

HIGHER EDUCATION IN EMERGENCY SITUATIONS - PROBLEMS AND OPPORTUNITIES OF ONLINE TEACHING AND LEARNING

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Abstract: *The paper presents the results of a research aimed at determining teachers' attitudes regarding the problems and possibilities of online teaching in emergency situations. The COVID-19 pandemic has caused extraordinary living and working conditions that have left some impact on the teaching and education systems. Therefore, the problems and opportunities of online teaching have been observed in the context of the pandemic. The research sample included 102 teachers from higher education institutions on the territory of the Republic of Serbia. For the needs of the research, a questionnaire with an assessment scale was prepared and shared with the teachers through a link. The teachers expressed their perceptions, attitudes, opinions and experiences related to personal competencies, preparation and support for online classes, practical implementation of online teaching and their relationship with students, as well as to didactic and methodological aspects of learning in an online environment.*

Key words: *online teaching, university teachers, emergency situations*

1. INTRODUCTION

Natural and man-made disasters cause serious consequences and disturbances in the environment (ecological, social, economic, etc.) which have become increasingly difficult to predict in recent years. Therefore, the concepts of disaster and emergency management have become the focus of interest for the scientific public. Authors who study these concepts perceive the acquisition of knowledge and the importance of education in direct connection to the processes of raising the resilience of communities and developing the capacities for recovery from disasters and emergencies (Faber et al., 2014; Tuladhar et al., 2015; UNICEF, 2011). Hyogo Framework for Action (HFA) (2005–2015) emphasized the importance of the role of education in creating a culture of safety and resilience at all levels. According to HFA, disasters are basically reduced when people are well aware and the motivation is to create a culture of prevention and resilience to disaster (Zhou et al., 2014). The successor instrument to the Hyogo Framework for Action is the Sendai Framework, adopted in 2015.

Climate change and the COVID-19 pandemic have further drawn the attention of the academic community to the problems of education in emergency situations. In this regard, numerous declarations (see Nikolic & Vukic, 2022) emphasize the role of education for climate change, while the problems of education and learning in emergency situations have been brought to attention by pandemic conditions during the last two years. In addition to the issues related to the implementation of new educational programs, the creation of new educational tools and materials, the adoption of new policies and strategies, the authors put the focus of the problems of education in emergency situations on the development of teacher capacities and the empowerment of education creators (Anderson, 2012; Murphy, 2020).

The COVID-19 pandemic has led to the organization of online teaching in a sudden situation for which the world was not prepared, which is typical for emergencies (Quacquarelli Symonds, 2020; Rashid & Yadav, 2020). Schools and universities were closed in more than 160 countries, which affected over one and a half billion pupils and students (91%) worldwide. The COVID-19 has disturbed the operations of higher education globally. With the spread of the corona virus, higher education systems have switched from traditional to online access to teaching and learning within a short time to promote social distancing (Quacquarelli Symonds, 2020).

Pandemic conditions of learning brought valuable experiences (Vannak, 2020) and emphasized, or better yet, redefined, the role of teachers in emergency situations. Such conditions highlighted the necessity of future skills that include creativity, communication and collaboration, alongside empathy and emotional intelligence, helped to unlock the technology to deliver education by using available and up-coming technological tools, to recognize and acknowledge online learning in many countries (e.g. Cambodia), to strengthen teamwork and partnership within the community, to share learning materials more efficiently and improve the monitoring of student activities, etc. Through social media platforms, educators connect with students as individual learners, so the students know that the teachers are interested in them and that they follow their activities.

However, there are many more studies (Quacquarelli Symonds, 2020) that confirm numerous problems and limitations of online teaching in pandemic conditions (finance, Internet availability or instability of the Internet connection, digital (i)literacy, heterogeneity of learning styles, methodical (un)preparedness of teachers for online teaching, students' burden with tasks and projects, lack of feedback, weak communication and interaction, weak motivation and passivity of students (Cao et al., 2020) etc.).

Analysis of the relevant literature (Moorhouse, 2020; Omotayo & Hilaru, 2020; Quacquarelli Symonds, 2020) shows that the largest number of research on teaching and learning in pandemic conditions focuses on student behavior (perception, evaluation, satisfaction, performance, etc.). Despite the large number of quantitative and qualitative analyses of the effectiveness of online learning, there are few studies on teachers' experiences and didactic and methodological aspects of online learning in emergency conditions.

