

Solutions, experiences in online education in Hungary and Serbia related to the situation caused by Covid-19

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Abstract— The authors focused on the challenges and options implied by the digital work form in both countries. Describing the specific technological and methodological solutions, the article provides a detailed introduction of the way Serbia and Hungary responded to the respective VUCA phenomenon. An important aspect of such approach is the application of virtual and augmented learning spaces and presentation methods in education. The essay will include the description of future plans as well.

Keywords—ICT based online platforms, teaching support system, digital education, digital learning environments

I. INTRODUCTION

The coronavirus pandemic has resulted in a new social and, at the same time, new educational situation in the countries of the region, which has been resolved in various ways. Traditional contact-based education has been discontinued and replaced by online education. Also common is that numerous digital curricula have been produced during this period, and significant databases have become available. In addition, many online platforms (such as a significant number of test builders) have made their previously premium services available free of charge.

II. EXISTING SYSTEMS AND LEARNING ENVIRONMENTS

The popularity of online education has grown significantly in Hungary and Serbia even before the 2020 pandemic. In addition to forms of blended education, completely online institutional educational environments have appeared as well. A Hungarian innovative project was started in 2016 called K-MOOC (Carpathian Basin Online Education Center), where several MOOC courses were offered in Hungarian (Hegyési et al., 2016, Hegyesi - Kártyás, 2013). K-MOOC covers the entire Carpathian Basin and was the first to be connected to higher education, and faculties and universities. K-MOOC has set the goal of launching and disseminating online courses in Hungarian, primarily for Hungarians in the Carpathian Basin, but also for all

Hungarian native speakers around the world. On the one hand, K-MOOC provides an online form of education recognized by credit or diploma for students of higher education institutions, faculties and departments in the Carpathian Basin, which teach in part or fully in Hungarian. On the other hand, it also offers another form of education for lifelong learning. Its members are Hungarian-language universities and colleges in Hungary and abroad, which join the K-MOOC Network. Peer-to-peer institutions joining the Network in all disciplines prepare and publish free, online Hungarian language courses that are available to everyone within the framework of K-MOOC, and their students can take up courses from the available courses of any institution within the Network. The courses are accredited, compatible with the framework of the Network and worth credits in higher education. The language of the system is Hungarian and is maintained by the University of Óbuda (source: <https://www.kmooc.uni-obuda.hu/>) [1] [2].

At present, 46 courses have been announced in the learning management system (2020, summer semester), from different disciplines and under the supervision of different institutions.

The other framework that should be highlighted from the Hungarian language area is Webuni, which is less formal and not primarily designed for higher education (rather for lifelong learning and for professional training). Developments for Webuni began in 2012 and the way it operates is defined as a community knowledge-sharing platform. The initiative provides a platform and framework for trends in the United States (online education, Coursera and edX) [3].

Webuni defines the legitimacy of the system as follows: “Today’s young generations is much more open to online content, the world’s communication channels have been completely transformed in recent decades, while our education system has remained essentially unchanged. This changed and accelerated flow of information has necessitated a new kind of teaching-learning approach and thus a new kind of teacher competencies. With Webuni, our

goal was to create the technical background for this modern form of education that not only provides educators with the opportunity to adapt to today's digitized expectations, but also to gain a new source of revenue." (source: www.webuni.hu).

Additional benefits of the Webuni online learning environment are that it is operated and administered by the company, its interface is simple and clean, and it is optimized for the video-based education that most people use today. This method of online learning and teaching is the closest to traditional classroom practice.

This means that learning materials usually appear in the form of educational videos and can be accompanied by comments, notes, and questions from users. The online environment has a large number of existing courses and active users, so in addition to promoting the created courses through different channels, the system has a large number of potential students who have a profile and are familiar with online learning.

In the introduction, we pointed out that the situation is characterized by the fact that some premium services and databases have become free. The contents were made available to cross-border regions by the Nemzeti Köznevelési Portál - National Public Education Portal (<https://www.nkp.hu/>).

In Serbia, one of the most popular online educational websites is ITACADEMY (<https://www.it-akademija.com/>), which offers traditional, but completely online courses.

