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## **CHALLENGES OF QUALITY IN THE E-LEARNING PROCESS FOR HIGHER EDUCATION INSTITUTIONS DURING THE COVID-19 CRISIS IN BOSNIA AND HERZEGOVINA**

### **Abstract**

The COVID-19 crisis had a huge impact on education and became the subject of many scientific studies. The purpose of the paper is to investigate the opinions of professors and students on the quality of teaching and satisfaction with e-learning during the COVID-19 crisis. The aim of the research is to answer the question to what extent professors and students are satisfied with the quality of e-learning in higher education institutions, as well as their expectations in the future. The research was created on the research platform 1KA and conducted in the period from November 12, 2021 to February 12, 2022 in Bosnia and Herzegovina. A survey questionnaire was used as a research instrument, which was sent to 192 addresses, 101 publics and 91 private faculties in Bosnia and Herzegovina, and included 132 professors and 202 students. The results of the research showed that the quality of teaching is positively influenced by the satisfaction and level of usefulness of the tools used among professors, but also among students. The results also confirmed that more

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work experience leads to lower e-learning expectations in the future. The paper presents empirical research that was conducted on the territory of Bosnia and Herzegovina about the impact of COVID-19 on the quality of e-learning. The scientific contribution of the paper is reflected in the fact that it can be used in research related to the impact of crises on teaching in higher education institutions, as well as potential future emergency situations of crisis and uncertainty that result in new models of teaching that combine classroom and e-teaching.

*Keywords:* COVID-19; crisis; e-learning; quality; higher education

## **Introduction**

After the whole world faced the COVID-19 crisis, digital e-learning in many countries has grown from extracurricular activities, which used to be nice to have, to a necessary lifeline for education. A number of impressive innovations have been created all over the world in all segments of society, including the education system, as a rapid adaptation to the new conditions was required, and world's countries were faced with great challenges. Forms of e-learning are becoming increasingly popular around the world and there is a growing number of different types of education that can be achieved through e-learning.

Based on The United Nations' (UN) 17 Sustainable Development Goals (SDGs), one of the goals is to achieve quality education. Quality education not only aims to empower educational opportunities but also to alleviate poverty all around the world by 2030.<sup>1</sup>

In the education system, the importance of implementing various innovative teaching solutions in different contexts and scales with quality care for all those involved in the teaching process has become particularly important. The pandemic affected primary and secondary education, but perhaps it had the greatest impact on higher education, given that the professional part of teaching (professional practice, fieldwork,

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<sup>1</sup> Population and the Sustainable Development Goals. 2021. Available online: <https://populationmatters.org/sdgs?gclid=%20CjwKCAjwhOy%20JhA4EiwAEcJdcQihsqlWPQCWg-LXCiaYtlNHTWggLpxUzZTqJ7AZAKyjt1y8OleWRoCORwQAvDBwE> (accessed on 9 May 2022).

work in laboratories, cabinets, etc.) had to be completely abolished or reshaped (Čirić, 2021).

The authors (Tonković, Pongračić and Vrsalović, 2020) state that the peak of the crisis caused by the COVID-19 pandemic caused nearly 1.6 billion students worldwide, in 195 countries, to be unable to use their classrooms. Schools were largely closed and students were denied educational opportunities, leaving long-term social and economic consequences. Student teaching has been transformed through the Internet in the form of online learning as an alternative approach to education. Online learning is beginning to be used primarily in higher education. In the mid-1990s, technologies such as video and audio began to be used (Korljan and Škvorc, 2009). China was the first country to close all schools in the country as one of the measures to prevent Covid-19. In early March 2020, UNESCO proposed that pandemic-affected countries provide students with online instruction. The digital approach to education during online learning increases inequality between students and creates greater differences between them. The consequence may be a reduction in the effectiveness of education among students of lower socio-economic status.

In March 2020 in Bosnia and Herzegovina, as in the rest of the world, instruction in classrooms was discontinued and e-learning in higher education institutions was introduced.

Finances are also a big problem for both the university and the students. Due to the already small investments of some countries in education, faculties have to get additional funding in some way. Investors stop investing, so the solution would be to reduce staff and increase enrolment fees. This would lead to a lack of professors, which would be problematic, but also fewer enrolled students, and there is a possibility that students would not continue their education (Friga, 2020; Mascolo, 2020). Although there were great challenges for teachers, educational institutions and the government when it comes to distance learning, the pandemic also created numerous opportunities. A strong link has been established between students and teachers, as well as teachers and

parents, as education requires parents to support students academically and economically. (Schleicher, 2020).

