



## Distance education of medical students during COVID-19 pandemic

**T. Sukhomlyn**  
**L. Hordiienko**  
**A. Sukhomlyn**  
**T. Zaporozhets**

*Ukrainian Medical Stomatological Academy*

### Article info

Received 08.03.2020  
Accepted 30.04.2020

*Sukhomlyn, T., Hordiienko, L., Sukhomlyn, A., Zaporozhets, T. (2020). Distance education of medical students during COVID-19 pandemic. Fundamental and applied researches in practice of leading scientific schools; 38 (2), 119-121.*

1) PhD (Medicine), Associate Professor of the Department of Physiology, Ukrainian Medical Stomatological Academy

2) PhD (Medicine), Associate Professor of the Department of Microbiology, Ukrainian Medical Stomatological Academy

3) PhD (Medicine), Instructor of the Department of Microbiology, Ukrainian Medical Stomatological Academy

4) PhD (Medicine), Professor of the Department of Physiology, Ukrainian Medical Stomatological Academy

The novel coronavirus (COVID-19) pandemic has changed our habitual world. It has affected all social activities, including medical education. Academic educational community has been forced to face up to the transition from traditional classroom teaching model to distance learning. As a result the way of learning organization is seriously changing. Educators around the world develop new online content, adapt curricula, upskill digital competencies, and adjust teaching approaches.

This study analyzes practical differences and methodological specificities of distance learning modalities. The purpose of this article is to highlight different approaches and available e-learning tools which can be useful for online learning. The present work describes different methods of synchronous and asynchronous learning considering our experience of their application in distance education. Also, these modes can be successfully used in combination with traditional teaching. There is no doubt that online learning will increase impact on medical education over the coming years.

**Key words:** *distance learning; medical education; online platform; learning management systems; COVID-19; undergraduate education.*

### Introduction

This year our medical education has confronted with novel challenge, COVID-19 pandemic. Originating in China, it has disseminated throughout the world. The World Health Organization recommended [17] social distancing and self-isolation measures which included distance learning in higher education institutions. This pandemic has disrupted medical education across the globe [1, 10, 13], including Ukraine.

In the era of information technology, distance education modalities are available to almost all students. Although effectiveness of online learning remains unknown it is increasingly popular in modern education [11]. This learning style is used mostly for specialization courses in continuing medical education which allows combining courses with other activities. So distance learning in medicine is more common in postgraduate education [8, 15]. Also, online

learning has been used as method that facilitates classroom face-to-face learning. Recent studies [2, 7, 18] did not demonstrate significant difference between online learning and traditional education, but there were limited evidences of e-learning effectiveness due to inconsistent results in small studies. But remote teaching is still a new experience for Ukraine where traditional classroom teaching dominates in sphere of undergraduate medical education.

### Results and discussions

Transition from live to remote learning required great efforts of instructor who had never taught in the virtual classroom. Educators had to create online content, solve a lot of technical problems, and evaluate learners. Choice of teaching tactics and tools could have a big impact on effectiveness of distance learning. David Cook [5] describes key steps of web-based learning: perform a needs analysis,

determine technical resources and needs, evaluate software, secure commitment from all participants, develop content, encourage active learning, evaluate learners and course. Time constraints make this way especially difficult to occur for educators who have never faced online teaching [14]. Therefore we used methodological and technological experience of our colleagues.

There are a lot of methods of online learning which have been used in medical education. These methods can be divided into individual and collaborative learning. We conducted collaborative learning for groups of 12-13 students (medical and dental faculties). This learning style can be sub-divided into synchronous (live sessions, instant messaging, and live forums) and asynchronous (file sharing, discussion boards, and email) [11, 16, 18]. To achieve a better result we combined elements of both methods.

Live-video conferencing provides effective synchronous learning and opportunity for face-to-face interaction when lockdown limits person meetings [10]. Interactivity between the instructor and the student is better regarded by the learners because they can discuss their learning and ask question. Also, teacher can see if students understand the material. It's much easier when you see student's facial expression or hear tone of voice. Naturally, video-conferencing tools like "Zoom" or "Skype" have become a popular mode in distance learning. But specialists do not recommend to rely on only this method because online conferencing platform often are overloaded [6]. Poor connection, limited time of live session can be problem too. In addition, some students reported that they feel fatigued from long looking at the screen after several live sessions a day [2]. Therefore, teacher always should remember this arranging schedule of video-conferencing. We conducted live sessions via such accessible and user-friendly platform as "Zoom". This platform has a lot of useful tools (recording of session, survey, chat room) for distance learning. These tools can be used for integration of classroom and remote learning in the future [8]. We also used instant messaging as channel of connection with learners. It was extremely convenient for quick questions and live sessions engagements [4].

