers	Share by the number of answers (%)
No direct communication and interaction with professors	36%
No direct interaction among students	19%
Lack of motivation among students	22%
The effect of traditional learning is lost	16%
No disadvantages	6%
Other answers	1%
Total:	100%

Source: Author survey, June 2020

An important issue in the organization of online teaching is the question of how to present the material provided in lectures and exercises. In this regard, various forms of video, audio presentations, lectures via Internet platforms in real time, as well as posting materials on a particular site or learning platform can be used. The results of the survey show that it was most suitable for students to use video and audio materials – 60.53% of surveyed students opted for this option (Chart 1). The advantage of this way of presenting the material is reflected in the availability of materials at any time, as well as the possibility for students to return to some explanations in the materials while learning. A slightly smaller number of students opted for the use of presentations with audio explanations (17.54% of surveyed students), as well as lectures via the Internet platform in real time (17.54% of surveyed students). A small number of students (4.39% of the surveyed students) chose the option that it is sufficient that the usual lecture material is available in a location that can always be accessed.

Chart 1. Desirable platforms for presenting materials within online learning
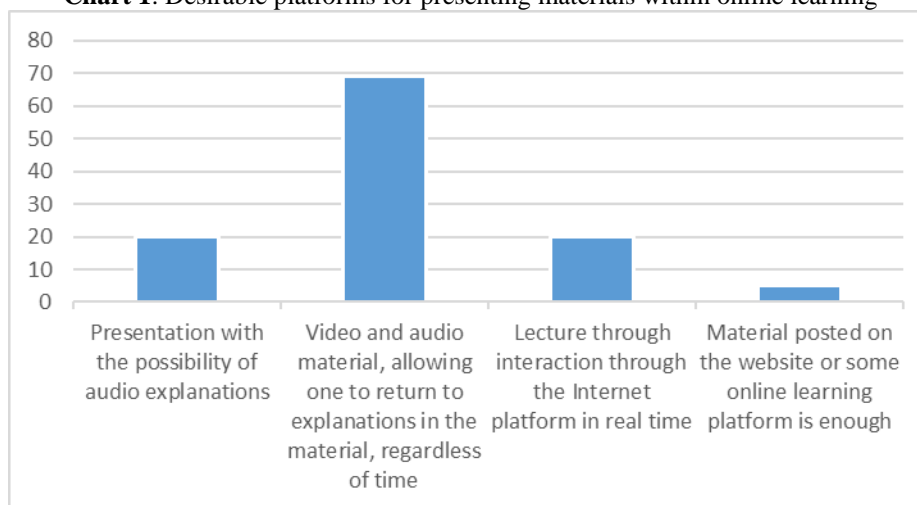
Source: Author survey, June 2020

Based on the previously presented results, a general conclusion is that students still (to some extent) rely on traditional learning, but recognize and appreciate all the benefits that can be obtained through Internet technologies.

The second group of questions in the survey focused on the specific experiences that students gained in online teaching during the emergency period caused by the pandemic. The questions were mostly prepared in the form of classic grades that students gave for certain aspects of online learning.

A special challenge in the process of online learning is the organization of tests and assignments. As this aspect of online learning received significant attention during extraordinary circumstances, it was interesting to see how students assessed the relevance of tests and assignments, which were organized in online form, and which aimed to better prepare them for final exams.

Table 4. Grading the relevance of tests and assignments during emergencies caused by the Covid-19 pandemic

| Grade	Share in %
Grade: 1	1.75%
Grade: 2	7.02%
Grade: 3	15.79%
Grade: 4	28.95%
Grade: 5	46.49%
Total:	100.00%

Source: Author survey, June 2020

As can be seen in Table 4, the largest number of surveyed students (46.49%) gave the highest grade for the relevance of tests and assignments, while a slightly lower score – a very good 4 – was given by 28.95% of surveyed students. The lowest grade was given by a small number of students (1.75% of surveyed students).

In considering the role of certain forms of online learning in extraordinary circumstances, it is of special importance to consider the opinion of students about the importance of direct and personal interaction in real time, as well as online communication with teaching staff.

As can be seen in Chart 2, the survey results show that the majority of students (59.09% of surveyed students) believe that direct and personal interaction is easier to understand the material and that there is an option to further clarify the material, and a slightly smaller number (32.73 % of surveyed students) believe that the possibility of online communication is sufficient (usually via e-mail) because the learning material is already available at a location. The smallest number of students (8.18% of surveyed students) believe that communication with the professor is not necessary, if the learning materials are well prepared.

