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Abstract: Emergency remote teaching was first introduced in the educational system of the Republic of Serbia during the COVID-19 pandemic, not as a planned change but as an imposed solution aimed at suppressing this infectious disease. This raises the question of the sustainability of remote teaching after the pandemic and the effects and experiences with emergency form of this method of teaching in the form it was used during the pandemic. Therefore, this paper is aimed at examining whether and in what manner technical factors such as digital competence, device equipment, Internet connection, and Zoom fatigue could contribute to students' attitudes and satisfaction with this form of teaching, as well as how all these factors might contribute to the perception of satisfaction, efficiency, and sustainability of RT among the students of the teacher education faculties. The research involved 138 female university students from the faculties of education in Serbia. The results point to the unpreparedness of the educational system for the quick transition to emergency remote teaching and to inadequate logistic support for the implementation of this form of learning: from insufficient computer literacy, problems with the good-quality Internet in the territory of the whole country, having no adequate devices for following classes (most frequently mobile phones), students' dissatisfaction with the effectiveness, to the phenomenon of Zoom fatigue as a consequence. The main finding is that students perceive remote teaching as a "necessary evil", something that should be applied only when it is absolutely impossible to have the usual form of classes, only in emergency situations. This is also corroborated by the fact that after the pandemic, the school system returned to classes under traditional conditions. This leads to a conclusion about the unsustainability of the remote teaching model in Serbia, at least in the form that was applied, most probably because it was university students' first and only experience in relation to it gained with emergency remote teaching, in the conditions of the COVID-19 crisis with its health, psychosocial, and economic pressures and with emergency form of this method of teaching.

Keywords: COVID-19 pandemic; digital literacy; emergency remote teaching; remote teaching sustainability; technical support; university students; zoom fatigue

1. Introduction

1.1. Circumstances in the Educational System of the Republic of Serbia During the COVID-19 Pandemic

Emergency remote teaching (ERT) first appeared in the educational system of the Republic of Serbia as a form of teaching after 15 March 2020 [1], at all levels of education as



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a consequence of the state of emergency declared on 15 March 2020 due to the pandemic of the infectious disease COVID-19 [2], which, with different modifications, even after the official end of the state of emergency on 6 May 2020 [3] remained in force at the faculties as late as the end of September 2022. Until the moment of the introduction of the state of emergency as an anti-pandemic measure, there had been a legally stipulated possibility of remote teaching, but it was never resorted to in Serbia [4]. However, although ERT was introduced as an anti-pandemic measure at all levels of education (primary, secondary, and higher), it was the only form of teaching in higher education. In fact, primary school students had lessons from all subjects on television, while secondary school students had TV lessons for the subjects considered the most important (the Serbian language, mathematics, history...), which had an undesired consequence that the public (both professional and general) rather turbulently reacted to the content of certain lessons and their public interpretation [5]. Having in mind that attending primary school is compulsory in the Republic of Serbia, opting for the public TV service, the signal of which covers the whole territory of the country, was logical since in some parts of the country there are settlements with poor Internet connection which, according to the surveys, was emphasized as a problem by as many as 39.5% secondary school respondents in relation to teaching of those subjects not covered by the public TV service [6]. Furthermore, a certain number of children from vulnerable groups (most frequently due to their poor financial situation) had no access to the Internet and computing equipment, so they had to borrow them or be given them by schools. The surveys show that laptops and mobile phones were used equally in this method of teaching, with a much lower share of tablets and a negligible share of desktop computers, which points to the students' being unequipped with the devices necessary for this form of teaching [7], i.e., to the students' resorting even to those devices (mobile phones) whose longer use for this purpose, due to eyestrain, may cause eyesight deterioration etc. [8–14]. In some cases, the lack of devices or the absence of the Internet (particularly in rural regions) was overcome in such a manner that the teachers sent hard copy teaching material by mail or even gave it to parents, relatives, or neighbours to pass it on to students. On the other hand, although attending secondary school is not legally obligatory, almost all young people opt for this level of education in order to acquire certain educational qualifications as an entry to the labour market based on the knowledge and competences gained through schooling. A smaller number of subjects for secondary school students were also covered by TV lessons, with the additional use of different information-communication technologies (ICTs), while for other subjects, social media were used, such as Viber, WhatsApp, or free Internet tools intended for communication, which is illustrated by the research into teaching sociology in secondary schools [7].

Conversely, it turned out that ERT in its full form (both synchronous and asynchronous) was mostly used to meet the needs of higher education. In fact, although several study programs were accredited for remote teaching before the pandemic [4], the university community was left to make use of its own means. Unlike the two lower levels of education, which received active assistance and clear and specific work guidelines and recommendations from the government, higher education institutions had neither guidelines nor support. Universities were given the freedom to respond with their own capacities to the challenge of maintaining the continuity of teaching during the pandemic and the impossibility of maintaining the regular teaching model [15]. In practice, this meant that not only did ERT proceed differently at different faculties, but also that the teaching staff within the same faculty used different methods [16–18] with the logistic assistance of IT experts employed at the faculties, as was also the case in other countries [19–24].

This kind of non-uniformity in teaching practice could affect not only the quality of lessons, but also communication with students, the length of remote lessons, and students'

satisfaction with the overall teaching process [25–29]. During the pandemic, a special problem was posed by teaching practical lessons and exercises. During the state of emergency, classes were either completely suspended or transferred to ERT on a feasible scale. After the state of emergency ended, the situation was somewhat better, but a large number of studies from different fields [30–32] of science reported a high degree of students' dissatisfaction worldwide in relation to acquiring competencies in the area of professional practice [4,16,22,28,30,33–38]. Moreover, there were huge disagreements about fulfilling pre-examination obligations and the actual taking of examinations [16,26]. In order to avoid irregularities in the circumstances of online grading, in which the students would use forbidden means to get better grades, the only uniform rule at all the faculties in Serbia was to take examinations live and not online, on the faculty premises, in a traditional manner, and with the observance of all prescribed anti-pandemic measures for the purpose of protecting the health and safety of students and professors.

1.2. Literature Review

Comprehensive literature, apart from the non-uniformity of professors' computing competences [17,26,39,40], points out that the same dilemma refers to students [41,42]. Understandably, at the moment the pandemic was declared, most professors were not members of the millennial generation, which is considered the most competent in the use of ICTs, because it is a generation included from the earliest age in the digital world. A comprehensive literature review found a generation gap regarding the use of ICTs [23], which might also be explained as a type of ICT-related skepticism. The data obtained to date show better knowledge and routine use of ICTs and, accordingly, better knowledge and a more positive attitude toward ERT among young people, and they are expected to be better in the digital space when it comes to remote teaching, particularly when it refers to faculty, students, and assistants [7,29,43–46]. However, the research results also point to the fact that, apart from the age group [17], the amount of time spent on digital devices and the Internet [12,13,47–49], the accessibility of digital devices for attending remote lessons [40,42], and the quality and speed of the Internet connection [26,50,51], there is yet another factor potentially important for the implementation of ERT—the content followed by consumers. Although young people have much more spare time than professors, their interests are different, and they do not use the Internet exclusively for acquiring knowledge, but on the largest scale as a means of communication and keeping in touch with other important people, which substantially increased during the pandemic, particularly during the state of emergency [52], which lasted almost three months in Serbia. The abrupt use of the means of maintaining communication and contact with peers and spending spare time with different entertainment content may lead to a superficial approach to the use of these means for educational purposes [18]. This is corroborated by the data reported by teachers [17] and, to a smaller extent, by students: students' inappropriate use of social media icons, languages, and outfits [53], the lack of attention, attempts to cheat the system by only logging into the lesson, and by turning off the camera so as to hide that students are not actually present in remote lessons (one of the authors of this paper had a case of calling the students' names and posing them certain questions online. One student logged out ten minutes afterward and was later informed by other students that her name had been called. This student openly stated that she had gone to the shop to buy milk. In the RT context, this would mean the abuse of RT and unacceptable behaviour. These examples make us wonder about the claims, which may also be found in the literature, that ERT makes it possible to do "several jobs at the same time" because the question arises as to whether such multitasking is real or simulated. In addition, is it possible to concentrate equally on doing several jobs at the same time or at least be minimally concentrated, as

required by the teaching process? Distractions often occur as a result of multitasking [54] because people are overconfident in their ability to engage in a few tasks at any one time [55]. Multitasking overconfidence is one of the main characteristics of Millennials. However, from the ERT aspect in the lockdown, this situation could also be explained by the fact that during the lockdown it was allowed to go to the shops only on certain days, most frequently in the period of 3–4 h, in order to buy groceries, while strictly observing anti-pandemic measures. If it coincides that the student lives alone and has no one to turn to, or is perhaps the only healthy person in her environment, in charge of buying groceries for herself and others, while the time for online classes and free movement overlap, can this be considered legitimate, although illegal acting, since presence in online classes is compulsory? Finally, this student's open confession and apology point out that she had to act this way in an extraordinary situation. Many teachers experienced the moment when they had to put understanding before duty and show more understanding for their students [56-58]), time spent by students simultaneously doing various entertainment activities while officially being present in lessons, etc. [4,28], and other unprofessional online behaviour, such as teaching to blank screens.