2. METHODOLOGY

In order to review the experiences of teachers in implementation of online teaching during the pandemic COVID-19, an empirical study was conducted. The research sample consisted of 102 teachers from Serbian higher education institutions. The study is based on a descriptive method, survey and scaling techniques, and uses a questionnaire with an assessment scale which teachers filled in online (via the link provided to their email address). The research instrument was especially constructed for study purposes. The paper presents a part of the

results related to the problems and opportunities of online teaching, viewed through several aspects:

(1) **teachers' competencies, preparation and support for online classes** – the task of the teachers was to choose one of the offered answers to the following questions: *Did you have organized trainings on the application of platforms (Zoom, Teams, Google Meet) that you used before starting online teaching?* (yes or no) and *How do you assess the resources of your faculty for the implementation of online teaching?* (the faculty can implement online theoretical lectures and practical exercises; the faculty can implement theoretical lectures, but there are no conditions for the implementation of online practical exercises; the faculty does not have good conditions for the implementation of online teaching). In addition, teachers were asked to express their attitudes on a five-point Likert-type scale (1-strongly disagree, 5-strongly agree) in relation to the following items: i1 - Before online teaching, my digital competencies were not at a satisfactory level; i2 - I had experience in online teaching before the COVID-19 pandemic; i3 - I was able to contact the technical support/administrators in order to solve the difficulties I encountered while working in the online environment at any time; i4 - I had all the necessary equipment (computer, headphones, etc.) and a suitable workspace before online teaching started; i5 - It took me more time to prepare for online classes than for usual classroom teaching; i6 - It was difficult for me to adapt the contents of my subject to the online environment.

(2) **implementation of online teaching and relationship with students** - teachers expressed their attitudes on a five-point scale (1-strongly disagree, 5-strongly agree) in relation to the following items: i7 - During online teaching, it was difficult for me to manage time (duration of certain activities); i8 - During online teaching, I had more time to dedicate to the individual needs of students; i9 - During online teaching, students were more motivated and dedicated to work than usual; i10 - During online teaching, students had greater freedom to ask questions; i11 - During online teaching, student activity was not at a satisfactory level; i12 - During online teaching, interaction with students was not at a satisfactory level; i13 - During online teaching, it was difficult for me to establish authority and I felt that I had no control over the teaching process; i14 - During online teaching, I lacked face-to-face interaction with students (e.g. seeing student reactions and facial expressions).

(3) **didactic and methodological aspects of learning in an online environment** – the task of the teachers was to express how often (never, rarely, often) they implemented the following activities during online teaching: dividing students into groups and assigning them activities; using presentations; playing educational films and videos; initiating a discussion on a topic and encouraging students to express their opinion; leaving the role of “presenter” to students (e.g. presentation of their papers, pre-exam obligations, etc.); giving tests/quizzes; giving homework; recording lectures and posting them on the platform. In addition, they were asked which teaching method they most often used during online teaching (teachers were offered teaching methods - lecture, conversation, demonstration, text-method, with the possibility to add their own answer).

The research sample structure with regard to the set independent variables (academic rank, length of service and previous training in the field of ICT) is presented in Table 1.

The largest percentage of teachers are full professors (33.3%), followed by assistant professors (29.4%), assistants (13.7%), associate professors (12.7%) and graduate student instructors (6.9%). The category *other* includes 3.9% of respondents (demonstrator, dean and professor of vocational studies). The lowest percentage of teachers have a work experience of over 30 years (15.7%), while they are almost evenly distributed in other categories. Over 40% of respondents have never had training in the field of ICT (43.1%), while almost a quarter of

teachers (24.5%) have had such training just before the implementation of online teaching during the COVID-19 pandemic

Table 1: Research sample structure

academic rank		length of service		ICT training	
graduate student instructor	7 (6.9%)	up to 10 years	28 (27.5%)	only one training	17 (16.7%)
teaching assistant/assistant with a doctorate	14 (13.7%)	11-20 years	31 (30.4%)	few trainings	16 (15.7%)
assistant professor	30 (29.4%)	21-30 years	27 (26.5%)	a training organized just before online teaching	25 (24.5%)
associate professor	13 (12.7%)	over 30 years	16 (15.7%)	no training at all	44 (43.1%)
full professor	34 (33.3%)				
other	4 (3.9%)				

3. RESULTS AND DISCUSSION

Problems and opportunities of online teaching in the conditions of emergency situation COVID-19 that have been identified are presented in the paper through three categories: teachers' competencies, preparation and support for online classes; implementation of online teaching and relationship with students; didactic and methodological aspects of learning in an online environment.

