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Original research paper

UNIVERSITY EDUCATION IN SERBIA DURING THE COVID-19 PANDEMIC – STUDENTS' PERSPECTIVE*

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ABSTRACT

The COVID-19 pandemic forced the transition to online teaching and learning in Serbian higher education. Therefore, this paper studies the results achieved at Serbian universities during the Covid-19 pandemic. The methods used are the descriptive method together with the scaling technique and the Likert scale. The sample included 400 tertiary-level students from Serbia. The obtained results showed both advantages and disadvantages of online university teaching and learning during the pandemic from the students' perspective, which might contribute to the improvement of this mode of teaching. (SOUV). Factor analysis was applied to determine the main variables that were used for further statistical data processing: the manner in which lectures and tutorials were held, the predominant teaching platforms used, the mode of examination and students' academic achievements during the pandemic. The results proved that online teaching could not replace the traditional mode of teaching. Moreover, the results showed that the predominant teaching platforms used were Google Meet, Zoom and Google Classroom. The majority of the students claimed that the main advantage of taking examinations online was saving time and money, whreas its main disadvantage was techincal issues that could impede the process of examination. Also, this research proved that studying in time of the pandemic stimulated their digital literacy. The fact that the respondents stated both advantages and disadvantages of virtual teaching may contribute to the improvement of this manner of teaching. Thus, this paper aims to stimulate future research that will provide an indepth analysis of tertiary-level teaching during the pandemic.

Key words:
COVID -19, online learning, university teaching, students.

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INTRODUCTION

It is inevitable that society and its educational system are prone to various changes that contribute to their advancement. These changes are conditioned either by intentional social demands for further development or by unpredictable circumstances. The latter is illustrated by the changes inflicted by the Covid-19 pandemic that had a global impact.

The research can include the analysis of the situation encounterd in university or tertiary-level education during the pandemic, whose purpose is to determine which solutions proved to be useful and which segments of university education could be additionally improved for the benefits of the educational system not only during the Covid-19 pandemic but also after it has been over.

The pandemic forced universities to quickly adapt their curricula to the requirments stipulated by governments and the World Health Organization. Distance learning, performed via the internet, was introduced into the majority of international and national universities. The present studies dealing with the effect of the Covid-19 pandemic on academic achievements in university education show that these achievements depended on numerous factors, such as the government support, technological advancement of a country, students' financial and social status, etc. This research emphasizes the advantages and disadvantages of university or tertiary-level online teaching, whose results could contribute to certain further studies in the field.

Review of the relevant research of university education during the covid-19 pandemic

On March 15, 2020, a state of emergency was declared throughout Serbia due to the outbrake of the coronavirus, which meant the cancellation of classes in universities, secondary and primary schools as well as in preschool institutions (Official Gazette of the RS, 2020). It also meant the transition of traditional university teaching to online teaching, in line with the practice applied by other world universities in the USA, China and India (Dumnić, Doroslovački, Kolaković, Stefanović and Kupusinac, 2021; Medvecki, Živolić, Vrtunski, Mocelj, Konjović & Simunović, 2021). The traditional face-to-face classes had to be replaced by distance teaching and learning, this being the most acceptable alternative in the given circumstances that could enable the continuation of education (Paudel, 2021). The model of hybrid education had already been practiced in Serbia; however, since there were only several curricula acredited for online teaching, the state of emergency declaration was a challenge for higher-education institutions to organize online teaching. University online classes were not orgnized according to one homogenous plan nor were they entirely

systematic (Bralić & Katić, 2020; Kovačević *et al.*, 2021). The research presented in this paper defines online teaching in all aspects of university education, conducted by means of digital technologies and the internet.