The purpose of this study is to investigate challenges of the quality, satisfaction and expectations with e-learning in higher education during the COVID-19 crisis in Bosnia and Herzegovina.

## **Theoretical framework**

Distance learning allows the learning and teaching process to take place in a virtual environment, without the physical presence of students and teachers, using digital technologies, which is a big plus in the organisation of classes during the COVID-19 pandemic. The definition that most often defines distance learning says that it is an approach to learning for those who are physically distant (Volery and Lord, 2000; King, Young, Drivere-Richmond and Schrader, 2001; Guilar and Loring, 2008). During the COVID-19 pandemic, the so-called digital literacy has been developed and expanded (Coiro et al., 2008). One of the biggest challenges in the introduction of digital literacy around the world is the quality application of traditional forms of teaching through the application of new technology. According to the authors (Mwanza and Engeström, 2005) emphasis is placed on the so-called activity theory, in which the teaching process is approached by students using various instruments and learning tools.

Online learning is defined as the experience of transferring knowledge through various media such as images, videos, online communication and other media that support online learning knowledge of using video, audio, images, text communication, software (Basilaia and Kva-vadze, 2020). According to (Herdiani, 2020) learning is the most important part in improving the quality of education. Evaluation also plays an important role, as a way to determine the effectiveness and efficiency of the learning process, teacher quality and student learning outcomes. Many authors have highlighted the huge problem of class attendance due to lack of appropriate technology and / or Internet access (Sahu,

2020; Sun et al., 2020; Demuyakor, 2020; Moralista and Oducado, 2020; Gyimah, 2020; Al Lily et al., 2020).

According to the authors (Sun et al., 2020) due to the COVID-19 pandemic, there were difficulties in education that the Chinese education system solved by providing online education across the country, and students in poor conditions and having problems with attending lectures and classes videos providing education are provided. The development of technology has enabled such rapid adaptation, which has been pointed out by other authors (Demuyakor, 2020; Mascolo, 2020; Gyimah, 2020).

The impact of the pandemic on education is a dynamic and unpredictable topic and not all effects will be negative. (Tonković, A., Pongračić, L., Vrsalović, P. 2020). As a result of the COVID-19 pandemic, many faculty members had to abruptly switch from direct instruction to online lecturing. Some professors did well in this, while others struggled. The results showed that the goals of the faculty in the approach to learning were positively related to the perception of the transition to online teaching as a positive challenge and useful for the development of their own competencies. On the other hand, avoidance of performance (appearance) and avoidance from work followed this change as threatening, which in turn was negatively related to the assessment of the quality of student teaching. Taken together, these results indicate the importance of faculty goals and attitudes for successful online teaching and learning (Daumiller et al., 2021). Also, one of the important problems is computer (il)literacy (Bao, 2020; Moralista and Oducado, 2020; Mascolo, 2020; Al Lily et al., 2020). Some professors stated that it was harder to prepare for online classes in such a short time (Mascolo, 2020). Since mastering digital literacy is a predominantly complex process, it caused a lack of interest in e-learning among some teachers. (Li, M.; Yu, Z., 2022).

Quality refers to the ease-of-use tools, functions, contents and multimedia instructions as well as quality of teaching. Literature has shown that quality contributes positively to satisfaction with e-learning (Demuyakor, 2020.; Daumiller et al, 2021.; Li, Yu, 2022.)

Technology therefore provides an opportunity to develop distance education. It is not a new phenomenon, and Bao (2020) states that there are a large number of universities that have been involved in such a way of working for a long time. An important advantage of distance learning is certainly the lower costs of organising classes compared to the classic instruction in classrooms, but also saving travel time from place of residence to place of education or to the workplace. Another important factor in the benefits of teaching for students is the ability to choose where to listen to classes (Farhan et. al. 2018). The advantage of e-learning is manifested, among other things, through greater opportunities for visualisation of individual content, more effective communication between students and teachers, and easier access to teaching materials (Katavić et. al. 2018). According to Sokolova (2018), e-learning is more suitable for part-time students, for lecturers who intend to further their education, but also for people with health restrictions.

Positive online learning experience should be created on the basis of students' online instruction perceptions, namely, interaction, instructional support, and prior experience with computers, to spur learning motivation and inclusiveness. Most students favourably perceived that quality academic experience was enhanced through online instruction in comparison to traditional classroom (Ivers et al., 2005).