3.1. Teachers' competencies, preparation and support for online classes

Teachers' competencies, preparation and support for online classes were analysed through their answers to two closed-ended questions and their attitudes expressed on a five-point Likert-type scale.

Teachers' answers to question *Did you have organized trainings on the application of platforms (Zoom, Teams, Google Meet) that you used before starting online teaching?* indicate that just a little over half of them have had organized trainings - 52.9% of teachers answered "yes", while 47.1% of teachers said that they did not have such trainings.

Teachers' answers to the question *How do you assess the resources of your faculty for the implementation of online teaching?* are as follows:

- the largest percentage of teachers (68.6%) believe that the faculty can implement online theoretical lectures and practical exercises;
- 20.6% of teachers believe that the faculty can implement online theoretical lectures, but that there are no conditions for the implementation of online practical exercises, while
- the smallest percentage of teachers (10.8%) believe that the faculty does not have good conditions for the implementation of online teaching.

Table 2 presents teachers' attitudes regarding the items i1-i6 and the differences in their attitudes based on their academic rank, length of service, and previous training in the field of ICT.

Considering the percentage of teachers who disagree and strongly disagree, it can be concluded that more than a half of teachers believe that their digital competencies were not at a satisfactory level before online teaching (55.9%). Also, more than half of teachers (59.8%)

had no experience in online teaching before the COVID-19 pandemic. In the case of this item, there is a statistically significant difference in the attitudes of teachers depending on their previous training in the field of ICT ($p=0.000$). This is quite understandable, because previous training of teachers in the field of ICT probably included the possibilities for the implementation of teaching in online environments. However, there is a much larger percentage of teachers who have not been trained in this area, or have only been trained once - before or during a pandemic (Table 1 – Research sample structure).

Table 2: Differences in teachers' attitudes on their competencies, preparation and support for online classes

	Strongly disagree		Disagree		Neither agree, nor disagree		Agree		Strongly agree		X ² test (p value)		
	N	%	N	%	N	%	N	%	N	%	academic rank	length of service	ICT training
t1	33	32.4	24	23.5	22	21.6	17	16.7	6	5.9	0.187	0.779	0.472
t2	46	45.1	15	14.7	14	13.7	9	8.8	18	17.6	0.579	0.754	0.000
t3	4	3.9	4	3.9	11	10.8	18	17.6	65	63.7	0.574	0.763	0.490
t4	12	11.8	12	11.8	14	13.7	19	18.6	45	44.1	0.408	0.473	0.221
t5	11	10.8	14	13.7	16	15.7	31	30.4	30	29.4	0.025	0.292	0.125
t6	20	19.6	26	25.5	25	24.5	23	22.5	8	7.8	0.986	0.025	0.314

An encouraging fact that should be noted is that more than 80% of teachers (18.6% who agree and 44.1% who strongly agree) were at any time able to contact the technical support/administrators in order to solve the difficulties encountered while working in the online environment.

When added up, the percentages of teachers who agree and strongly agree show that more than a half of teachers (62.7%) had all the necessary equipment (computer, headphones, etc.) and a suitable workspace before online teaching. However, it must not be neglected that almost a quarter of teachers did not have all the necessary conditions for the implementation of online teaching.

Most teachers (59.8%) needed more time to prepare for online classes than for usual classroom teaching. In the case of this item, there is a statistically significant difference in the attitudes of teachers depending on their academic rank ($p=0.025$). The reason for this difference can be found in the “incompetence” of teachers with higher academic ranks (probably older teachers) in the online environment.