The COVID-19 pandemic accelarated the acknowledgement of online teaching as a teaching mode that could contribute to the improvement of university education and to better academic achievements (Matijašević, Carić & Škorić, 2021). Classes taught via the internet allow for a great number of students to attend. Also, teaching materials are always available and constantly upgraded by new information accessed from the internet. Flexibility is reported to be one of the greatest advantages of online teaching as classes taught online are better adjusted to students' needs (Akuratiya & Meddage, 2020; Almazova, Krylova, Rubtsova & Odinokaya, 2020; Haider & Al-Salman, 2020; Nedelcu, Ofiteru, Balan & Zamfir, 2021). Moreover, teaching materials can be recorded and saved, thus being always available, which is an important aspect. The aforementioned implies that teaching is performed at a pace most suitable to students. Another important and frequently emphasized advantage of online teaching is the fact that students are able to communicate with their colleagues and teachers and to cooperate with one another. This communication is twofold: synchronous, when they can communicate in real time by means of numerous audio and video platforms, and asynchronous, which provides more time for devising questions/answers and for overcoming any kind of hesitancy or vagueness in communication (Longhurst, 2020; Matijašević *et al.*, 2021; Stojanović, 2020; Paudel, 2021). Some research proves that communication between students and teachers via digital applications and social media during the pandemic reached a higher level of communication (Karalis & Raikou, 2020), which is the reason why it is recommended that this type of communication be continued in normal circumstances (Pavlović, Ivanišević, Radišić & Lošonc, 2021). This exchange of educational contents created "diverse possibilities" for an interchange of knowledge in the manner most suited to students. For example, the authors who examined the characteristics of the Zoom application, used for lectures and tutorials, pointed out its advantages concerning this interchange of information and knowledge (Abdulkareem & Eidan, 2020; Duarte & Beufils, 2021). Namely, students who participated in one of these studies observed that they benefited from using platforms such as Zoom for online learning since they developed new skills in that way, whereas a number of respondents reported about the improvement of their communication and organizational skills.

As regards the assessment of students' work, digital platforms and applications initiated a completely new form of assignments and tasks, as well as the possibility for students to get their exam results in a short period of time. Besides, the platforms facilitated the organization of exam terms and rationalized teachers' and students' time (Tolnouer-Ackerman, Jemrić Ostojić & Babović, 2020).

Certain constraints of online teaching might be overcome by the mode of hybrid teaching, the pandemic permitting (Bralić & Katić, 2020; Jakšić, Mitrović,

Ćurčić & Gračanin, 2021; Pavlović *et al.*, 2021; Stojanović, 2020). Considering the constraints and limitations of the imposed and modified manner of teaching and learning, relevant reference materials mention technical obstacles and impediments (Bralić & Katić, 2020; Dumnić *et al.*, 2021; Karalis & Raikou, 2020; Matijašević *et al.*, 2021; Stojanović, 2020). Serbian students stated that they did not consider online teaching suitable for acquiring permanent knowledge and skills (Kovačević *et al.*, 2021; Pavlović *et al.*, 2021; Stojanović, 2020). The aforementioned studies and their results and conclusions were based on students' experience with online teaching – students realized that this manner of teaching and studying was not timesaving, that they lacked motivation for studying, and that it was a more stressful manner of studying than the traditional, face-to-face teaching and learning. The reasons for such perceptions could be found in the lack of direct communication between students themselves, and between students and teachers (Bao, 2020; Jakšić, Mitrović, Ćurčić & Gračanin 2021), which increased their social distance (Adnan & Anwar, 2020; Paudel, 2021; Yilmaz Ince, 2020), and consequently decreased their chances for developing communication skills (Jakšić *et al.*, 2021). However, these reasons could be of a completely different nature, which deserves a thorough research in order to understand this problem better.

Health recommendations related to the pandemic affected the regular exam procedures, so that a number of extra exam terms were introduced. Written tests took prevalence over oral exams in universities in many countries, including Serbia. University teachers had to put an extra effort into devising tests, particularly for those study programs where it was not common practice, while students were forced to adapt to altered exam conditions (Bralić & Katić, 2020; Jena, 2020; Matijašević *et al.*, 2021; Tolnouer-Ackerman *et al.*, 2020). Technical problems that might affect online teaching and students' attendance were emphasized as one of the obstacles to the efficiency of this mode of university teaching. The pandemic had a negative impact on every possible form of cooperation between universities, between students and teachers, despite the fact that communication could be maintained via the internet. Students' social and psychological health was impaired by the lack of human contact (Tolnouer-Ackerman *et al.*, 2020; Jena, 2020). Besides difficulties related to taking exams, students expressed their doubts about the possibility to acquire some permanent knowledge in this way. Therefore, it is of utter importance to specify certain inadequacies and shortcomings of online teaching during the COVID-19 pandemic in order to devise appropriate methods for overcoming them.

