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ONLINE LEARNING DURING THE PANDEMIC OF COVID-19: EXPERIENCES OF STUDENTS AND UNIVERSITIES

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Abstract:

The COVID-19 pandemic had a significant influence on university education and organization of lecturing. Most universities throughout the world had not been prepared for the new circumstances, and this ultimately affected both the organization and the quality of lectures. Universities were obliged to follow trends and implement new strategies in lecturing in order to support their students where help was most required, and furthermore, in order to maintain the quality of their experiences and education. The objective of this research was to gain insight into how students reacted to the new pandemic situation and whether they are satisfied with online teaching so that universities could use the results to adapt and conduct online teaching in the future. The research found that students considered online learning had affected their efficiency, productivity, and level of motivation in the process of learning. Apart from these adversities regarding online teaching and learning, the survey found that the students' attitude toward the implementation of technology in university education would improve the process of online lecturing and examination and enhance the present situation.

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INTRODUCTION

For a short period of time, the COVID-19 pandemic had a great impact on the entire economy, on every field and branch of society, and on university education, too. As indicated by UNESCO, it influenced the education of over 220 million university students in the world (UNESCO, 2021). University education in the world had to undergo major changes, which required all its participants to adapt to the situation. Students were confused by the new teaching organization, teaching, and non-teaching staff were faced with completely new working conditions, and management had to make quick and risky decisions that could not be identified in advance (Marinoni, van't Land, & Jensen, 2020).

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One of the first and most prominent changes that occurred in the process of university education was in the lecturing process. The sudden closing of the university as a measure of social distancing has caused a complete change in the way lectures are held. The general face-to-face lecturing within the university premises was replaced by learning from one's home by following the online lecturing platforms (Rashid & Yadav, 2020). Within a few days the traditional form of lecturing in the university premises, to which all employees, professors, and students had been used to, was transformed into online lecturing. The students, who had been accustomed to learning within university premises, were unprepared for these changes. In the past, online learning had been considered to be a method applicable to nonformal education. However, this method of lecturing turned out to be the solution to replace the traditional lecturing process (De Brouwer, Raimondi, & Moreau, 2020). Information and communication technologies (ICT) enable students and universities to take advantage of new educational opportunities that improve teaching and learning (Maatuk *et al*., 2022). Apart from the positive effect regarding online lecturing, this method of learning influenced the productivity and motivation of students in the process of learning. On the other hand, the initial response of many universities to the new situation applied ad-hock solutions in order to provide a swift and efficient solution. Recent studies indicate that many universities were forced to modify their lecturing process and apply online learning.

The purpose of this paper is to give an insight on how universities had transferred to new methods in the education process and to establish the positive and negative effects that online education had on students. Research had been undertaken to provide a better insight into the experience and opinions of university students and to establish the effect online learning had on them.

This paper consists of three sections. The first section covers the adaptation of universities in the world to the altered circumstances. The second deals with the students' adjusting process, and the third is an analysis of the attitudes and challenges regarding online education and learning among university students in Serbia.

LITERATURE REVIEW

How did universities adapt to the Covid-19 situation?

Apart from the persisting crisis that COVID-19 had brought to the healthcare system, it had been followed by a socio-economic crisis, which influenced all aspects of life - its common functioning, businesses, and university education, too (Marinoni, van't Land, & Jensen, 2020). It is common to define higher education as a set of specific and local organizations, roles, and interactions between subjects and economic transactions (Gumport, 2007). The consequences of the COVID-19 pandemic on higher education are negative on the global level. The new conditions are suitable for countries with underdeveloped education systems to implement new solutions and solve existing and new problems caused by the pandemic. Although many countries responded to disruptions in the education system in a timely manner by introducing new teaching models, some scientists predict a decline in the quality of acquired knowledge by students. It is necessary to pay a lot of attention to the maintenance of the quality of teaching and imparted knowledge (Pavlović *et al*., 2021) The adaptability of the business, changes in its organization, and an agile approach were required. Since the duration of the crisis could not be defined, this made it difficult to plan and create a strategy. Optimal measures undertaken to resolve a short crisis and provide a swift recovery might prove inefficient if the crisis lasts longer than planned (World Bank Group, 2020). Some universities had a straightforward response and reacted