At the same time, concurrently with the problem of keeping physical distance and the reduced number of live contacts with other people (particularly during the state of emergency), the problem of excessive use of digital technologies and the Internet emerged, both for the sake of spending spare time suddenly available in infinite amounts, especially among young people, and for educational purposes [59]. The experiences before the pandemic do not speak only about the users' addiction to the Internet but also about other phenomena that may be considered a direct consequence of the excessive use of digital technologies both among employed people and young people [60–63]. The development of technology has enabled people to overcome physical limitations; namely, if one cannot be physically in two places at the same time, who says that it is impossible in virtual reality? Even before the pandemic, many training sessions, conferences, and courses as a form of online learning and teaching enabled people to have access not only to asynchronous but also to synchronous forms of remote teaching [17,46]. The problem related to digital fatigue was first noticed by the participants of digital conferences, not only scientific ones, but also those related to business [11,48]. For example, if it is necessary to organize an urgent meeting at a time when participants are on different continents, the only way to do it is via a videocall, i.e., a synchronous form of teaching. It causes various problems, such as man's functioning in different time zones [48], the abilities to keep attention and concentration during hours-long meetings [13], particularly with no breaks, incessant looking at the same point accompanied by the screen radiation, lack of privacy (if a meeting is attended in the family environment) [63-65], the need to make the best possible impression [66-69], the inability of exchanging non-verbal communication [11,67], mirror anxiety [14], facial appearance dissatisfaction [60], etc.

Researchers and the media have begun looking into the novel phenomenon of feeling exhausted and tired during or after videoconferencing or synchronous virtual meetings, known as videoconference fatigue or Zoom fatigue [40,47]. The use of "Zoom" as a replacement for videoconferencing resulted in the ubiquity of the Zoom platform in videoconferences, although Zoom fatigue refers to the fatigue attributed to videoconferencing on any platform [12,70]. Based on this, Fauville et al. [12] concluded that there is a special phenomenon called Zoom Exhaustion and Fatigue (ZEF). ZEF implies that continuous hours-long presence at online meetings leads to numerous problems in an individual's everyday functioning, which is manifested in different ways [71–75]. Considering that ERT also meets all these preconditions, particularly in the event of a pandemic and restricted movement and the emphasis on maintaining physical distance as an important prevention measure against the virus spread, there is a basis for assuming that ZEF is also possible in ERT, primarily because the dominant factor for registering the appearance of ZEF in previous research was the amount of time spent working in the digital environment, and not the form of work itself, i.e., the topics and the subject of meetings. Furthermore, having in mind that fatigue is a state in which a person's cognitive capacities (not only biological, but also emotional ones) are overexerted, it is logical to assume the existence of a negative effect of this type of fatigue on the quality of following lessons and the level of adopting knowledge, which is corroborated by the results of previous research [17,76], particularly in a situation when there is a fatal threat to oneself or other dear persons. During times of heightened stress, individuals focus on survival rather than cognitive growth or self-fulfilment [77].

Numerous studies have also been conducted among teachers and school and college students, with the main topics being experiences regarding teaching efficiency and attitudes toward working in a digital environment [17,27,78,79]. However, an equally intriguing question, apart from ERT efficiency and satisfaction, is the role of digital competence, not only as an antecedent, but also in terms of its effects in students [22,32,56,57,80,81] and professors [82–84].

Therefore, this research aimed to establish whether ERT, as a solution forced in the pandemic situation for the purpose of maintaining the continuity of teaching, is sustainable in the post-pandemic environment. Namely, RT is stipulated as a form of online teaching in higher education, intended for normal circumstances and approved by a national accreditation body, clearly defined and organized both regarding the curriculum content, circumstances in which lessons take place, and the method of grading, which is placed as a voluntary choice to all participants in the educational process (sometimes the question of choosing the method of following RT is equal to necessity. For many years the primary school educational system in the Republic of Serbia there has had the project "Remote Learning", implemented by the Special School "Dragan Hercog". The project is intended for children who, mainly for health reasons, are unable to attend school regularly with their peers, to ensure their constitutionally guaranteed right to attend primary school, which is mandatory according to the law of the Republic of Serbia [85]. This school covers 12 children's hospitals in the territory of Belgrade, as well as institutions for schoolchildren without parental care. If an other institution in the territory of the Republic of Serbia wishes to be involved in this system at the parents' request, it must obtain the consent of the Ministry of Education. The school can also organize lessons in hospitals and at home, for schoolchildren whose health conditions prevent any other form of lessons (children with a weakened immune system, children undergoing spa treatment, and children who have multiple hospital therapies during the school year). However, the circumstances accompanying the COVID-19 pandemic deprived students worldwide of this possibility. Moreover, various technical difficulties have become a universal problem in educational systems. That is why this research had the following goals:

- To establish whether there were technical preconditions for efficient attendance of ERT among the students of teacher education faculties in Serbia (Internet, devices, digital competencies, and literacy)
- 2. To establish whether and how ERT experience affected the perception of RT sustainability in general
- 3. To establish whether ERT led to the problems in terms of Zoom fatigue and exhaustion, and to what extent and scope they were present among the female students of teacher education faculties in Serbia, as well as whether they could affect the perception of ERT and attitudes toward RT in general among these students

Accordingly, the following hypotheses were proposed:

- 2. The experience with ERT during the COVID-19 pandemic will contribute to the formation of negative attitudes toward RT as a method of teaching
- 3. In the course of ERT, the students had difficulties in mental terms, in the form of Zoom fatigue and exhaustion, since ERT and RT, due to the method of implementation (particularly in the synchronous form), do not differ substantially from other video conference calls, regardless of their goal and purpose.

This is particularly important since the curricula of the faculties of teacher education make it compulsory to attend subjects related to educational and digital technologies dealing with the topic of ICT use and the implementation of teaching in the modern digital environment. The Faculty of Education in Belgrade, as the largest faculty of this kind in the Western Balkans, also has a laboratory that deals with the application of AI (Some authors point out that one of the direct consequences of the COVID-19 pandemic was the accelerated application of AI in almost all spheres of life, which is an unexpected feature of the "new normality" in which we live [86]) in education [87–89].

2. Materials and Methods

Sample: In this research, a virtual exponential non-discriminative snowball sample was applied [90]. This type of sample has become quite frequent in social sciences and qualitative surveys, and by its type, it belongs to appropriate samples, i.e., those that are not founded on probability. Nevertheless, unlike an ordinary appropriate sample, the snowball sample is specific for the attempt at its objectivization through a large number of points from which the questionnaire is approached.

The sample included 167 students of basic and master academic studies at all teacher education faculties in Serbia: Belgrade (with the departments in Novi Pazar and Vršac), Sombor, Subotica, Užice, Jagodina, Vranje, and Leposavić. The research covers only those students who, during their studies, had the opportunity to attend remote lessons apart from their regular lessons because of the circumstances emerging with the beginning of the COVID-19 pandemic. Third-year students had the opportunity to attend regular lessons only after the pandemic, while fourth- and fifth-year students were able to attend regular lessons both before and after the COVID-19 pandemic. The average age of the university students was M = 23.70 (SD = 3.24) years. The survey also included male students; however, considering large disproportion and pronounced domination of women in the total student population of teacher education faculties in Serbia of more than 91% [91], the comparison by gender was impossible and they were excluded. In addition, a comparison by cohort was not possible since the range of age of students varied from 21 to 40 years. Moreover, in the further analysis of the answers, 19 respondents who said that they had not attended remote lessons were excluded from the research. These were master's students who had already completed their basic studies and enrolled in their master's studies later, but did not study during the online teaching period. Several students who did not attend remote lessons at all, although it was planned, were also excluded from the survey. After these corrections in the sample, the research included 138 female students (Table 1) in basic and master's academic studies at teacher education faculties in Serbia, who had the opportunity to attend ERT during their schooling.

	Year of Study	7		G	PA	
third	fourth	fifth	6–7	7–8	8–9	9–10
64	22	62	9	47	59	33

Table 1. Sociodemographics of the sample (frequencies).

Procedure: In this research, the survey method applied was an online survey (the online survey is, by its type, a form of a written survey because it "implies written communication between the interviewer and the respondent", whereas its specific feature is that it is given in electronic form, i.e., that it is distributed via the Internet [92])using a Google questionnaire as an instrument. The survey was conducted in May and June 2023. The researchers delivered the link with the questionnaire to all teacher education faculties in Serbia, with the request to put them on their respective websites; to the students whose e-mails they had, asking them to forward the questionnaire to their fellow students from their own or some other teacher education faculty in Serbia; to the student parliaments of teacher education faculties, asking them to put the links on the already existing student groups usually used by the students from their faculties for mutual communication, on different social networks (Facebook, Viber, e-mail...). In this manner, several dozen different entry points in the questionnaire were provided, which practically eliminated the possibility of partiality. The survey was anonymous and voluntary.

