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## ADVANTAGES AND DISADVANTAGES OF DISTANCE EDUCATION IN TEACHING CLINICAL DISCIPLINE TO STUDENTS OF THE MEDICAL UNIVERSITY

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*The challenges of society have made adjustments to the medical education system of Ukraine. In the conditions of the pandemic of the coronavirus infection COVID-19 and the introduced martial law throughout the territory of Ukraine, distance learning (DL) turned out to be the only possible form of the educational process. The purpose of the study was to study the peculiarities of teaching the discipline "Propaedeutics of Pediatrics" in the conditions of the National Academy of Sciences. The process of DL at the Department of Propaedeutics of Childhood Diseases of the Dnipro State Medical University (DSMU) took place using the MOODLE electronic portal, the Google Meet video service, the YouTube platform, the website and the electronic magazine of the Dnipro State Medical University. An anonymous survey of 210 third-year students was conducted regarding their attitude and degree of satisfaction with the educational process at the Department of Propaedeutics of Childhood Diseases using educational distance technologies. As the results showed, the majority of the interviewed students are completely satisfied with the process of DL. However, when choosing a form of education, preference is still given to the classroom format of education. Among the advantages of DL, students noted the saving of time and financial costs for moving between buildings and clinical bases, the comfort of studying in a home environment, the possibility of studying at any convenient time, the availability of information resources, and the possibility of re-processing complex material. However, the biggest drawback of the DL was the lack of opportunity to work with the patient and master practical skills. So, DL, like any other method of teaching and learning, has its advantages and disadvantages. But currently existing technologies of medical education with the help of modern digital platforms, high-quality content filling of educational web resources, introduction of an effective system of quality control of acquired knowledge make it possible to adapt to the new realities of the educational process and ensure consistently high quality of medical education*

**Keywords:** distance learning, medical education, educational process, propaedeutics of pediatrics, questionnaires, students

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### 1. Introduction

The challenges of society, in particular the global pandemic of the new coronavirus infection COVID-19, which began two years ago, and the introduction of martial law throughout Ukraine in connection with the armed aggression of the Russian Federation, have made adjustments to the medical education system of Ukraine [1]. In these conditions, distance learning (DL) turned out to be the only possible form of the educational process. However, the specificity of medical education is that most of the clinical competencies of the future doctor are inextricably linked to forms of education that require the personal presence of students both in classes and during practice in the hospital [2]. It is difficult to imagine the training of a doctor without learning practical skills at the patient's bedside, curation of the patient, writing an educational case history, instructions and direct contact with the teacher. However, under the conditions of information resources, it is possible to integrate DL into the system of medical educational space, thereby expanding

the creative possibilities of the educational process, ensuring the availability of education, without affecting its quality. The implementation of remote forms of education is a promising direction of medical education, their use increases the availability of knowledge, the quality of rapidly updated content, flexibility, mobility and modularity, which meets the requirements of higher education [3].

### 2. Literary review

DL has existed for many years, is an independent form of education and allows you to get a full-fledged higher education, which was used in many universities for correspondence education. But it was not used among medical universities, except in the 50s of the 20th century, when a mixed form existed for a while: in the junior years, it was distance, and starting from the 3rd year, when clinical disciplines were studied, all students switched to full-time education [4].

It always seemed that DL could not be used in clinical departments of medical universities. It was be-

lieved, that the profession of a doctor can be mastered only by imitating the experience of one's mentors at the patient's bedside. And this is true: it is impossible to become a doctor only by studying textbooks and solving test problems [5]. However, it was the remote form of education that turned out to be the only possible form of the educational process during the period of quarantine restrictions, and currently during the hostilities in Ukraine.