METHODOLOGY

Research aims and objectives

The COVID-19 global outbreak, which is still an ongoing danger, presented higher education institutions with the impediment of transforming to a new curriculum in accordance with the regulations and recommendations issued by the Government of the Republic of Serbia. This paper is focused on the degree of academic achievement in university education during the COVID-19 pandemic in Serbia. This research aims to examine the advantages and disadvantages of higher education in Serbia during the COVID-19 pandemic. The empirical part of the research examines the students' attitudes towards their academic achievements in relation to distance online teaching during the COVID-19 pandemic. The goal of the research is to examine the students' attitudes towards the organization of lectures and tutorials, predominant platforms used, weaknesses and strong points regarding examination procedures and their own achievements in higher education during the COVID-19 pandemic in Serbia. Students have encountered new ways of organizing lectures, tutorials, and exams, which may have an impact on their own academic achievements. Therefore, their opinion about the new academic circumstances can contribute significantly to the analysis of the degree of success of higher education during the pandemic. The research implies that it is possible to suggest certain measures to overcome potential shortcomings of university education during the COVID-19 pandemic. Thus, the quality of tertiary-level education in Serbia can be improved so that it can successfully face challenges of modern times.

Sample

The research was conducted on the sample comprised of 400 university students from Serbia. The sample was convenience sample but selected from the purposefully chosen students population. The research was carried out by means of the Google questionnaire and voluntary participation was ensured. The questionnaire was distributed via e-mails, faculty sites, social media, and university students' associations in Serbia.

The following table shows the structure of the sample regarding the independent variables of the research (academic major, year of study, place of residence and dwelling place during studies).

Table 1: Sample structure regarding the socio-demographic characteristics of the sample

		N	%
Academic major	Natural sciences and mathematics	73	18.3
	Technical and technological sciences	92	23.0
	Social sciences and humanities	198	49.5
	Medicine	37	9.3
Year of study	First	83	20.8
	Second	59	14.8
	Third	89	22.3
	Fourth	169	42.3
Place of residence	Rural	350	87.5
	Urban	50	12.5
Dwelling place during studies	In their own household	35	8.8
	With parents	194	48.5
	In a rented flat (tenants)	131	32.8
	In student dormitories	40	10.0
Total		400	100.0

Instruments and methods of data collection

The research was conducted in May and June in 2021, which means that it included both the academic term (during which classes were held) and the exam term. The methods used were descriptive method and the scaling technique. The authors themselves created the instrument for the purposes of this particular research. This instrument (SUOV) contained 44 items, grouped in four subscales respecting data factorization, and the research tasks. The respondents were asked to provide their answers using the Likert-type scale (with the response categories ranging from 1 – Strongly disagree to 5 – Strongly agree). The respondents filled in the Google questionnaire via the Google application.

The instrument reliability was determined by the Cronbach's Alpha test. The data were statistically processed using the SPSS program (21). The statistical procedures used were factor analysis, t-test, and F-test. The Cronbach's Alpha test (α= .82) tested the reliability of the instrument in the segment related to the level of

success of university teaching during the pandemic. The scale constructed for the purposes of this research was deemed reliable respecting the necessary criteria.

RESULTS

The students' responses related to university teaching and its quality during the COVID-19 pandemic in Serbia were analyzed regarding the main factors of the research. The main factors were determined by means of the factor analysis of the research results.