Instruments: The survey questionnaire consisted of the following sections:

- 1. sociodemographic features: gender, year of study, department, GPA.
- 2. a set of questions about remote teaching: the method of following lessons, regularity of attendance, method of organizing lessons, length of the lessons, results, attitudes about ERT efficiency, possibility of RT re-introduction, preferences for remote teaching, regularity of attending regular lessons, interestingness of remote teaching, a set of questions about computing competences, and technical preconditions of ERT among students.
- 3. Zoom Exhaustion and Fatigue Scale [12]—ZEF Scale is an instrument intended for assessing the respondents' fatigue intensity and the modality of their fatigue after attending remote lessons. The scale consists of 15 items, with 3 items for each of the five fatigue modalities: general, visual, social, emotional, and motivational (e.g., "I felt tired after attending the remote lesson"). Moreover, the overall result on the scale is also taken into account. The respondents gave answers on a five-point Likert scale (from "1 = Strongly disagree" to "5 = Strongly agree"). The scale reliability measured by Cronbach's alpha in the original research was between 0.82 and 0.90 [12] and between 0.70 and 0.91 [47].

Variables:

Independent variables in the research were:

- 1. The method of following emergency remote teaching (ERT) was measured by choosing one of the offered categories: mobile phone, tablet, desktop computer, laptop, or none of these devices.
- 2. The regularity of RT attendance and the regularity of attending traditional lessons after returning to the faculty were measured according to the following categories: regularly in all subjects, mostly in the majority of subjects, sometimes in some subjects, only in some subjects, and on a scale on which I had to attend lessons or did not attend at all.
- 3. The method of organizing ERT: the respondents stated the method in which remote lessons were organized (Zoom, Skype, Google Classroom, Teams, Moodle, Viber, e-mailed presentations, something else—state what).

- 4. The length of remote lessons on a daily basis: the students were asked how many hours a day they spent on average attending remote lessons, and their answers were subsequently classified into the following categories (up to 2 h, 3–4 h, and 4–6 h).
- 5. The results of ERT: the variable was measured by the students' choice of the answers: whether the grades in the examinations taken after remote lessons were better than those after the subjects attended through traditional teaching methods, approximately equal grades to those after the subjects attended through traditional forms of teaching, or worse than after the subjects attended through traditional forms of teaching.
- 6. The attitude toward RT efficiency: the students answered the question of whether, in their opinion, remote teaching had proved to be: better and more useful than traditional lessons, whether these lessons were the same, but held in a different manner, or whether RT was worse and less useful.
- 7. The attitude toward the possibility of re-introducing remote teaching (RT): the students answered the question in which circumstances they found it acceptable to attend remote lessons again: never, in extraordinary circumstances (pandemic, war, natural disasters, etc., namely as ERT), i.e., to introduce it as a permanent form of teaching.
- 8. Preference for RT: the question referring to how much the students generally liked remote teaching, with the offered categories as follows: I did not like it at all; I saw it as a necessary evil; I liked it very much.
- 9. The attitude toward the interestingness of RT was investigated with the aid of the statement: "Remote teaching was interesting because online lessons brought dynamics and novelties into the teaching process", which was measured using a five-point Likert scale (from "1 = Strongly disagree" to "5 = Strongly agree").
- 10. A set of attitudes toward computing competencies referred to the assessment of one's and professors' competencies in relation to information technologies. On a five-point Likert scale from "1 = Strongly disagree" to "5 = Strongly agree"), the respondents assessed the following statements: "Remote lessons have made me acquire new computing skills in order to be able to follow the lessons; otherwise I would not have paid attention to those skills", "In remote lessons, I was disturbed by my poor computing literacy and by not being familiar with the use of the teaching platforms", and "In remote lessons I was disturbed by the professors' and assistants' poor computing literacy and their not being familiar with the teaching platforms".
- 11. A set of attitudes toward the availability of the means for accessing remote lessons. On a five-point Likert scale from "1 = Strongly disagree" to "5 = Strongly agree"), the respondents assessed the following statements: "In remote lessons, I was disturbed by the poor Internet connection" and "In remote lessons, I was disturbed by not having adequate computing equipment".

Dependent variables:

The dependent variables in this research were the overall score and five subscales (general fatigue, visual fatigue, social fatigue, motivational fatigue, and emotional fatigue) on the Zoom Exhaustion and Fatigue Scale.

Data processing methods: The data were processed in the program SPSS 22.0. More specifically, frequencies, percentages, χ^2 test, descriptive statistics measures, ANOVA, and linear regression (method ENTER) were used for data processing.

3. Results

3.1. Technical Conditions of Attending ERT

Emergency remote lessons were dominantly held through the Teams platform—77.7%, far less through Zoom 12.2% and Google Classroom—7.4%, while 2.4% students received presentations and learning material by e-mail and 2.7% students used other platforms.

Certain higher education institutions in Serbia have created their own ERT platforms [93]. In addition, it should be noted that 50% of students followed remote lessons via their mobile phones, 45.3% via laptops, and 4.7% via desktop computers.

As for the availability of the resources for the possibility of following remote lessons, the obtained results are shown in Figure 1. The students thought that they were in a better position in terms of being equipped with the actual technical devices in comparison to the quality and availability of the Internet.



Figure 1. Availability of technical resources for students' following remote lessons during the COVID-19 pandemic (%).

Statistically significant differences were found regarding the ratio of devices used for following ERT and the possession of adequate computing equipment ($\chi^2 = 22.013$, df = 8, p < 0.005).

The students who followed ERT via their mobile phones agree on a much larger scale with the statement that in their following ERT they were rather disturbed by the fact that they had no adequate computing equipment for this form of lessons (Figure 2).



Figure 2. Ratio between the method of following ERT and the possession of adequate computing equipment (%).

On average, the students attended remote lessons for about four hours a day (M = 3.82, SD = 1.84). Of these, remote lessons of up to 2 h a day were attended by 26.4% of students, 2-4 h a day by 39.2% of students, and 4-6 h a day by 34.4% of students.

Statistically significant differences were also found in the ratio between the length of attending ERT on a daily basis and the method of ERT attendance ($\chi^2 = 27.628$, df = 6, p < 0.000).

The students who spent the largest number of hours attending ERT on a daily basis mostly used laptops and desktop computers, while the smallest number of hours of ERT attendance was spent by the students who attended remote lessons on their mobile phones (Figure 3).



Figure 3. Ratio between the average number of hours spent attending ERT on a daily basis and the applied method of attendance (%).



Regarding the attendance of ERT, the regularity was higher in remote lessons (Figure 4).

Figure 4. Comparison of the frequency of attendance of these two forms of teaching (%).

Statistically significant differences were also found in the ratio between the length of attending ERT on a daily basis and regularity of ERT attendance (χ^2 = 18.351, df = 9, p < 0.031).

The students who spent the longst number of hours per day attending ERT also on the largest scale attended ERT from all subjects; from two to four hours on a daily basis these lessons were attended on average mostly by the students who sometimes attended certain subjects, while the smallest number of hours per day were spent on ERT by the students who attended only the lessons in certain subjects in case they had to (Figure 5).



Figure 5. Ratio between the average number of hours spent attending ERT on a daily basis and the regularity of ERT attendance (%).

As for the attitudes toward digital competencies, the obtained results are shown in Figure 6. The students believed that, in general, attending ERT actually contributed to their improved digital competence. Moreover, they did not think that their level of digital competence was so low that it would prevent them from attending and following ERT. Conversely, they believe that when holding remote lessons, professors and assistants have a somewhat poorer knowledge of modern information technologies than they do.

Statistically significant differences have also been found regarding the ratio of the devices used for following ERT and the attitudes about the improvement of own computing competence ($\chi^2 = 17.105$, df = 8, p < 0.029)

The students who attended remote lessons via their mobile phones disagreed to a much larger extent that ERT contributed to the improvement of their digital competences, unlike the students who attended remote lessons via their laptops (Figure 7).

The obtained results also showed significant statistical differences in comparison to the attitudes about ERT efficiency and the attitudes about the teachers' digital competence ($\chi^2 = 16.029$, df = 8, *p* < 0.031).

Students who complained about teachers' poor digital literacy and lack of knowledge about the use of teaching platforms in ERT mostly believed that RT was worse and less useful than the traditional model of teaching (Figure 8). Students who believed that the obstacle to their adoption of knowledge was not the teachers' poorer computing literacy in ERT mostly believed that RT was the same teaching, only organized in a different manner.



Figure 6. Attitudes about students' and professors' digital competences in remote lessons during the COVID-19 pandemic (%).



Figure 7. Ratio between the devices used for following ERT and the improvement of their own digital competence (%).

Statistically significant differences were found in attitudes toward the preference for remote teaching and acquiring new digital competencies ($\chi^2 = 15.678$, df = 8, *p* < 0.047).



Figure 8. Ratio between attitudes toward ERT efficiency and teachers' digital competence (%).

The students who thought that RT had contributed to the improvement of their own digital competencies liked this form of teaching very much, in contrast to the students who did not think that their digital competence was improved during their attendance of RT (Figure 9).



Figure 9. Ratio between preference for RT and improvement in digital competence (%).

3.2. Perception of RT Sustainability from the Aspect of ERT

Statistically significant differences were found in the regularity of attendance depending on the method of implementation ($\chi^2 = 74.650$, df = 12, p < 0.000).