swiftly to the imposed changes and challenges, while others had a poor response in adopting online education, which presented a significant obstacle in adopting online learning methods and tools. One of the reasons is that online education requires more effort and different methods, in comparison to face-to-face education that had been previously applied (I. Elaine & Seaman, 2007). On the adaptation, impact, and changes in teaching, the following table shows that the percentage of higher education institutions where classes have been canceled is very low in all regions except Africa where classes have been suspended in most of the higher education institutions.

Table 1. Impact of COVID-10 pandemic on teaching and learning by region

Country	Not affected	Classroom teaching replaced by distance teaching and learning	Teaching suspended but the institutions is developing solutions	Teaching canceled
Africa	3%	29%	43%	24%
America	3%	72%	22%	3%
Asia & Pacific	1%	60%	36%	3%
Europe	Almost 0%	85%	12%	3%

Source: *International Association of Universities, 2020*

Karalis and Raikou stated that hasty solutions resulted in conflicting opinions and two diverging approaches. It was found in the former case that online education had been efficient and that one should focus on all its benefits (Karalis & Raikou, 2020). Singidunum University is an example of such a hasty reaction. When the State of Emergency was declared in Serbia on 13th March 2020, by which movements of its citizens had been restricted, within only 3 days the online education process was established through the Google Meet software. Thanks to the immediate response of both the management and employees, the students lost no lecture, exercise, or consultation (Singidunum University, 2020). Digital technology has become one of the top priorities of higher education, and it directly affects all elements of the student experience (Bond *et al.*, 2020). The students at the University of California and the University of Colorado complained of fatigue during their Zoom lectures. They solved this problem with the Otter for Education software (Otter, 2018) which offers online transcription and notes thus relieving students. The lecturers found this intelligent software to be extremely useful to the students with difficulties in learning and other difficulties previous to and during the online environment. In the online environment, remote testing posed a challenge for the lecturers. This was solved in over 500 institutions by applying the Examity validation system in the examination process. Here the examination process is based on biometric analysis of a push button, predictive analytics, and video review, by which the identity of the student is established, and the content of the examination preserved (Examity, 2022). Chatbots have the ability to ask and answer questions, in this case from students or other interested users, without the involvement of university employees (Abdul-Kader & Woods, 2015). The Ocean County College had an e-mail communication problem and an engagement rate of only 10%. Then the college joined AdmitHub and initiated a chat box in 2017 named Reggie. In the second year of its implementation, the engagement soared for 26% and it was capable to answer 98% of the questions without requiring any human support (Mainstay, 2017).

