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### CHALLENGES IN TEACHING AND LEARNING IN HIGHER EDUCATION DURING THE COVID-19 CRISIS, CASE STUDY

Monika Marković<sup>1</sup>, Tihana Sudarić<sup>2</sup>, Marija Ravlić<sup>3</sup>, Željko Barać<sup>4</sup>

<sup>1,2,3,4</sup>University of Josip Juraj Strossmayer in Osijek, Faculty of Agrobiotechnical Sciences Osijek, Osijek, Republic of Croatia

<sup>1</sup>monika.markovic@fazos.hr, <sup>2</sup>tihana.sudaric@fazos.hr, <sup>3</sup>marija.ravlic@fazos.hr, <sup>4</sup>zeljko.barac@fazos.hr

**Abstract:** The COVID-19 pandemic has significantly affected many segments of human life and activities, including the education system. As a consequence, universities are facing challenges on how to continue with quality teaching where face-to-face classes have opted and remote teaching is introduced. Remote teaching and learning usually carry a stigma of being lower quality than the traditional (face-to-face), which is why it is necessary to evaluate the teaching staff as well as the student experience within remote education. The survey conducted at the Faculty of Agrobiotechnical Sciences Osijek, Republic of Croatia aimed to analyze how students as well as teaching staff were satisfied with remote education during the first wave of coronavirus pandemic. Survey results have shown that most of the students were satisfied with the organization and implementation of remote learning and teaching as well. An interesting observation was the importance of teacher-student interaction as well as the teacher presence during remote education.

**Key Words:** COVID-19 pandemic, higher education, remote teaching, remote learning

#### 1. INTRODUCTION

COVID-19 (coronavirus) crisis has caused many changes within the social, health, economic, and education systems worldwide. According to United Nations, UN [1] the COVID-19 pandemic has caused the largest disruption of education in history, having already had a near-universal impact on learners and teachers around the world, from pre-primary to secondary schools, technical and vocational education, and training (TVET) institutions, universities, adult learning, and skills development establishments. The same author claims that by mid-April 2020, 94% of learners worldwide were affected by the pandemic, representing 1.58 billion children and youth, from pre-primary to higher education, in 200 countries. When the coronavirus first appeared in the Republic of Croatia in early 2020, the educational system was not prepared for remote learning, there were no teaching methods or methodology. However, it is important to emphasize that Croatia started education reform in 2016 and that from 2017 digital transformation is also involved in the reform and includes improving the digital skills of students, teachers, professional associates, and principals as well as equipping the schools [2]. Within reform, teacher training began in 2018 through virtual classrooms on the Moodle platform (Loomen) which finally contributed to the rapid application and effective usage of remote learning given the situation caused by the COVID-19 pandemic. As for higher education, the results of a questionnaire conducted by the Ministry of Science and Education (MZO) showed that most higher education institutions (80%) conduct their study programs using various e-learning tools. During the academic year, 2019/2020 students mostly have remote classes, with the chance to return to classrooms in mid-May as needed, in terms of performing practical, laboratory, clinical or artistic exercises.

#### 2. MATERIAL AND METHODS

During the first wave of coronavirus in Croatia, several higher education institutions conducted a study on student and teaching staff experience with the organization and implementation of remote education. Faculty of Agrobiotechnical Sciences Osijek is a member of the Josip Juraj Strossmayer University of Osijek. After the first wave of coronavirus, that is remote learning during the summer semester of 2019/2020 academic year, the Faculty of Agrobiotechnical Sciences has surveyed to analyze student satisfaction with remote learning, i.e. e-platforms that were used, teaching staff readiness and presence, and availability of learning materials. The survey was conducted on 326 students and contained 16 questions. The survey was attended by students of all levels of study, that is BSc, MSc, and professional study. In total, 74.8% of BSc, 21.2% of MSc, and 4% of students of professional studies were included in the survey (figure 1). Furthermore, 85 teachers (assistants, assistant professors, associate professors, professors and associates) were included in survey to analyse which e-platform was mostly used before and during the pandemic, and their satisfaction with remote classes and remote exams.

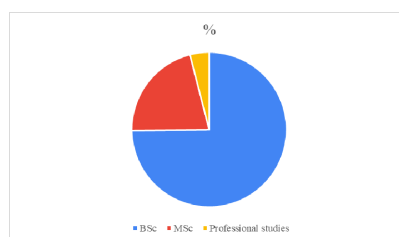


Figure 1. Levels of the study

### 3. RESULTS AND DISCUSSION

According to the survey results, 318 students (97.5%) stated that they were properly informed about remote learning. The students that gave a negative answer belong to study groups whose other members stated that they were notified on time. Furthermore, 2 out of 8 students stated that they do not have access to the Internet in the household, while 7 students stated that they have medium computer literacy, and 1 student stated that they have lower IT literacy. Further, students were asked about the e-learning platform that they have used (multiple answers were allowed). Survey results are presented in figure 2.