Students who regularly attended remote lessons also continued to attend traditional lessons to the largest extent after returning to the faculty (Figure 10).



Figure 10. Ratio between ERT attendance and traditional lessons attended after returning to the faculty (%).

The statement "Remote teaching was interesting because online lessons brought dynamics and novelties into the teaching process" was strongly agreed by 18.4% of students, agreed to by 18.4%, neither disagreed nor agreed to by 23.1% of students, disagreed to by 1%, and strongly disagreed to by 21.1% of students.

As for the outcomes of ERT in the examinations taken after ERT, 13.5% students said that they got better grades than after the subjects attended through traditional teaching methods, while 8.8% of them got worse grades than after the subjects attended through traditional teaching methods.

As for the students' general attitude toward remote teaching, only 9.5% of them believe that RT is better and more useful than traditional teaching; 48.6% of students believe that the lessons are the same, only organized in a different way, while 41.9% believe that RT is worse and less useful than regular teaching.

To 7.5% of students, re-introduction of RT would not be acceptable at all; to 70.1% of them, it would be acceptable only in extraordinary circumstances (pandemic, war, natural disasters, etc., or as ERT), while 22.4% of students would accept RT as a permanent practice.

As for the preference for RT, 29.7% of the students said that they did not like it at all; 25.7% of them saw RT as a necessary evil, while 44.6% expressed their preference for RT, stating that they liked it very much.

As for the students' attitude toward RT efficiency, the obtained results showed significant statistical differences in comparison to the outcomes of ERT ($\chi^2 = 14.064$, df = 4, p < 0.007).

The students who got better grades in the examinations taken after ERT than in those taken after the subjects attended through traditional forms of teaching, as well as those who got approximately equal grades, mostly believed that RT was the same teaching only organized in a different manner (Figure 11). Conversely, students who got worse grades in the examinations taken after ERT mostly believed that RT was worse and less useful than the traditional form of teaching.



Figure 11. Ratio between attitudes toward RT efficiency and the outcomes of ERT (%).

As for the preference for remote teaching, statistically significant differences were found in the outcomes of ERT ($\chi^2 = 14.628$, df = 4, *p* < 0.006).

Students who received worse grades in the examinations taken after ERT than in those taken after traditional forms of teaching do not like RT at all, while those who received better or approximately equal grades in the examinations taken after ERT liked RT very much (Figure 12).

As for the students' attitude toward RT efficiency, the obtained results showed significant statistical differences in comparison to the preference for RT (χ^2 =59.753, df = 4, p < 0.000).



Figure 12. Ratio between the preference for RT and outcomes of ERT (%).

The students who preferred remote teaching believed that it was better and more useful than traditional teaching, while among the students who found remote teaching worse and less useful, there was an approximate number of those who did not like remote teaching at all and those who saw remote teaching as a necessary evil (Figure 13). In fact, the largest number of those who liked RT thought that it was essentially the same as RT, but proceeding in a different manner.



Figure 13. Ratio between attitudes toward remote teaching efficiency and preference for remote teaching (%).

As for the students' attitude toward RT efficiency, the obtained results showed significant statistical differences in comparison to the attitude toward the possibility of reintroducing RT ($\chi^2 = 37.750$, df = 4, *p* < 0.000).

The students who were in favor of the permanent introduction of RT believed to the largest extent that RT is essentially the same as teaching, which is only organized in a different manner (Figure 14). On the other hand, among the students who believe that RT is acceptable only in certain circumstances, such as ERT, there is an approximate number of those who find RT worse and less useful than traditional teaching and those who believe that RT is the same teaching only organized in a different manner. The students who found the introduction of RT unacceptable under any circumstances mostly believed that it was worse and less useful than the traditional form of teaching.

As for the preference for remote teaching, statistically significant differences were found in the attitude toward the possibility of re-introducing RT ($\chi^2 = 40.834$, df = 4, p < 0.000).

To the students who did not like ERT at all, it was unacceptable to re-introduce it, while those who liked it were in favor of introducing RT as a permanent form of teaching (Figure 15).



Figure 14. Ratio between attitudes toward remote teaching efficiency and the possibility of reintroducing remote teaching (%).



Figure 15. Ratio between the preference for ERT and the acceptability of the re-introduction of RT (%).

3.3. ERT, RT, and ZEF Relationship

As for the Zoom Exhaustion and Fatigue Scale, the main data are shown in Table 2, where the highest level of Zoom Exhaustion and Fatigue is recorded in general and visual fatigue, while the lowest level was recorded in emotional fatigue. However, none of the scales or the ZEF score exceeded the average values since the results on the scale ranged from 1 to 5. Therefore, it may be concluded that, despite the differences within the dimensions of the Zoom Exhaustion and Fatigue Scale, the students of the faculties of teacher education did not show a high level of Zoom Exhaustion and Fatigue.

Scale	М	SD	Cronbach's α
General	2.57	1.19	0.84
Visual	2.57	1.26	0.91
Social	2.16	1.17	0.88
Motivational	2.35	1.21	0.85
Emotional	2.14	1.14	0.87
ZEF Score	2.33	1.09	0.96

Table 2. Zoom Exhaustion and Fatigue Scale descriptives.

After the statistical analysis, no statistically significant differences were found on the Zoom Exhaustion and Fatigue Scale in terms of the following independent variables: the method of following ERT, regularity of ERT attendance, students' grades in the examinations taken after attending ERT, and the attitude toward the students' acquiring new computing competencies due to the transfer to ERT during the COVID-19 pandemic. In addition, within the subscales of the Zoom Exhaustion and Fatigue Scale, there was only one statistically significant difference on the social fatigue subscale regarding personal incompetence in computing competence (F = 2.572, p < 0.05). The post hoc Scheffé Test results showed that students with better computing literacy and knowledge about the use of remote teaching platforms had the lowest level of social fatigue (M = 1.95). Students who answered "Agree" to the statement "In remote lessons, I was disturbed by my poor computing literacy and by not being familiar with the use of the teaching platforms" had the highest level of social fatigue M = 3.09 (in contrast to the students who answered "Strongly agree" M = 2.43).

Conversely, the ANOVA test results have shown statistical differences on all dimensions of the Zoom Exhaustion and Fatigue Scale regarding the students' general attitude toward RT, preference for RT, attitude toward the possible re-introduction of RT, average length of ERT, interestingness of RT, availability of technical resources for following ERT, own and professors' incompetence regarding the use of modern technologies in the implementation of ERT (Table 3).

Figure 16 shows the ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the length of ERT attendance. The post hoc Scheffé Test results show that the students who attended ERT for a longer time are statistically significantly different from other two groups of students on the dimensions of the Zoom Exhaustion and Fatigue Scale. Namely, this group of students had much higher scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding the level of general fatigue.

Figure 17 shows the ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward the smaller possibility of following ERT due to the poorer Internet connection. The post hoc Scheffé Test results showed that there were significant statistical differences in the students' attitudes toward the smaller possibility of following ERT due to the poorer Internet connection. Students who had no problems with ERT due to the poorer Internet connection achieved much lower scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding social and emotional fatigue.

Figure 18 shows the ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward smaller possibility of following ERT due to the lack of adequate devices. The post hoc Scheffé Test results showed that there were significant statistical differences in the students' attitudes about the smaller possibility of following ERT due to the lack of adequate devices on the dimensions of the Zoom Exhaustion and Fatigue Scale. Students who had no problems with ERT due to the lack of adequate devices had far lower scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding social and emotional fatigue.

Table 3. Values of F and statistical significance of technical preconditions for attending ERT and differences between attitudes about RTon the dimensions of the Zoom Exhaustion and Fatigue Scale.

Scale	Length of Remote Lessons on a Daily Basis	Devices	Internet	Professors Incompetence	Interestingness	Attitude	Preference	Re-Introduction
General	14.283 ***	4.495 **	5.227 **	3.589 *	4,431 *	12.645 ***	16.579 ***	6.369 **
Visual	9.596 ***	4.443 **	2.966 *	3.175 *	5,429 ***	15.261 ***	15.754 ***	15.171 ***
Social	7.250 **	6.669 ***	5.151 **	3.200 *	3,915 *	8.522 ***	12.243 ***	7.439 **
Motivational	7.953 **	7.119 ***	6.218 ***	3.444 *	2,495 *	9.692 ***	10.006 ***	7.212 **
Emotional	5.473 *	6.809 ***	6.121 ***	5.187 **	3,492 *	9.519 ***	12.814 ***	11.913 ***
ZEF Score	9.027 ***	6.061 ***	5.311 **	4.564 *	4,071 *	11.820 ***	13.895 ***	9.199 ***



Note: * *p* < 0.05; ** *p* < 0.001; *** *p* < 0.000.

Figure 16. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the length of remote lessons on a daily basis (%).



Figure 17. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward the smaller possibility of following ERT due to the poorer Internet connection (%).



Figure 18. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward smaller possibility of following ERT due to the lack of adequate devices (%).