Table 2: Factor analysis

Factors	Initial values			Extracted values		
	Total	Variance percentage	Cumulative percentage	Total	Variance percentage	Cumulative percentage
1	9.832	22.346	22.346	9.832	22.346	22.346
2	5.492	12.483	34.828	5.492	12.483	34.828
3	3.454	7.850	42.678	3.454	7.850	42.678
4	2.836	6.445	49.124	2.836	6.445	49.124

Method of extraction, factor analysis

The application of factor analysis determined 13 factors, 4 of which were retained for the purposes of the research in form of research tasks, as shown by the largest percentage of the total cumulative variance that is 49.12% for the fourth factor. The methodological framework of the tasks was determined by factorization, and it was decided to show all initial items without the reduction of the items from the research instrument.

The first factor was defined as *The method of holding lectures and tutorials,* the second factor was defined as *Predominant platforms,* the third factor was defined as *Examination procedures,* and the fourth factor was defined as *Students' academic achievements.*

Advantages and disadvatages of holding university lectures and tutorials online

The online teaching model that was used in Serbian universities referred to holding lectures and tutorials via the internet. Students interacted with their colleagues and teachers via online communication, thus doing their share of the participation. This factor included the questions that may provide a better insight into the advantages and disadvantages of university online teaching in our country.

Table 3: Holding university lectures and tutorials online

Advantages	Disadvantages
Participation from any place and at any time	Internet connection and technical equpment
Online classes save time and money	Onlne classes are different from face-to-face classes
Constant access to lectures and tutorials	Platforms do not allow teachers to devote their time to each student

The factor of holding university lectures and tutorials online includes the following items from the Likert-type scale (*Online teaching allows participation from any place and at any time; Online classes save time and money; Online teaching provides the opportunity to study at a pace most suitable for me; Online teaching stimulates teachers' and students' creativity; The distribution of teaching materials is more efficient in the digital classroom; Lectures and tutorials can be recorded and saved to be accessed whenever necessary; Online teaching platforms enable versatile and extensive communication between university teachers and students; Online teaching platforms provide university teachers with an opportunity to consider each of their students as individual personalities; Students feel that online teaching increases the sense of isolation and contributes to the lack of social life; Online teaching affects students' health; Technical problems obstruct online university classes; Online teaching requires powerful internet connection and good technical equipment; Students' feedback is difficult to receive; A large number of students can be an impediment to holding online classes; Students' active participation is low; Practical activities are impossible to perform during online classes; The quality of online teaching is affected by university teachers' insufficient IT skills; Online teaching cannot completely replace face-to-face teaching; Online teaching can be an accompaniment to traditional, face-to-face classes*).

Table 3 displays the most frequent answers provided by the respondents in the Likert scale. High arithmetic mean results (M > 4.00) indicate that students assessed positively certain factors, such as the possibility to attend classes from any place and at any time, that online teaching saves time and money and that it allows constant access to lectures and tutorials. They demonstrated a relatively high level of agreement with the statement that online teaching requires powerful internet connection and technical equipment (M = 3.99).

However, the respondents did not completely agree with the statements that online teaching can replace face-to-face classes in full (M = 2.13), that online teaching platforms provide university teachers with an opportunity to consider each of their students as individual personalities (M = 2.53), that online teaching enables versatile and extensive communication between university teachers (M = 2.92), that onnline teaching stimulates teachers' and students' creativity (M = 2.64), that online teaching affects students' health (M = 2.91) and that online teaching is affected by a large number of students attending online classes (M = 2.92).

The respondents were indeterminate regarding the statements that university teachers' insufficient IT skills affect the quality of online classes (M = 3.32), that online teaching can be an accompaniment to traditional, face-to-face classes (M = 3.44), that the distribution of teaching materials is more efficient in the digital classroom than in a traditional one (M = 3.46), that students' feedback is difficult to receive in the context of online teaching (M = 3.52), that students' active participation is low (M = 3.54), and that online teaching provides an opportunity to study at a pace most suitable for them (M = 3.49). They also expressed uncertainty regarding the statements that practical activities are impossible to perform during online classes (M = 3.88) and that technical problems obstruct online university classes (M = 3.80). The analysis of the differences in the students' attitudes towards online university classes, both lectures and tutorials, in relation to the studied variables did not yield statistically significant results (p > .05), which is the reason why this segment of the statistical analysis was not presented in tables.