III. SOLUTIONS AND EXPERIENCES IN HUNGARY AND SERBIA TO THE SITUATION CAUSED BY COVID-19

In Serbia, a state of emergency was imposed on the 15th of March, 2020, which lasted until the 6th of May (Службени гласник РС", бр. 29/2020, Службени гласник РС", бр. 65/2020). Starting from the 17th of March, education has been organized in the form of distance learning and traditional education was completely discontinued.

The Ministry of Education, Science and Technological Development has adopted an operational plan that includes a large number of different programs and alternative digital ways of teaching and learning in preschool institutions, and in all grades of primary and secondary school. The focus is on organized distance learning that contributes to the implementation of programming with contents of general education subjects and professional subjects with the largest amount of classes (source: <http://www.mpn.gov.rs/>) [8].

Educational contents are broadcast on the TV channels RTS2 and RTS3, and are also available for downloading through the free application for mobile phones and tablets via "RTS Moja škola" ("RTS My School"), on the RTS website and the multimedia platform "RTS Planeta" (<https://mojaskola.rtsplaneta>) [4]. A national platform for online learning has been established on the "Moja škola" website available at www.mojaskola.gov.rs, which supports the broadcasting of classes on RTS. The website available at www.rasporednastave.gov.rs was also established, where the broadcast schedule of the RTS classes is available, along with a link to the platform "Moja škola"

www.mojaskola.gov.rs. During the crisis period, Microsoft provided the use of the Office 365 platform for free, within which a version of the "Teams" application, adapted for education, is available. The "Zoom" application is intended for online meetings and is available in a free version with certain limitations in functionality. Due to the fact that some schools use it for remote teaching, for those who do not have Internet access at home, free access to the application was provided through the mobile networks MTS Telekom and Telenor. Upgrading and expanding the functionality for formative monitoring and evaluation of students is done through "esDnevnik" – starting on the 2nd of April, 2020, parents have been enabled to follow all the formative grades of students through the portal's parent module (<https://moj.esdnevnik.rs/>). For eighth grade students who did not have the conditions to attend distance learning and access the online final exam, Internet access and/or technical devices (tablets and mobile phones) were provided from donations thanks to the Huawei Serbia Office and companies donated 100 tablets. In addition, Comtrade provided 300 phones, Telekom provided 800 Internet cards and 800 phones, VIP donated 800 Internet cards and 400 phones, while Telenor donated 800 Internet cards and 400 phones, which totals at 4,400 devices and cards (source: <http://www.mpn.gov.rs/>).

During the state of emergency, kindergarten education also stopped and switched to online. In this regard, the priority tasks of the system of preschool education in this period include the following groups of activities:

- 1. activities related to the preservation of human health and safety in accordance with the measures prescribed by the Government of the Republic of Serbia, Government decisions, recommendations and instructions;
- 2. activities that support families with preschool children on how to provide proper conditions for the normal functioning, learning and development of children during the state of emergency and home isolation;
- 3. activities that support professional networking, networking and exchange of experiences of practitioners in the field of research, joint learning and competence development.

According to the results of the Questionnaire (whose preliminary analysis was prepared by the UNICEF team), which was completed by 168 public preschool institutions in the Republic of Serbia, in the segment related to activities to support children and their families, the most commonly used media of communication with families were "Viber" and "WhatsApp" services (71%); in second place, in terms of frequency of use, preschool institution employees used social networks for communication with families. Most educators and parents agreed on the optimal way, frequency and terms of communication (84%). Parents, in accordance with their abilities and rhythm of life, were involved in the communication with educators, which is stated by 76% of preschool institutions (source: <http://www.mpn.gov.rs/>).

Thanks to UNICEF, which procured and donated licenses for the “Camtasia” software in a very short period of time, the recording of classes at home began in early April, while their broadcasting started on the RTS channels in mid-April. New ways of realizing distance learning are being designed in accordance with the possibilities of the system and the short deadlines (source: <http://www.mpn.gov.rs/>). This solution has also been chosen by the Hungarian minority living in Serbia (<https://pannonrtv.com/rovat/tavoktatas>) [5], the Croatian minority solved the issue of distance learning with the help of the Novi Sad Television channel (<https://hmv.org.rs/obrazovanje/nastava/>), while the Albanian minority did so with the help of local TV stations as well as YouTube channels (<https://www.youtube.com/channel/UChZaCMCMvF2c7biQRAHjUtw/playlists>).