Figure 19 shows the ratio of the dimensions of the Zoom Exhaustion and Fatigue Scale and the attitude toward the smaller possibility of following ERT due to the professors' poorer digital literacy and lack of knowledge about the use of the teaching platforms. The post hoc Scheffé Test results show that the students' attitudes about the poorer following of ERT due to the professors' poorer digital literacy and the lack of knowledge about the use of the teaching platforms are statistically significantly different on the dimensions of the Zoom Exhaustion and Fatigue Scale. Students who had no problems with ERT due to the teachers' poorer digital literacy and the lack of knowledge about the use of the teaching platforms achieved much lower scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding social and emotional fatigue, as well as the total score on the ZEF Scale.

Figure 20 shows the ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward RT interestingness. The post hoc Scheffé Test results show that the students' attitude toward RT interestingness is significantly different on the dimensions of the Zoom Exhaustion and Fatigue Scale. Students who did not find remote lessons interesting at all achieved much higher scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding the levels of general and visual fatigue.



Figure 19. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the attitude toward the smaller possibility of following ERT due to the teachers' poorer digital literacy and the lack of knowledge about the use of the teaching platforms (%).



Figure 20. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and attitude toward RT interestingness (%).

Figure 21 shows the ratio of the dimensions between the Zoom Exhaustion and Fatigue Scale and attitude toward RT. The post hoc Scheffé Test results show that the students who found RT worse and less useful than traditional teaching were statistically significantly different from the other two groups on the dimensions of the Zoom Exhaustion and Fatigue Scale. This group of students had much higher scores on all dimensions of the Zoom Exhaustion and Fatigue.



Figure 21. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and attitude toward RT (%).

Figure 22 shows the ratio between the dimensions of the Zoom Exhaustion and Fatigue Scale and the preference for RT. The post hoc Scheffé Test results showed a substantial statistical difference between the students who liked RT and the other two groups of students on the dimensions of the Zoom Exhaustion and Fatigue Scale. This group of students had much lower scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding social and emotional fatigue.



Figure 22. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and preference for RT (%).

Figure 23 shows the ratio between the Zoom Exhaustion and Fatigue Scale dimensions and the acceptability of RT re-introduction. The post hoc Scheffé Test results show that the students who would not want to attend RE ever again are statistically significantly different from the other two groups of students on the dimensions of the Zoom Exhaustion and Fatigue Scale. This group of students had much higher scores on all dimensions of the Zoom Exhaustion and Fatigue Scale, especially regarding the level of visual fatigue.



Figure 23. Ratio between the Zoom Exhaustion and Fatigue Scale dimensions and attitude toward the acceptability of RT re-introduction (%).

Further analysis was conducted to determine the importance of the level of scores on the Zoom Exhaustion and Fatigue Scale of the parameters that were suggested to be of potential importance by previous research results, such as the length of attending remote lessons on a daily basis, the type of devices on which the students followed remote lessons, the regularity of attending remote lessons, availability of the means for accessing remote lessons (the Internet and adequate computing equipment), and digital competences (personal and professors').

The results show that the only significant predictor of all scores was different on the dimensions of the Zoom Exhaustion and Fatigue Scale, including the total score for the length of time attending ERT on a daily basis (Table 4). Another significant predictor of the scores on the dimensions of the Zoom Exhaustion and Fatigue Scale was the quality of the Internet connection, which was a significant predictor of all subscales in the total score, except for the visual fatigue subscale. Teachers' digital competence appeared to be an important predictor only for the total ZEF score. The other predictors were not found to be statistically significant.

Table 4. Predictors of the results on the dimensions of the Zoom Exhaustion and Fatigue Scale.

	R	R ²	Adjusted R ²	F	р	Partial	p
			General				
Length and Internet	0.551	0.304	0.268	8.364	0.000	0.398 0.172	0.000 0.046

	R	R ²	Adjusted R ²	F	p	Partial	p
			Visual				
Length	0.469	0.220	0.180	5.451	0.000	0.291	0.001
			Social				
Length and Internet	0.508	0.258	0.219	6.743	0.000	0.313 0.237	0.000 0.005
			Motivational				
Length and Internet	0.522	0.272	0.235	7.259	0.000	0.212 0.237	0.013 0.005
			Emotional				
Length and Internet	0.519	0.269	0.231	7.008	0.001	0.212 0.189	0.277 0.028
			ZEF score				
Length and Internet and Feachers' digital	0.541	0.292	0.255	7.730	0.000	0.337 0.202	0.000
competences						0.337	0.00

Table 4. Cont.

4. Discussion

Previous research into ERT and COVID-19 in Serbia is characterized by their reference to the experiences of secondary school students, college students, teachers, and professors [7,94,95]. The research mostly dealt with establishing the advantages and disadvantages of ERT and the satisfaction with the quality of ERT among students and teachers [4,17,41,96]. Moreover, until the end of the pandemic or even three years later, there is still no systemic solution based on the knowledge acquired about ERT that would serve to implement and create a sustainable ERT model in case of a new pandemic or some other unpredicted circumstance leading to the re-introduction of ERT [41], although some people even propose knowledge systematization within a new discipline called "disaster pedagogy" [46], after the model of sociology of disasters or ERT knowledge systematization within remote pedagogy [97] (This systematization of knowledge within new subdisciplines of pedagogy should shift the focus of the problems observed in ERT to their resolution, or pointing to the fact that the cause of the problem lies in the background regarding technical aspects (Internet, devices, competences, literacy and digital infrastructure)-teachers intuitively feel that they need to be student-oriented and not device-oriented, and that transitioning from regular teaching to remote teaching is a qualitatively different experience that should be aligned with the principles of forming instructional material so that it may attract and keep students' attention, increase their satisfaction with the quality and outcomes of knowledge, as well keep students' interest in the given field [98]). Moreover, it is important to always bear in mind that ERT is not the same as RT [4,16,18,99–103], which was originally intended for people who wanted to be further educated, but for some reason (most often due to the shortage of money or physical distance) they were not able to attend regular lessons [46]. Adedoyin and Soykan [104] think that major challenges in the functioning of ERT technology (devices, equipment, Internet connectivity), socio-economic factors (accessibility and availability of technology), human intrusions (conduciveness of home environment), digital competence (skills, knowledge and attitude of students and teachers), assessment and supervision (integrity of the academic system), heavy workload

(teachers, lecturers and administrators have to produce online teaching material), and compatibility (compatibility of online learning with disciplines that require laboratory, clinical and other practical training). Moreover, it should also be noted that the final goal of either ERT or RT is not to replace face-to-face courses fully or ad infinitum [21]. RT is mostly structured and standardized, most often of an asynchronous type, although it can be synchronous as well, adjusted to online implementation, and not compulsory, but a matter of personal choice [17,46,105]. In contrast, ERT courses are unplanned, under-developed, under-supported, rapidly delivered, and likely of lower quality [19,99,106,107] and in the method of their implementation they mainly rely on the use of the existing Internet platforms, to which the content and the method of teaching is adjusted without making changes to the curriculum or the methodology [108] with potential losses in knowledge, meaning and communication among participants. In the situation of the COVID-19 pandemic, ERT was isolated and the only possible solution, which was imposed on education in order to maintain the continuity of the teaching process with the simultaneous observance of anti-pandemic measures [99,109]. During the COVID-19 pandemic, ERT was implemented through improvisation by presenting all teaching curricula and syllabi intended for live lessons via media (in primary schools: on television; in secondary schools: by combining television and online; and in faculties: online). As a matter of fact, improvisation was necessary in ERT because the implementation of this form of teaching is related to emergency response to crisis; long-term sustainability is not an intended goal of ERT [99]. This is why it should be kept in mind that attitude toward RT may be directly conditioned by its association with ERT, in which the students had acquired some experience in cases of associating this form of teaching with the COVID-19 pandemic and the state of emergency, disease, death, impossibility of the freedom of movement, restricted social contacts and, in general, the disturbance of ordinary courses of life [18,110–112], which definitely makes it more difficult to compare with previous ERT experiences [19]. In this situation, students and professors found themselves in a situation where teaching had to continue and were essentially left to themselves with respect to the implementation of the teaching process, since it was impossible to wait for general and universal solutions from the Ministry of Education and the universities. Relying on their own technical resources (devices, the Internet, and digital competencies), students and professors tried to do their best to implement the teaching process in this situation. Some research [17,41,113] indicates that they succeeded to a certain extent, since satisfaction with teaching quality increased from one semester to another (a total of five semesters implemented in the ERT regime). However, it should be noted that a digital generation gap was present, since most professors do not belong to Generation Z, which substantially compounded their job and, on the other hand, made lesson preparation and implementation longer, more complex, and complicated than ever [37,46]. Technical equipment did not pose a difficult problem to them because they had no financial difficulties, unlike the possession of adequate digital competences—while among the students in our research, it was exactly the opposite. It is interesting to emphasize that some studies also point to the fact that even better digital literacy (There is a conceptual difference between digital literacy and the possession of digital competences authors in Serbia (digital literacy—one of the general competences that every individual in a modern society needs [17]) and digital competences (digital literacy/basic computer skills; VC skills (Zoom/Skype); online search, data management; recording/editing audio/video files; educational games; collaborative projects; digital ethics; overall digital competences [41]). These differences exist worldwide; some authors believe that digital competence is broader and includes digital literacy [114]. Others believe that digital literacy is broader and denotes previously learned digital competencies [115], and some authors use these terms as synonyms [116]. In our paper, these terms are also used as