Synchronous learning resembles face-to-face teaching but it also has significant weaknesses. Live sessions are not always accessible to all participants. Using of technologies can limit ability of some students to participate in educational activities in real time. All students need to have up-to-date computers, unlimited data plans on their smartphones, and reliable internet access. Sometimes our students could not join video-conference due to technical problems. Software program could crash taking time to restart it. Synchronous learning, however, was effective and attractive to students.

Educators have been using methods of asynchronous learning very successfully for a long time. Asynchronous learning stimulates independence because students can choose content and work at their own pace. Remote learning allows students to study at a convenient time.

Asynchronous communication (email, discussion boards) may cause a significant delay in interaction between teacher and students. However, in this case students have time to ponder their response. This method of

communication stimulates reflection and independence of learners. Also, it is accessible and reliable.

Asynchronous methods encourage gaining knowledge. Many students are able to find necessary information, others needs instructor's help. Therefore distance education requires a lot of teaching content. The simplest mode of delivery of contents is file sharing. Teacher provides students with reading assignments (textbooks or links for reading), multimedia (slideshows, animations, prerecorded video or audio), and instructions (learning objectives, self-assessment questions).

Lectures play an important role in online learning as well as in face-to-face learning. It is useful to have recordings of all lectures and practicals on video. But format of the online lecture differs from the traditional. Virginia Gewen [6] advises to create succinct video lecture. Students would rather watch a series of short videos than a single long video. Therefore, educators should focus on the most important things that students have to learn. Also, many instructors recommend creating screencasts (e.g. PowerPoint presentations) with audio overlay which creates a sense of presence. Students are more likely to watch slides with teacher's voice. We used such tools as "VoiceThread" and "Zoom" for recording online lectures.

Thus, teachers have to use a lot of methods of online learning. It can be difficult for teachers to delivery online content and manage their classes. Consequently learning management systems (LMS) have become increasingly common in distance education. Most of existing LMS are commercial products. We chose Google classroom as LMS in our online teaching because this service is free, user-friendly, and accessible. Participants can access the Google classroom using a private code. Instructors and students can send messages through email and chat room. Teachers can share files and hyperlinks, create assignments (clinical cases, study questions) and grade them, monitor the progress of each student. This platform allows to create quizzes for students with multiple-choice questions and single-answer questions. Software program can automatically grade answers.

Evaluation of students involved answers on tests, assignments, and interview during live sessions. According to our results academic performance of most students did not change significantly after transition from classroom teaching to distance education. Online learning required hard work, strong motivation and constant efforts of students [3]. Some students showed low academic achievement under these circumstances. There are many reasons for decreasing of academic performance: lack of experience in distance education; lack of motivation; problems with internet access, lack of IT skills. Usual methods to handle low academic achievement were not available due remote learning. So we used phone, e-mail, instant messaging to communicate with these students motivating them, encouraging a positive attitude, offering alternative ways of communication, and stimulating learner interaction.

We created a short survey to collect feedback from our students in Google classroom. We asked about their attitude to distance education and our online courses. Most of students who have taken part in survey found the online learning to be informative and interesting. They remarked a

lot of advantages of remote learning: 1) ability to study at their own pace, self-regulation of learning; 2) students can learn whenever and wherever they want; 3) accessibility of learning online content; 4) individual approach; Also, students noted disadvantages of distance education: 1) necessity to have fast internet and access to devices; 2) lack of practical sessions; 3) lack of social interaction. However, the benefits of online learning greatly outweigh the disadvantages.

Distance education has strengths as well as weaknesses. Longhurst et al. [9] highlight strength, weakness, opportunity, threat (SWOT) analysis of transition to distance education: 1) strengths (development of new online resources, upskilling in new technologies); 2) weaknesses (time constraints, lack of practical sessions, issues with assessment); 3) opportunities (academic collaboration, working remotely, incorporation of blended learning in future curriculum); 4) threats (reduced student engagement, diminished teacher / student relationship). Today all teachers have to develop online courses to be ready for transition to distance education in case of such situation as lockdown [12]. Moreover, e-learning has become essential part of medical education and its impact will increase in the future.

## Conclusions

The best way of distance education is using of different modes simultaneously (e.g. online learning platform, video conferencing, email, group chat and messaging) to improve interaction between instructor and participants.

