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Remote medical and physical education - challenge of modernity

Abstract

Introduction: The article briefly study the essence of the distance learning format and reviews the experience of using the distance learning in medical and physical culture education; forms of conducting practical and lecture classes are described; forms of monitoring current and final classes using modern information and communication technologies at the at Kostroma State University and Karaganda Medical University.

The use of the distance learning in medical and physical culture education in modern realities and the use of innovative teaching methods in the medical and physical culture educational process contributes to the formation of a person who is creative, which independently thinks and makes his own decisions.

Methods: Description, Observation, Analysis, Synthesis. Each teacher and student is aware about the information that was used in writing this article.

Results: The distance learning is a motivated pedagogical technology in medical and physical culture education in the context of the coronavirus pandemic. This article shows the experience of using the distance learning at our universities using various programs and computer technologies.

Conclusions: The analysis of distance learning at our universities revealed that teachers need the help of specialists in the field of IT technologies to develop and form modern, high-quality content and technical distance learning courses; it is necessary to increase the financial and time resources of universities and teachers; for the formation of practical skills, a combined teaching method is required with a clear choice of topics and the percentage of classroom and distance learning.

Keywords: online learning, modern educational technologies, digital learning, IT-technologies, student-centered learning, non-traditional forms of conducting classes, computer programs

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Introduction

The education system is a dynamic system due to the fact that global changes are taking place in the modern world, which requires the use of innovative technologies that radically change the approach to learning. In medical and physical education, the use of modern teaching methods and new technologies allows us to form an active civic position of students, in the future as qualified competent specialists.

The following types of education are referred to modern innovative educational technologies: personality-oriented, problematic, open (distance), modular, multilevel; group system; research, design and game methods; competitive nature of education; information and communication technologies (computer programs, electronic educational resources, Internet technologies), training in collaboration, an innovative portfolio assessment system.[1]

Technological development and rapid progress of information technologies gave impetus to innovative reforms in the learning process. In the context of the coronavirus pandemic, online education has become popular and relevant not only for technical specialties, but also for medical and physical specialties.

Virtual meetings gave the opportunity a solution for physicians to continue receiving education, training, and communications. Though virtual meetings attempt to resemble in-person meetings as closely as possible, these have a different dynamic as the presenter and attendees find themselves speaking to a camera rather than to a physical audience. This virtual environment takes away from the human element of immediate feedback through non-verbal cues, but in return it provides benefit of remote attendance to keep attendees safe from contagion.[2]

But at the same time, the online form of education still remains one of the burning polemic problems in higher medical and physical education.[3]

Methods

By writing this article, we used methods of the empirical level (observation and description), as well as methods of the experimental-theoretical level (analysis and synthesis). During the transition from March 16, 2020 of our universities to the online form of education and to the nowadays, the leadership of our universities has applied and applies all the technical capabilities and ensures the most complete transition of the educational process and other activities to the online mode. This implies conducting all types of classes and conducting all types of assessment of students' knowledge remotely, via the Internet. The analysis of the weeks spent showed that the interest of students in classes in the subjects studied at our medical universities is quite high. All students have successfully adapted to distance learning, and are actively involved in various forms of

classes. Diagnostics of the learning process performs many important functions, and the main ones are teaching and developmental ones, which are associated with the need to teach students logical thinking, the development of imagination, attention and other psychological and pedagogical components of the characteristics of cognition. The greatest effect in education can be achieved only by combining several teaching methods at the same time and taking into account that different methods are used to solve certain problems. Our teachers use various teaching methods in distance education such as the method of acquiring knowledge; method of skills and abilities formation; method of applying knowledge; the method of consolidating and testing knowledge, abilities, skills (control methods). This article is the result of our analysis of the pedagogical process in the context of the coronavirus pandemic at our universities.

Results

The transformation of the educational system that arose during the pandemic led to a change in technologies and techniques during the acquisition of educational content, teaching methods and the entire educational process in our universities, as well as a change in the psychophysiological characteristics of teachers and students (communication, organizational skills, individual typological components thinking, reflection, the ability to correctly and optimally build their trajectory of education and job).