synonyms), and skillful use of digital technologies did not warrant the quality of teaching as it might have been expected at first sight, since the members of the millennial generation perceive and use digital devices and content more as means of entertainment and contacting friends and close persons rather than for learning [4,7,33,52,117]. Furthermore, apart from their learning independence, the students' aspiration level may be different: RT before COVID-19, as well as the results of the studies conducted on that topic, involved respondents who were interested in personal development [27,118,119], less as a form of formal education and more as additional development or acquisition of informal education (courses, conferences, do-it-yourself instructions, etc.). In addition, the triple coincidence of the circumstances should not be ignored either: in only several days, stakeholders in educational systems worldwide encountered the declaration of the contagious disease pandemic, the introduction of lockdown, suspension of the previous method of studying, and transitioning to a completely new and unexplored form of teaching. Of course, it should be noted that the pandemic affected other spheres of life, from the acquisition of food and other necessities, via the prohibition of movement and suspension of social life, to concerns regarding avoiding infection and potentially fatal outcomes. All human activities were accelerated and compressed, so a large number of them needed to be transferred into virtual reality: physical activities were reduced, while mental activities were more engaged than ever before. Information overload could also lead to a reduced ability to adopt knowledge, even among those students who, despite the modified conditions of everyday life, were motivated to learn, as corroborated by other studies [22,32,120]. In addition, it should be noted that the digital environment is still not a natural human environment and that working in such an environment inevitably leaves biological, mental, and social consequences such as eyesight problems (Computer Vision Syndrome, digital eyestrain), sedentary lifestyle, poor body posture, alienation, ZEF, technostress, burnout, sleeping disorder, etc., which is indicated by numerous studies [4,8,11–13,41,64,121–126]. Some of these studies were conducted even before the COVID-19 pandemic [121,124,125], but it was only in the expansion of remote teaching that began during the pandemic that the previously observed problem was examined in detail and placed into the centr of attention: it got its name and definition, as well as its operationalization in the form of a psychological measurement instrument [12]. Therefore, it remains interesting to see what results will be reached by future research on this phenomenon and whether the trend of increasing problems of physical and mental health caused by remote teaching (as well as WHF) will continue after the end of the COVID-19 pandemic.

It should also be mentioned that all these problems affected teachers as well, while different studies state that teachers did not have a problem with motivation, but with their workload; some studies state that teachers reported an increased workload of 80% during the pandemic, and that they needed 43.8% more time for ERT preparation in comparison to regular lesson preparation during pre-COVID times [127]. Another common problem was the transition to working from home for both students and teachers, not only because of the loss of most aspects of non-verbal communication, social facilitation, and group cohesion that are present during live lessons, but also because of the absence of free space for work and attending lessons due to family duties, as well as the inability to establish balance between these two types of duties, which led to further gender inequality during the pandemic [30,120,128–130]. Both female teachers and female students had to be committed to lessons, do house chores, fulfil family obligations, and look after infected/ailing family members. Moreover, it should be observed that at the beginning of the pandemic, studies in Serbia pointed out that "partnership practices showed the most continuity compared to prepandemic circumstances. In most cases, a positive change was identified, caused by partners spending more time together, having new mutual interests, or intensifying intimacy. The

results showed that changes in partnership for the worse were rare" ([131], p. 831). In addition, it should not be forgotten that the members of certain professions, as well as certain workplaces, were riskier in terms of the employees and their family members being infected [132,133] and that, for example, at the medical faculties, teaching staff also had to be involved in hospital and clinic activities in addition to their regular lessons, which further threatened their physical and mental health during the COVID-19 pandemic.

The results obtained in this research show that the students attended remote classes for an average of four hours a day, reporting the mode of two hours a day, which is less than the results obtained by other researchers [111,134]. The lessons were implemented mostly via Microsoft Teams (77.7%) and Zoom (12.2%). Other research in Serbia shows that other ICT forms were present in the implementation of the teaching process: Google Classroom, Skype, Moodle, and Viber [16,17,28,41,46,105,135]. In Portugal, the most used platforms were Zoom (100%), Moodle (96.7%), and Teams (56.7%) [23]. ERT proved to be a very good solution only in terms of the impossibility of attending classes: attendance regularity was larger in remote teaching than in live classes after returning to the traditional teaching method. Furthermore, different studies have also reported other benefits of ERT: health protection, flexibility, possibility of repetition, improvement of digital competences within lifelong learning (which is of particular importance for future teachers since they are role models to their students), the emergence of a new form of classes—hybrid learning, alternative to student mobility, resorting to web tools in their classes [4,22,32,58,136].

However, we should also take into account the negative phenomena reported in other studies [17,41,59]: mostly professors and, to a smaller scale, students, speak about the pretended and fictitious presence of individual students in remote lessons (e.g., logging in with the turned off screen and sound, where no one can be certain whether students are really there; absence of answers, lack of class involvement, etc.). On the other hand, attending lessons, particularly during the state of emergency, was a rare possibility of maintaining at least the virtual form of school socialization, which is a problem, indicated by the results of almost all studies conducted on this topic [4,59,127]. However, the specific feature of this research is also the presence of 44.93% of students of master studies in the sample, who, at least some of them, were provided with full flexibility and adjustment of family and business obligations thanks to this method of teaching implementation, which is proved by other studies as well [27]. That is why it is necessary to pay special attention to RT sustainability when it comes to vulnerable groups of students, e.g., post-graduates, due to their balancing work and family duties with the studying requirements, students with disabilities, poor students with no money for additional studying costs, and foreign students [21,58,137–139]. Nevertheless, with all this in mind, another thing should be taken into account: the results show that the students who regularly attended remote lessons continued attending traditional lessons to the largest extent after returning to the faculty. This is also corroborated by the result that the students who spent the largest number of hours per day following remote lessons also followed lessons in all subjects regularly and to the largest extent even when the lessons returned to their ordinary conditions.

As for the technical aspect of ERT, it transpired that the majority of the students followed lessons on their mobile phones (50%) and a slightly smaller number of them on laptops (45.3%), which is in line with the results of foreign research [47,111,140] as well as on the sample of the students at the Faculty of Law in Niš [41], but not with the results of the research conducted among the students of economics [28]. However, the question of devices for following ERT proved to be an important factor for three reasons. First, the students who attended remote lessons via their mobile phones on a much larger scale agree with the statement that in their attendance of remote lessons they were mostly disturbed by not having adequate computer equipment for such a form of teaching. Problems with

attending remote lessons via mobile phones, such as phone battery life, processor power, and memory space were also highlighted in previous research [141,142]. The second reason is that the results showed that the students who had access to laptop and desktop computers and followed ERT via them spent the largest number of hours on a daily basis following ERT, while the smallest number of hours on a daily basis were spent by the students who followed lessons via their mobile phones. The amount of time spent in active lessons was undoubtedly an important factor not only of learning efficiency and outcomes measured by grades, but also of the long-term quality and maintenance of knowledge from the perspective of lifelong learning. However, this information indirectly speaks about the material situation of students as well. Students' socio-economic status was also an important factor that affected the manner of attending ERT throughout the world and contributed to increasing inequality in the outcomes and quality of knowledge obtained through ERT during the COVID-19 pandemic [81,129,134]. The third reason is the result of the connection between the method of following ERT and the increased level of digital literacy. In fact, students who followed ERT via their mobile phones did not think that following ERT contributed to their digital competence, in contrast to those students who followed lessons via their laptops. This parameter was also significantly reflected in the general attitude toward RT: the students who believed that remote learning contributed to the improvement of their personal digital competences liked this form of teaching very much, in contrast to the students who did not find any improvement in their digital competences while attending remote lessons. Moreover, it turned out, as indicated by other researchers [25,143], that the students' previous knowledge and level of digital literacy before the introduction of ERT was an important factor in the improvement of computing competence during ERT. In our research, 47.9% of students believed that attending ERT contributed to the improvement of their computing competence, while Pavić et al. [35] obtained a percentage of 53.4%, and Jerotijević Tišma et al. [33] obtained a percentage of 75.6%. The obtained results also show that the students did not think that their level of computing competence was so bad as to prevent them from following and attending ERT (12.3%), which is corroborated by the results obtained by Milojević et al. [103]. In other words, those who had adequate previous knowledge perfected their digital competences further, while those with the basic level of digital literacy did not find ERT a particular problem, but they did not benefit from it substantially, i.e., they did not acquire any new digital knowledge. On the other hand, in her research conducted among the students of the Faculty of Law in Niš, Ignjatović [41] found that, although 75.95% reported possessing excellent digital skills, ERT was the first encounter with organized online teaching for as many as 83.83% of them. Among the students of the Faculty of Sport and Physical Education in Niš, 40% reported possessing excellent digital skills [121], as well as to 18.8% students of the Faculty of Economics in Belgrade, Novi Sad, Niš, and Kragujevac [28]. This raises the question of whether being familiar with social media, at least with entertainment content, is a sufficient level of digital literacy in the ERT conditions [27], particularly if taking into account the data provided by Belev et al. [22] that 72.1% of students of the Bulgarian Navy Academy and 53.1% of students of the Croatian Navy Academy, ERT was their first experience with any form of remote teaching. Moreover, even before the pandemic, students showed the attitude that remote teaching was only a voluntary addition to regular teaching [144].