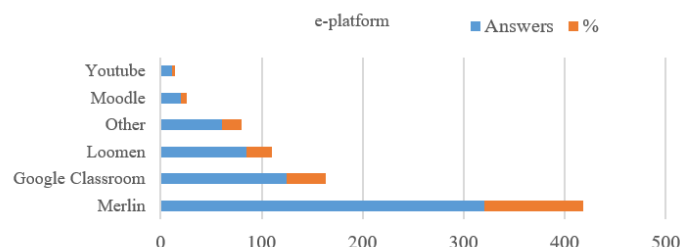


Figure 2. e-learning platform used by students

Most students used Merlin as an e-learning platform (98.2%). Further, students used Google Classroom (38.3%), Loomen (25.2%), Moodle (6.1%), YouTube (3.4%), while 18.7% of students have used other e-learning platforms. Students were asked about the implementation of e-platform in their study before the coronavirus pandemic. The results are presented in figure 3. 25.8% of students very rarely used some of the e-learning platforms before the coronavirus pandemic, 24.8% of students have rarely used, 23.9% of students have sometimes used. 12.9% of students stated that they often used some of the e-learning platforms while 12.6% have always used them.

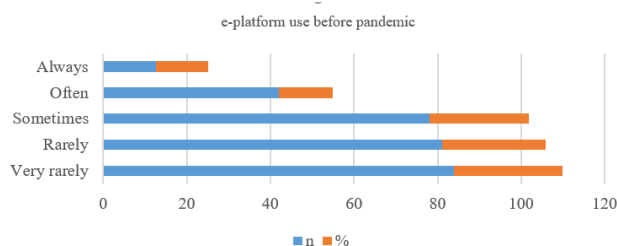


Figure 3. The use of e-platform before the coronavirus pandemic

Furthermore, students were asked to rate how the teaching staff was prepared for performing remote learning (figure 4). 18.7% of students stated that the teaching staff was completely prepared for remote teaching. 31% stated that the teaching staff was prepared, 30.4% sometimes prepared, 13.8% unprepared and 6.1% of students stated that the teaching staff was completely unprepared for remote teaching.

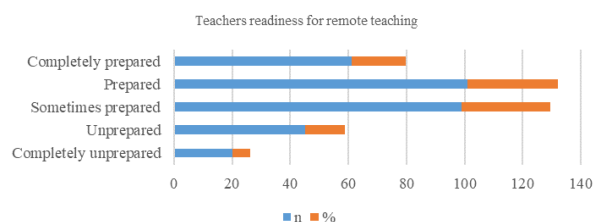


Figure 4. Teaching staff readiness for remote teaching

As for the availability of remote learning materials (figure 5), 34% of students stated that the learning material was very available. 29.1% of them stated that remote learning material was available, 26.7% moderately, 8% rarely and 2.1% declared that the remote learning material was very rarely available.

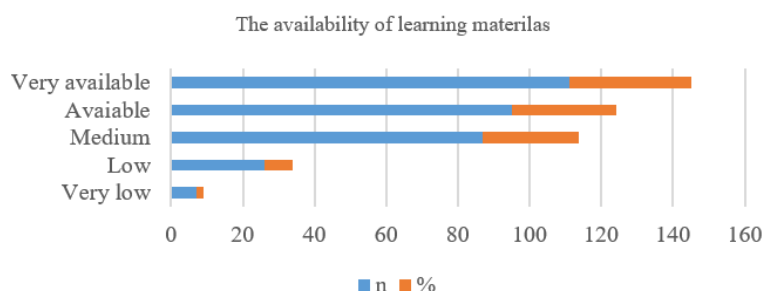


Figure 5. Students opinion about the availability of the remote learning materials

According to survey results, most of the students were very satisfied with the teaching staff presence during remote learning. As it is presented in figure 6, 32.2% of students stated that the teaching staff was always present, 30.1% almost always, 26.7% sometimes. 8.9% of students stated that the teaching staff was rarely present and 2.1% very rarely.