One of the leading places in the training of a qualified doctor is the study of the subject of propaedeutics of pediatrics by students of the third year of medical universities. Pediatric propaedeutics is one of the first clinical disciplines that provides students with a basic level of knowledge for studying further specialized pediatric disciplines and forms clinical thinking in future doctors [6]. Previously, third-year students traditionally studied propaedeutics of pediatrics on clinical bases based on the principle of "closer to the patient". Practical patient examination skills were learned and tested in classrooms and wards during patient examinations, as well as with the help of dummies and some technical means. The teacher was able to demonstrate practical skills, manipulations and check the correctness of their implementation by the student, correct the identified shortcomings [7]. In connection with the total transition of all educational institutions to a distance learning format, certain difficulties appeared when students mastered practical skills: the lack of simulators-dummies for practicing skills and the lack of live communication with patients. This forced teachers to search for and master the information technologies of distance education. New computer programs and platforms have appeared, with the help of which distance education has gained opportunities for closer communication between the teacher and students, for students to acquire certain special knowledge and to control their practical application [8]. New modern educational programs are being developed, aimed at spreading various forms of DL in the medical field of the world. The use of modern electronic devices, such as a laptop, tablet, mobile phone, has made it possible for the teacher to communicate with students face to face online, regardless of the distance they are from each other [9, 10].

It should also be noted, that the organization of high-quality DL in the conditions of martial law is a complex and extremely difficult process. Changing places of residence, being in dangerous regions, the absence of the Internet, mobile communication, computers, tablets and other means necessary for learning forced scientific and pedagogical workers to review the models, methods and approaches to the organization of the educational process in a short period of time, which would help to create favorable conditions for future specialists to acquire competencies that would fully satisfy the needs of society.

Thus, medical education differs sharply from other types of education in that it is impossible to fully learn practical and clinical skills in a distance form, and the question of the forced transition of a higher medical educational institution to only DL requires careful analysis, related not only to the assessment of education efficiency, but also to the level of students' satisfaction with the educational process. Determining the satisfaction of

students with DL allows to identify the weak points of the activity of the higher educational institution and to purposefully carry out measures to improve them.

### 3. Research aim and tasks

The research aim is in studying the advantages and disadvantages of DL in teaching the clinical discipline to medical university students and in evaluating the effectiveness of various methods of DL.

To achieve the goal, the following tasks were set:

1. To characterize the peculiarities of the organization of the educational process at the Department of Propaedeutics of Childhood Diseases.
2. To analyze the possibilities, advantages and disadvantages of using DL at the clinical department.
3. To evaluate the satisfaction of the third-year students with the quality of DL according to the results of the questionnaire.

### 4. Materials and methods

The study was conducted at the Department of Propaedeutics of Childhood Diseases of the Dnipro State Medical University (DSMU) at the end of the spring semester of 2022. DL was carried out according to the programs, requirements and schemes of full-time education. The main types of distance learning classes were traditional forms of educational training, namely lectures and practical classes.

The process of DL at the Department of Propaedeutics of Childhood Diseases was carried out using such electronic resources as the MOODLE electronic portal (<http://moodle.dmu.dp.ua>), the Google Meet video service, the YouTube platform, as well as the website and electronic journal of students' progress.

The virtual learning environment MOODLE (Modular Object-Oriented Dynamic Learning Environment) has a convenient intuitive interface, students and all teachers have a personal account, registering with an individual login and password. It should be noted, that the MOODLE system is very mobile, it allows the teacher to create all kinds of web courses and fill them with various educational content. The main structural unit of each module corresponding to the discipline is the "Interactive class", access to which is opened according to the calendar and thematic plan. Regulatory documents of the module include thematic plans of lectures and practical classes, as well as the schedule of classes. The lesson consists of informational and control blocks. The information block includes methodical recommendations, a list of literature with references to sources in electronic libraries, video recordings of practical skills of clinical examination of pediatric patients. The control block consists of control questions, tasks for the development of clinical thinking and testing, which allows you to quickly and qualitatively assess the level of training of students. A limited amount of time is allotted for each of the presented tasks.

Practical classes were conducted online according to the schedule in the format of a Google Meet video conference, where the teacher could not deviate from the standard format of the class with the possibility of an oral interview and demonstration of the child examination method using an electronic presentation, photo and video materials, and each student had the opportunity to active-

ly communicate with the teacher and classmates in real time. Links to Google Meet video conferences were placed on the page of the corresponding e-learning course on the MOODLE platform.

