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The Benefits of Innovative Technologies in Teaching Subjects in Medical Education.

Demikhova N, Smiianov V, Smiianov Y, and Lukyanikhin V*.

Department of Family and Social Medicine, Department of Management* Sumy State University, Ukraine.

ABSTRACT

In modern life information and telecommunication technologies are becoming more and more developed. It especially attracts and captures the young - young scientists, teachers and students. The purpose of the article is to highlight the experience of implementing technology of problem-based learning in the traditional system of teaching medical disciplines. We try to analyze the impact of the training project Tempus «Introduction of innovative teaching strategies in medical education and the development of the international network of national training centers" (530519-TEMPUS-1-2012-1-UK-TEMPUS-JPCR) on the quality of teaching students of medical orientation. A problem-oriented learning is used as an innovative educational technology in teaching of biomedical subjects - (problem-based learning - PBL), team training(team-based learning - TBL), interactive lectures (interactive engagement, peer instruction with clickers), discussion, training in cooperation (collaborative learning), cooperative learning (cooperative learning). We came to the conclusion the development and implementation of the system of communicative, interactive problem-based learning, characterized by practice-oriented approach, provides a reproducible stable planned results in practical terms with the formation of skills and abilities at the beds of the patients, helps self-organization and increases competitiveness of a person, able to adapt in the conditions in society that is developing rapidly.

Keywords: innovative technologies, medical education, PBL (problem-based learning) implementation.

**Corresponding author*



INTRODUCTION

In modern life information and telecommunication technologies are becoming more and more developed. It especially attracts and captures the young - young scientists, teachers and students. The Internet, various gadgets, which are available from mobile devices (laptops, pads, mobile phones) that can not only provide interactive communication, but also create a powerful portal for finding and sharing information. These opportunities penetrate deeper into our lives, including the system of education.

The reform of medical education in Ukraine is based on the competency approach to the skills formation that will allow to improve the quality of education of the graduates of medical educational institutions, but requires new approaches to the educational process. [1]

Using the traditional teaching strategy - from knowledge to problems - students can not master the abilities and skills of independent learning and scientific search, as they get ready for learning results. In this case, there is a gap between theoretical knowledge and its practical application. In most cases, a student does not understand the necessity to study basic sciences (anatomy, histology, physiology, etc.) and can't apply the knowledge in clinical practice. Consumption of "ready" scientific achievements can not form a model for future real activity in the minds of students. Therefore, in the future when they face nontrivial situation that requires implementing their own knowledge in a new field, they appear not to be prepared enough. [2, 3, 4]

Important at this stage is the question of adaptation and teaching students in close to real practical clinical situations, which university graduates will face in their future practice as a doctor or a pharmacist.

The purpose - to highlight the experience of implementing technology of problem-based learning in the traditional system of teaching medical disciplines. We will also try to analyze the impact of the training project Tempus «Introduction of innovative teaching strategies in medical education and the development of the international network of national training centers" (530519-TEMPUS-1-2012-1-UK-TEMPUS-JPCR) on the quality of teaching students of medical orientation.

A problem-oriented learning is used as an innovative educational technology in teaching of biomedical subjects - (problem-based learning - PBL), team training(team-based learning - TBL), interactive lectures (interactive engagement, peer instruction with clickers), discussion, training in cooperation (collaborative learning), cooperative learning (cooperative learning).

One of the main educational technologies used in teaching of medical sciences and biology, is problem-oriented learning. It is based on the system of clinical situations (cases) that gives a problematic situation to the group of students. In most cases it doesn't allow to explain a certain fact by using existing knowledge or perform a certain action using familiar standard methods, this encourages students to find a new way to solve it. This need creates a motive, requires non-standard thinking and acting, that reflects the essence of problem-based learning. The highest level of the problem-based learning is when students during the school week set a problem themselves and solve it themselves.