Advantages of university online teaching regarding the predominant platforms

Officially issued measures that demanded total social isolation and distance forced universities to transfer to a different mode of teaching in order to continue their activities efficiently and to maintain interaction with students. They had at their disposal various platforms and applications which in turn gained greater significance when it comes to education.

Table 4: Students' attitudes towards the predominant platfoms used in university online teaching

	M	Sd
Google meet	3.33	1.77
Zoom	3.35	1.62
Google classroom	3.41	1.68
YouTube	2.49	1.49
E-mail	4.22	1.05
Viber or Whatsapp	1.77	1.22
Facebook	2.69	1.47

Table 4 shows the arithmetic mean obtained from the respondents' answers regarding the platforms and tools most frequently used during the pandemic *(Online classes held via Google Meet; Online classes held Zoom; Online classes held via Google Classroom; Online classes held via YouTube; Student-teacher communication via e-mail during the pandemic; Student-teacher communication via Viber or Whatsapp; Student-teacher communication via Facebook*).

The results shown in Table 4 prove that students and teachers communicated mainly via e-mail during the pandemic (M = 4.22), and the least via Viber or Whatsapp (M = 1.77). Frequently used platforms were Google Meet (M = 3.33), Zoom (M = 3.35) and Google Classroom (M = 3.41), while Facebook (M = 2.69) and YouTube (M = 2.49) were rarely used. These data provided the answer to the question about the predominant platforms during the pandemic as far as university classes are concerned. Yet, the results would be more useful if the use of these platforms in univeristy classes could be examined in normal circumstances. This is a suggestion for some future studies and research.

This research aimed to analyze statistically significant differences in the respondents' answers about the predominantly used platforms in university classes regarding the respondents' academic major and year of study. The results are shown in Table 5.

Table 5: Differences in the students' responses about the predominant platforms used in university online teaching regarding their academic major and year of study

Predominant platform in university classes	N	M	Sd
Natural sciences and mathematics	73	21.97	4.46
Technical and technological studies	92	17.70	5.15
Social sciences and humanities	198	22.63	4.60
Medicine	37	21.35	5.25
F = 22.15 df = 3 p = .0001			
First year	83	21.64	4.69
Second year	59	16.78	5.39
Third year	89	23.80	5.70
Fourth year	169	21.30	4.14
F = 25.35 df = 3 p = .0001			

Based on the results shown in Table 5, there was determined a statistically significant difference in the students' answers about the predominant platforms used in university classes regarding the students' academic major ($p < 0.05$). The statistically significant difference was detected between the responses provided by the students of technical and technological sciences and those given by the students of natural sciences and mathematics, social sciences and humanities, and medicine. Namely, the students of technical and technological sciences used the aforementioned platforms less (M = 17.70) than the students of natural sciences and mathematics (M = 21.97), the students of social sciences and humanities (M = 22.63) and the students of medicine (M = 21.35). As regards the year of study, there was found a statistically significant difference between the responses provided by the second-year students and those given by the first-year, third-year and fourth-year students. The second-year students stated that they used the mentioned platforms less (M = 16.78) than the students of the first year of study (M = 21.64), third-year students (M = 23.80) and fourth-year students (M = 21.30). Regarding the variable place of residence, the differences in the respondents' answers were not found, i.e., the responses were homogeneous. The reason why the students' answers about the predominant platforms used in online university classes varied regarding the variable year of study might be a query to be analyzed and explored in some future research.

Advantages and disadvantages of online university examinations

Testing students' knowledge via the internet created various doubts and represented a considerable challenge. Therefore, this research examined positive and negative sides of this mode of examination and assessment of students' knowledge (*Online exams save time and money; Stagefright and fear of making mistakes are less during online examinations; Online examination is more flexible than the traditional examination at faculty; Online examination provides an opportunity to demonstrate one's true knowledge; Online examination offers various ways of testing students' knowledge; Online examination creates doubts among teachers about their students' real knowledge; Technical problems may obstruct online examinations; Online examination is preferable when combined with traditional examination at faculty*).