The main goal of the discipline "propaedeutics of pediatrics" is to master practical skills for students. Of course, DL cannot fully ensure the assimilation of the practical aspect of the discipline. Therefore, due to the lack of opportunities for students to work at the patient's bedside, the most optimal solution for successful learning of the educational material was the demonstration of video clips or the teacher performing certain skills on a dummy (methodology of palpation, percussion, auscultation, checking pathological symptoms, etc.). In addition, to activate the students' cognitive activity and develop their clinical thinking, the teachers prepared clinical situational tasks with a list of questions, such as the formulation and justification of clinical syndromes, the selection of the leading clinical syndrome, the interpretation of the results of the patient's examination.

It should be noted, that the use of educational and methodological recommendations, lecture material, prepared by the department's staff, and videos, posted on the academy's student portal with a demonstration of practical system inspection skills allowed students, as active participants in the educational process, to constantly improve their own knowledge and skills, expand their horizons and creative activity.

The created complete lecture video course on the discipline was available throughout the entire period of study, which satisfied the demand of education seekers for asynchronous learning, that is, when a student listens to lectures not in real time, but at a time convenient for him/her.

At the end of each lesson, the teacher evaluated the students and filled out an electronic journal. After entering the results in the electronic journal, the information immediately becomes available to students, the head of the department, the dean's offices and the university administration. When viewing the journal, these users can see grades by topic of the academic discipline. In addition, teachers can monitor the quality of the educational process, keep track of students' current performance and absences, predict the results of their intermediate and final certification.

At the end of the academic year, an anonymous survey of third-year students was conducted regarding their attitude and degree of satisfaction with the educational process at the Department of Propaedeutics of Childhood Diseases using educational distance technologies. A questionnaire was developed, which included 25 questions on various aspects of DL, and also included questions about students' attitudes towards DL. 210 Ukrainian students who gave informed consent to participate in the research took part in the survey.

Statistical processing of the obtained results was carried out using the software "Microsoft Excel 2022". The percentage of respondents' answers was calculated and the descriptive statistics method was used.

## 5. Research results

In response to the question "Are you satisfied with the quality of the organization of DL at the Department

of Propaedeutics of Childhood Diseases?", the majority of respondents (80.9 %) answered that they were completely satisfied with the process of DL, and only 40 (19.1 %) respondents were partially satisfied. However, when choosing a form of education, the majority of students (75.2 %) still prefer the classroom format of education, and only 52 (24.8 %) students prefer the distance learning format.

In connection with the fact that the MOODLE and Google Meet platforms were the main electronic resources for DL at the Department of Propaedeutics of Childhood Diseases, students were asked to evaluate the data of the system according to certain characteristics. The Google Meet program was evaluated by students on average at  $4.7 \pm 0.05$  points in terms of ease of use. At the same time, the majority of students (70.5 %) rated the ease of use at 5 points, 54 (25.7 %) students – at 4 points, and only 8 (3.8 %) students – at 3 points.

The MOODLE system was evaluated according to such characteristics as: ease of use, fullness of the system with video lectures and video films, fullness with training manuals and methodical recommendations, as well as test and situational tasks. Ease of use of the MOODLE system was rated by students on average at  $4.8 \pm 0.04$  points. According to this parameter, 172 (81.9 %) respondents rated the MOODLE system at 5 points, 34 (16.2 %) respondents rated it at 4 points, and 4 (1.9 %) respondents rated it at 3 points. Fullness of the system with video lectures and video films was also estimated at an average of  $4.8 \pm 0.05$  points. Fullness of the MOODLE system with video lectures was rated by 178 (84.8 %) students at 5 points, 24 (11.4 %) students at 4 points, and 8 (3.8 %) students at 3 points. The majority of students (81.9 %) rated the system's completeness with video films on child examination methods at 5 points, 36 (17.1 %) students at 4 points, and 2 (1.0 %) at 3 points. Fullness with training manuals and methodical recommendations and their ease of use were estimated by students at  $4.5 \pm 0.08$  points. At the same time, 136 (64.8 %) students rated this characteristic at 5 points, 44 (20.9 %) students at 4 points, and 30 (14.3 %) students at 3 points.

Fullness of the system with test and situational tasks was estimated by students at an average of  $4.9 \pm 0.03$  points. According to this parameter, 184 (87.6 %) respondents rated the MOODLE system at 5 points and 26 (12.4 %) respondents rated it at 4 points (Fig. 1).