The traditional system of medical education in Ukraine is based on holding lectures and practical (laboratory) classes with students, the central figure of this system is a teacher. Problem - oriented learning involves creation of problematic situations under the supervision of the teacher and active independent activity of students in order to solve them, resulting in creative mastering of professional knowledge, skills and abilities. A student is the central figure of such a model of learning. The task of the teacher (tutor) is only in some correction of a general learning direction, coordination of students' learning activity. [5-8]

Since 2012 Medical Institute of Sumy State University (SSU) is a member of the implementation of the training project Tempus «Introduction of innovative educational strategies in medical education and development of the International network of national training centers" (530519-TEMPUS-1-2012-1-UK-TEMPUS-JPCR). Organization of educational process by credit system has allowed to adapt the curriculum in a relatively short period and integrate the elements of problem-based learning in it. 1,5 year training program by problem-based learning technology using clinical cases (case studies) given by the University of St. George (UK),is included in the 2nd and 3rd years of studies of the students of medical institute.



The curriculum in case of problem - based learning is formed by the "spiral" type, allowing you to return to previously acquired knowledge, deepen it and obtain new one. This approach helps to use previously obtained knowledge and skills in a new clinical situation, to offer a new way of solving by combining previously known elements, and find unique solutions, which have no known analogues.

The newly created pilot program started working in 2014-2015 academic year. During the first year (2nd course) students should master the 35 linear cases, during the second year (3rd course) - 18 ramified cases that have interactive character that approximates the process of learning to real clinical situations.

Actually, cases are integrated multi-situational tasks (complex tests, CCT), which are common in traditional medical education. Innovation is in the way of presenting the information about a patient to students and the ways of solving of a problematic clinical situation.

The main components of the lesson by problem-based learning technology are:

1. updating the knowledge of the basic subjects needed for solving of the clinical situation;
2. analysis of the problematic task by discussing it in a group and the comparison of your own opinion with the views of other team members, correction of their own point of view under the influence of reasoned proofs;
3. giving a number of assumptions by the method of the team "brainstorming" and then narrowing the search field to determine the main problem;
4. formulation and the logical proof of working hypotheses by constructing a chain of causation;
5. checking of the solutions. In case of ramified cases wrong tactics require to go back a few steps back and review the basic hypothesis.

By oral questioning of students and checking their knowledge we found out that the level of students' interest in learning increased, their motivational component increased, the final results of teaching disciplines in a new perspective also increased. Thus, among the questioned students 80% gave a response that they like the proposed teaching model more, it is more convenient and useful for acquiring knowledge. Average mark grew by 15%. During the first year of the implementation of the pilot program 32 students learned on the basis of the new model, in the 2015-2016 academic year more than 60 people are studying on its basis and this process is getting widespread. Teachers mention the improvement of the teaching conditions and, therefore, improvement of the students' learning results on such a streamlined basis.

Combination of the system of traditional teaching with elements of problem-based learning is a reserve for further improvement of training of the students. Most teachers have refused to present material in the form of traditional lectures and thus have become consultants and coordinators of the educational process that allows students, working independently in small groups, to solve problems, give various hypotheses and seek the possibility of verification. The emphasis is not on memorizing and learning by heart, but on the analysis of the situation and its discussion with the active involvement of students in the process of meaningful, reasoned, conscious learning.

So the problem-based learning have changed the role and function of the teacher. Mastering the skills of a tutor by the teachers of the Medical Institute of SSU occurred during training, conducted by the University of St. George (UK), with the issuance of the certificates. It was necessary to understand that the main tasks of the teacher in terms of problem-based learning are the following: creation of maximum positive emotions for students during the class, encouraging a student to use his intuition in combination with responsibility for decisions, stimulation of cognitive activity of students, informational supply of the educational process, monitoring of the correct direction of diagnostic search, etc.

Basing on problem-based learning tasks, the new technique sets a number of requirements to the teacher: the joint search, based on the distribution of activities between students and a teacher; focus on the assessment of the possibilities for students to determine the direction and content of the next stage of the search; tolerance to students' mistakes made while trying to find their own solutions; broad outlook, teacher's erudition.