Almost a third of teachers (22.5% who agree and 7.8% who strongly agree) found it difficult to adapt the contents of their subject to the online environment, while a quarter of teachers show uncertainty about this (24.5% of teachers answered *I neither agree nor disagree*). However, the largest percentage of teachers (19.6% who strongly disagree and 25.5% who disagree) say that adapting the content was not difficult for them. In the case of this item, there is a statistically significant difference in the attitudes of teachers depending on their length of service ($p=0.025$). The reason for such difference may again be found in the fact that the online environment is not “close” to teachers with longer work experience as to younger teachers (graduate student instructors, assistants) who probably encountered ICT content during their schooling.

3.2. Implementation of online teaching and relationship with students

Table 3 presents teachers' attitudes regarding the items i7-i14 and the differences in their attitudes based on their academic rank, length of service, and previous training in the field of ICT.

Table 3: Differences in teachers' attitudes on the implementation of online teaching and their relationship with students

	Completely disagree		Disagree		Neither agree, nor disagree		Agree		Completely agree		X ² test (p value)		
	N	%	N	%	N	%	N	%	N	%	academic rank	length of service	ICT training
t7	43	42.2	19	18.6	19	18.6	18	17.6	3	2.9	0.051	0.383	0.205
t8	24	23.5	29	28.4	30	29.4	12	11.8	7	6.9	0.167	0.133	0.530
t9	30	29.4	25	24.5	34	33.3	10	9.8	3	2.9	0.044	0.203	0.632
t10	26	25.5	24	23.5	28	27.5	17	16.7	7	6.9	0.400	0.378	0.174
t11	5	4.9	14	13.7	27	26.5	35	34.3	21	20.6	0.495	0.040	0.366
t12	9	8.8	17	16.7	34	33.3	22	21.6	20	19.6	0.593	0.856	0.152
t13	38	37.3	28	27.5	20	19.6	11	10.8	5	4.9	0.038	0.508	0.095
t14	0	0.0	3	2.9	7	6.9	14	13.7	78	76.5	0.090	0.850	0.301

When added up, the percentages of teachers who disagree and strongly disagree show that most teachers (over 60%) did not find it difficult to manage time, i. e. the duration of certain activities (60.8%) and to establish authority and control over the teaching process (64.8%) during online classes. There is a statistically significant difference in teachers' attitudes in the case of these items depending on the teachers' academic rank ($p=0.051$ for i7; $p=0.038$ for i13). Such differences may be influenced by greater (long-term) experience in teaching practice of teachers with higher academic ranks in terms of good time organization of certain stages of the lesson and practical activities and greater confidence when it comes to managing the teaching process.

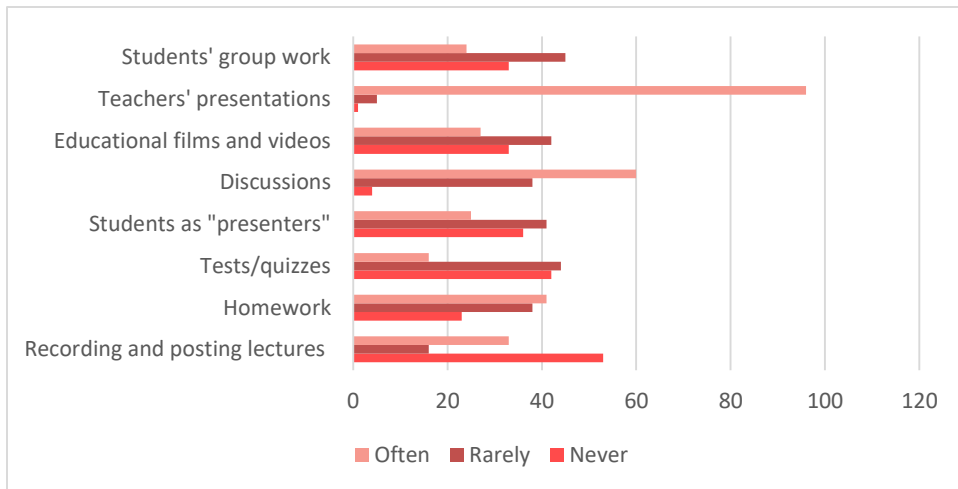
Approximately a half of the teachers (those who disagree and strongly disagree) pointed out that they did not have more time to dedicate to the individual needs of students (51.9%) during online teaching, that the students were not more motivated and dedicated to work (53.9%), nor that they had greater freedom to ask questions (49%) compared to the usual classroom teaching. There is a statistically significant difference in teachers' attitudes in the case of the item *During online teaching, students were more motivated and dedicated to work than usual* depending on their academic rank ($p=0.044$).