In a different case, Karalis and Raikou (Karalis & Raikou, 2020) stated that the introduction of information and communication technologies in university education might generally affect the quality of education, human relations, productivity, motivation, mental health, and other factors that are induced by the pandemic and by online learning. Apart from the mentioned successful adjusting to the online environment and implementation, certain universities noticed its negative consequences, too. Zhang and Gao (Gao & Zhang, 2020) wrote that professors at the Chinese universities noticed that the transfer to online education had been a challenge and presented an evolutionary environment for both lecturing and learning. When organizing online education one must consider the differences in education in a virtual environment, communication difficulties, the lack of concentration, and interaction with professors. Research made by the Organization for Economic Cooperation and Development found that less than 40% of lecturers considered themselves ready to use digital technologies for lecturing (OECD, 2020). High-performance digital education and improvement of digital skills and competence in online education must be considered a priority in online education. With the current global movement towards online teaching caused by COVID-19, technological improvements and solution-focused approaches would make a significant contribution to research and improvement of higher education (Seko & Lau, 2021). The increasing use of data and technology in education simultaneously affects the development of online learning platforms, learning analytics as well as the use of artificial intelligence in education (Knighta, Gibson, & Shibani, 2020). The universities have to make changes in their organization and consider the differences and level gaps regarding digital skills in their professors, the improvement of their capacities, the better financial support of education and the following of the achieved results (Pavlović *et al*., 2021) Teaching staff are challenged to implement new ways of learning and research-based educational practices to facilitate students' acquisition and application of knowledge (Opre *et al*., 2022). But teaching staff who refuse to embrace change and learn and apply all the benefits of technology and online platforms will have to face the fact that this is not the future, but the present. Another big challenge for professors is the planning and preparation of new lectures that will be delivered online. The biggest challenges are creating a lesson plan, preparing exercises, practice tasks, defining evaluation criteria, and designing interactive activities. However, the fear of the aforementioned is unfounded in most cases. The essence of setting the general and specific goals of the course or subject, and defining the necessary practice tasks, content, and literature are very similar and do not change from the lecture model. All of the above is also applied during online classes with certain modifications so that students do not have difficulty understanding the things presented to them (Ko & Rossen, 2017). Besides, the COVID-19 pandemic affected the financial situation of universities. High expenses for buying new equipment, software, and other elements required for online lecturing brought serious financial consequences on the universities and dropped their income compared to the previous year. Technical solutions cannot be implemented without adequate resources in terms of qualified people and, of course, finances (Børte, Nesje, & Lilljord, 2020). There was also a weaker financial situation among the students, so many were forced to skip their studies or postpone their exams. This further dropped the income of universities. Low income requires a reduction in expenses, hence in the reduction in the number of lecturers and other personnel (Burki, 2020). Burki found that Covid-19 pandemic cost Universities in Great Britain about 790 million pounds. Facing these challenges some institutions were forced to completely cancel lecturing. The report of the International Association of Universities (Marinoni, van't Land, & Jensen, 2020) stated that 43% of universities in Africa had to make a pause in lecturing during the period of their seeking solutions by the institution, while in 24% of universities the lecturing had been completely terminated.

Adaptation of students to the situation caused by COVID-19

After the universities had transferred to the new forms of lecturing the students were forced to follow lectures and exercises via certain online platforms. In comparison to certain professors, the students had less problems in adapting to new solutions. Nowadays students grew up using technologies. Prensky (Prensky, 2001) stated that they are "digital native" because their comprehension, learning and everyday behavior is different compared to the elder generations, including lecturers with few digital skills. It is obvious that the lecturers are more and more aware of these differences and strive to learn and adopt the required skills to be able to participate in an interactive and efficient online environment. In a relatively short period of time, millions of people, including many students, have signed up for MOOCs (massive open online courses) which can have a negative impact on higher education (Pozón-López *et al.*, 2021). However, many students had limited access to the lectures, either because of possessing inappropriate devices or had poor internet links. There is also a "digital disbalance" in society, therefore not all students had an appropriate communication environment outside the university for them to be able to transfer to online education (Rashid & Yadav, 2020). At the basis of human achievements is hard work, dedication, and strong motivation to achieve success. Students with high achievement motivation are ready to adapt to new conditions, to take risks and to persevere in an environment they are not used to. This leads to the conclusion that the level of motivation is at different level from student to student (Babić & Kordić, 2014). The influence of professors on students was limited, thus the students' achievements in learning generally depended on their own efforts, i.e., their motivation, productivity, discipline, and proactivity (Gao & Zhang, 2020). In an online environment, students have to control their time, be attentive and learn. Students must be devoted, persistent and have self-control. Authors from the town of Novi Sad concluded that their students were not very satisfied with online education and that had higher expectations. Maybe they generally expected more from online education, and their expectations were not fulfilled. The research found that their average opinion regarding online education was below average (Grubić-Nešić, Milić, & Tomić, 2021). Factors that lead to student satisfaction with online teaching are a clear course structure, good organization of lectures, availability of professors and a sense of community in the online environment (McInnerney & Roberts, 2004). Dumford and Miller states that the students with a larger number of online courses reported that teaching effectiveness declined and that the quality of interactions with colleagues and professors. significantly reduced (Dumford & Miller, 2018). The pandemic has an impact on people's physical health, however, after all the experiences related to the quarantine period and a completely changed lifestyle, the pandemic had a great impact on people's psychological health as well (Marić, 2021). Although previous surveys found that children and youngsters had mild forms of Covid-19 compared to adults, the surveys from the School of Medicine in Belgrade found that they are more prone to develop mental consequences. Among the mental consequences in youngsters, anxiety was the greatest problem because of the lack of contact with their colleagues, and diminished control of stress (Grujičić *et al.*, 2020) Also, in a situation where the whole world, including medical workers and scientists in the field of medicine, encountered an unexplored virus, it is expected that a large amount of information, but also disinformation, will spread very quickly. The biggest problem for people's mental health is excessive exposure to multiple sources of information. Television, radio, portals, and social media are channels through which information spreads very quickly. People's lives and daily habits have changed, and this has had a great impact on the mental health of the population from every age category (Grujičić *et al.*, 2020)