The main disadvantage of distance learning is the lack of contact with students. In a study (Strugar et al., 2020), teachers stated that they try to devise ways to motivate students, more than usual because they lack direct contact with students. What most authors point out relates to the marked increase in student laziness and disinterest (Bao, 2020; Strugar et al, 2020; Moralista and Oducado, 2020). According to research, Boliger and Wasilik (2009) 86% of teachers stated that they need more time to prepare for distance learning compared to classical teaching. The results of research (Bognar, Filipov, 2020) showed that thanks to the advancement of technology, professors have more opportunities to expand their knowledge and improve teaching methods.

## Research methodology

In this research we adopted a research methodology developed by Raspor (2021). This new approach allows researchers to collect and analyse data about professors as well as student administration office professionals and students. Furthermore, with the use of this methodology a comparison between specific findings and conclusions can be made. Research analyses quality, satisfaction and expectations among professors and students in Bosnia and Herzegovina during the COVID-19 crisis and lockdown.

The research was based on a survey questionnaire; it was the 1ka online survey.<sup>2</sup> It was up and running between 12 November 2021 and 12 February 2022. The questionnaire was sent to 192 addresses, 101 publics and 91 private faculties in Bosnia and Herzegovina. Data was collected by using an online questionnaire based on seven-point Likert scale. Participants were asked to express their agreement with statements where »1« is used for »I strongly disagree« while »7« means »I strongly agree«. So, all items were positively worded. The data was statistically analysed and tested using SPSS.

The participants were asked to share some personal information such as gender, work experience, age, and to answer questions related to quality, satisfaction and expectation with e-learning during the COVID-19 crisis.

The hypotheses of the research are the following:

- H<sub>1</sub>** Quality of e-learning for professors and students in higher education is positively related with tools, functions, contents and multimedia instructions.
- H<sub>2</sub>** Satisfaction with quality of e-learning will be influenced with perceived usefulness of e-classroom.
- H<sub>3</sub>** Expectations of study with e-learning in future for professors are correlated with the years of work experience.

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<sup>2</sup> Questionnaire link (<https://www.1ka.si/a/356277>; <https://www.1ka.si/a/356274>)

The mentioned correlation in these three hypotheses is indicated by the existing knowledge, which posits improvement of learning outcome, quality communication and multimedia instructions. The criteria for the quality of science and research are clearly specified and have measurable elements, while the situation with the quality of education is far more complex and difficult to measure. The quality of online education determines the level of student satisfaction and contributes to further development of the recognition of the institution. It is closely related to the ease-of-use and the possibility of support from professors, as well as the techniques and media used for teaching. It is important for the universities to strive for improving techniques and providing a reliable source of education.

## Research results

Study included 132 BiH professors, 58 males (44,3%) and 73 females (55,7%) and 202 students, 46 males (22,8%) and 156 females (77,2%). The participants' demographic data is presented in Table 1 and Table 2 below:

*Table 1: Demographic data for professors*

	Frequency	Percent
<b>Participants age groups</b>		
< 25 years old	3	2,3
26–40 years old	52	39,4
41–60 years old	66	50,0
> 61 years old	11	8,3
Sum	132	100
<b>Work experience in this field</b>		
Less than 3 years	11	8,2
3–10 years	38	29,0
more than 10 years	82	62,1
No answer	1	0,7
Sum	131	100



Participant structure based on the academic title		
Professor	17	12,9
Associate Professor	32	24,2
Assistant Professor	38	28,8
Senior Lecturer	5	3,8
Lecturer	8	6,1
Lector	2	1,5
Teaching Assistant	28	21,2
Other	2	1,5
Sum	132	100
Institution of employment		
Faculty within University	113	85,6
Independent Higher Education Institution	19	14,4
Sum	132	100

Source: Author's research

Table 2: Demographic data for students

	Frequency	Percent
Participants age groups		
< 25 years old	175	86,6
26–40 years old	21	10,4
41–60 years old	5	2,5
> 61 years old	1	0,5
Sum	202	100
Enrolled in the academic year 2020–2021		
Freshman year 2020–2021	48	24,5
Sophomore/Junior/Senior year 2020–2021	139	70,9
Graduate	9	4,6
Sum	196	100
Study programme:		
Higher education programme	50	24,8
Associate's degree programme	16	7,9
Bachelor's degree programme	114	56,4
Master's degree programme	10	5,0