The research results proved that the majority of the respondents agreed with the statement that taking exams online saves time and decreases their expenses, but that technical problems can obstruct taking exams online ($M > 4.00$). The obtained results also show that the students who participated in this research did not agree with the statement that online examination is an opportunity to demonstrate one's true knowledge ($M = 2.61$).

The respondents' were indeterminate regarding the statements about the stagefright and fear of making mistakes during online examination ($M = 3.25$), flexibility of online examination in comparison to traditionally conducted examinations at faculty ($M = 3.61$), creating doubts among teachers about their students' real knowledge ($M = 3.81$), offering various ways of testing students' knowledge ($M = 3.14$) and that it is preferable that online examination be combined with traditional examination conducted at faculty ($M = 3.40$).

Table 6: Differences in the students' responses about advantages and disadvantages of online examination in the context of university education regarding their academic major, year of study and living conditions during their studies

Manner of conducting examinations in university education	N	M	Sd
Natuaral sciences and mathematics	73	28.32	5.18
Technical and technological sciences	92	26.22	5.49
Social sciences and humanities	198	29.53	3.38
Medicine	37	25.50	4.45
F = 17.12 df = 3 p = .0001			
First year	83	25.57	6.21
Second year	59	29.78	5.39
Third year	89	28.88	3.35
Fourth year	169	28.51	3.46
F = 13.12 df = 3 p = .0001			
In their own household	35	30.29	1.78
With parents	194	28.14	4.74
In a rented flat (tenants)	131	27.57	5.00
In students' dormitories	40	28.43	4.33
F = 3.23 df = 3 p = .02			

Table 6 shows a statistically significant difference in the students' attitudes towards the manner of taking exams regarding their academic major, year of study and living conditions during their studies ($p < .05$). A statistically significant difference was spotted between the answers provided by the students of social sciences and humanities, as well as the students of natural sciences and mathematics, and those provided by the students of technical and technological sciences and medicine. The students of social sciences and humanities (M = 29.53) and the students of natural sciences and mathematics (M = 28.32) expressed more positive attitudes towards the manner of taking exams that their colleagues who study technical and technological sciences (M = 26.22) and medicine (M = 25.50).

As regards the year of study, there was determined a statistically significant difference between the responses given by the students of the first year and those

provided by older students ($p < .05$). Online examination received a more negative evaluation by the students of the first year ($M = 25.57$) than by the students of the second year ($M = 29.78$), of the third year of study ($M = 28.88$) and of the fourth year ($M = 28.51$).

Moreover, there was determined a statistically significant difference between the responses provided by the students who live in their own housheols and those who are tenants. Namely, the students who live in their own household evaluated online examination more positively ($M = 30.29$) than those who live in rented flats ($M = 27.57$). No differences were found in the answers of the respondents regarding the variable rural or urban swelling place.

Students are aware of the advantages and disadvantages of online examination during the pandemic. What is peculiar is the fact that students themselves perceived these advatages and disadvantages. The advantages and disadvantages of online examination were differently perceived by the students of different academic majors, particularly by the students of medicine. The students of the second, third and fourth year of study assessed these aspects differently than the students of the first year of study. This is not surprising since the first-year students are yet to gain experience in taking exams, something that their older colleagues have already had. Online examinationa had a special impact on the students who live with their parents, which is the reason why their attitudes differed from those expressed by the students who live in rented flats or in students' dorms.