Two surveys found that the lack of presence in university premises had a bad impact on students. This was not the case only in Serbia but elsewhere, too. Social relations may have a significant influence and motivate one to study, which has an effect on academic success. The multiple obligations, continuous struggle to have good merits, lack of free time, the introduction of online education, new experimental methods applied in education put stress on the students, which might develop into more severe mental health issues (Ilić-Živojinović, 2015). A large amount of stress can be explained as "a state of mental or emotional strain or tension". Stress can lead to depression, panic, anxiety, sadness, pessimism, and lack of self-confidence (Zotović, 2002). In the second study on this subject, Tull and his partners found that staying at home, online education, and the stress that it brought resulted in an increased level of anxiety, financial worries, and loneliness. The lack of relations with people belonging to the same age group and their interactions and complete change in everyday habits may affect the mental health of students, their mood, motivation, and academic success (Tull, *et al*., 2020).

METHODOLOGY

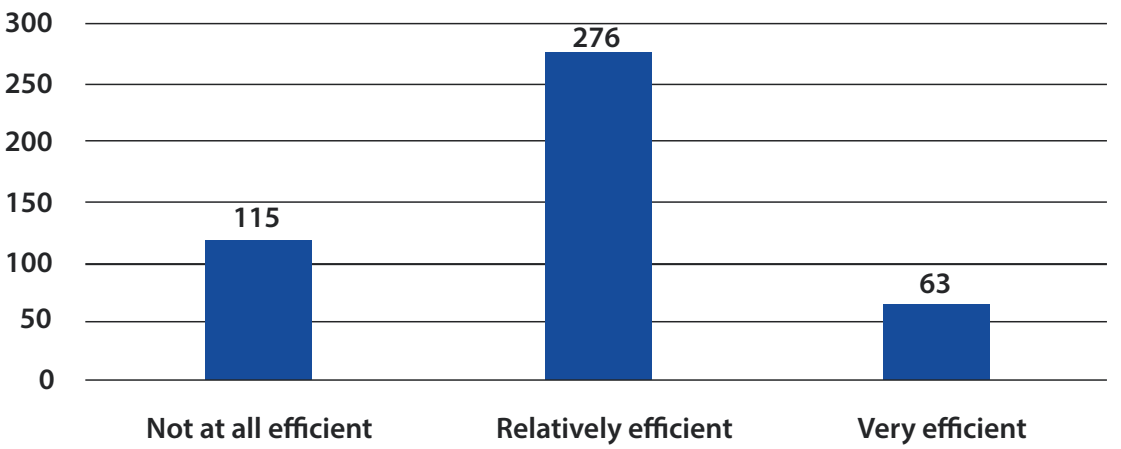
The research in Serbia was undertaken in December 2021 with 454 participants. They were students from several universities, colleges, modules and branches of online education. The ratio of participants was 73,6% female and 26,4% male students. They were classified according to their year of study, though most of them were in the first year of study (26,4%). There were 19,6% from the second year, from the third 22,2%, and from the fourth year 19,8 participants. The least incorporated were those on master studies (11%) and PhD studies (0,9%).