In the context of the Covid-19 pandemic, the current situation has revealed and accelerated all the hidden reserves and opportunities for distance learning in medical and physical education at Kostroma State University and Karaganda Medical University has shown its potential capabilities and resources in the use of new pedagogical technologies in accordance with international best practices.

In at Kostroma State University and Karaganda Medical University some elements of digital distance learning were already used, which were successfully applied and improved during the forced transition to the online form of education during the Covid-19 pandemic.

At the same time, modern educational technologies used by our teachers in the process of teaching students are aimed at student-centered learning, where the main role is assigned to the formation and organization of students' critical thinking skills.

As a result of the use of various forms of distance learning, teachers of the at Kostroma State University and Karaganda Medical University have begun to form a new student personality, able to think creatively, to responsible for their actions and actions, and independently choosing their learning strategies and tactics.

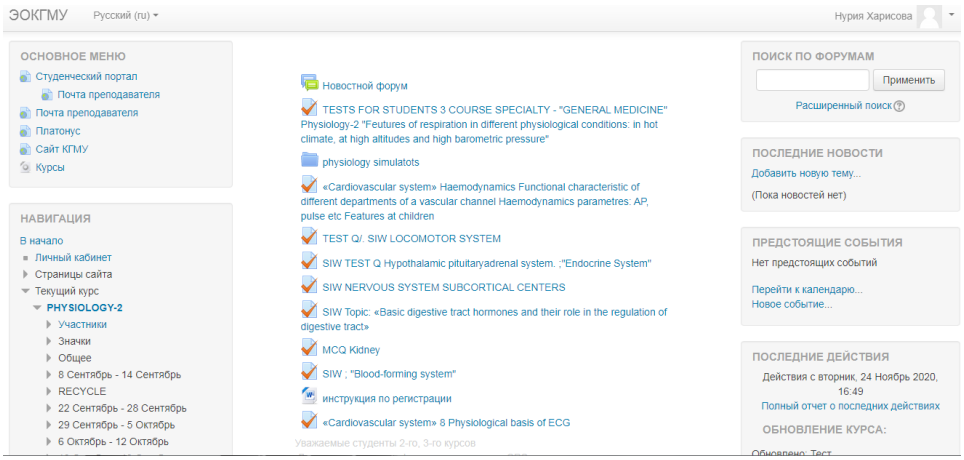
The unexpected situation in the world made it possible for our teachers to use all conditions and opportunities to create all sufficient and health-saving learning conditions. Teachers and students of our universities quickly mastered various distance technologies (case technologies, TV technologies, network technologies). Moreover, many universities around the world provided an opportunity to their educational resources (video lectures, electronic textbooks, online libraries (https://www.coursera.org/learn/physiology/home/welcome (Coursera)).

ZOOM conferences, FREE CONFERENCE CALL, MOODLE, MICROSOFT TEAMS, SKYPE, CISCO WEBEX MEETINGS, and many others applications are used for classes and lectures by teaching staff.

For effective delivery of lectures and practical lessons in a distance format, it is necessary to use such new pedagogical technologies as the "inverted classroom", which involves students' independent study of the topic of a lecture or practical lesson before they begin. At the same time, students are given links to additional materials (videos, presentations, scientific articles). In this case, the emphasis is on the independence of students. When the teacher meets with the students, a lecture or a practical lesson can be held in the form of a discussion or a round table. At the same time, it is necessary to constantly involve students in the discussion of the topic. Students were given the opportunity to receive explanations of the most complex issues; in practical classes, important questions were explained and a full survey of students was conducted.

Thus, they have increased confidence in involvement, in close interaction between the student and the teacher. To improve the teaching methodology in a distance format, it is necessary to record your lessons, view them, and improve your technical and methodological best practices, and share with your colleagues.