Despite some important problems, online learning proves its effectiveness in medical education. Distance education would never replace face-to-face interaction between instructor and students but it gives opportunity to continue training of physicians during these uncertain times. In addition, the advantages of online education can be effectively used to amplify traditional teaching models in the future. We can expect the modalities of online learning will probably increase over the coming years.

Future studies could analyze the effectiveness of distance education to promote the quality of the training for medical students.

## References

1. Ahmed, H., Allaf, M., & Elghazaly, H. (2020). COVID-19 and medical education. *Inf Dis.* [https://doi.org/10.1016/S1473-3099\(20\)30226-7](https://doi.org/10.1016/S1473-3099(20)30226-7).
2. Berndt, A., Murray, C. M., Kennedy, K., Stanley, M. J., & Gilbert-Hunt, S. (2017). Effectiveness of distance learning strategies for continuing professional development (CPD) for rural allied health practitioners: a systemic review. *BMC Medical Education*, 17, 117. <https://doi.org/10.1186/s12909-017-0949-5>.
3. Bin Mubayrik, H. F. (2020). Exploring Adult Learners' viewpoints and motivation regarding distance learning in medical education. *Advances in Medical Education and Practice*, 11, 139-146.
4. Buelow, J. R., Barry, T., & Rich, L. E. (2018). Supporting learning engagement with online students. *Online Learn*, 22, 313-340.
5. Cook, D. A., & Dupras, D. M. (2004). A practical guide to developing effective web-based learning. *J Gen Intern Med*, 19(6), 698-707.
6. Gewin, V. (2020). Five tips for moving teaching online as COVID-19 takes hold. *Nature*, 580, 295-296.
7. Groenwold, R. H., & Knol, M. G. (2013). Learning styles and preferences for live and distance education: an example of a specialization course in epidemiology. *BMC Medical Education*, 13, 93. <https://doi.org/10.1186/1472-6920-13-93>.
8. Kanneganti, A, Lim, K. M. X., Chan, G. M. F., Choo, S. N., Choolani, M., Pratt, I. I., & Logan, S.J.S. (2020). Pedagogy in a pandemic – COVID-19 and virtual continuing medical education (vCME) in obstetrics and gynecology. *Acta Obstet Gynecol Scand*, 99, 692-695.
9. Longhurst, G. J., Stone, D. M., Duloher, K., Scully, D., Campbell, T., & Smith, C. F. (2020). Strength, Weakness, Opportunity, Threat (SWOT) Analysis of the Adaptations to Anatomical Education in the United Kingdom and Republic of Ireland in Response to the Covid-19 Pandemic. *Anatomical Sciences Education*, 13, 298-308.
10. Moszkowicz, D., Duboc, H., Dubertret, C., Roux, D., & Bretagnol, F. (2020). Daily medical education for confined students during COVID-19 pandemic: A simple videoconference solution. *Clin Anat*. <https://doi.org/10.1002/ca.23601>.
11. Regmi, K., & Jones L. (2020). A systemic review of the factors-enablers and barriers-affecting e-learning in health sciences education. *BMC Medical Education*, 20, 91. <https://doi.org/10.1186/s12909-020-02007-6>.
12. Rose, S. (2020). Medical student education in the time of COVID-19. *JAMA*. <https://doi.org/10.1001/jama.2020.5227>.
13. Pather, N., Blith, P., Chapman, J. A., Dayal, M. R., Flack, N., & Fogg, Q. A. et al. (2020). Forced disruption of anatomy education in Australia and New Zealand: an acute response to the Covid-19 pandemic. *Anatomical Sciences Education*, 13, 284-297.
14. Sandhu, P., & Wolf, M. (2020). The impact of COVID-19 on the undergraduate medical curriculum. *Medical education online*. <https://doi.org/10.1080/10872981.2020.1764740>.
15. Schneder, S. L., & Council, M. L. (2020). Distance learning in the era of COVID-19. *Archives of Dermatological Research*. <https://doi.org/10.1007/s00403-020-02088-9>.
16. Warden, C. A., Stanworth, J. O., Ren, J. B., & Warden, A. R. (2013). Synchronous learning best practices: An action research study. *Computers & Education*, 63, 197-207.
17. WHO. (2020). Coronavirus disease (COVID-19) advice for the public. URL: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
18. Yamagata-Lynch, L. C. (2014). Blending online asynchronous and synchronous learning. *International Review of Research in Open and Distributed Learning*, 15(2), 189-212.