ChemLab, it is only $ 520.00 for the university, that can buy a set of programs for teacher and twenty students, that will ensure full implementation of the program in a specialized computer class and even on some library computers for training during free time [2].

***Conclusion:*** The benefits of the chemical applications usage in a university training program is obvious, I just want to quote the widely known phrase, that "student should not use computer for already prepared knowledge, but learn with help of the computer".

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## EXPERIENCE OF IMPLEMENTING PROBLEM- BASED LEARNING (PBL) IN ASTANA MEDICAL UNIVERSITY

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**Keywords:** TEMPUS, Astana Medical University, problem-based learning.

Call for innovative processes in the field of content, structure, organization of medical education updating with the purpose to perfect competences of medical university undergraduates, increase of competitiveness of the Kazakhstan experts in the world market of medical services are defined in the State program of health care development in the Republic of Kazakhstan and the Concept of medical and pharmaceutical education development of the Republic of Kazakhstan for 2011-2015 [1,2].

For the achievement of general and special competences by the graduates of «Astana Medical University» JSC in Mission and the purposes of higher education institution, the Strategic plan of the higher education institution development there was proposed the implementation priority of the innovative learning approach. For this purpose, along with the other higher education institutions of Greece, England, Georgia and the Ukraine, Astana Medical University since 2013 has started working in the international grant project «Establishment of the Supra-Regional Network of the National Centres in medical Education, focused on PBL and Virtual Patients» within the European program «TEMPUS». TEMPUS – one of the European Union programs directed to the support of the higher education updating processes in the partner countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean, mainly, through projects implementation of interuniversity cooperation.

There are supported consortia, within the «TEMPUS» projects, consisting generally from higher educational institutions or their associations, and also unacademic partners.

For this work coordination at the level of higher education institution there were created the Centre of medical education and Committee on implementation of new educational technologies, the TEMPUS working group. The principles of quality management system are used for more effective result. Within the integrated system of management there was created «Provision on tutoring». All work is carried out according to the perfection model (EFQM) that is new, higher criterion of innovative activities assessment.

Within the TEMPUS program, by the method of problem-based learning, 9 lectures of the "MUA" JSC have gone a cycle of seminars and trainings. Trainings were conducted by the supervisor of e-Learning of St. George's University (London) professor of Terry Poulton and consultant on PBL of the same university Ella Iskrenko.

From among the teachers who were trained eight people received certificates of tutors, and one – the certificate of PBL trainer. Aiming to increase professional qualities of facilitator, the PBL trainer provided 4 trainings for tutors: «Principles of problem-based learning method», «Students and a tutor in PBL», «Facilitation in PBL», «Adaptation technology of PBL- cases». The PBL method is considered to be a successful innovative method of learning directed to student's individual work. In this method the accent of training process displaces from teacher on student inasmuch students play more active role, trying to solve a practical task. This technique instructs the student to comprehend everything told by the teacher during lectures and written in textbooks more widely and more deeply.

Howard Barrows, taken part in the development of the PBL method at MacMaster University in Canada gives definition of PBL from the point of view of the specific attributes peculiar to this method [3]. Such characteristics of PBL as personal directivity, fixing learning process around the problem and orientation to work in small groups, where the teacher acts as mediator. Gijselaers defines PBL on the basis of the theoretical training principles, such as step-by-step creation of knowledge, meta - learning and context learning [4]. Savin-Baden systematizes the PBL models as follows: PBL for knowledge achievement, PBL for professional activity, PBL for interdisciplinary understanding and comprehension, PBL for interbranch learning and PBL for critical competences acquisition [5].

The literature distinguishes three levels of the learning method based on a problem: theory, model and practice [6]. Simply speaking, a certain task (problem), often taken from real life, is offered to students and "a set of tools" for its solving.

For the greatest efficiency of this method it is necessary to organize educational process properly. The use of this method assumes that certain changes will be made in the plan of classes, lectures, seminars and also in the knowledge assessment methodology to optimize benefit of PBL.

Among advantages of such training method it is possible to specify the following:

1. The PBL method inspires students for individual work.

2. The PBL method teaches students to reason. It isn't enough just to learn the offered material. To learn a formula, rules and definitions is only the first step in understanding of a subject. The student understands why these or those theories, concepts and rules are important. And perceives them by now in a different way.

3. The PBL method stimulates students to think nontrivially. Properly organized setting of a problem stimulates students to search for non-standard solutions. In many cases it is often the quality which is looked for by employers while hiring of new experts.

4. The PBL method "heats" interest of students in sciences. It is important for educational process to be interesting and fascinating. And the more actively students participate in it, the more interesting the learning process becomes for them.

5. The PBL method trains students for «real life». This method gives a chance to bind the theory to practice therefore a student understands practical aspects of the future profession.

At the present moment at «Astana Medical University» JSC have been created groups which are working on clinical cases adaptation on PBL, introduced the required changes in the existing educational program «General medicine», selected groups of the first-year students who participate in the project, made a schedule of classes, opened a site with the materials reflecting the «TEMPUS» project implementation and a Web portal for virtual patients creation. Workgroup members in association with the tutors have analyzed educational programs of partner higher education institutions, defined general structures of the program, scrutinized the distinctions in educational programs design, adjusted approaches of common accordance for PBL implementation in each new educational program. At the present time there has been conducted an analysis of the PBL existing cases of educational program of Saint George University, London and accomplishing their integration into the educational program of AMU JSC for 1, 2 and 3 years of education. The process of cases adaptation has been started according to the «Virtual Patient» program, provided by the western side. These cases require modifications and add-ins concerned with normative and legal acts of the Republic of Kazakhstan, peculiarities of diseases diagnosis and delivery of health care, the nomenclature of medicines, ethnic features. The technology of cases adaptation is based on brining the listed peculiarities in accordance with the standards of our country.

Classes with students on the PBL program are conducted in the special rooms equipped with all necessary technical means. Since February 2014 by this method there have been taught 4 small groups (32 students) of the «General medicine» faculty. Both students and tutors were pleasantly surprised with the extensive information volume about structure and functioning of an organism, diagnostic methods and treatment, patient's rights which can be derived while studying a simple clinical case. And that is especially important, to make training activity very fascinating. «It is very interesting for us. High motivation for individual study of the material. We feel like doctors and we neatly realize that the patient's life and health depend on the level of our knowledge and solutions», - tell students during the

reflection which is carried out by the tutors after each class. And it is the evidence of the PBL method efficiency, stimulates functioning of the Medical Education Centre, the Committee on implementation of new educational technologies, the «TEMPUS» working group and tutors for its improvement.

Thus, the implementation of PBL in educational process of «AMU» JSC, providing tutors and students with necessary conditions for the development of their creative potential, training in small groups and personal oriented environment contribute to the improvement of medical personnel training quality, competences perfection of undergraduates, increase of competitiveness of the Kazakhstan experts in the world market of medical services.

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## MEDICAL DECISION SUPPORT SYSTEM BASED ON SEMANTIC PARSING AND TEMPORAL RELATION EXTRACTION

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Medical reports contain huge amounts of data about the patient's health, medications, recommendations, procedures, etc. which are expressed mostly as narrative text. This information not only comprises the actual health condition of the patient, but also encompasses the past medical experience and events like symptoms, diseases, medications.