Integrated Master's degree programme (Long-cycle Master's degree programme)	6	3,0
Doctoral degree programme	1	0,5
No answer	5	2,5
Sum	202	100

Source: Author's research

Both our datasets were checked for outliers which have not been detected. Correlation tables resulted in low to medium correlations between our independent variables. Multicollinearity does not seem to be a problem since the variation inflation factor (VIF) is well below the marginal value of 5 (Hair, 2010). All variables used in prediction models are normally distributed. Skewness and kurtosis factors are both inside the suggested interval between values of -2 and 2 (Mishra and Pandey, 2019). Normality of distributions was additionally confirmed with variables histograms (Hopkins and Douglas, 1990).

The results reveal that professors have a high level of positive attitude toward e-learning usage, from perceived usefulness of e-classroom (M= 5.54) to e-learning satisfaction (M = 5,17). It seems that professors believe that e-learning is useful and that they are satisfied with the quality of the system. Their expectations for the future are also at high level (M=4,38).

First, we performed a regression analysis for professors (Table 3 and 4). Regression analysis is a statistical method used to examine the influence of independent variables on a dependent variable.

Table 3: Regression analysis H1 and H2 for professors

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	,684	,349		1,961	,052
	Satisfaction	,578	,084	,562	6,895	,000
	Advantages	,234	,081	,235	2,888	,005
a. Dependent Variable: Quality						

Source: Author's research

Depended variable Quality is an important aspect that influences satisfaction and advantages of e-learning.

Table 4: Regression analysis H3 for professors

Model	B	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	4,902	,232		21,087	,000
	Years of pedagogical experience	-,198	,089	-,196	-2,238	,027

a. Dependent Variable: Expectations

Source: Author's research

After that, we performed a correlation analysis for professors (Table 5). Correlation analysis is a type of statistical technique used to measure the strength of a relationship between two variables. It is used to determine whether there is a linear relationship between two variables, and if so, the strength and direction of that relationship.

Table 5: Correlation analysis

		Satisfaction	Advantages	Quality	Expectations	Years of pedagogical experience
Satisfaction	Pearson Correlation	1	,721**	,731**	-,199*	,012
	Sig. (2-tailed)		,000	,000	,024	,889
	N	143	143	140	128	131
Advantages	Pearson Correlation	,721**	1	,639**	-,227**	,148
	Sig. (2-tailed)	,000		,000	,010	,091
	N	143	143	140	128	131
Quality	Pearson Correlation	,731**	,639**	1	-,175*	,056
	Sig. (2-tailed)	,000	,000		,048	,523
	N	140	140	140	128	131
Expectations	Pearson Correlation	-,199*	-,227**	-,175*	1	-,196*
	Sig. (2-tailed)	,024	,010	,048		,027
	N	128	128	128	128	127
Years of pedagogical experience	Pearson Correlation	,012	,148	,056	-,196*	1
	Sig. (2-tailed)	,889	,091	,523	,027	
	N	131	131	131	127	131

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

Source: Author's research

Following the same procedure, we performed a regression analysis for students (Table 6).

Table 6: Regression analysis H1 and H2 for students

Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	B	Std. Error	Beta			
1	(Constant)	,502	,169		2,970	,003
	Satisfaction	,574	,049	,626	11,775	,000
	Advantages	,277	,052	,281	5,287	,000

a. Dependent Variable: Quality

Source: Author’s research

Finally, we performed a correlation analysis for students (Table 7).

Table 7: Correlation analysis

		Satisfaction	Advantages	Quality
Satisfaction	Pearson Correlation	1	,763**	,849**
	Sig. (2-tailed)		,000	,000
	N	267	265	240
Advantages	Pearson Correlation	,763**	1	,778**
	Sig. (2-tailed)	,000		,000
	N	265	265	240
Quality	Pearson Correlation	,849**	,778**	1
	Sig. (2-tailed)	,000	,000	
	N	240	240	241

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Author’s research

Our results show that quality is positively influenced by satisfaction and usefulness among professors ( $b=0.578$ ,  $p=0,000$  and  $b=0.234$ ,  $p=0.005$ ) as well as among students ( $b=0.574$ ,  $p=0,000$  and  $b=0.277$ ,  $p=0.005$ ). **This confirms our hypotheses H1 and H2 completely.**

Our hypothesis H3 tested the influence of work experience on study expectations with e-learning in the future. We detected a statistically significant negative impact ( $b=-0.198$ ,  $p=0,027$ ) and **confirmed hypothesis H3** since more work experience leads to lower expectations in the future.