The largest number of students in the Republic of Serbia, according to school reports, is included in the implementation of distance learning - in both primary and secondary schools this is true for 99% of students, while in schools for the education of students with disabilities the coverage is 93%. This applies to both watching TV classes and using the online learning platforms, as well as the use of alternative forms of distance learning (source: <http://www.mpn.gov.rs/>) [7]. Universities and university faculties have independently defined methods and platforms for online education. For example, the University of Novi Sad used a MOODLE-based customized platform, “SOVA” (<https://sova.uns.ac.rs/>). In contrast to public education, higher education has been re-launched and admission, as well as some laboratory exercises and measurements have been maintained in the traditional way, while also respecting the rules of social distancing and hygiene.

In addition to instructional videos, the Ministries of several neighboring countries also operated centrally administered virtual classrooms (Croatian example: <https://skolazavot.hr/>), while in other countries in the region it was entrusted to the teachers or schools to implement a distance learning platform [15].

Video conferencing was popular (Skype, Microsoft Teams, 8x8, or Jitsi Meet), which is perhaps the closest to the traditional learning environment and could be employed for teaching effectively without a pre-made digital curriculum [20].

Special mention should be made of the possibility of recording videos during a “Skype” call, which is a video conference in real time, but at the end of the call it is converted into an educational video that can be viewed for 30 days. In addition to these options, virtual classrooms (more precisely LMS - Learning Management System) such as “MOODLE” or “Google Classroom” were also popular [11-14] [18] [19].

In terms of trends and further developments, this new educational situation has highlighted the benefits of online education, but has also pointed out its weaknesses. It was apparent from the beginning that disadvantaged students were most likely to be placed on the periphery in this educational situation.

In Hungary, at least one third of the students from the group of socially disadvantaged students could not take part in online education (Rosa Parks Alapítvány, Motiváció Egyesület, Partners Hungary - Rosa Parks Foundation, Motivation Association, Partners Hungary, 2020). In most cases, there is a lack of distance learning equipment (laptop, tablet, Internet access) which most schools are unable to help with, as well as a lack of adequate space for learning, and in addition, many such households do not have electricity either. Parents are unable to help interpret tasks and in many cases lack the appropriate digital competencies. The situation is similar for disabled children, but it is likely that the interpretation of tasks and the lack of digital competencies are a problem here [10].

More data: <https://partnershungary.hu/wp-content/uploads/2020/04/Szegrega%CC%81cio%CC%81-e%CC%81s-digita%CC%81is-oktata%CC%81s-a-koronavi%CC%81rus-ideje%CC%81n.pdf>, [6].

In Serbia, the Ministry of Education, Science and Technological Development in cooperation with UNICEF and the Institute for Psychology assessed and published a report named: Tracking the ways of participation and learning processes of students from vulnerable groups during education through distance learning (Praćenje načina učešća i procesa učenja učenika iz osetljivih grupa tokom ostvarivanja obrazovno-vaspitnog rada učenjem na daljinu)

In primary schools, distance learning covers 83% of students who are members of the Roma national minority who need additional support in education, with 56% of these students watching TV or online classes and 27% receiving alternative forms of support, while 17% of students are not included in learning in any way. In secondary schools, 91% of students from this vulnerable social group are covered by distance learning. Of the total number of these students, almost 74% watch TV or online teaching, and almost 17% participate in distance education through alternative forms of support, while 9% is not included at all (source: <http://www.mpn.gov.rs/>).

When it comes to students with disabilities, 96% of these students in primary schools are covered by distance learning. About 76% of these students follow TV or online classes, and for about 20% of them alternative forms of support are provided, while the remaining 4% are not included in distance learning. In secondary schools, distance learning covers 97% of students with developmental disabilities and disability. About 87% of students watch TV or online classes, while 10% are included in alternative forms of support, and the other 3% are not included in any form of teaching (source: <http://www.mpn.gov.rs/>).