The instrument applied was a created Google questionary, which the students would have to fill in online, for the purpose of this empiric research. It was distributed to the participants by mail and social networks. All participants that took part in the research were guaranteed anonymity and had been told that their answers would solely be used for research. The main research technique was the questionary, which was to establish the attitude of the participating students on the challenges they met when learning and acquiring knowledge in an online environment. The questionary consisted of 6 questions, of which the first two focused on one's general opinion regarding online education and its efficiency. The next two questions focused on the motivation and productivity of online education. The last two questions were about the participants' opinions on implementing technology in education and the online environment. The questions were closed type and the research had an empirical character. After completing the questionnaire online, the results were summed, and an analysis based on the results had been made. The analysis of the results applied was in the descriptive method.

RESULTS AND DISCUSSION

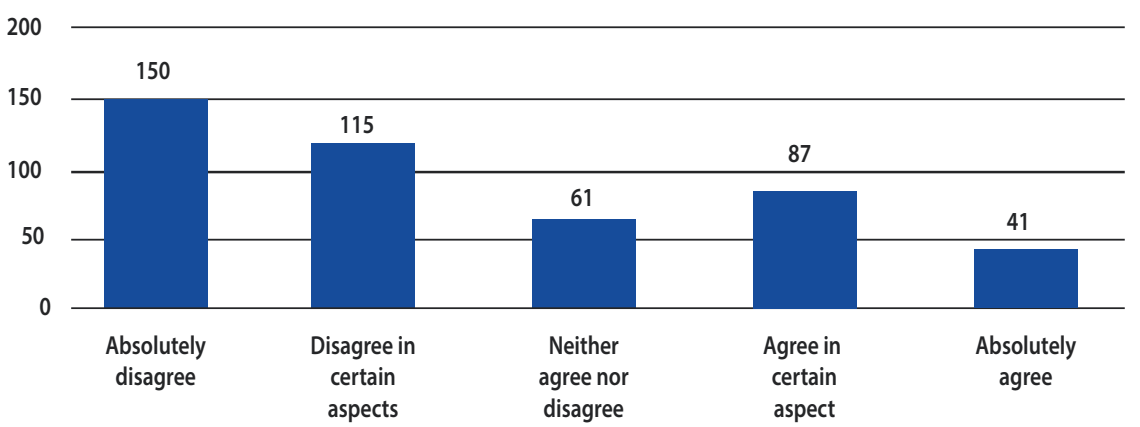
The first question was about the attitude of the participants regarding online learning. The students' answers were based on their experience after many months of learning in an online environment and their opinion regarding its efficiency.

Graph 1. Students' opinion on the effectiveness of online teaching



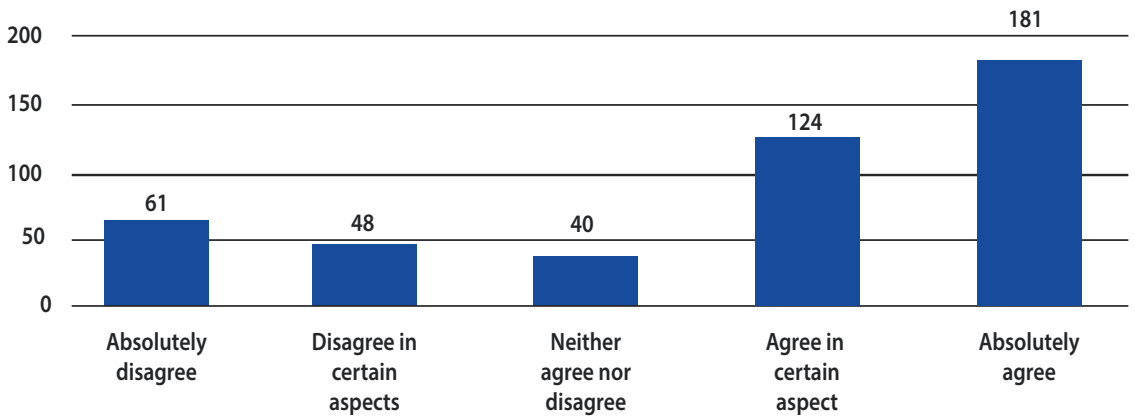
Graph No.1 indicates that as much as 60,8% of the participants consider online learning relatively efficient. However, one should consider the number of participants that found it not at all efficient was 25,3%. Only 13,9% considered online learning very efficient. This co-insides with the previous research (Grubić-Nešić, Milić, & Tomić, 2021) which found a decline regarding online learning efficiency. These results clearly indicate that online education should be accustomed to students and should undergo further adjustment.