As for the practical significance of the analyzes of clinical cases in pediatric propaedeutics, the majority of students (69.5 %) noted that they develop the skills to identify pathological symptoms, learn to interpret the results of laboratory and instrumental research methods (52.4 %) and substantiate pathological syndromes in virtual patients (49.5 %).

Among the advantages of DL at the Department of Propaedeutics of Childhood Diseases, the interviewees noted: saving time and financial costs for moving between buildings and clinical bases (83.8 %), the comfort of studying in an ordinary home environment (53.3 %), the possibility of studying at any convenient time (48.6 %), the availability of information resources (45.7 %), the possibility of re-processing complex material (41.9 %).

Less significant advantages for students were: the possibility to choose the optimal rate of learning the material

(39.1 %) and the development of self-discipline (26.7 %) (Fig. 2).

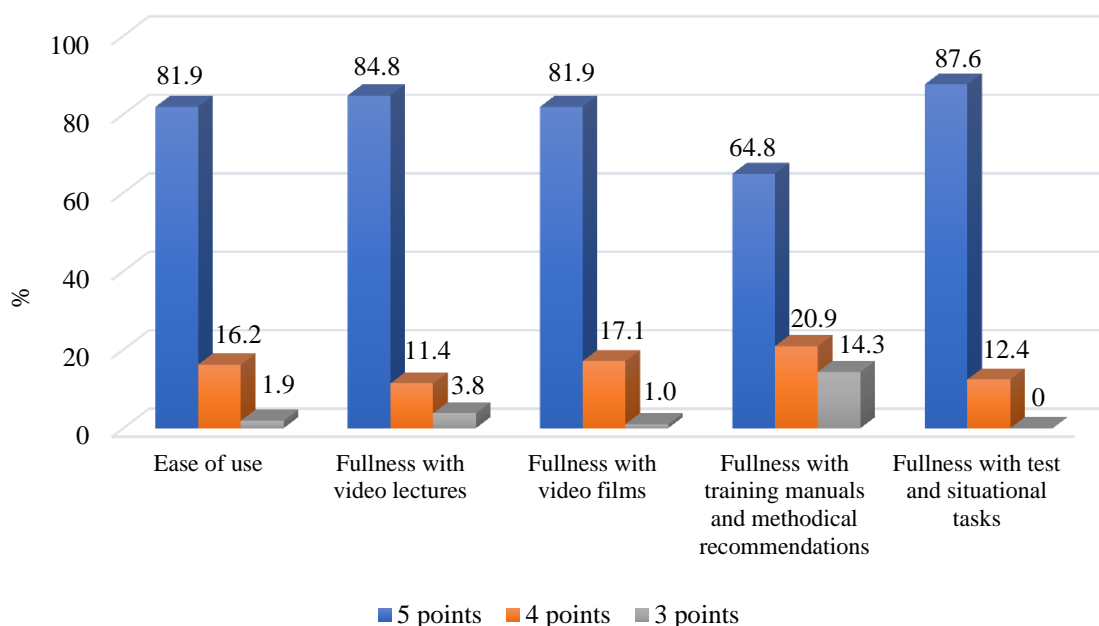


Fig. 1. Evaluation of the MOODLE system on a five-point scale by students of the third year