On the other hand, a little more than 1/6 students think that the professors and assistants had a somewhat poorer knowledge of modern ICTs (15.1%) than them and that it was an important factor for assessing the quality of ERT, which is supported by previous studies [22,27,28,32,39,40,82–84]. The highest percentage of students who complained about teachers' poor digital literacy during remote teaching believed that remote

teaching was worse and less useful than the traditional teaching model [25,145]. This is corroborated by the results of the research conducted on the sample of professors: in fact, the professors themselves were aware of their own problems regarding digital literacy [17,26,42,46]. An extremely large number of university professors encountered some form of remote teaching for the first time only after the state of emergency was declared. Stančić and Senić Ružić [16] state that for as many as 63.4% of ERT, it "was the first time they had organized online teaching". Walsh et al. [58] provide the percentage of 66.67%, while Pires et al. [23] mention 50%. Ignjatović [41] provides data on 55.4% professors, while Nikolić and Miladinović [46] state that 43.1% professors encountered some form of online teaching for the first time. Professors who had previous experience with online teaching/learning had more positive attitudes toward ERT, reported more positive experiences in their work with students, and used more online tools in their teaching [16,146,147]. However, it should be noted that the problem was most pronounced during the state of emergency, while before the end of the pandemic, the situation improved in terms of the professors being satisfied with the achieved progress and that, despite their initial skepticism—particularly among the professors with the higher educational titles—they highlighted some advantages of digitization in higher education, and even suggested that professors' extracurricular activities, such as sessions and meetings, should be held online for the purpose of saving time and a more efficient approach to work [17,28,41], which would mean adopting the Swedish work model at the faculties before the COVID-19 pandemic, when all forms of teaching obligations and duties, except for teaching, were transferred online with the aid of ICTs [148]. A particularly intriguing finding is that only 2% of professors found themselves to be digitally illiterate, in contrast to their assessment by the students—23% [46]. Furthermore, in their research, Koruga et al. [75] state that, according to teachers, ERT improved their own digital competencies, but not their students' digital competencies. It seems that the locus of control plays an important role and that blaming other people and circumstances is a tendency equally present among the students and the professors when it comes to distractors of ERT during the COVID-19 pandemic. That is why it is not surprising that many authors [24,39,94,149–151] point out the need to organize training in the field of ICT application for teaching as a solution to the problem.

Another technical factor disturbing the attendance of ERT was the availability of good-quality Internet: despite all the above-listed problems, the students believed that they were in a better position when it comes to being equipped with the actual technical devices (a total of 16.2% students said that the obstacle in remote teaching was the lack of adequate devices) than when it comes to the Internet (a total of 26.4% students said that the obstacle in remote teaching was the lack of adequate Internet connection), which is in line with the results of numerous research studies during the period of the COVID-19 pandemic, not only in economically less developed countries [25,27,28,39,41,46,57,61,121,134,142,143,152–159]. The students in European countries, such as Croatia, Bulgaria, Turkey, and Spain also reported problems with the Internet connection during ERT [22,32,81].

As for the assessment of ERT sustainability and quality, only 9.5% of students think that RT is better and more useful than live lessons, in comparison to 7.8% as found by Nikolić and Miladinović [46], and 24.2% as found by Pavić et al. [35], or 12.3% students of the Bulgarian Navy Academy and 17.3% students of the Croatian Navy Academy [22], while almost half of them (48.6%) think that remote teaching is the same, only organized in a different manner. Similar results were obtained by Prodanović and Gavranović [143], in whose research 15% of students found RT better, 50% preferred the traditional teaching method, while 35% thought that it was the same teaching but organized in a different manner. Other researchers have also reported similar results [17,21,28,62,109,160–167]. In contrast, Milanović et al. [76] found that only 21.2% foreign students of medicine in

Serbia believed that RT and the traditional teaching model might be of the same quality regarding the quality of acquired knowledge—the same belief is held by Nikolić and Miladinović [46] on the basis of their result of 37.2%. Other studies have reported similar results [17,109,164,168,169]. Forexample, Belev et al. [22] state that for 45.5% of students at the Bulgarian Navy Academy and 39.8% of students at the Croatian Navy Academy, the quality of ERT was their biggest challenge. Professors have also expressed skepticism in this regard [16,17,72].

The students who were in favor of RT as a permanent form of teaching believed to the largest extent that it was essentially the same teaching, only organized in a different manner, which is in line with the results obtained by some researchers [18,153]. Other studies show that the majority of students, or 75%, think that RT should not replace traditional teaching [135], as compared to the percentages of 66.2% obtained by Kaličanin et al. [170] and 50.4% obtained by Dabetić [17]. Conversely among the students who think that RT is acceptable only in extraordinary circumstances, such as ERT, there is an approximate number of those who believe that RT is worse and less useful than traditional teaching and those who believe that RT is the same teaching that is only organized in a different manner. The students who find the introduction of RT unacceptable under any circumstances believe to the largest extent that it is worse and less useful than the traditional form of teaching. This is in line with previous research results in Serbia, indicating that Serbian secondary school and university students traditionally prefer traditional teaching, regardless of the circumstances [18,27,41].

As for the learning outcomes after ERT, 77.7% students got approximately equal grades as after attending the subjects in traditional forms of teaching. Students who got better grades in the examinations taken after ERT than in the subjects attended in traditional forms of teaching, as well as those who got approximately equal grades, mostly believed that RT is the same teaching, only organized in a different manner. On the other hand, the students who got worse grades in the examinations taken after ERT mostly believe that RT is worse and less useful than the traditional form of teaching. This is consistent with the results obtained by other researchers [18,27,28,37,41,135,161,167,171–173]. Students who received worse grades in the examinations taken after ERT than in the subjects attended in traditional forms of teaching do not want the RT situation to repeat ever again. In contrast, those who got better or approximately equal grades in the examinations taken after ERT than after the subjects attended in traditional forms of teaching believe that RT should be a permanent form of teaching. These results are in line with previous findings that students who are satisfied with ERT intend to use RT in the future [174–177]. In contrast, the results obtained by other researchers [33,135] show that the degree of satisfaction with the teaching model is not related to the level of grading: students with higher grades think that their success in examinations would have been the same if there had been no coronavirus pandemic. The students, who preferred RT believed that it was better and more useful than lessons implemented in a traditional teaching method, live, while among the students who found RT worse and less useful, there was an approximate number of those who did not like remote lessons at all and those who saw remote teaching as a necessary evil. In fact, the largest number of students who liked RT believed that it was essentially the same teaching, only organized in a different manner. The students who did not like RT at all found it unacceptable to re-introduce it, while those who liked it were in favor of introducing it as a permanent form of teaching. The same results were obtained by Dabetić [17], and Nikolic and Miladinović [46]. These results indicate that grade as an indicator of efficiently adopted knowledge is an important factor of satisfaction with ERT from the students' perspective. On the other hand, a large number of teachers (but also of students) highlighted grading during ERT exactly as the most critical point [4,16,22,25,28,32] since it

was mostly suspended during the state of emergency, and that a large number of professors began suspecting that their students resorted to non-ethical and non-academic measures in fulfilling pre-examination duties (cheating etc.) These problems have been overcome to a certain extent, since most examinations were held live, in line with the anti-pandemic measures, but it is also possible that the professors' grading criteria were substantially lower due to the circumstances imposed by the COVID-19 pandemic. Moreover, the possibility of finding an explanation in the fact that ambitious students who did not succeed in adapting to this way of functioning and grading have been deprived of good grades should not be excluded, which they automatically ascribe to external factors, according to the control locus theory, rather than to their own confusion and non-engagement [178].