Graph 2. Online teaching equally helps in the acquisition of knowledge in relation to classical teaching



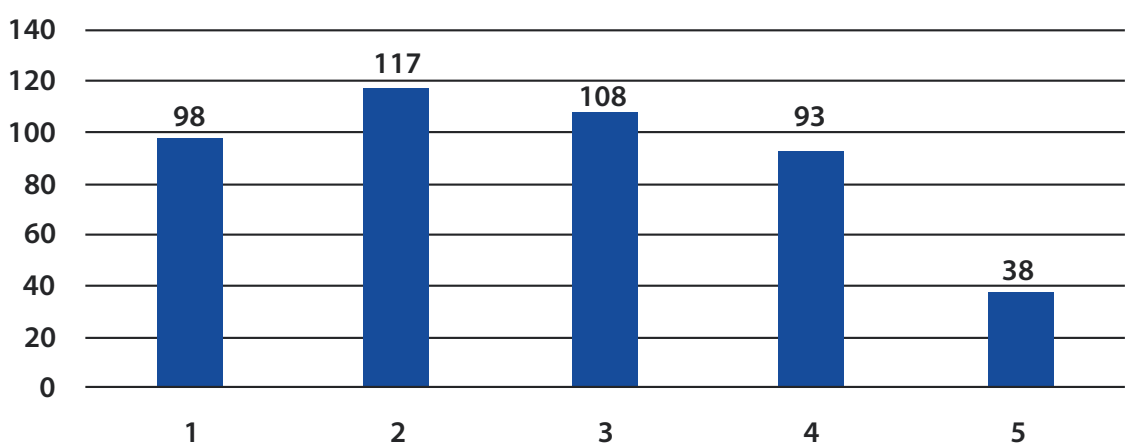
Graph No. 2 shows us to which extent do the students consider that online learning manages one to acquire knowledge and skills in online learning compared to standard (direct) learning. As much as 33% of the participants consider that they did not achieve equal skills and knowledge through online learning. If considering those that disagreed in certain aspects, this number reached 58,35% of participants. Only 8% of the participants absolutely agree that they had acquired the amount of knowledge and skills as if by standard learning.

Graph 3. Students' opinion on whether online teaching has affected the decline in productivity