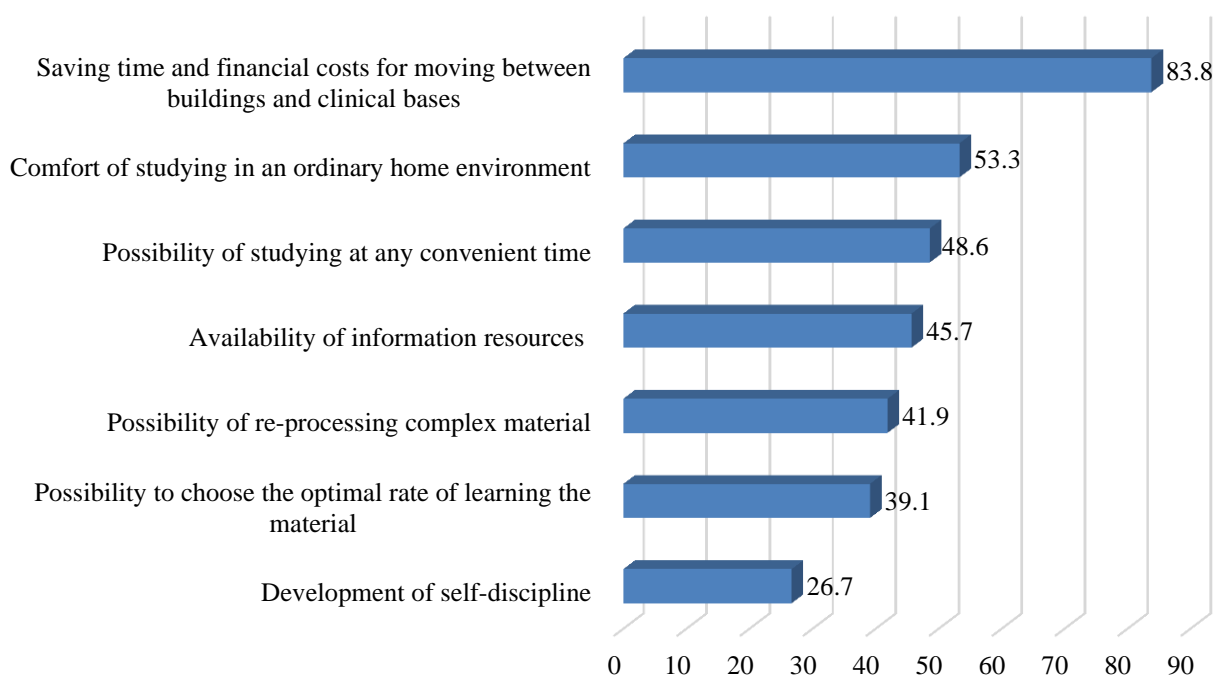


Fig. 2. Distribution of the advantages of distance learning according to the degree of significance among third-year students

At that time, the majority of students noted two of the most significant disadvantages of DL – the lack of opportunity to communicate with patients and master practical skills (90.5 %), as well as the lack of live communication with teachers and fellow students (63.8 %). Almost half of the students noted among the shortcomings the low speed of the Internet and the freezing of sites with a large number of visits (49.5 %), as well as the negative impact of a long stay at the computer on

health (48.6 %). A third of the students indicated the need to always have a computer and access to the Internet (34.3 %) and difficulties in learning the content of practical classes (28.6 %). The least significant disadvantages of DL among students were: excessive study load (19.1 %), biased assessment of knowledge by teachers (10.5 %), additional costs for payment of the Internet tariff (4.8 %) and the need to master additional computer programs and applications (1.9 %) (Fig. 3).

