DISTANCE LEARNING TECHNOLOGY IN TRAINING COMPETENT MASTER OF DENTISTRY UNDER EXTREME CONDITIONS BY EVALUATION OF FOREIGN STUDENTS

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ABSTRACT

The object of research: Masters of Dentistry professional training in Bogomolets National Medical University (Kyiv, Ukraine) with the distance learning technology
Investigated problem: Educational process in extreme condition as pandemics and wars, possible ways to solve the problem how students and teachers cope with both challenges in Ukraine on the way of preparing competent doctor from the point of view of foreign students.
The main scientific results: Preliminary data of medical university students from foreign countries – future masters in dentistry of the Bogomolets Medical University (Kyiv, Ukraine) survey, conducted in term April-November 2022 about their perceptions of online learning and teaching in extreme conditions as they experienced during lockdown in terms of COVID -19 outbreak and continuing russian`s aggressive war in Ukraine. Our findings from survey concern questions of student`s general view on online educational technology as well peculiarities of approaches in teaching we can use for acceptable in such extreme conditions educational outcome. We start discussion about some useful methodological approaches for distance education technology in extreme conditions.
The area of practical use of the research results: Sharing with educational community our experience and features about distant learning in extreme conditions of dental students.

1. Introduction

1. 1. The object of research

The professional training of a doctor based on a competency-based approach is the paradigm of modern higher medical education. Improving its quality is constantly in the active segment of the activities of both foreign and domestic specialists. Extreme conditions – epidemic threats and wars make significant adjustments to the organization of the educational process in institutions of higher medical educational institutions (HMEI).

1. 2. Problem description

At a time when the international educational environment was actively looking for a solution to educational problems in connection with the threat of the spread of COVID-19, a full-scale military aggression of russia unfolded in Ukraine. The system of higher education, in particular medical education, has met with an additional challenge: how to ensure the professional training of a specialist in such extreme conditions? The situation was aggravated by the need to protect the lives of students and teachers and evacuate from dangerous areas, which include Kyiv. The format of the educational process in such conditions has changed its traditional forms and methods. Distance learning development came to the fore.

The objective of distance learning is to provide citizens with the opportunity to exercise the constitutional right to receive education and professional qualifications, advanced training, regardless of gender, race, nationality, social and property status, type and nature of occupation,

worldview, affiliation to parties, attitude to religion, religion, health status, place of residence in accordance with their abilities [1].

Immersion in the retrospective of the emergence of distance learning testifies to its origins from the 18th century (the Boston method of "short hands" – communication of participants in the educational process via mail) and proves that this technology has been successfully functioning for centuries. Studies by American scientists have confirmed that it significantly enhances the theoretical component of the professional training of doctors [2, 3]. At the beginning of the 21st century, according to scientists [3, 4], in the United States, the vast majority of educational institutions consider distance learning as a strategically important direction in the development of education, which has been joined by more than 100 million students. Among US teachers, 57.0 % consider it no less effective than traditional teaching technologies [5].

The outbreak of the COVID-19 pandemic has forced the educational industry around the world to completely reconsider approaches to learning in the shortest possible time in order to protect large WHE teams from the danger of infection. However, despite the complexity, all interested and motivated participants in the educational process have found ways to overcome the obstacles caused by the difficult epidemiological situation. Thus, an analysis of a survey of university students at the height of the COVID-19 pandemic demonstrates that students are quite skillfully coping with the problems of distance education [6]. At the same time, teachers were able to rethink the approaches to both the plan of the lesson itself, and the methodology and format of presenting the material. True, at the same time they note problems related to the loss of personal communication, which does not allow the student to be guided by a proven traditional method. The coordination of the time and duration of the lesson is also one of the significant problems, as is the slowdown in all areas of modern fleeting life, independent of the desire of people [7].

The development and use of distance education is based on the innovative pedagogical development of the same name. It meets all the methodological requirements of higher education [8], including medical education: conceptuality; consistency; the ability to manage; efficiency; reproducibility; visualization.