More than a half of teachers emphasized that during online teaching student activity was not at a satisfactory level (34.3% who agree and 20.6% who strongly agree), with a statistically significant difference in their attitudes depending on the length of service ($p=0.040$).

One third of teachers (33.3%) show uncertainty when asked whether their interaction with students during online teaching was at a satisfactory level, and only a quarter (25.5%) of teachers (those who disagree and strongly disagree) think that the interaction was at satisfactory level. Accordingly, the majority of teachers (76.5%) strongly agree that they lacked face-to-face interaction with students during online teaching. An interesting fact is that there are no teachers who strongly disagree with previously stated, whereas only 2.9% teachers answered *I disagree* (3 teachers).

3.3. Didactic and methodological aspects of learning in an online environment

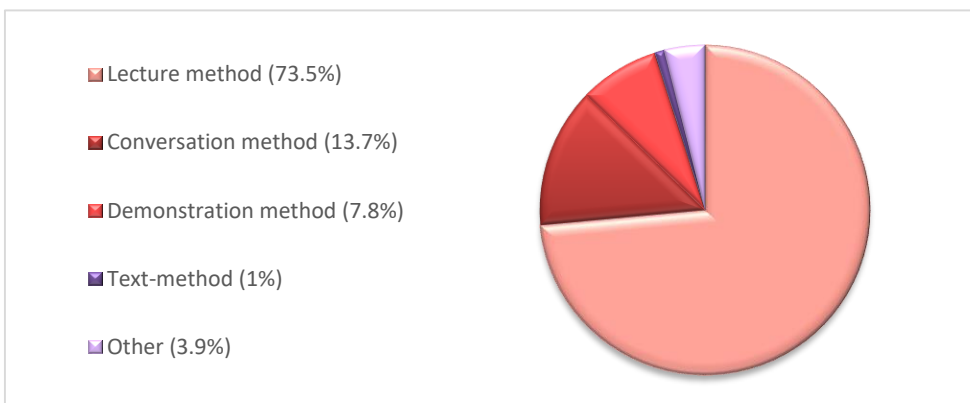
Graph 1 presents teaching activities and teachers' attitudes about how often (never, rarely or often) they implemented them during online teaching.



Graph 1. Frequency of teaching activities during online teaching

Around 40% of teachers *rarely*: divided students into groups and assigned them activities (44.1%), played educational films and videos (41.2%), left the role of the “presenter” to students - presentation of their papers, pre-exam obligations, etc. (40.2%) and gave tests/quizzes (43.1%). Almost the same percentage of teachers (41.2%) *never* gave tests/quizzes during online teaching, but they often gave homework (40.2%). More than a half of the teachers *never* recorded and posted their lectures on the platform (52%), but they often initiated a discussion on a topic and encouraged students to express their opinion (58.8%). Notably, 94.1% of teachers *often* used presentations.

Graph 2 shows which teaching methods were most often used by teachers in the implementation of online teaching.



Graph 2. The most often used teaching methods in online teaching

The majority of teachers used lecture method (73.5%) for online teaching. The conversation method was used by 13.7% of teachers, while the demonstration method was used by only 7.8% of teachers. Teachers used the text-method the least (1%). Several teachers chose the

category “other” where they stated the following: “Lecture method and conversation method”, “Research work, problem method”, “Combination of all the above” and “Methods changed depending on the teaching unit”.

4. CONCLUSION

The results of this research represent a contribution to the literature related to education and learning in emergency situations. Numerous problems and challenges accompanying the realization of teaching (Vlachopoulos, 2020) in new educational (virtual) situations have been confirmed. As results, the online learning does not run well since it lacks preparation and planning. First of all, the results indicated insufficient competence of teachers in the field of information and communication technology - teachers either did not have the training in ICT or only had it once, before or during the COVID-19 pandemic. Therefore, the results showing that the teachers “transferred” the traditional teaching, based on the lecture method (which was dominant among the majority of teachers) to the online environment are completely understandable and expected. In addition, the students remained passive during online classes, and the lack of “face-to-face” interaction was noticed by almost all teachers. Nevertheless, the data showing that the teachers could count on the help of technical support/administrators in order to solve difficulties encountered in an online environment, that most teachers had access to the necessary equipment for online teaching, and that the majority of faculties had opportunities for online teaching is encouraging.