The research shows how successful quality of e-learning can have a positive impact on the satisfaction of all users. For professors, it is understood that they possess pedagogical as well as certain digital competences. The research results showed that during the COVID-19 crisis, professors faced the challenges of using new tools when teaching,

which was reflected in lower expectations for professors with longer work experience. Therefore, constant education of the teaching staff is necessary, because regardless of whether it is classroom instruction or e-teaching, the teacher is the moderator and creator of the teaching.

## **Conclusion**

Previous studies have examined the benefits and challenges associated with online instruction during regular classroom settings. This study provides new results through the presentation of the challenges and advantages of using e-learning during the pandemic, where both the professors and the students were equally taken aback. The results of this research determined the factors that help ensure the quality of online learning. The study results have highlighted that the satisfaction and usefulness along with tools, functions, contents and multimedia instructions positively influence the quality of professors' and students' online learning experiences. Our results support H1, H2 and H3 set in this study.

COVID-19 crisis tested our ability to deal with large-scale disruptions. E-learning came abruptly with the pandemic, but it has been around for many years. Opportunities are the biggest advantage of e-learning, its implementation and organization. E-learning can provide unique learning styles and improve academic performances both for professors and students.

Students need quality in e-learning along with tools, functions, contents and multimedia instructions. E-learning quality and contents have emerged as a solution to minimize the disruption of educational system and satisfy the needs of students.

Research has shown that expectations of e-learning in the future are correlated with work experience, so professors with longer work experience have lower expectations of e-learning than those with shorter work experience. Therefore, systematic professional development of the teaching staff is essential so that they can approach e-learning and the use of digital tools as efficiently as possible. In addition to pedagogical

competences, the professor must also have digital competences, in order to know which particular digital tool should be applied. It is also necessary to adopt a strategy at the level of Bosnia and Herzegovina, which will ensure and enable equal quality education for students and continuous training of professors at all higher education institutions. Future research should consider the importance of quality in e-learning implementation, effective learning outcome and multimedia instructions that will add value to the education field.

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## **IZAZOVI KVALITETE U PROCESU E-UČENJA ZA VISOKOŠKOLSKE INSTITUCIJE TIJEKOM KRIZE COVID-19 U BOSNI I HERCEGOVINI**

### **Sažetak**

Kriza COVID-19 imala je ogroman utjecaj na obrazovanje i postala je predmetom mnogih znanstvenih istraživanja. Svrha je rada istražiti stavove profesora i studenata o kvaliteti izvođenja nastave i zadovoljstva e-učenjem tijekom krize COVID-19. Ciljevi su istraživanja odgovoriti na pitanje u kojoj su mjeri profesori i studenti zadovoljni kvalitetom izvođenja e-učenja u visokoškolskim institucijama te koja su njihova očekivanja u budućnosti. Istraživanje je kreirano na platformi za istraživanje 1KA i provedeno je od 12. studenog 2021. do 12. veljače 2022. godine u Bosni i Hercegovini. Kao instrument istraživanja korišten je anketni upitnik koji je poslan na 192 adrese, 101 javni i 91 privatni fakultet u Bosni i Hercegovini, a obuhvatio je 132 profesora i 202 studenta. Rezultati istraživanja pokazali su da na kvalitetu izvođenja nastave pozitivno utječu zadovoljstvo i razina korisnosti uporabljenih alata među profesorima, ali i među studentima. Rezultati su također potvrdili da više radnoga iskustva dovodi do nižih očekivanja od e-učenja u budućnosti. Rad predstavlja empirijsko istraživanje koje je provedeno na prostoru Bosne i Hercegovine o utjecaju pandemije COVID-19 na kvalitetu izvođenja e-učenja. Znanstveni je doprinos rada u tome što se on može koristiti

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u istraživanjima vezanima za utjecaj kriza na izvođenje nastave u visokoškolskim institucijama te potencijalnim budućim hitnim situacijama kriza i neizvjesnosti koje rezultiraju novim modelima izvođenja nastave koji kombiniraju učionicu i e-nastavu.

*Ključne riječi:* COVID-19; kriza; e-učenje; kvaliteta; visokoškolske institucije