The distance learning system takes into account the main pedagogical principles: the principle of activity, problematic nature, motivation of educational activities, developmental learning, functionality, individualization of learning and collectivity in learning [9].

According to the Regulations on distance learning, it is being developed in Ukrainian higher education [1], although, apparently, as evidenced by modern realities, the legislative framework requires constant improvement. More controversy among scientists is caused by distance education in medicine. In addition, the experience of both domestic and foreign scientists proves that this technology is successfully used in higher medical education.

Distance learning in higher education is carried out by using a distance form as a separate form of education or using distance education technologies. Its provision is carried out comprehensively in the following forms: independent work; training sessions, practical training.

At the beginning of 2020, the COVID-19 pandemic made the first adjustments to the educational processes of HMEI. Since the formation of special competencies and the training of a future doctor in practical skills based on thorough theoretical training is one of the priorities and requires unconditionally traditional communication with teachers and patients, it is important to realize which components of the professional competence of future masters of dentistry can be influenced in the distance learning format. In particular, special attention is drawn in this context to the epistemological and praxeological competence components [10], which, according to scientists, looks quite realistic [4, 5].

Distance education is not an analogue of "correspondence". It differs from distance learning using the latest technologies in the learning process, the speed of communication between the teacher and the student, which allows to expand the geography of the course participants and their thematic range due to the possibility of using almost all forms of education, including independent work [11].

Let's agree with the opinion of scientists [12] that, to a large extent, the relevance of online learning in the system of medical education lies in the expansion and deepening of students' knowledge, that is, the activation of the epistemological component [5].

Among the advantages of distance learning, scientists distinguish the following [13]: territorial independence; availability of educational materials; mobility; communication with teachers is carried out in different ways (e-mail, Zoom, Facebook, Telegram, Google-meet); psychological comfort; financial benefit; schedule flexibility for the teacher; temporary independence – possible variability in the choice of time during the hours allotted for the lesson, agreed upon by the participants in the educational process. In addition, the skills of using telemedicine technology are being formed, since in the process of practical training at the clinical department, detailed clinical aspects are spoken out without an existing patient. At the same time, among the shortcomings, one should mention the emergence of problems of motivation for self-learning of educational material, since this requires the student to self-organize, self-responsibility for the result, as well as the inability to acquire practical skills, which is unacceptable for future doctors.

Distance technology allows to successfully use other innovative pedagogical technologies specific to medical education (case method, brainstorming, games, design, telemedicine techniques), which contribute to the formation of both general and special competencies, in particular: teamwork, creative thinking, learning through research [14].

A special place in the professional training of the future master of dentistry is occupied by praxeological competence [10]. Since the concept of praxeological competence goes beyond purely practical manual training, distance technology makes it possible to enhance the formation of its specific factors. In particular, the use of a set of tasks presented in albums and workbooks developed at the departments [15, 16], video materials for performing manual skills, video recordings of surgical interventions in accordance with the industry educational standard [17].

The regulatory framework for distance education in Ukraine was developed in peacetime and a calm epidemic situation to improve the quality and mass character, attract the maximum number of people who want to get an education, regardless of time and geographical boundaries and physical limitations of a person [1, 18, 19], and at the HEI level (in particular, at the Bogomolets National Medical University (NMU) [20]). With the start of russia's full-scale attack on Ukraine, additional acts were adopted [21–23].

In the context of the development of distance education technology, as evidenced by the active period of its implementation in Ukraine and in the world, the educational community has achieved significant success, however, data on international and domestic experience in the use of distance education for applicants for higher, in particular medical, education during martial law and active We did not find any military action.

1. 3. Suggested solution of problem

To solve the research problem, it is necessary to get an answer to the question: what means of distance technology for teaching clinical disciplines, the conditions for its implementation, the effectiveness of approaches to teaching were successful according to the assessment of foreign students of future masters of dentistry.

Aim. To study the effectiveness of distance learning technology as assessed by foreign students of future masters of dentistry in a situation of extreme states of the coronavirus pandemic and active hostilities.