Investing in technology system is crucial for both private and public higher education institutions (El-Azar & Nelson, 2020). Starting from the need for a technological support and other specific requirements imposed by online teaching, it is necessary for teachers to be well prepared to work in the virtual classroom. The students have to be familiarized with online learning to enhance their digital literacy and refine their misperceptions about online learning. Future teacher training must include the integration of technology in teaching and learning, technology enhanced teaching and learning, information and communication technology in teaching and learning, and online learning courses in their curriculum since the needs of technology integration in teaching and learning is inevitable. More studies on online teaching and learning are encouraged (Moorhouse, 2020), but there is insufficient research on particularities of online teaching and learning in emergency situations.

The COVID-19 pandemic makes us realize that we should always be ready to cope with the unexpected and get prepared to provide students the best no matter where the learning process takes place. All educational institutions should have plans for the implementation of the teaching process in crisis and unknown situations in the future while at the same time, the institutions should also look to the strengths and opportunities out of the crisis. Higher education should use the valuable experiences gained during the pandemic in order to reexamine the education strategies and review programs and the teaching process, both in the light of new risks and threats and in the context of interaction with the latest digital trends and innovations brought by Industry 4.0.

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REFERENCES

- Anderson, A., (2012). Climate change education for mitigation and adaptation, *Journal of Education for Sustainable Development*, Vol. 6, (No. 2)
- Cao, W., Fang, Z., Hou, G., et al. (2020). The psychological impact of the Covid-19 epidemic on college students in China, *Psychiatry Research*, Vol. 287.
- El-Azar, D., Nelson, B., (2020). How will higher education be different in 2030? Available from: <https://www.britishcouncil.org/voices-magazine/future-higher-education>
- Faber, M., Giuliani, L., Revez, A., et al. (2014). Interdisciplinary approach to disaster resilience education and research, *Procedia Economics and Finance*, Vol. 18.
- Lei, Z., Srinath, P., Janaka, J., et al. (2014). The implication of hyogo framework for action for disaster resilience education, *Procedia Economics and Finance*, Vol. 18.
- Moorhouse, B. L., (2020). Adaptations to a face-to-face initial teacher education course ‘forced’ online due to the Covid-19 pandemic, *Journal of Education for Teaching*, Vol. 46 (No. 4).
- Murphy, M., (2020). COVID-19 and emergency eLearning: Consequences of the securitization of higher education for postpandemic pedagogy, *Contemporary Security Policy*, Vol. 41 (No. 3).
- Nikolic, V., Vukic, T., (2022). Climate change education - guidelines and recommendations, *Proceedings of the International Conference on Physical Aspects of Environment ICPAE2022*, Radovancevic, D. (Ed.), ISBN 978-86-7672-354-6, Technical Faculty “Mihajlo Pupin”, Zrenjanin.
- Omotayo, F. O., Haliru, A. R., (2020). Perception of task-technology fit of digital library among undergraduates in selected universities in Nigeria, *The Journal of Academic Librarianship*, No. 46 (Vol. 1).
- Quacquarelli S., (2020). The impact of the coronavirus on global higher education, Available from: <http://info.qs.com/rs/335-VIN-535/images/The-Impact-of-the-Coronavirus-on-Global-Higher-Education.pdf>
- Rashid, S., Yadav S., (2020). Impact of covid-19 pandemic on higher education and research, *Indian Journal of Human Development*, <https://doi.org/10.1177/0973703020946700>
- Tuladhar, G., Yatabe, R., Dahal R. K. et al. (2015). Assessment of disaster risk reduction knowledge of school teachers in Nepal, *International Journal of Health System and Disaster Management*, Vol. 3 (No. 1).
- UNICEF. (2011). *Disaster Risk Reduction and Education*, UNICEF, New York.
- Vannak, H., (2020). SWOT analysis of Covid-19 on education, Available from https://www.researchgate.net/publication/345397967_SWOT_Analysis_of_Covid_19_on_Education
- Vlachopoulos, D., (2020). COVID-19: Threat or opportunity for online education? *Higher Learning Research Communications*, Vol. 10 (No. 1).