In the MOODLE system (modular object-oriented dynamic learning environment), students at the Kostroma State University and Karaganda Medical University were provided with online courses of disciplines with a course program, a glossary, a system of practical classes and lectures, assignments of various formats, test-learning test material, chat (quick communication with the teacher), student assessment journal, statistics of studies, student personal data. Educational content was provided both in WORD format and in the form of hyperlinks to the desired educational content. Thus, universities teachers allowed the student not to get lost in the information space. Figure 1 shows an example of page Online-course "Physiology-2" in Learning Platform MOODLE.



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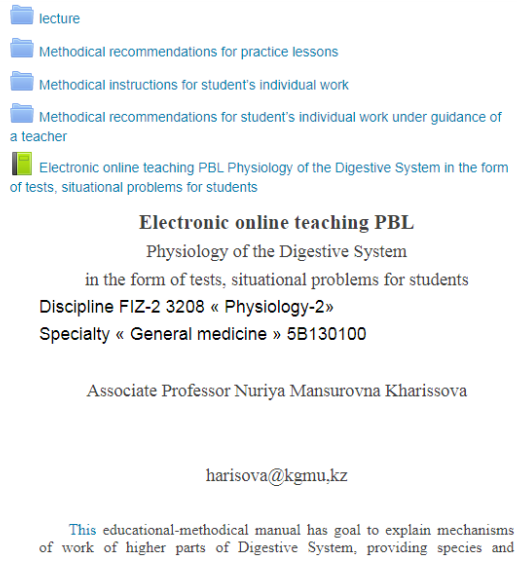
lecture

Methodical recommendations for practice lessons

Methodical instructions for student's individual work

Methodical recommendations for student's individual work under guidance of a teacher

Electronic online teaching PBL Physiology of the Digestive System in the form of tests, situational problems for students

Electronic online teaching PBL

Physiology of the Digestive System

in the form of tests, situational problems for students

Discipline FIZ-2 3208 « Physiology-2»

Specialty « General medicine » 5B130100

Associate Professor Nuriya Mansurovna Kharissova

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This educational-methodical manual has goal to explain mechanisms of work of higher parts of Digestive System, providing species and

Figure 1 Example of page Online-course «Physiology-2» in Learning Platform MOODLE.

We would also like to note the weak points in distance learning (DL) at the «Karaganda Medical University»: some failures in online educational services due to the increased load on them, unstable Internet in remote areas, inadequate quality of services provided, hasty creation of online courses by teachers and the like.

In addition, in the system of medical and physical education in basic fundamental disciplines, and in particular in physiology at the Karaganda Medical University and physical-training process at the Kostroma State University, not all classes can be conducted in online technology. To master the necessary physiological-clinical and physical skills, it is necessary to create mini-groups in real time, where students must master them realistically either at the center of simulation technologies or at the patient's bedside and gyms.

Many medical students and sportsmen students at the Kostroma State University and Karaganda Medical University were at the forefront in the fight against coronavirus (in clinics and pharmacy centers, schools and gyms) and demonstrated their knowledge, clinical and physical educational skills under the guidance of their teachers and clinical mentors.

It is interesting to note that students at Kostroma State University and Karaganda Medical University successfully defended master's and PhD dissertations in the online technology mode by using the Team Conference mode. The final exam for students was carried out in the Session.kgmu.kz program developed at the Karaganda Medical University. For students of the 3rd year of integrated education in basic fundamental and clinical disciplines, an objective structured clinical exam (OSCE) was conducted in a remote format.

Since 2014, at Karaganda Medical University has been conducting an OSCE for 3rd year students in the specialty "General Medicine", who are engaged in an integrated interdisciplinary educational program (anatomy, histology, physiology, pathological anatomy, pathological physiology, general pharmacology, visual diagnostics) and the teaching of fundamental, basic disciplines becomes professionally oriented and close to the future student specialty. OSCE allowed evaluating the practical and communicative skills of students at the universities at Karaganda Medical University on the basis of objective testing through the implementation of clinical tasks in a center of practical skills (CPS).

Students of the educational program "General Medicine" in the learning process acquire certain knowledge, abilities, skills and competencies in accordance with state educational standards. The main competence of graduates of medical schools are: general education; knowledge of biomedical sciences.; communication skills; skills of continuous self-improvement; skills of scientific research; ability to work in a team; professionalism; clinical skills. These competencies are demonstrated when passing the OSCE-exam.