2. Materials and methods

The study was based on the requirements of World Medical Association Code of

– voluntary anonymous survey of 65 foreign students of the 4th and 5th year of the Faculty of Dentistry of the National Medical University with the consent of the participants

– interview with students on the topic of research after the final module control;

– analysis of the obtained results;

– their generalization.

The study was conducted in April-November 2022 against the background of a full-scale war on the territory of Ukraine after the russian attack on a sovereign European state.

Currently, some of the foreign students surveyed were in their countries of permanent residence due to the COVID-19 disease, while the other part was evacuated from Kyiv to safe coun-

tries, mainly the EU. All students continued their studies, mostly joined the work on the Zoom platform in time, uploaded abstracts on the topic of the lesson and completed tasks on the web-based learning platform of NMU "LIKAR_NMU" (http://likar.nmu.kiev.ua), and during its blocking due to hostilities – to the teacher's e-mail.

The teachers who took part in the study were also evacuated during the first months of the war. The presence of modern gadgets and the Internet made it possible to continue the systematic educational process.

The assessment was carried out based on the results of a face-to-face discussion on the relevant topics, description of radiographs, testing and pre-sent abstracts on topics.

At the end of the cycle, the final modular control of standard requirements was carried out.

3. Results

1. A significant part of students (about 47 %) do not perceive distance learning even during epidemics, wars or other extreme conditions as the main format of the educational process instead of full-time. This indicates the need to prematurely create conditions for ensuring the educational process in such situations (**Fig. 1**).

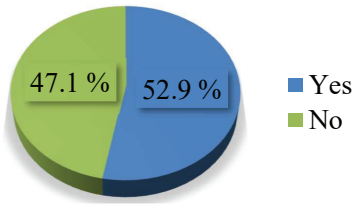

Fig. 1. Distance learning in times of epidemics and wars or other extreme conditions can be relevant for students instead of full-time study?

2. Conducting a practical lesson on the Zoom platform or a similar web resource for 40–60 minutes, according to the vast majority of students, is enough to master the topic. It should be noted that a longer duration of the lesson is considered necessary by those students who made up the module on "good" and "excellent", and only a small number of those who received "satisfactory". The question arises – to what extent are students motivated to a deeper understanding of the topic and do they adequately assess the level and quality of their knowledge on the problem of study? (**Fig. 2**).

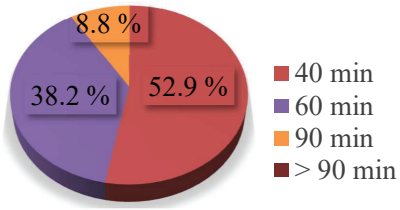

Fig. 2. Zoom-class duration that could be enough for mastering the topic

3. About 59 % of respondents preferred writing essays on the topic of the lesson based on the materials of the workbook and lectures. This indicates that only a third of students are oriented towards deep familiarization and analysis of the data obtained from other available scientific and information sources. This situation may indicate a lack of commitment to independent work and self-education, which is one of the important criteria for a competent specialist (**Fig. 3**).

4. The overwhelming majority (about 80 %) consider notes in the form of a brief abstract of 3–5 pages sufficient to cover the topic of the lesson, although the topics of academic disciplines cover a significant amount of issues. Among those who submitted works of 20–30 pages, the majority did not creatively work through this material, and the content contained information

that was copied from some source and often did not fall within the scope of the problem under study (**Fig. 4**).

