

Implementation and Evaluation of Online Learning at the Faculty of Dental Medicine and Health, Osijek, Croatia – Project Report

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ABSTRACT

This paper presents the report on the project of implementation and evaluation of online learning at the Faculty of Dental Medicine and Health Osijek. The aim of this project was to include online learning in the teaching process at the Faculty of Dental Medicine and Health, and to assess student's satisfaction with online learning implemented during elective courses in social sciences. Several dislocated study programs were included, where video conferencing equipment was installed and video conference lectures were held during elective courses in social sciences (Health economics, Health management, Quality control) using Carnet video conferencing system. Lectures were recorded and made available for students to access at different times and locations. An anonymous survey assessing students' experience and perception of online education was conducted after each course as a part of the regular anonymous course evaluation survey. A large proportion of students were satisfied with the online lectures and agreed that online teaching improves education quality.

Key words: online learning, videoconferencing, education, Croatia

Introduction

Online learning comprises a broad set of applications and processes and the definition varies depending on the organization and the intended use. At its core, it involves electronic means of communication, and when used for education, we can say it is the process of learning enhanced by the use of electronic technology and the Internet to deliver instructional materials and activities¹. It involves virtual communication between students and teachers, where physical distance becomes irrelevant². Online learning provides multiple benefits, including increased flexibility, accessibility, low cost, individualized learning, and has been demonstrated to be as effective as conventional face-to-face teaching^{3,4}. Despite the numerous advantages, appropriate technology and a standard of training and knowledge of implemented technology are needed for online learning to be effective. Additionally, constant evaluation and comparison of online and face-to-face teaching are needed, with systematic assessment of students' perception and satisfaction. This is especially important among health care faculties, a major part of

which involves learning clinical and technical skills. For that purpose, we conducted the project of implementation and evaluation of online learning at the Faculty of Dental Medicine and Health Osijek, beginning with the elective courses in the field of social sciences. The aim of this project was to include online learning in the teaching process at the Faculty of Dental Medicine and Health, and to assess students' satisfaction with online learning implemented during elective courses in social sciences.

Online Learning – Advantages and Challenges

To prepare qualified health professionals for the internet-based era of digital information, the teaching methods need to gradually change. Over the last decades, the increasing popularity of online learning helped to overcome some problems with traditional learning, such as time and space restrictions. Online learning makes teaching and learning

separable with a flexible approach that allows students to access their courses at different times and locations via internet-based information delivery systems⁵. A crucial advantage of online learning is enhanced individualized learning, as students control the pace of instruction and learn according to their ability. Students can interact and organize given information by pausing to research topics they do not understand or rewinding to revise the previous knowledge⁶. However, some factors can still negatively affect online learning, such as academic and technical skills, students' motivation, and the need for minimum equipment, including a personal computer and a stable Internet connection⁷. Ineffective design and arrangement of multimedia materials can lower the quality of online learning. Teachers have to spend more time preparing for classes and adjusting course material to be appropriate for online education. Finally, with the lack of face-to-face interaction, students feel isolated from their peers, which can impair their engagement and satisfaction, and reduce cognitive resources⁸. United States Education Department conducted research on online learning studies and highlighted the main findings to be students' better performance during online courses than during traditional instructional classes, and the best performance during blended courses with combined elements of traditional and online courses⁹. Blended courses are generally well accepted by students, who tend to be more participative during online classes. This may be explained by the fact that students take lessons in the comfort of their homes, without having to travel or be confined to the classroom. Teachers can also benefit from a blended course because once prepared and well organized, online teaching saves time and effort with the same effectiveness¹⁰.

Online Learning at the Faculty of Dental Medicine and Health Osijek

The project of online learning implementation at the Faculty of Dental Medicine and Health Osijek was select-

ed and supported as an internal scientific-research project at the University of Osijek. Faculty of Dental Medicine and Health Osijek conducts several dislocated undergraduate and graduate study programs. Graduate university study program of Physiotherapy in Orahovica and Graduate university study programs of Nursing in Osijek, Slavonski Brod, and Čakovec were included in this project. After video conferencing equipment was installed for every study program included, video conference lectures were held during elective courses in social sciences (Health economics, Health management, Quality control) using Carnet video conferencing system. Lectures were recorded and made available for students to access at different times and locations, enhancing individualized learning.