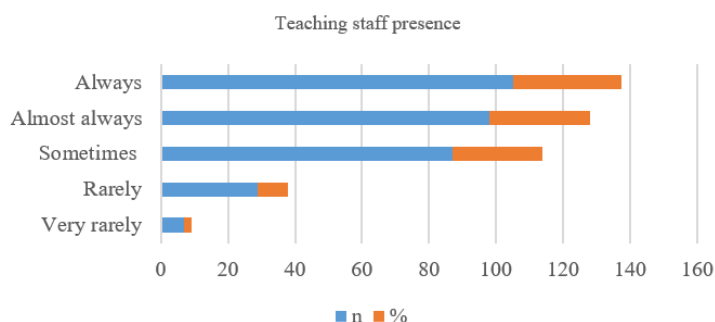


Figure 6. The presence of teaching staff to students during the remote learning

This result emphasizes the importance of the teacher-student relationship within the class environment. Bender [3] gives an opinion about the possible dangers of psychological distance, between instructors and students in any classroom setting. The author claims that the physical remote inherent to online classes can exacerbate this and that teacher presence means creating the perception for students, that the teacher is present right there with them in the process of learning. It should be noted that most often the topic of creating a presence in online education is viewed from the student perspective [4]. According to Anderson et al. [5], teaching presence consists of three critical roles. The first responsibility is the design and organization of the learning experience, then the creation implementation, and monitoring activities, and finally, contribution of academic knowledge and relevant experiences through forms of direct instruction. Also, Hodges et al. [6] claim that careful planning for online learning includes not just identifying the content to cover but also carefully tending to how you're going to support different types of interactions that are important to the learning process. This approach recognizes learning as both a social and a cognitive process, not merely a matter of information transmission.

From the very beginning of remote learning, most questions from students, but also teaching staff were related to evaluation and grading in remote learning. 54.3% of students from the Faculty of Agrobiotechnical Sciences in Osijek have stated that they were satisfied with the exams in remote education. 26.4% of students believe that this form of exams is not an indicator of knowledge. 19.9% of students found that exams in remote education are better than the traditional ones. 12.6% of students believe that performing the exams in remote education is a bad idea, while 8.3% of them stated that the exams in remote education are useless.

Another example is the University of Zagreb [7] that surveyed students and University vice deans during April 2020 (3067 survey participants). The survey topic was organization and readiness to conduct remote education, technical prerequisites, and evaluation of the teaching process during the COVID19 crisis. Survey results showed that 67.5% of students found that coping of the teachers in remote learning was more than good, 11.8% rate it as excellent, and a small percentage (6%) rate it as unsatisfactory. As for remote learning, students have declared that 46.6% of modules were in form of remote learning, 19.1% have stated that some of the modules were in form of the remote learning, and 0.7% none of the models.

An interesting study was conducted by Preisman [8]. The author studied from the teacher point of view, whether creating a greater sense of teaching presence is an effective investment of time and energy. The author has used data collected from student grades, student-instructor communication, discussion board postings, and course evaluations. The author emphasizes two findings. First, that according to the study results there was minimal evidence from this study that demonstrated creating a greater sense of teaching presence in the online classroom was an effective use of the instructor's time and efforts. End the second that the teacher plays a key role in the creation and facilitation of the learning process, but it is likely more important for the teacher to simply be available for students through a well-structured course as opposed to creating a presence of oneself in the online classroom. Barton and Maness [9] claim that one of the greatest challenges in quality online instruction is the design and organization of an environment that appeals to and engages students through communication and feedback. Hodges et al. [7] have stated that well-planned online learning experiences are meaningfully different from courses offered online in response to a crisis or disaster. That is why authors suggest terminology and formally propose a specific term for the type of instruction being delivered in these pressing circumstances: emergency remote teaching.

According to our survey results (85 teachers) at the Faculty of Agrobiotechnical Sciences Osijek, 96.5% of teachers have used Merlin e-platform as a tool in remote teaching, 18.8% have performed classes on Zoom, 8.2% Google classroom, while 4.7% have used Youtube. More than 80% of teaching staff declared that they have not used any e-platforms before the coronavirus pandemic. 40% of teaching staff stated that they are satisfied with the quality of their remote classes, 37.6% were very satisfied, 20% moderately satisfied, 1.2% were unsatisfied and 1.2% very unsatisfied. As for remote on-line exams (multiple answers were allowed), 44.7% of teaching staff stated that will perform the remote examination, 32.9% will perform remote colloquiums. 22.4% stated that they do not plan to perform remote examination and 11.8% colloquiums. The University of Zagreb survey showed that 71.4% of the teaching staff have declared that more preparation (50%) is needed for remote learning than the teaching in the classroom.

#### 4. CONCLUSION

The coronavirus-caused pandemic has spurred rapid changes in the education system, i.e. remote teaching and learning, including adaptation to new technologies, teaching staff training in digital education, and lessons planning by using e-platforms. Although most respondents in our survey did not implement remote teaching or learning before the coronavirus crisis, the results showed that most teachers did well in using e-platforms and remote teaching. Furthermore, what is most important, the student experience with remote teaching and learning was mostly satisfying. As it seems, in the present situation the teacher's role is not only to contribute with the academic knowledge but also to give full support and encourage students as well. Clearly, further teaching staff educations and institutional evaluations are necessary to improve the quality of remote teaching and learning.

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