

Digital education at the University of Montenegro during the COVID-19 pandemic

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Introduction

The digital transformation in higher education is mainly influenced by technological advances, the need for individual flexibility, and the increasing demand for digital skills [1]. Furthermore, the COVID 19 pandemic has accelerated the digital transformation. At the beginning of the pandemic, Higher Education Institutions (HEIs) have reacted promptly by transforming almost all their activities, including teaching & learning, research, administration into a digital format [2]. Digital education included modes of e-learning and distance learning [1].

The previous literature identified various similarities between e-learning and distance learning [2]. However, e-learning presents the delivery of learning through web-based technology and the internet [3], while distance learning presents correspondence course in which learning materials are sent to the students via email or posted at university web site/platform [4]. In general, most of the universities combine both modes for digital education [5]. For this purpose, IT market is offering technologies such as video conference platforms and applications, like Zoom, Adobe connect, Kaltura, Panopto, Microsoft Teams, Google Classroom, etc.

However, the shift to digital education through e-learning and distance learning modes has raised many questions on its quality. Accordingly, to establish effective virtual learning environment, it is necessary to provide suitable digital infrastructure for teaching staff and students. In addition, teaching staff needs digital skills in order to adapt their teaching process as well as pedagogy to online environment [1].

Transformation toward digital education at the University of Montenegro

The use of digital tools for education has been present at the University of Montenegro for a certain time. The Development Strategy of the University of Montenegro for period 2019 – 2024 recognizes the importance of digital education [6]. It became clear that e-learning and distance learning should be included to a much greater extent in the teaching & learning process, and therefore, it was necessary to provide a sophisticated infrastructure and training for both teaching staff and students to overcome the upcoming obstacles and challenges. *The* Center of the Information System (CIS) team has had the most substantial role in the process of digitalization at the University of Montenegro.

At the outbreak of pandemic in Montenegro in March 2020, the University of Montenegro announced suspension of all face-to-face classes. Students that were residing on campuses in Podgorica, Niksic, Kotor and Cetinje were required to move out of dormitories. Most of foreign students on mobility stayed in Montenegro as the country had the lowest amount of recorded cases in Europe in that period. Noteworthy, the University management issued an announcement indicating that teaching & learning processes are to be continued online, using both e-learning and distance learning modes.

Implementation of online teaching & learning at the University of Montenegro was not new, but it was limited to just few faculty units. At that time, the vast majority of teaching staff and students have had little if any experience of online classroom, from both technical and pedagogical point of view. Thus, there was a significant pressure on the CIS team from the very beginning. The CIS team created instructional guides and conducted online workshops to provide teaching staff and students with knowledge on how to use various e-learning platforms (mostly Zoom and Skype) and distance learning (mostly Moodle, University web site and e-mail communication) [7]. Thanks to this, teaching staff have put a lot of effort into setting up online courses, developing learning materials and tests, and holding consultations.

The CIS team has launched a service which provided access to AAA infrastructure to all students at the beginning of the 2018/2019 academic year, namely automatically generated credentials that would be used to access online services provided by the Academic Network [7]. Under 10% of active students used these accounts until March 2020. Full usage capacity was achieved during the pandemic. In order to provide distance learning service, the latest version of Moodle platform has been installed on a virtual server [7].

The CIS team also identified a requirement for additional support in order to resolve all ongoing problems as quickly as possible and started a User Support Service through email address nastava@ucg.ac.me which provided both students and teaching staff with fast replies and support so they could attend classes or give lectures regularly while staying at home [7].

As Montenegrin Law on Higher Education [8] indicates that final exams must be held at the premises of the universities, upon reduction of measures against COVID 19 at the end of May, final exams were organized in June and July. Also, in June, management of the University of Montenegro made an announcement stating that, where applicable, all lab exercises for academic year 2020/2021 should be prepared and recorded during summer break, and delivered to students if situation does not allow face to face exercises. As for the first semester of academic year 2020/2021 there was not state lock-down, classes were held blended, both face-to-face and online, according to the national measures for schools and universities in Montenegro. Face-to-face classes held where it was possible to provide social distancing.

For the current academic year, the CIS team prepared Moodle platform for both e-learning and distance learning modes [7]. Considering that the teaching process requires an audio visual contact, the CIS team has created a cluster made of fourteen BigBlueButton servers which provide a powerful videoconferencing tool, integrated with the existent Moodle platform. Besides, other activities supported by Moodle platform, such as an upload of teaching materials, creation of activities and tests, teaching staff can use this tool to create video conferences, including the possibility of saving them in the real time, setting them for further viewing, defining time limitations and management of entire administration within the same course. Since the beginning of academic year 2020/2021, 11.000 out of 17.000 active students have used this Moodle platform. University of Montenegro plans to further invest in enhancement of digitalization of teaching & learning process as well as in additional student and staff services associated to digitalization. Besides investing in digitalization from its own resources, the University of Montenegro is seeking

for additional funds from the EU programs. Within Erasmus + CBHE 2019 call, University of Montenegro will benefit from received grants from two projects related to enhancement of digital education. The first Erasmus + project “Development of Regional Joint Master Program in Maritime Environmental Protection and Management - MEP&M” with coordination of the University of Montenegro is aiming to implement the first online joint master program in English language using state of the art digital technology for creation of e-learning courses. The second Erasmus + project “Improving the process of education through the development of e-learning multimedia platform and smart classrooms - SMARTEL”, with the University of Montenegro participating as partner institution, is aiming to implement a state of the art multimedia learning platform and smart classrooms at the University level.

Additionally, in order to maintain social distancing in period of pandemic, the CIS team developed a software for electronic submission of required documents and enrollment of candidates at the University of Montenegro [7]. Software was used for enrollment at all study levels, from undergraduate (bachelor degree) to graduate (master degree) level. This was the first time to organize online enrollment at the University of Montenegro.

Conclusion

COVID 19 pandemic has pushed us to rethink how to meet the demands of digital transformation in higher education. At the University of Montenegro, teaching staff put a significant effort into converting their face-to-face lectures into a digital format and have demonstrated a great level of flexibility. To assure digitalization process on the long run, the University is tending to organize trainings for teaching staff in order to further enhance their skills and know-how. Additionally, University will provide further investments in the technical infrastructure supporting digitalization of education and student services in order to establish blended learning approach in its teaching & learning process.

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