As the analysis showed, the conduct of the OSCE in 2020 in the context of the coronavirus pandemic and the OSCE exam of previous years had significant differences. If this type of exam of the past years was held in real time (students went to the clinical station and answered the questions posed in the presentation, demonstrated skills, worked with standardized patients), then in this year students passed this exam in writing form, in more comfortable conditions, in the Session.kgmu.kz program.

Exam in past years had the following types of examination stations: Clinical stations, where the student communicated with a standardized patient; practical stations (Practice station), on which the student did the technical procedures (listening to heart sounds, ECG recording, etc.); static stations (Static station / Non Interaction station), where the student analyzed the results of laboratory and instrumental data, treatment plan, treatment appointment, prescribing.

In preparing for the exam, the teachers of the basic fundamental and clinical departments were involved. 10 variants of clinical tasks were prepared for each of 8 systems (endocrine system, respiratory system, nervous system, digestive system, cardiovascular system, locomotor system, urinary system, reproductive system), according to which a set of questions and slides were prepared presentations. In addition, evaluation sheets and evaluation criteria were prepared for the implementation and interpretation of knowledge, skills, abilities according to the passport of the specialty and syllabus.

For each of the 8 systems, a syllabus was compiled, which describes the discipline, Forms of classes (Lectures, Practical classes, student individual work under teacher's guidance, student individual work), Period of study, Mandatory prerequisites, Additional prerequisites, Purpose of discipline, Summary of discipline, Policy for ensuring academic honesty, Discipline policy, Learning outcomes, Curriculum, Evaluation criteria. The features of physiological and biochemical processes in the body, histology, topographic and pathological anatomy, pathological physiology, methods for diagnosing pathological disorders in each system of the body, the main symptoms and syndromes, methods of laboratory and instrumental diagnostics, pharmacological correction are presented.

To summarize all of the above, it is safe to say that distance education has proven itself in medical education. Universities teachers were conducting preparatory work to create optimal forms of education for independent work of students under the guidance of a teacher, conducting practical classes and lectures in distance format in the 2020-2021 academic year.

Currently, the teaching staff conducts classes with students who are in the settlements at the place of residence. We have established contact with students who live in India and study at our universities. Medical students need enough hours of practice to master the necessary skills and abilities, to achieve the ultimate goals of education and to fulfill the mission of Karaganda Medical University. For almost 70years, the Karaganda Medical University has trained professionals who meet the requirements of the national health system and international standards through the introduction of innovations in education, science and practice.

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The combination of certain pedagogical technologies allows us to provide a qualitative degree of mastery by students of knowledge, skills for the development of professional competencies in the learning process for future clinical practice.

Discussion

It is known that new educational technologies rely on the education system, where education takes place not only in knowledge, but in ways, forms and methods of "acquiring" it, that is methodology of scientific and cognitive activity with the formation of creative imagination and ingenuity, changing the structure of the mental activity of future specialists, followed by the application of "acquired knowledge" in clinical practice.[4]

Student-oriented learning contributes to the involvement of students in an active learning process, where the student is the creator of their knowledge and competencies, as opposed to classes under the guidance of a teacher. This type of learning is non-progressive due to the fact that the knowledge acquired in this way is shallow and superficial.[5]

In addition, the given approach motivates the student to adapt to new knowledge, challenges and problems that he will face in the future in his professional life.[6]

Lectures continue to be one of the leading methods of teaching basic fundamental disciplines, but also the leading form of organization of the educational process in a higher educational institution (universities). The correct organization of the educational process, the use of modern hardware and software when lecturing on-line (ZOOM), the optimal combination of lectures with other teaching methods: practical or laboratory work; independent work of students under the supervision of a teacher, independent work of students, as well as the use of various types of lectures and oratorical skills of a teacher in the educational process - all this will determine the success, efficiency, effectiveness and ultimately the quality of student learning at the present stage.[7]