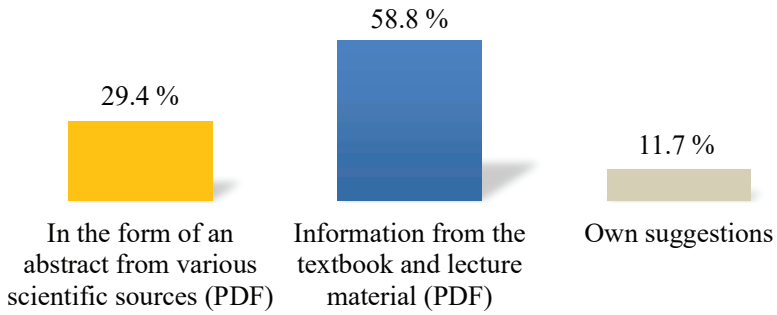

Fig. 3. Form of the syllabi considered to be prepared for the classes

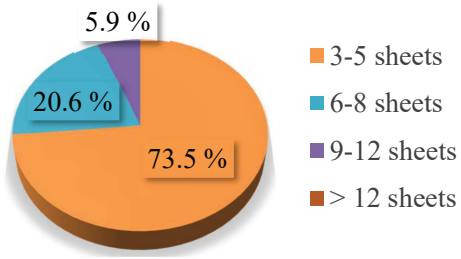

Fig. 4. Quantity of the abstract pages considered to be sufficient to cover the topic of the lesson

5. The form of discussion in the form of a survey followed by a discussion of incomprehensible aspects of the topic turned out to be the most acceptable for 47 % of the respondents, but 30 % prefer the teacher's explanations at the beginning. Independent work and finding answers is not a priority (**Fig. 5**).

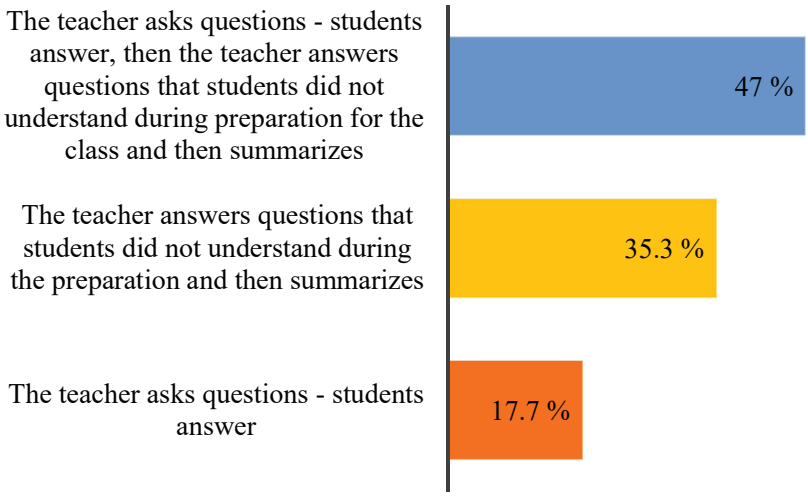

Fig. 5. Way of the discussion in Zoom between teacher and a student considered to be appropriate

6. Most of the students surveyed (53 %) want to take a theoretical block remotely in 3–5 courses, and 6 – a practically oriented course – work with phantoms (11 semester), in the clinic (12 semester). Thus, they prefer a 360-credit scientific-vocational training program rather than a 300-ECTS vocational-educational program (both have a place in the Industry Education Standard ("Dentistry") (**Fig. 6**).

7. Among the supporting materials needed for distance learning, video demonstrations of practical manipulations (47 %) and surgical interventions (approx. 32 %) are most preferable. Only about 18 % of those willing to work with workbooks and other tasks requiring the completion of relevant tasks to deepen knowledge turned out to be only about 18 %. Among them are those students who, following the results of determining the educational result, showed a high level of competence (**Fig. 7**).