As we may conclude, although RT is assessed as relatively interesting (36.8%) and appealing (44.6%), which is in line with other studies [38,46,103], to most students, it is acceptable only in extraordinary circumstances (pandemic, war, natural disasters, etc., i.e., as ERT—70.1%), as also obtained by Jovanović et al. [28]. Although the students think that RT brings along certain advantages, such as staying healthy in the COVID-19 circumstances, flexibility and time saving, money saving, the possibility of repetition, etc. [4,22,32], it seems that there are some obstacles preventing the students from fully accepting the RT model as a model of attending lessons in normal circumstances, which is in line with the previous results [22,35,46]. Apart from technical obstacles, the inability to adjust to a completely different form of teaching in such a short period of time, challenges regarding health and the "new normality" caused by COVID-19, there is also a problem with the eidetic image of an ideal online student. The successful online student is an introverted scientist, the one with strong emotional intelligence, self-awareness, self-regulation abilities, self-discipline, time management knowledge, organizational skills, interpersonal communication adeptness, technology fluency, and an internal locus of control [21,179,180], thus being an ideal fiction and, in addition, resisting all challenges of physical and mental health during the pandemic. It should consider and investigate whether this is the consequence of the awareness of insufficient digital literacy of the participants in the educational process, the position about ICTs as a way of spending spare time, communication and being informed about students' other interests [18,33,52,61,117], the traditional understanding of the concept of teaching [17,27,33,46,103,109,181,182] or the impossibility of keeping attention and concentration solely on the teaching content [6,18,25,27,143,161,162,183] from various reasons, such as family duties, lack of own place and for work, gender inequalities in domestic labor [30,58,82,120,128–130,134,184] or increased requests for independence of work in the RT process [33–35,142,143,160,185]. Moreover, it is also possible that there is fatigue and overload in terms of virtual reality [33], as well as a need for fulfilling the basic gregarious motive of human nature [25,61,62,154,158,186], in the situation when it is exactly the missing moment for the purpose of suppressing the pandemic and preserving an individual's health. To many of them, attending ERT became the only form of socialization, especially during the state of emergency (which varied in length in different countries and was declared multiple times) and an attempt to maintain the appearance of normality [187] but also a form of being able to confide in someone and find comfort and possibly help [58,97].

This is exactly what the data obtained on the ZEF Scale indicate. Although none of the scales, including the ZEF score, exceeded the average values, the highest level of Zoom Exhaustion and Fatigue was recorded for general and visual fatigue, and the lowest for emotional fatigue. Fauville et al. [12] noted highest mean score in the general fatigue subscale also, followed by the motivational and lowest result was on visual subscale. Oducado et al. [47] found that students obtained the highest level of fatigue in the general fatigue subscale, followed by visual fatigue. Emotional fatigue was the lowest. This can

be explained by the overuse of mobile phones as the main device for ERT, and moderate levels of interestingness and likability, particularly because Erza et al. [134] in their research also state that students with a lower socio-economic status, due to their material situation, had to attend classes using their mobile phones, which led to skipped materials and diminished eyesight. Some research also points out mobile phones as the main cause of visual impairments in children [188–191]. Many studies have also emphasized the role of the COVID-19 pandemic overuse of digital devices, and the state of emergency at the beginning of the pandemic [9,10,191–193].

The results show that the only important predictor of all scores is different on the ZEF dimensions, including the total score of the length of ERT attendance on a daily basis: the more time the students spent on ERT, the more tired they got, which is in line with previous results [33,47,59,149,161]. Although this phenomenon is related to videoconferencing in different settings [194,195], during the pandemic, it assumed a new meaning because the entire social life was transferred online. Moreover, Internet connection quality has also proved to be an important predictor on all subscales and in the total score, except for the visual fatigue subscale, which was also pointed out in previous studies [47]. Students who had problems with ERT due to a poorer Internet connection had higher scores on the ZEF Scale, particularly regarding social and emotional fatigue, just as the students whose problem was the lack of adequate computing equipment for following ERT. Furthermore, students with better computer literacy and knowledge of using remote teaching platforms had the lowest level of social fatigue. Teachers' digital competence proved to be an important predictor only regarding the total ZEF score: students who had more problems in following ERT due to the professors' poorer digital literacy were more tired and exhausted. However, there are indications that the professors also suffered from the effects of ZEF [17,75] which are not necessarily related to incompetence, but instead to interruptions (e.g., family duties regarding very young children, unexpected appearance or interruption of other family members, friends or pets, etc.).

Students who found RT worse and less useful than traditional teaching, the students who did not find RT interesting at all, as well as the students, who would not like to attend RT ever again, score a higher level of fatigue on all dimensions of the ZEF Scale, particularly regarding general and visual fatigue. This is why it is possible to pose a question as to whether this negative attitude toward RT is at least partly the consequence of excessive visual strain and the feeling of being constantly in front of the monitor, without the possibility of free movement and acting due to the need to stay constantly in front of the monitor, or of some other factors associated with the matter of mental health during the pandemic [33–35,76,196,197].

5. Conclusions

Unlike remote teaching (RT), which is defined and clearly conceived in advance, harmonized with the method of implementation, and mainly constitutes a form of an individual's personal freedom of choice from different reasons (from the aspect of finance, jobs, spare time, etc.), ERT was a forced change of the entire school context and environment due to the risk of infection with the potentially fatal virus COVID-19. This coercion occurred simultaneously at four levels: students', teachers', technical, and content. Students could only rely on their own digital knowledge and capacities, following the professors' instructions. Their professors were not in a much better situation since they were directed solely to support by the computing services at the faculties where they worked. The curriculum and teaching material were adapted to the existing technical solutions, whereas there was an inevitable loss in the knowledge transfer process, where, in all professions, the most affected ones were the subjects in which professional practice

as a special form of teaching was an inevitable form of acquiring knowledge. In addition, the great burden and differences in the levels of computing equipment and digital literacy of both students and teachers created a specific amalgam of different questions with no adequate answers, where everyone acted as best as possible, having in mind primarily maintaining the continuity of knowledge transfer and the teaching process.

We attempted to draw some conclusions about students' views on RT in the postpandemic period based on their views on ERT during the COVID-19 pandemic. Therefore, in logical terms, we are making a generalization leap, as we conclude the sustainability of RT based on the experiences gained from the application of ERT. Although the students are, in general, satisfied with the level and amount of knowledge acquired during ERT, finding it interesting and useful, they are still not certain about its long-term sustainability in normal circumstances, as RT, but rather associate it with extraordinary circumstances (first of all, the COVID-19 pandemic and all the accompanying negative effects: fear of infection and death and forced restriction of the freedom of movement and socializing with other people). Students only have experience with ERT, while they have no direct experience with RT, so the results obtained must be interpreted accordingly. In addition, the possible conservativism of students in this regard should be taken into account, as should the fact that Serbian people have traditionally very high scores in Hofstede's uncertainty avoidance. However, it is certain that the conservative view of education will be abandoned very quickly, simultaneously with the revolutionary advancement of AI, especially in the sphere of education, of which students are still not sufficiently aware.

As a direct consequence of the excessive use of ICT during the pandemic, various phenomena manifested themselves, such as technostress and ZEF. The most important aspects of ZEF in this research are visual, emotional, and social fatigue, which primarily speak about the excessive straining of the eyesight that is not biologically predetermined for such an amount of information and strain, as well as emotional and social responses and resentment toward the situation in which the natural form of human communication was modified and even suspended.

There are several possible ways in which further research may contribute to the systematization of ERT knowledge in terms of various aspects of studying during the COVID-19 pandemic and its application in the educational system, and on the basis of which it would be possible to contribute to the development of RT and its sustainability.

- 1. Differences regarding different levels of studies (basic and postgraduate).
- 2. Different vulnerable groups during studies in the pandemic conditions (exchange students, students with disabilities, foreign students, employed students, students with children, poor students, and first-generation students).
- 3. The influence of ERT on the level of knowledge (whether students who could not regularly attend professional practice needed additional time and training in order to adequately fulfil their work tasks after starting a job).
- 4. Not entering the desired faculty as a consequence of the pandemic (worsened financial situation, parent's death, perception of certain professions as riskier than others in the pandemic conditions).
- 5. Scientific fields (whether in the domain of specific professions, humanities and STEM are really in a better position as compared to medical and social sciences).
- 6. Systematization of acquired knowledge about ERT—the application, not only in the field of a specific course, faculty, or country, but also interdisciplinary international exchange of knowledge regarding ERT problems that could affect the implementation of RT and its sustainability. Since remote teaching still belongs to innovative educational models [198], it is also necessary to consider the possibility highlighted by some authors citing Vygotsky—that knowledge is developed and built and not solely

transferred [199,200], stressing the importance of the pedagogical design of remote teaching [201]. Therefore, in the teaching circumstances of the digital setting, it is necessary to bear in mind that only knowledge obtained in the course of RT is mediated by the use of digital tools, which further affects not only the studying outcome, but also the formation of opinions and speech (not only at the earliest age, when speech is learned, since linguists have studied for years the impact of technology on the development of vocabulary, just as psycholinguistics studies the impact of technology on higher cognitive processes). Millennials already possess digital syncretism, which compounds their communication with older people who are not familiar with the digital setting and tools).

- Emphasizing good practice examples worldwide in the implementation of different courses.
- 8. Establishing cooperation with IT industry for implementation within IT framework and its alignment with the needs of digital pedagogy in order to establish a sustainable and systematically planned model of teaching in different emergency situations.
- 9. Examining the role of accelerated development of AI, which will lead to significantchanges in education, with the potential consequence of the development of the RT system supported by AI, which might be assumed as a model integrating these two technologies.

Special attention needs to be dedicated to the uniformization of the levels of teachers' digital literacy through systematic forms of lifelong learning by the Ministry and/or university (seminars, conferences, training, material, etc.) as well as students' digital literacy through introducing subjects intended for capacitating students for handling modern digital technologies present in their profession, or with the aid of the centers within the faculties, for example, the Centre for Robotics and Artificial Intelligence within the Faculty of Education at the University of Belgrade [202].

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