Chart 2. Importance of direct, personal interaction with teaching staff in mastering the material during extraordinary circumstances caused by the Covid-19 pandemic
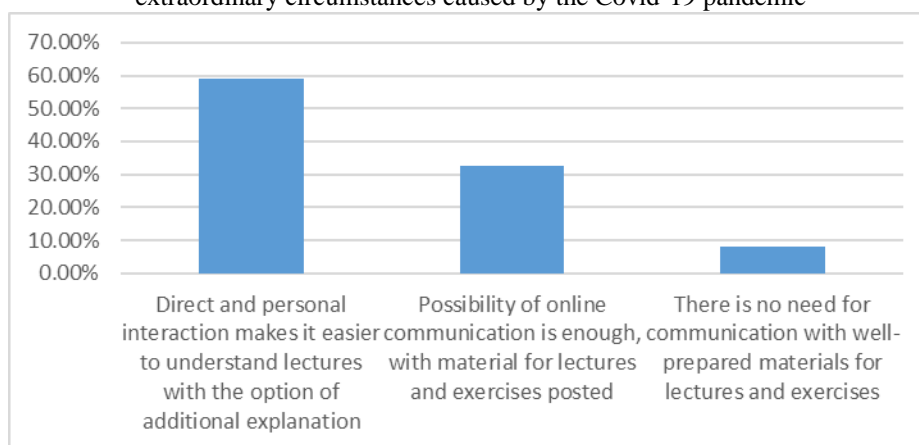
Source: Author survey, June 2020

Finally, in the use of various forms of online learning, the importance of mutual interaction between students through various platforms cannot be neglected. In that sense, the surveyed students evaluated the possibilities for interaction with other virtual participants. The results are shown in Table 5.

Half of the surveyed students gave the highest grade for the available opportunities for interactivity with other virtual participants. Grade 4 was given by 25.45% of the surveyed students, while the two lowest grades were given by 5.45% of the surveyed students. These results lead us to the conclusion that the possibility of mutual interaction of students in the online learning process was at a very satisfactory level. In this regard, students mostly used groups that are most often created via Viber or Whatsapp applications,

which allows them to communicate with each other and get information in real time, but they also used the capabilities of so-called "chat rooms" on some online learning platforms.

Table 5. Grading opportunities to interact with other virtual participants (online platforms, Viber or Whatsapp groups) during emergencies caused by the Covid-19 pandemic

Grade	Share in %
Grade: 1	5.45%
Grade: 2	5.45%
Grade: 3	13.65%
Grade: 4	25.45%
Grade: 5	50.00%
Total:	100.00%

Source: Author survey, June 2020

CONCLUSION

The COVID-19 pandemic has shaken almost all important national and global systems – from health to economic. It is clear that the impact of the COVID-19 pandemic will be far-reaching and will have a significant impact on the education systems in the world, as well as on the education system of Serbia. The experience gained during the COVID-19 pandemic is valuable in determining the place and role of distance learning in the Serbian education system. It turned out that the assumption that investment in distance learning based on modern technological solutions would be justified in many ways was correct, both in the economic sense and in the pedagogical-professional sense. Bearing in mind that various technological solutions are already used in education and that they will continue to play a key role in the education of future generations, it is necessary to realistically consider the needs for new ICT skills in education. In a world where knowledge is a click away, the role of teachers and educators must change.

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SUMMARY

This paper examines the role of distance learning in the education system, with special reference to the extraordinary circumstances caused by the Covid-19 pandemic. It is clear that the COVID-19 pandemic has shaken almost all important national and global systems - from health to economic. And it is obvious that the impact of the Covid-19 pandemic will be far-reaching in the future. In this paper we focus on its impact on the education systems as a general, as well as on the education system of Serbia. During the state of emergency in Serbia, caused by the Covid-19 pandemic, various platforms and applications for distance learning were used in the education system. The Ministry of Education, Science and Technological Development has supported the implementation of education activities through various channels and forms of communication, such as: broadcasting specially prepared and adapted education content for primary and secondary school students on TV channels RTS2 and RTS3 of the Public Media Service of Serbia. Further on, Ministry of Education provided support through the portal *My school*. Also, Comtrade company, in cooperation with the Office for Information Technology and e-government and Ministry of Education provided a distance learning system - *My classroomTeslaEDU*. At the same time, Microsoft offered the free use of the Office 365 platform, within which a version of Teams application adapted for education was available. In addition, it is worth noting that the following platforms and applications were used in education system of Serbia: Moodle platform, Digital Solidarity portal, Zoom and Viber applications, Cisco Webex Teams, G-Suite for education, Google Classroom platform and others. For the purpose of this paper, a special research was conducted, which is based on a survey conducted among students of the Faculty of Economics in Belgrade. 114 students participated in the survey. The most important conclusions of the research are the following:

- regarding the attitude of students towards online and traditional learning, it is noted that the largest number of students believe that the online learning can be combined, as an additional form, with traditional learning;
- as the main advantage of online learning students see the possibility of their own organization of learning time, learning from the home and easy access to information;
- regarding the shortcomings of online learning, the results of the survey lead us to the conclusion that the biggest shortcoming of online learning is the fact that there is no direct communication and interaction of students with professors. The other shortcoming is the lack of student's motivation to learn;
- among the different ways of presenting the material during the online learning, students preferred to use video and audio materials;

finally, in terms of mutual interaction between students through various platforms for online learning, students rated the possibilities for interaction with other virtual participants with the highest marks.