An anonymous survey assessing students' experience and perception of online education was conducted after each course as a part of the regular anonymous course evaluation survey. The questionnaire was adjusted to be relevant to a completed course by professors of the Department of social sciences. Students answered the questions by choosing a number between 1 and 5 that best represented their agreement with a given statement (1 = complete disagreement, 5 = complete agreement). All participants agreed to the consent statement for voluntary participation and the declaration of anonymity prior to participation. The most relevant findings were as follows: 76.7% of students agreed (grades 4 and 5) that video conference teaching improves education quality, and 83.6% were satisfied with the video conference lectures (grades 4 and 5). Furthermore, the majority of students agreed that video conferencing enables the communication between multiple lecture halls in different locations around the world (95.9%), and that video conferencing can engage the world's most famous experts in the field of social sciences (94.5%) (Table 1).

TABLE 1
THE MOST RELEVANT QUESTIONS IN THE SURVEY AND RESPONSES GIVEN BY STUDENTS

Questions	Frequency distribution (%) for grades chosen as responses to statements (n=73)				
	1	2	3	4	5
Video conference teaching improves education quality	1.4	5.5	16.4	30.1	46.6
The professor was able to communicate with students in multiple locations without technical problems	0.0	13.7	21.9	21.9	42.5
Video conference teaching is a way to introduce additional IT technologies such as holographs and augmented reality	1.4	0.0	20.5	21.9	56.2
By video conferencing it is possible to engage the world's most famous experts in the field of social sciences	0.0	0.0	5.5	19.2	75.3
Video conferencing enables the communication between multiple lecture halls in different locations around the world	0.0	0.0	4.1	19.2	76.7
I'm satisfied with the video conference lectures	0.0	0.0	16.4	32.9	50.7

Online Learning amid and after the COVID-19 Pandemic

Our project at the Faculty of Dental Medicine and Health Osijek proved to be most useful since the COVID-19 outbreak disrupted traditional education. With the existing video conferencing equipment and teachers who gained experience in online education while participating in the project, the transition to online learning was facilitated. The COVID-19 pandemic has a dramatic effect on every aspect of community and society worldwide, substantially affecting education at all levels¹¹. The education system must be successful at responding to the challenge of developing high-quality education methods and adequate innovations supplementing the clinical clerkship because future health professionals depend on it. Growing evidence claim that online learning is equally effective to traditional methods¹², shows improved student motivation and concentration levels¹³ and enhanced academic performance due to its flexibility and accessibility¹⁴. A recent meta-analysis of studies comparing traditional and online education in the areas of knowledge, practical skills, and satisfaction showed no significant differences between online and classroom lectures¹⁵. The results of the study conducted at the University of Zagreb showed that most traditional classes could be transferred to online lectures, according to students' opinion who found pre-recorded lectures to be the most useful segment¹⁶. If done correctly, online course material enriches the curriculum and transfer suitable segments of traditional classes to an online environment, leaving more time for specific segments of course to be delivered by traditional teaching. Teachers' satisfaction and attitudes have also been assessed, with similar re-

sults: teachers agree that preparing and organizing online course is more time invasive, but they plan to continue teaching online due to flexibility, interactivity with students that is of higher quality than in traditional classrooms, and opportunity of professional growth¹⁷. Since online learning is globally well accepted, there is a great chance that online teaching will continue even after pandemic-related restrictions¹⁸.

Conclusion

Online learning is a relatively new method of education that is proving to be an adequate replacement for some types of traditional lectures. Generally well-accepted and with numerous advantages, online learning is still in a stage of explorations and adjustments by teachers and students, which has been accelerated by the COVID-19 pandemic. Educators are currently trying to combine the strengths of both teaching methods into a blended teaching and learning experience. The project of implementation online learning at the Faculty of Dental Medicine and Health Osijek was the beginning of online learning for our teachers and students, which was well organized and accepted, and as such greatly eased the transition to fully online education during the pandemic.

Acknowledgements

The study was funded by grants dedicated to funding of internal scientific-research and artistic projects at the Josip Juraj Strossmayer University of Osijek, grant number ZUP2018-89_(1) (to Davorin Pezerović).