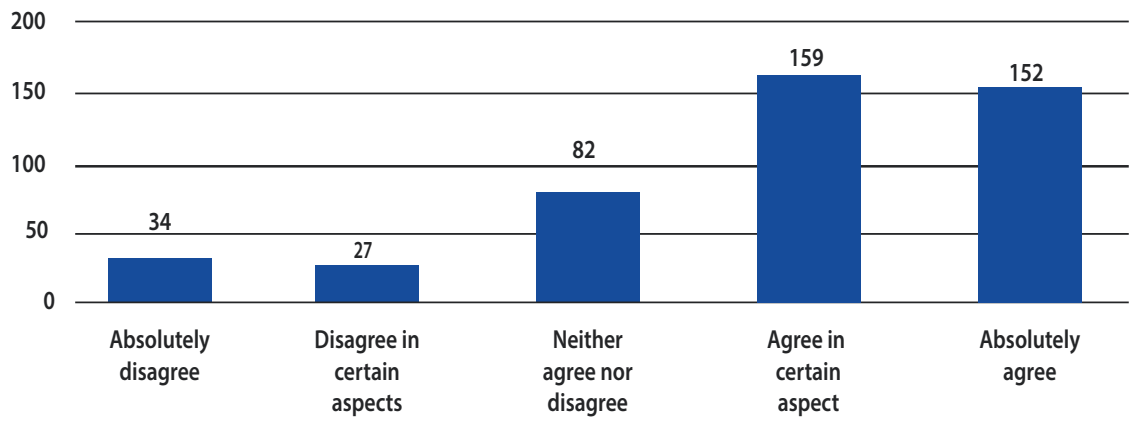
Graph No. 3 indicates that online learning reduced productivity in learning. 39,9 % of participants considered that online learning had affected their productivity, and if we include those who considered that it affected their learning to a certain degree, the percentage of those whose opinion was that online learning had a negative influence on their learning reaches 67,2%. Only 8% of the students were of a neutral opinion. When compared to the statements of Karalis and Raikou (Karalis & Raikou, 2020), who stated that the introduction of technology in university education might affect one's productivity, our results confirm their standpoint.

Graph 4. The level of motivation of students while attending online classes



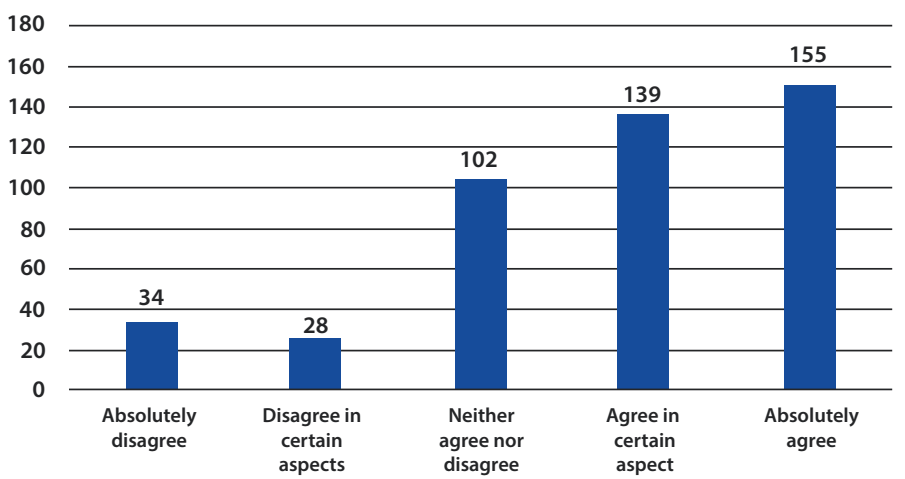
Graph No. 4 presents the average motivation level in students regarding online learning. Merit 1 indicates a very low level of motivation while merit 5 indicates a very high level of motivation. The average merit is 2,68. Only 8,4% of students were motivated by online learning, while approximately half of the participants (47,4%) said that their motivation was low. The results and the answers of the participants comply with the opinions of the authors of the existing research.

Graph 5. Technological solutions in online teaching would increase productivity and motivation to learn



Graph No. 5 presents the opinion of students when technology and smart tools had been applied in online learning, whereby 64,7% of students said that the application of technology absolutely helped them and also improved their learning, while 34,1% agree it helped in certain aspects. The implementation of technology and smart tools in university education might have been completely strange to some students, and this is indicated by the 22,5% of students with a neutral opinion. Modern technologies have infiltrated not only the entire industry and business branches but the highest levels of education, too. This development of technologies forces universities all over the world to keep step with the trends and use all the benefits that technologies provide.