When it comes to students from other vulnerable groups, such as students from families of low socioeconomic status, refugees, migrants and others, 94% of those attending primary schools are involved in some form of distance learning. Of the total of these students, about 82% watch TV or online classes, about 12% are covered by alternative forms of support, and 6% are not included in any way. In secondary schools, 67% of students in this category are enrolled in classes via distance learning. Among all these

students, 60% watch TV or online classes, about 7% are covered by alternative forms of teaching, and 33% are not included at all (source: <http://www.mpn.gov.rs/>)

	Total of students who do not watch TV / online classes for the stated reason	Students belonging to the Roma national minority	Students with disabilities	Students belonging to other vulnerable groups
They do not have internet access	7615 (40,7%)	4865 (40,2%)	1393 (39,7%)	1824 (41,9%)
They do not have a suitable device	4922 (26,3%)	3112 (25,7%)	826 (23,6%)	1249 (28,7%)
They have no support in the family for distance learning	4497 (24%)	3249 (26,8%)	746 (21,3%)	951 (21,9%)
Something else	1692 (9%)	889 (7,3%)	542 (15,5%)	326 (7,5%)

Table 1.: Frequency of different reasons why students are not covered by TV and online classes by group (source: <http://www.mpn.gov.rs/>)

The other area from which most requests for help came was the scope of activities associated with music. Here, fluctuations in Internet bandwidth can result in serious outages and it is difficult to monitor the process, while playing music together online can also be a huge challenge both organizationally and technically.

A. Solutions and experiences in Hungary

In Hungary the Government and the Educational Authority have forwarded the following methodological recommendations for the educational system during the COVID-19 pandemic. In the state of emergency caused by the corona virus the educational system has to be continuously operated, students must be provided with the opportunity to learn and schools and pedagogues have to adapt to the unexpected situations. Pedagogues play a complex role in the education process. On the one hand they function as the sources of information and transmitters of knowledge in charge of the development of various student skills. Furthermore, on the other hand the teacher functions as a guide or tutor supporting, motivating, and directing independent learning. When teachers are deprived of the option of direct personal contact with students, the latter function entailing the support of independent learning and the search and processing of information becomes crucial. In order to assure the right to learning pedagogues should provide information and support to students, identify the educational material to be processed and determine the means of monitoring the acquisition of knowledge within the framework of distance learning via the use of information communication devices.

Consequently, each school selected a digital platform and made it available to the students in a short time. Such surfaces included the Ms Teams, Team Link, Google Classroom, the Kréta system, the Moodle system, the Neo LMS, Neptun Meet, Discord, and Skype for Business. [16] [17].

IV. SUMMARY, PLANS, OPPORTUNITIES, AND VISIONS FOR THE NEXT SCHOOL YEAR

The epidemiological situation in Hungary and Serbia is different. At the time of writing (early August, 2020), the number of new infections per day in Serbia is around 300 (more than 26,000 cases in total), while in Hungary the number of new infections per day is around 10, with a total of more than 4,000 reported cases (source: <https://www.worldometers.info/coronavirus/>). Therefore, under these different circumstances, decision makers must plan the new school year.

In Serbia, no final decision has been made yet on how education would continue. Education Minister Mladen Šarčević has stated that they assume that younger children will be taught in school.

The primary goal is for students in the lower four grades to attend school for three weeks and take part in distance learning in the fourth week, while upper grades would be divided into two weeks of school and distance learning. Children will need to wear a face mask if this will be recommended by professionals. According to Šarčević, traditional education will only be possible again when the situation is completely safe, and this will obviously only be possible after the discovery of the vaccine (source: Pannon RTV) [9].

The plans for the future include the full integration of the Moodle electronic learning environment with the Ms Teams system and the Neptun student administration system. Such developments appear to be inevitable due to the expected second wave of the pandemic. In the meantime, the digital skill development and methodological preparation of pedagogues is vital as such programs can significantly impact the efficiency of the educational process during digitalized instruction.

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