Our own experience shows that for the organization of problem-based learning a teacher has to overcome a number of difficulties: low motivation for learning of some students, their indecisiveness and lack of activity, inability to distinguish significant aspects of the problematic task (clinical situation), attempts to use similar algorithms to solve different types of problems .

Interesting in this context is the practice Herbartian theory of education, in which the emphasis is placed on the didactic preparing of the teacher, his ability to think and "pedagogical tact." It is thanks to J.-F. Herbart the question of "pedagogical tact" became the common heritage of pedagogical thinking and activity. In "Teaching Notes" ("Padagogische Schriften") (1802) it was found out that pedagogical tact is produced in the process of teaching practice, in fact through the influence on our feelings. Feelings, by J.-F. Herbart, are combined through mutual understanding between students and teachers through pedagogical influence. The scientist and his followers emphasised that the success or failure of any educational efforts depend on how the teacher "produces" his tact through his thinking, considering, research and scientific quality.

Students should be gradually developed, accustomed to the synthesis of knowledge and its application in practice. The following will be helpful: business games, "brainstorming" analysis of micro situations with a teacher, which are widely used in the Medical Institute of SSU, both in the problem-based and traditional learning.

But for such work a teacher himself must have developed skills and experience both as a physician and educator. A necessary condition for professional growth is teacher's mandatory training abroad, which allows to get new experience, stimulates the learning of foreign languages.

So the teacher must not only put a set of knowledge in the medical student, but move his process of thinking with the help of person-oriented approach to learning.

Another condition for improving the quality of medical education is to introduce in the learning process new information, interactive telecommunication technologies which are widely applied in a problem-based learning.

Each class held basing on the methods of problem-based learning should be finished with a discussion of literature and resources needed to prepare the case. As part of the Tempus project the only window of the virtual library was created on the platform of Microsoft Office 365. The portal provides access from any mobile device for all participants of the educational process (tutors, students) to educational materials that can be presented in Russian or English. In addition, the library allows you to locate and use multimedia atlases, online banks of electrocardiograms, X-rays, tomograms, movies, elements of animated computer simulation in the educational process.

Remote technologies allow to get access to educational content independently from the location, help the organization of dynamic learning process. Important for implementation of these technologies is creating of electronical educational devices(textbooks, lecture series, etc.). For this in Sumy State University was created an open access platform OpenCourseWare (OCW), available at <http://ocw.sumdu.edu.ua>.

To create a high intensity of information flow for a limited period of airtime thanks to Lync Online it is possible to hold virtual "round tables", seminars and conferences for students and teachers. Also the device allows videotranslations of operations, manipulations and distance consulting of patients.

So information technologies help students to master knowledge faster, to operate mobile data sets and to be at the cutting edge of modern science.

Training of doctors at the transition to family and health insurance sets high demands to the knowledge of specialists. Family doctor should possess a great amount of knowledge, to be able to work with modern equipment, perform a series of manipulations,etc.

Application of knowledge and understandings, forming of judgments, communication skills and ability for lifelong learning are key competencies of the future doctor [The framework of qualifications for the European Higher Education Area [electronic resource]. - Access: http://www.ehea.info/Uploads/QF/050520_

Framework_qualifications.pdf]. Problem-oriented learning allows you to master these competencies in the best possible way. It will allow to prepare a new generation of professionals who will perfectly master professional skills, will be able to learn constantly, grow professionally and adapt to the environment, quickly solve problems and obtain knowledge throughout all their professional lives.

Thus, the development and implementation of the system of communicative, interactive problem-based learning, characterized by practice-oriented approach, provides a reproducible stable planned results in practical terms with the formation of skills and abilities at the beds of the patients, helps self-organization and increases competitiveness of a person, able to adapt in the conditions in society that is developing rapidly.

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