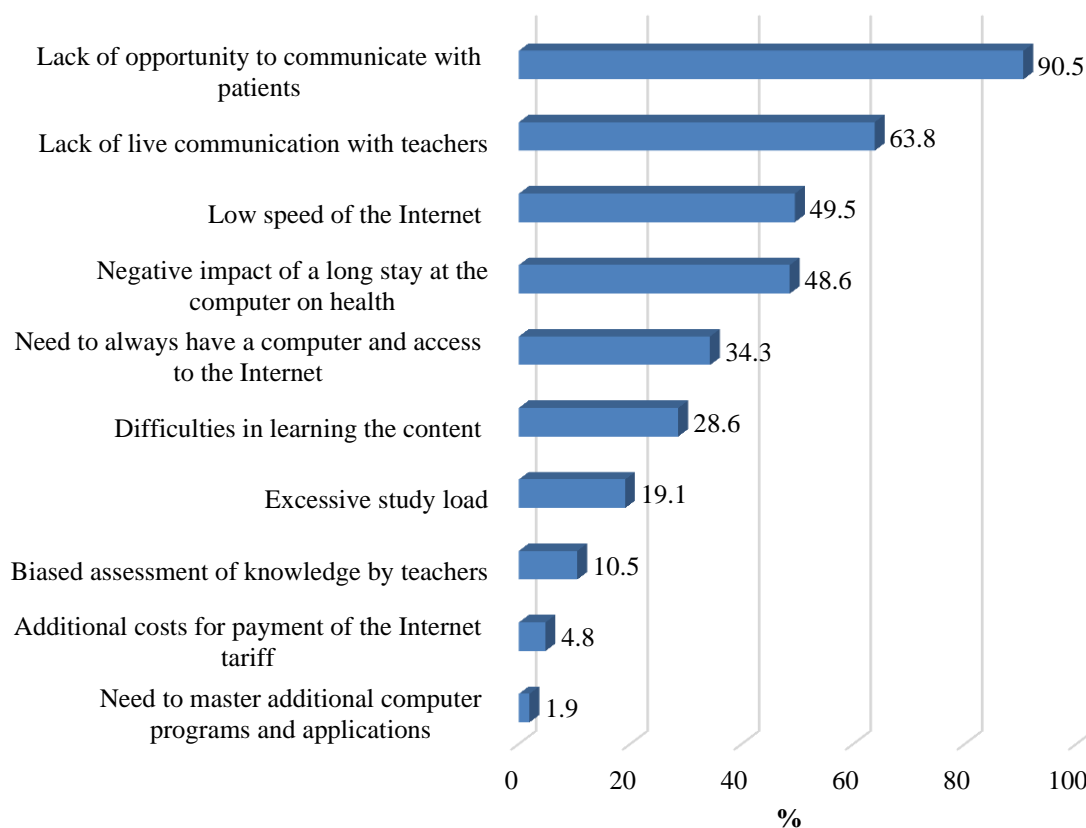


Fig. 3. Distribution of the disadvantages of distance learning according to the degree of significance among third-year students

It should be noted, that the excessive academic load may be related to the fact that each department tries to provide its subject with informational and control materials as best as possible, believing that students have more free time during the academic year, which it would be appropriate to use for preparation to classes

In general, with regard to the assessment of the DL process at the Department of Propaedeutics of Childhood Diseases on a five-point scale, the majority of surveyed students (62.9 %) rated the distance learning process at 5 points, 70 (33.3 %) respondents rated it at 4 points, and only 8 (4 %) of respondents – at 3 points.

Among the proposals for improving the educational process at the Department of Propaedeutics of Childhood Diseases, the students highlighted the following: increasing the share of video lectures, visual presentations and educational videos, expanding the possibility of interactive communication with the teacher, and the possibility of working in the hospital unit to master practical skills.

## 6. Research results discussion

Thus, DL in Ukraine is not only a forced step in difficult conditions. It has long-term effects on the further functioning of the Ukrainian higher education system. After all, the acquired experience will certainly be used even after the end of the war. It is unlikely, that there will be a return to full face-to-face education without the partial application of mixed (distance) technologies.

DL, like any other method of teaching and learning, has its advantages and disadvantages. But currently existing DL technologies with the help of digital platforms, high-quality content filling of educational web resources, introduction of an effective quality control system of acquired knowledge provide an opportunity to adapt to the new realities of the educational process and ensure consistently high quality of medical education. And although no video conference can replace real communication and practical work, it makes it possible to ensure the continuity of medical education with a temporary emphasis on theory, followed by implementation in practice in favorable conditions.

This study was limited to the primary clinical discipline of third-year students – propaedeutics of pediatrics.

## 7. Conclusions

1. Currently existing technologies of distance learning through the use of modern digital platforms, high-quality content filling of educational web resources, introduction of an effective system of quality control of the acquired knowledge make it possible to adapt to the new realities of the educational process and ensure consistently high quality of medical education.

2. The advantages of distance learning at the Department of Propaedeutics of Childhood Diseases are: saving time and financial costs for moving between buildings and clinical bases, the comfort of learning in an ordinary home environment, the possibility of learning at any convenient time, the availability of information re-

sources and the possibility of re-processing complex material. The biggest disadvantages of distance learning are: lack of opportunity to work with a patient and practice practical skills, as well as lack of live communication with teachers and fellow students.

3. The majority of surveyed students are completely satisfied with the process of DL at the Department of Propaedeutics of Childhood Diseases. However,

when choosing a form of education, preference is still given to the classroom format of education.

#### Conflict of interests

The authors declare that they have no conflict of interest in relation to this study, including financial, personal, authorship, or any other, that could affect the study and its results, presented in this article.

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