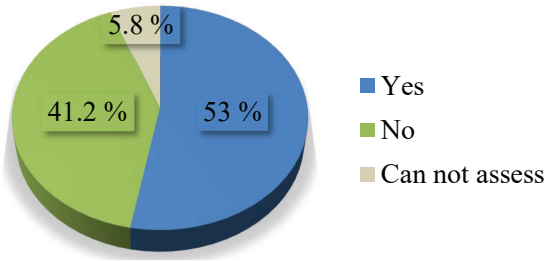

Fig. 6. It's appropriate to conduct in extreme conditions theoretical classes in distance learning on the 3–5 years, and on 6 year to undergo practical training with phantom (1st semester), and then in the clinic (2nd semester)

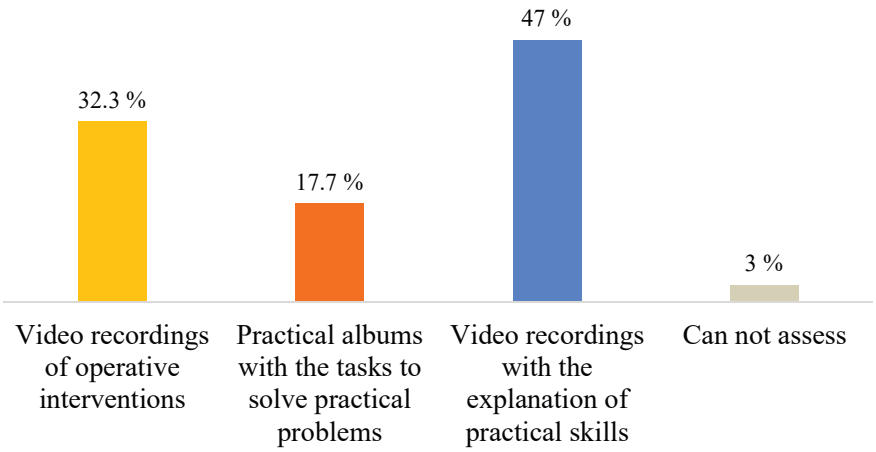

Fig. 7. Auxiliary materials needed for distance learning

8. 781 % of respondents want to pass the final module control in writing. Thus, students demonstrate uncertainty in their knowledge and fear of receiving additional questions on the topic, explain such a desire by psychological discomfort during an oral dialogue with teachers, however, it is positive that every fifth student (21 %) is still ready for an open dialogue with a teacher, realizing their own potential benefit from it (**Fig. 8**).

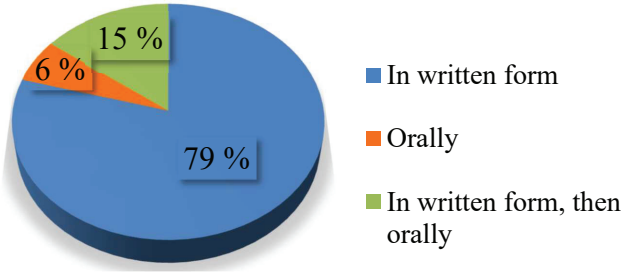

Fig. 8. Conduction way of the module control

9. On the whole, approx. 74 % of respondents, while about 9 % consider it excellent (**Fig. 9**).

10. 48 % of students consider it expedient to introduce distance learning as a form of medical education in non-extreme conditions of society, which confirms the data of point 1 (**Fig. 10**).

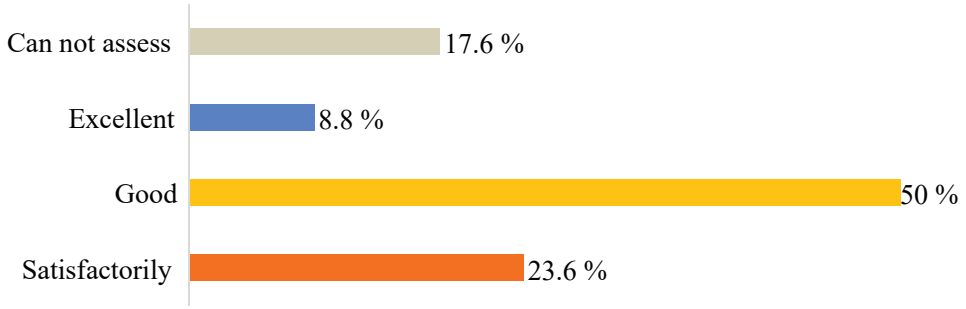

Fig. 9. Satisfaction with the results of distance learning (self-esteem)