University online teaching regarding students' academic achievement

University classes are focused on students as the active participants who acquire knowledge and develop skills. One of important goals of university education is qualifying students for permanent education by means of teaching skills and techniques for independent learning, discovering adequate information and digital competences. The question is whether university online teaching can contribute to the development of these skills and knowledge in students. Therefore, regarding the fourth factor, there were examined the students' attitudes towards their own academic achievement during the COVID-19 pandemic *(Online teaching is an opportunity to learn more due to the access to more information; Online teaching contributes to acquiring current knowledge; Online teaching is beneficial for critical thinking; Online teaching stimulates the development of communication skills, cooperation, use of various educational tools; Online teaching stimulates independent learning; Online teaching raises students' motivation for learning; Online teaching stimulates digital literacy; Online teaching demands greater responsibiliy from students than traditional classes; The restrictive measures put a ban on going abroad, which was detrimental*

for those who wanted to acquire new knowledge and experience and which could not be compansated by online classes; Academic achievement is conditioned by possessing good IT skills and being digitally literate).

This research proves that the students agree that online teaching stimulates digital literacy (M = 4.07), but that they disagree regarding the fact that it raises students' motivation for learning (M = 2.53). As far as their academic achievement is concerned, the respondents are generally indetermined, particularly considering the opportunity to gain more knowledge during online classes owing to the access to more information (M = 3.32), to acquire current knowledge (M = 3.35), then considering the fact that online teaching stimulates critical thinking (M = 3.04), communication skills, cooperation, use of various educational tools (M = 3.33) and the skills of independent learning (M = 3.78). The students are equally indetermined about the fact that online teaching demands greater responsibility from students than traditional classes (M = 3.26), that a ban on travelling abroad was detrimental for those who wanted to acquire new knowledge and experience that could not be compensated by online teaching (M = 3.29), and that their academic achievement is conditioned by their digital skills (M = 3.66).

Table 7: Differences in the students' answers about their academic achievement regarding their academic major and living conditions during studies

Academic achievement	N	M	Sd
Natuaral sciences and mathematics	73	32.33	8.01
Technical and technological sciences	92	29.41	5.13
Social sciences and humanities	198	29.44	7.33
Medicine	37	29.30	6.73
F = 3.47 df = 3 p = .02			
In their own household	35	27.86	7.81
With parents	194	28.93	7.05
In a rented flat (tenants)	131	30.94	6.98
In students' dormitories	40	33.48	4.35
F = 6.89 df = 3 p = .0001			

The analysis of the differences in the students' responses about their own academic achievement regarding the postulated variables, there were found statistically significant differences in the respondents' answers in relation to their academic major and living conditions during studies ($p < .05$).

The statistically significant difference was spotted between the responses provided by the students of natural sciences and mathematics and those given by the students of social sciences and humanities. The students of natural sciences and mathematics assessed their own academic achievement more positively (M = 32.33) than the students of social sciences and humanities (M = 29.44).

Considering living conditions during studies, there was observed a statistically significant difference between the responses given by the students who reside in students' dormitories and those who live in their own household and with parents. The students residing in students' dormitories assessed their academic achievement more positively (M = 33.48) than the students who live in their own household (M = 27.86) and those who live with parents (M = 28.93). This might result from the fact that they had their own quiet place for studying and were motivated by other colleagues residing in dorms, unlike the students from other categories regarding their dwelling place. These findings can be subjected to some comparative or a more detailed analysis.

DISCUSSION

The conducted research analyzed the students' attitudes towards online university teaching, both lectures and tutorials, predominant platforms used in online classes and examination procedures, as well as their own academic achievement during the COVID-19 pandemic. In Serbia, university classes were mainly held via e-mail, Google Meet, Zoom and Google Classroom. The results of the statistical analysis proved that the aforementioned platforms were less used for online university teaching of the students of technical and technological sciences than for the students of social sciences and humanities, natural sciences and mathematics, which is understandable taking into account the nature of classes held in those study field. The digital mode of teaching contributes to the students' IT literacy and improvement of their digital skills, the result that is in accordance with the findings of the study conducted by Duarte & Beaufils (2021). The students did not strongly agree with the statement that online teaching enabled them to study at a pace most suitable for them Also, the respondents were indetermined about the question of flexibility of conducting examinations and of combining online examination with traditional examination. Considering students' attitudes to online examinations, similar results were obtained from other studies conducted by various authors (Tolnouer-Ackerman *et al.*, 2020).