It is known that initially the OSCE format was introduced by Harden in 1975. This type of exam made it possible to evaluate the clinical competence of medical students. Since then, this type of exam has been used to evaluate students of medical universities, the ability to solve clinical problems, assess knowledge, skills, and is also a reliable tool for extracting information for feedback on changes in the learning process.[8]

An objective structured clinical exam assesses students' development of clinical skills and abilities and was first held in 2009 at the Department of Propedeutics of Internal Diseases at Karaganda Medical University.[9,10]

Modern science has created high-tech simulator simulators, 3D-interactive models that allow you to master real skills in the field of medicine. Currently, there are a lot of virtual tools for mastering this or that medical manipulation, but this will not replace the real communication between the doctor and the patient. A student who has mastered this or that skill in a virtual simulator perfectly can perform these manipulations erroneously in real life, due to the fact that the features of medical and physical education are full-time (classroom) education.[11]

The experience of working in the distance learning system, acquired during the pandemic, has shown its pros and cons in organizing the educational process of students in the direction of training "Pedagogical Education", profile "Physical culture, life safety".

An advantage was that

1. The material that was given in the practical classes was mastered by all students and assessed by the teacher, which would have been practically impossible if carried out in full-time format, since the lesson was limited by the time period and the teacher could only interview a part of the study group. For students of part-time education, it became possible to combine education with work.
2. The department has developed a large base of practical tasks for the distance education (DE), test events, video materials on the methodology of teaching motor actions in sports disciplines.

An argument against distance learning thing is when mastering the material of laboratory classes on Theory and methodology of sports disciplines, the teachers faced the problem of organizing the educational process in the SDO. To study this material, a sports facility (gym, stadium, pool), sports equipment and inventory are required, and it is imperative for the timely correction of errors that appear when performing a movement, visual communication and tactile communication. Teachers had to present educational material in lightweight assignments in which students could use the premises of their apartment or a small sports hall. The next problem was the elimination of errors in the performance of motor tasks by students. It was necessary either to describe each mistake in the comments for a long time, or to gather a group to analyze practically individual errors in ZOOM, or to call on the phone, which accordingly took a lot of time and was laborious for both the student and the teacher.

Through the eyes of the student, the effectiveness of DL technology at the university was assessed. The strengths of preschool education were identified (timeliness of receiving the necessary information from teachers - 23.6%; feeling of security, relaxation and psychological comfort in the family circle - 34.1%; reduced risk of diseases during the COVID-19 pandemic - 65.5%) and weaknesses of preschool education (weakening of motivation to study; there is no direct communication with teachers - 49.5% and with fellow students - 40.9; insufficient knowledge of computer technologies 18.8%; difficulties in allocating time (for study, for rest) - 27%). The analysis of the results of the survey revealed the concern of students that they cannot master certain physiological and clinical skills and skills of sportsmanship remotely.

Conclusions

Thus, we found that for the further implementation of distance learning in the field of medical and physical education, the following conditions are necessary:

1. Professionals in the field of ICT-technologies and multimedia can assistance for the development and formation of modern, high-quality content-based and technical equipment distance learning courses;
2. To increase the financial and temporary resources of universities and teachers;
3. It is necessary to apply a combined method of education with a clear choice of topics and the percentage ratio between classroom and distance learning to develop practical skills.
4. The results of the survey showed that many students (43.5%) are satisfied with distance education. But it is of great concern that some students lose motivation to learn, and therefore their academic performance decreases. At the same time, well-performing students show good knowledge of the subject being

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studied. In a distance learning format, students are concerned that they cannot master certain practical (physiological, clinical and sports) skills well.

Practice highlights

1. Achieving highly professional results in teaching students the basics of medicine and sport is possible with a combination of traditional (classroom) and modern (innovative) teaching methods in the educational process.
2. It is necessary to carry out individual work with each student.
3. In the classroom, it is necessary to pay great attention to the independent work of students under the guidance of the teaching staff.
4. Distance learning is an effective method in a pandemic situation.
5. It is necessary to record your lessons, view them, and improve your technical and methodological best practices, and share with your colleagues.

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Conflicts of interest

Author declares there are no conflicts of interest.

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