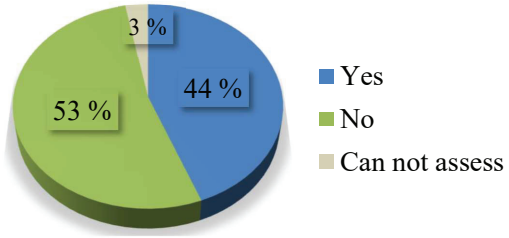

Fig. 10. It's appropriate to introduce distance learning as a form of medical education under normal, non-extreme conditions

4. Discussion

The conducted studies demonstrate that a significant factor in the introduction of distance technology in dental education, in addition to in-depth assimilation of the theoretical aspects of academic disciplines, students note the ability to form components of praxeological competence through the visualization of medicinal manipulations, in particular in the operating room, which do not allow mass production of artificial structures in dentistry; performance of tasks from methodological materials (albums, notebooks). The problem of evaluating the result remains debatable. According to the experience of the NMU, before the start of the practical lesson, the student must upload the work to the LIKAR_NMU platform, and the teacher must familiarize itself with the work. Unfortunately, this often makes it impossible for there to be no electricity, no internet/communications during active hostilities in the country.

In this regard, it is advisable to consider the possibility, based on the principle of academic mobility, which is one of the fundamental in the competent paradigm of education, on the basis of agreements on cooperation between medical universities of the world and Ukrainian medical HEI, to compensate for the development of clinical skills at the clinical bases of foreign HEI as much as possible. To do this, it is necessary to create mutually beneficial financial, legal and methodological support.

Sufficiently threatening the future profession of a doctor, a trend of social vulnerability among students was revealed – the necessary communication skills do not develop (with colleagues, patients, their relatives, medical staff), the opportunity to acquire the competence of working in a team is missed, and the problem of identifying virtue in the answers arises.

Based on the results of the use of distance learning technology in wartime, it should be noted that there was no need to change the methodological and educational content, however, at the same time, the improvement of technical support is urgent, in particular:

– distance learning technology requires a constantly functioning electrical network. Therefore, it is necessary to provide the Western Military District with alternative types of electricity, since, according to the experience of Ukraine, the energy system is one of the priority targets of the enemy;

– often – the lack of stable access to the Internet due to an emergency disconnection from the power grid, which, within the framework of the autonomy of the WMD, requires technical support for the energy-generating system;

– there may be an unpredictable failure in the timing of meetings on web platforms. Therefore, it is necessary to provide for an appropriate shift in the schedule for both students and teachers;

– in the regulatory documents regulating distance learning, it is not provided for its implementation in extreme conditions. The experience of Ukraine in this context shows that they need to be supplemented with relevant provisions to ensure the HEI functioning (power supply for the places of deployment of scientific and pedagogical workers, uninterrupted Internet (Star Link system), as well as security measures for the stay of participants in the educational process in the HEI (underground shelter architecture)).

5. Conclusion

According to the self-assessment of foreign students of future masters of dentistry, distance learning is acceptable, mainly as a necessary option caused by insurmountable circumstances, since the practical component of distance learning is insufficient. At the same time, half of the respondents would be willing to take a theoretical course in the discipline remotely, and a practical one – in the sixth, practically oriented year within the framework of a scientific and professional program (360 credits) approved in the industry standard for dentistry. Most of the respondents are aware of the need to master practical clinical skills and skills and need the maximum saturation of methodological support with video materials for their implementation. At the same time, students demonstrate insufficient motivation to work independently and search for information in scientific sources. They prefer the direct transfer of knowledge from the teacher, which calls into question their potential for continuous professional development in the future and largely contradicts the content of the competency-based paradigm of education. Despite this, the vast majority of respondents highly appreciate the level of knowledge gained in the process of distance learning.

In the future, the study will be supplemented with similar data on Ukrainian students and interns, and their comparative characteristics will be carried out. The timing of the study is limited by the duration of the extreme conditions that caused it.

Conflict of interests

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

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