Graph 6. The use of technology and smart tools would enhance online learning



Finally, the students were asked to analyze their attitudes regarding the implementation of technology in lecturing and examinations. Out of 454 participants in the research, 68,5% considered that technology solutions adapted to online learning would eliminate the existing disadvantages of online learning. Although the students generally had an adverse opinion regarding online learning, according to their opinions we think that something could be done for it to be improved. Useful new solutions applicable for online learning and improvement of the reduced productivity and motivation in learning would bring them more free time. The number of students that do not believe in the potential and positive effect on online education present 7,5% of the participants.

CONCLUSION

The entire world population had been affected by the COVID-19 pandemic and many universities, likewise. The university education had undergone sudden changes, which required adjustment of the lecturers, of other staff members, and of students. One of the first and most important changes was the change in the form of lecturing. The traditional lecturing within the university premises had to be transferred to online platform lecturing.

The universities and their management were forced to hastily adopt and implement certain changes in the organization of their business. Certain universities had done this without any difficulty and swiftly, while others significantly lacked the flexibility and capacity to adapt to the online lecturing process.

Young university students had no problem in adopting new solutions, compared to the elder students and lecturers lacking digital skills. The duration of the COVID-19 pandemic throughout several semesters of online learning had a negative influence on the productivity, motivation, and general satisfaction of the students regarding acquired knowledge. The lack of free time, the new form of lecturing, the experimental forms applied in them, as well as the social distance had brought serious consequences on the mental health of students.

Based on the collected and analyzed data, we found that the sudden change in the lecturing process had an adverse effect on the satisfaction of university students in Serbia. In online learning, the efficiency, productivity, and motivation in students were low when compared to the traditional form of lecturing. The present experience of the students confirms the assumption that the implementation of technology in the lecturing and examination activities would significantly improve these parameters. Online teaching implies implementation of technology in any teaching context. The use of artificial intelligence can make it easier for professors to perform tasks such as checking the validity of tests or reviewing assignments, while students can more easily take notes during lectures with the help of smart software. The current lectures of professors can be further improved by developing distance learning software that can be easier to use and more interactive. Also, non-teaching staff can more easily communicate with students using chatbots based on artificial intelligence. The goal of using modern software and technology is to save time and increase the accuracy of the daily activities of professors, students, and all other university employees. Since we are living in a digital era in which the high educated population are daily exposed to challenges and changes, in future research will apply longitudinal methods, i.e., repeat the research regarding online learning to establish whether after a lapse of time there have been significant improvements. The plan is to create and distribute a questionnaire each year in order to analyze the situation and the attitude of students regarding online learning.

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ISKUSTVA UNIVERZITETSKIH STUDENATA I NJIHOVI STAVOVI PREMA ONLINE UČENJU TOKOM PANDEMIJE COVID-19

Rezime:

Pandemija COVID-19 imala je značajan uticaj na univerzitetsko obrazovanje i organizaciju predavanja. Većina univerziteta širom sveta nije bila pripremljena za novonastale okolnosti, što je na kraju uticalo i na organizaciju i na kvalitet predavanja. Univerziteti su bili u obavezi da prate trendove i implementiraju nove strategije u nastavi kako bi podržali svoje studente tamo gde je pomoć bila najpotrebnija, a štaviše, kako bi zadržali kvalitet svog iskustva i obrazovanja. Cilj ovog istraživanja bio je da se stekne uvid u to kako su studenti reagovali na novu situaciju uzrokovanu pandemijom i da li su zadovoljni onlajn nastavom, kako bi univerziteti mogli da koriste rezultate za prilagođavanje i sprovođenje onlajn nastave u budućnosti. Istraživanje je pokazalo da studenti smatraju da je učenje putem interneta uticalo na njihovu efikasnost, produktivnost i nivo motivacije u procesu učenja. Osim ovih nedaća u vezi sa onlajn nastavom i učenjem, istraživanje je pokazalo da bi stav studenata prema primeni tehnologije u univerzitetskom obrazovanju unapredio proces onlajn predavanja i ispita i poboljšao sadašnju situaciju.

Ključne reči:
Covid-19,
Onlajn učenje,
Informacione tehnologije,
IKT.