Our respondents agreed that online teaching affected their social skills and increased their sense of isolation, which is in accordance with the results of the research conducted with the students in Pakistan, Nepal, and Turkey (Adnan & Anwar, 2020; Paudel, 2021; Yilmaz Ince, 2020). The results of this study showed that technical problems obstructed online lectures, tutorials and exams, and that powerful internet connection and technical devices are essential for students to participate in online classes. The research conducted in underdeveloped countries, such as Nepal (Paudel, 2021), emphasize this problem, as well. Also, practical activities are impossible to perform in online classes, which is the reason why our respondents agreed that online teaching cannot replace traditional teacing in traditional classrooms. A number of the students pointed out that online teaching denied them the opportunity to participate actively in classes. The students realized that completing online tasks was time-consuming, that their responsibility was considerable since good organization of time was now their responsibility. An interesting result, which was also obtained by Stojanović in her own study (Stojanović, 2020), was that the students perceived online teaching as not beneficial for acquiring permanent knowledge. The possibility for students to express their real knowledge and the possibility for teachers to assess that knowledge adequately was evaluated negatively. The reason why the students of social sciences and humanities and the students of natural sciences and mathematics had more positive attitudes towards online examination than the students of technical and technological sciences and the students of medicine lies probably in the nature of examinations conducted – it was easier to test theoretical knowledge online than to test the knowledge of the students who had to demonstrate it in laboratories and practical activities. The reason why the students of the first year of study had more negative attitudes towards online examination than the students of other years of study could be the lack of experience and of organizational skills that their more experienced colleagues possessed. The students living in their own household evaluated online teaching more positively than their colleagues who live in rented flats. However, the students residing in students' dorms assessed their academic achievement more positively than those who live with parents.

This paper is expected to encourage researchers, teachers, reflective practitioners, university teachers and other scholars interested in this topic to conduct not only quantitative but also qualitative research that would provide a better insight into this problem and shed some new light on the obtained statistical data. The presented research has its values, but also its limitations, which is the reason why further empirical research is necessary. One of the advantages is that this research is transversal in its nature, which means that it gives a better insight into young people's perceptions of the quality of university education. On the other hand, it is limited in that it does not explore cause and effect and does not insist that its results be valid for the whole population of students, which leaves much space for further analytical and research study.

CONCLUDING REMARKS AND PEDAGOGICAL IMPLICATIONS

The goal of the conducted research was to determine the quality and achievements of online university teaching during the COVID-19 pandemic in Serbia based on the students' attitudes.

The conclusion is that online university teaching conducted in Serbian universities have its advantages and disadvantages. The implications of this research are reflected in the necessity to strengthen material, technical and human capacities in education so that distance teaching and learning can be continued or conducted in the future, if necessary, with more success. A more permanent solution could be found in the combination of two teaching models to eradicate the shortcomings of either of them or to improve their common good points. This study did not include the attitudes, qualifications, and competences of university teachers for holding online classes, which is one of the limiting factors, and can be a topic to be examined in further research.

This research implemented independed research variables, which might be emphasized as the basis for new and innovative postulates of this current issue. The main contribution of this paper, the fact which makes it distinct in comparison to similar research papers, is the fact that these papers did not include the socio-demographic properties of the sample in the analysis. It is suggested that this research be repeated in the near future so that its results could be compared with the results obtained from later studies. Moreover, researchers are advised to explore this problem but to include different socio-demographic characteristics of the respondents, those that have not been yet examined, in order to obtain more comprehensive and elaborate results. Also, it is recommended to apply a different approach to this problem, to use qualitative methodology, interviews, and focus group interviews in order to obtain more precise answers from the respondents. This topic, online university teaching, is the issue that merits further examination. It is very important to emphasize that the quality of online university classes was not evaluated as "good or bad", but that it was analyzed as the product of the students' perception that indicates some further research ventures. The quality of online university teaching should be studied from other perspectives (university teachers, teaching assistents, researchers), from the perspective of the students of some other universities and from other countries.

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