REFERENCES

1. COOK DA, STEINERT Y, *Med Teach*, 35 (2013) 930. doi: 10.3109/0142159X.2013.827328. — 2. O'DOHERTY D, DROMEY M, LOUGHEED J, HANNIGAN A, LAST J, MCGRATH D, *BMC Med Educ*, 18 (2018) 130. doi: 10.1186/s12909-018-1240-0. — 3. AL-AZZAM N, ELSALEM L, GOMBEDZA F, *Heliyon*, 6 (2020) e5704. doi: 10.1016/j.heliyon.2020.e05704. — 4. KIM JW, MYUNG SJ, YOON HB, MOON SH, RYU H, YIM JJ, *PLoS One*, 15 (2020) e0243958. doi: 10.1371/journal.pone.0243958. — 5. PEI L, WU H, *Med Educ Online*, 24 (2019) 1666538. doi: 10.1080/10872981.2019.1666538. — 6. DAVIES K, *Clin Teach*, 15 (2018) 1. — 7. ABBASIA, AHMED N, SAJJAD B, ALSHAHRANI A, SAEED S, SARFARAZ S, ALHAMDAN RS, VOHRA F, ABDULJABBAR T, *Work*, 67 (2020) 549. doi: 10.3233/WOR-203308. — 8. SEYMOUR-WALSH AE, WEBER A, BELL A, *Rural Remote Health*, 20 (2020) 6038. doi: 10.22605/RRH6038. — 9. MEANS B, TOYAME Y, MURPHY R, BAKIA M, JONES K, Evaluation of evidence-based practices in online learning: a metaanalysis and review of online learning studies, US Department of Education, <https://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>. — 10. SHAH D, *Climacteric*, 19 (2016) 3. doi: 10.3109/13697137.2015.1115314. — 11. MARSHALL AL, WOLANSKY-SPINNER A, *Mayo Clin Proc*, 95 (2020) 1135. doi: 10.1016/j.mayocp.2020.04.015. — 12. SCHLENZ MA, SCHMIDT A, WÖSTMANN B, KRÄMER N, SCHULZ-WEIDNER N, *BMC Med Educ*, 20 (2021) 354. doi: 10.1186/s12909-020-02266-3. — 13. RODRIGUES H, ALMEIDA F, FIGUEIREDO V, LOPES SL, *Comp Educ* 136 (2019) 87. — 14. REGMI K, JONES L, *BMC Med Educ* 20 (2020) 91. — 15. Richmond H, Copsey B, Hall AM, Davies D, Lamb SE, *MC Med Educ* 23 (2017) 227. doi: 10.1186/s12909-017-1047-4. — 16. BANOVAC I, KATAVIC V, BLAZEVIC A, BICANIC I, HLADNIK A, KOVACIC N, PETANJEK Z, *Croat Med J*, 62 (2021) 173. doi: 10.3325/cmj.2021.62.173. — 17. MAYADAS AF, BOUME J, BASCICH P, *Science*, 323 (2009) 85. — 18. MOTTE-SIGNORET E, LABBÉ A, BENOISTB G, LINGLARTF A, GAJDOSF V, LAPILLONNEH A, *Med Educ Online*, 26 (2021) 1919042. doi: 10.1080/10872981.2021.1919042.

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UVOĐENJE I EVALUACIJA VIDEOKONFERENCIJSKE NASTAVE NA FAKULTETU ZA DENTALNU MEDICINU I ZDRAVSTVO OSIJEK – IZVJEŠĆE O PROJEKTU

SAŽETAK

Ovaj rad predstavlja izvještaj o projektu implementacije i evaluacije online-nastave na Fakultetu za dentalnu medicinu i zdravstvo Osijek. Cilj projekta bio je razviti praktične vještine i predvidjeti eventualne izazove i poteškoće tijekom online-učenja, postupno povećavajući udio kolegija koji će se uključiti u proces online-nastave. Uključeno je nekoliko dislociranih studijskih programa. Instalirana je videokonferencijska oprema nakon čega je održana online-nastava iz izbornih kolegija u području društvenih znanosti (Ekonomika u zdravstvu, Menadžment u zdravstvu, Kontrola kvalitete) korištenjem CARNET-sustava. Predavanja su snimljena i postavljena na poslužitelj čime je studentima omogućen pristup njima u bilo koje vrijeme i na bilo kojem mjestu. Nakon svakoga kolegija provedena je anonimna anketa kojom se ispitalo iskustvo i mišljenje studenata o online-nastavi. Gotovo svi studenti bili su zadovoljni online-nastavom i mišljenja su da ona poboljšava kvalitetu obrazovanja.