


COVID-19 challenges in organising teaching at a faculty of pharmacy

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We come from Bosnia and Herzegovina, a small country in western Balkans. Our Faculty of Pharmacy at the University of Sarajevo was opened in 1973, but from then on there was no kind of online teaching. So when the COVID-19 pandemic broke out, and when the university decided to stop all kinds of ‘in-class’ teaching (12 March 2020),¹ we were faced with something new.

We work at the Department of Pharmaceutical Technology, where we teach regular courses on ‘Drug Formulation’ and ‘Industrial Pharmacy’. Students take classes in these subjects in the seventh, eighth and ninth semesters. The exercises are practical and last several hours. On 25 March 2020, classes in the lecture hall were suspended until further notice by the decision of the Senate of the University of Sarajevo,² and then we realised that we must embark on the adventure of organising online classes.

We carried out short research on available online teaching platforms to find basic information on the platform’s capabilities, identify their advantages and disadvantages, and check their commercial prices.

We studied the following platforms for online courses: *Google Meet*, *Adobe Connect*, *Zoom* and *BigBlueButton*, and the following platforms for online examinations: *Exam.net*, *Virtualx*, *Google Forms*, *Skillsbook*, *Papershala*, *Edbase*, *Kaldin* and *TCEexam*.

After examining the possibilities of the available online teaching platforms, we agreed that Zoom and Google Meet provide the best results for running online courses. Adobe Connect, Blackboard Collaborate and BigBlueButton work on the same principle, but professional versions of these platforms were quite unaffordable to us.

The results for the online examination platforms are summarised in [table 1](#).

Given the security and price of the platforms, we concluded that Exam.net currently meets our criteria, but that it would be necessary to use two platforms simultaneously during the examination, one of which would allow an established video connection with students during the examination (eg, a combination of Exam.net and Zoom). Students accessed the examination platform from their laptop while simultaneously established a video connection with the teacher on their mobile device.

At the end of the semester, we conducted an online survey in which 60 (70.93%) of 86 students participated, and for 98.4% of the students this was their first online learning experience.

Although it is assumed that current students (digital natives) have adequate information and communications technology competence, they differ in their computer and information literacy as they come from different socioeconomic backgrounds.³ Of the students, 21.3% had technical difficulties (ie, unstable connection). One of them said she/he has problems with misunderstanding from parents who required help with housework at the time of the lecture because she/he comes from the countryside. Of the students, 75% were satisfied with the conducted online classes at our department. One-third found it easier to follow theoretical lectures online. Here are some comments from the students:

Although teaching assistants and professors did their best, I prefer lectures in the classroom which gives me the chance to interact with the teacher and my friends.

I don’t have the impression that I’m at the lecture, the presence of the family members makes it difficult to concentrate completely.

I miss my colleagues.

Of the students, 93.4% agreed that some parts of the modules should be continued online after the pandemic due to increased concentration (86.9%), attending classes from the comfort of their own home (88.5%) and student-centred process (60.7%).

41% of the students agreed that the available video material related to working on the equipment enabled them to work independently. Slightly more than half agreed that they could independently make pharmaceutical preparations in a laboratory based on available online material.

Of the students, 90.2% were satisfied with online examinations and the platform used to conduct the examinations (88.5%). All students were satisfied with the results achieved in online knowledge tests and 85.2% believe that they would not achieve better results if examinations were in class. This result is very interesting considering that the pass rate on this year’s online examination for ‘Drug Formulation’ is much higher (78.94%) compared with last year’s (53.79%), but the average grade is very similar (80.1% and 80.3%). The pass rate on this year’s online examination for ‘Industrial Pharmacy’ is much lower (37.3% compared with 62.84%); however, there was no significant difference between the knowledge scores.

We believe that our efforts to overcome an unexpected situation, for which we had no backup plan, came out with a good result, which was confirmed by our students.



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Table 1 Advantages and disadvantages of tested online examination platforms*

Online examination platforms	Advantages	Disadvantages
Edbase	Lockdown screen, timer, automatic grading for MCQ questions and manual grading for essays, unlimited question pools, smart grading and reporting system.	Paid-only service (may be a problem for undeveloped or developing countries).
Exam.net	Different security level lockdown screen, timer, supports different types of questions, ideal for essay-type tests or tests that contain a combination of MCQ and essay questions, automatic and manual grading, supports uploading of PDF files or pasting from other documents directly into the examination tool, no need for student accounts, can monitor student activity during examination, sharing examination with other teachers.	Paid-only service (may be a problem for undeveloped or developing countries).
Google Forms	Free of charge, unlimited number of students, supports different types of questions.	Security levels if a Chromebook is managed by the school for each student, unreliable grading system.
Papershala	An easy and simple user interface, reusable question option.	Supports only MCQ, no security options.
Virtualx	Role-based access and user security, supports formulas and equations, supports different types of questions.	No security options.

*Based on our personal experience.

MCQ, multiple-choice questions.

Online teaching has some great advantages over traditional, but lack of human interaction and the social side of learning are very critical.

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