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## USE OF INFORMATION AND COMPUTER MODELS IN THE PROCESS OF TRAINING FUTURE TEACHERS OF PHYSICS

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In article methodical aspects of use of information and computer models in the course of training of future teachers of physics are analyzed. The attention is focused on expediency of development of new means of informatization of training of students of higher education institutions to physics.

**Key words:** education informatization, computer models, training in physics, student.

Modern information preparation assumes that teachers of physics have to acquire knowledge of the basic concepts and informatics methods, work skills with information and various means of information and communication technologies. Besides, when studying physics at school computer modeling of objects, processes and the phenomena of the physical world have to be realized; physical and computer experiments, including such which can't be executed in a real mode of time; programs of calculation of results of experiment, solution of educational practical tasks; visualization of educational information.

In the annual message of the president of the Republic of Kazakhstan N. Nazarbayev to the people of Kazakhstan said: «...the modern education system corresponding to requirements of economic and public modernization is necessary to us...» [1].

Current world trends in development of the higher education predetermine need of reconsideration of its role and mission of elaboration of new approaches and definition of new priorities for society. It is the objective process caused by occurrence of mankind in new, information culture of the XXI century — an eyelid of high technologies, hitherto unknown in civilization development.

In the conditions of prompt development of science, fast updating of information, it is impossible to learn for the rest of life, it is important to develop interest to receiving knowledge, to continuous self-education. Intensive transformations in the society, caused by development of modern educational technologies, caused need for education system change. The main task of training is achievement of new, modern quality of education. Modernization of the Kazakhstan education defines a main objective of professional education as training of the qualified expert of an appropriate level and the profile which is masterfully using the profession, capable to effective work in the speciality at the level of the international standards, ready to the professional growth and professional mobility.

As important factor in development of the higher education informatization as realization of the package of measures, aimed at providing full and timely use of reliable knowledge in all socially significant human activities acts. Informatization process, having arisen at the same time with distribution of electronics, computers, communications, intensively develops and changes nature of work and a place of the person in educational space.

Modern society demands transition to essentially new level of high-quality education. The condition of education of the Republic of Kazakhstan and tendency of development of society demand an urgent solution of the problem of advancing development of an education system on the basis of computer technologies and creation in the country of the uniform educational information environment.

Future experts have to be competitive, demanded on a labor market. Therefore also the purposes of education are defined, first of all, on the basis of requirements of the training program to knowledge and abilities and requirements imposed by society to development and good breeding of new generation. Students have to be able independently, actively work, make decisions, flexibly adapt for changing living conditions.

Informatization of an education system is considered as strategically important direction of the State program of a development of education of the Republic of Kazakhstan for 2011—2020, the President approved by the Decree, upon transition to electronic training the priority — providing an education system with highly qualified personnel [2] is put. Vocational training and professional development of experts, formation of high level of their information competence plays great role.

According to the conclusion of UNESCO, informatization is a large-scale application of methods and means of collecting, storage and distribution of information providing systematization of available and formation of new knowledge, their use by society for the current management and further improvement and development.

It is obvious that on the one hand both specified definitions don't contradict each other, and, on the other hand, define, including informatization of education which is one of spheres of activity of the person. Thus, the concept «education informatization» can be entered by adaptation formulated above definitions.

Informatization of education represents area of scientific practical activities of the person directed on application of technologies and means of collecting, storage, processing and information distribution, providing systematization available and formation of new knowledge in education for achievement of the psychology and pedagogical purposes of training and education [3].

Computer modeling is a method of the solution of a task of the analysis or synthesis of difficult system on the basis of use of its computer model. The essence of computer modeling is concluded in receiving quantitative and qualitative results on the basis of available model.

Informatization assumes technological change of the contents, methods and organizational forms of education. The problem of the content of education at the present stage, a ratio of traditional components of educational process and the computer

technologies, new relationship of the student, the teacher and the educational environment has to be thus solved. Development of information and computer technologies involves formation of essentially new educational system which can provide providing educational services in educational process of higher education institution.

The socio-political peace arrangement which has been closely connected with information and computer technologies and global informatization of communication, demanded new approaches to extraction and processing of enormous volumes of knowledge, and also to education as to the instrument of transfer of this knowledge. As one of the priority directions of modernization of education competence-based approach which was considered in works of such researchers-methodologists as N.V. Bagramova, A.V. Farm, B.D. Elkonina, A.P. Tryapitsyna, V.A. Bolotov, etc. [3].

Now created game technologies, technologies of an individualization of training, problem training, communicative technologies, etc. are successfully used. All of them are based on methods of active training therefore they are called as modern educational technologies. Computer and network technologies, technologies of a total individualization of training and other methods of training which are based on competence-based approach, first of all, concern to them.

The subject of competence-based approach in system of the higher education becomes essentially important and actively discussed. It is connected with that it includes the new educational paradigm which vector is directed towards a humanization.

Competence-based approach, assumes formation at being trained defined by competence. The standard determination of competence of modern science doesn't exist, however practically all scientists emphasize that «competence» is concept complex, including both knowledge, and abilities, and the skills, however not identical to the simple sum of the last [4].

In the conditions of reforming educations it is headed for application of competence-based approach as it increases actually praktiko-orientation of education, its pragmatical, subject and professional aspect. Not excepting known approaches in pedagogics — personal, activity, but combining elements of that and another, competence-based approach has a humanistic, pragmatical and practical focus that allows to speak about its interdisciplinarity and systemacity. Systemacity реализуется by integration of all components of educational process into complete and dynamically developing pedagogical system [5].

Intensive transformations in the society, caused by development of new information technologies, caused need for education system change. Paramount problem of a technique of training is achievement of new, modern quality of education which is designated in the last governmental documents as orientation not only to assimilation by trainees of the oredeleenny sum of knowledge, but also to development of his personality, its informative and the ozidatelynykh of abilities [6].

On today's a stage at the International Kazakh-Turkish University (IKTU), in particular in the specialty 5B05110 — physics on occupations new techniques with use of the information and computer technologies (ICT) which are opposed to traditional training in English are used. To teach communication in English, it is necessary to

create real, real life situations which will stimulate studying of a material and to develop adequate behavior.

The increasing introduction of new information and computer technologies and application of competence-based approach in educational process of the International Kazakh-Turkish university, one of actual problems of training of specialists of the international level is a problem of development of methods of use of modern educational technologies in formation of professional and information and communicative competence of future experts.

Universal competence on which achievement of competences of all spheres of self-determination and self-improvement of the trainee is based, in the conditions of expansion and complication of the communication and information environment, a total computerization, communicative competence admits to informatization and virtualization of communication.

Today in the conditions of the world globalization development of information technologies leads to formation of new ways of use of the Internet. Now in the world consecutive and steady movement to creation of information society which is urged to create the best conditions for the maximum self-realization of each person is observed. The bases for such process are intensive development of computer and telecommunication technologies and creation of the developed information and educational environment.

Successfully to train students power engineering specialists in English, the teacher needs to awaken interest to a studied subject and systematically to support him. In this regard there is a problem of comprehensive and careful study of ways of obtaining information.

As now actively there is a transition to information type of society, informatization of education is considered as a necessary condition of development of the personality at the present stage.

It is important that on English occupations being trained felt beauty of a foreign language. Use of various active forms and work methods is for this purpose possible. We will note that tasks difficult, at first sight, attract being trained with the novelty, singularity, a non-standard. In the course of training and education of modern generation by one of the main aspects, except emotional development, increase of intellectual potential being trained is. Now on English occupations by the being trained very large volume of information influencing process of an intentsifitsirovaniye of training is given. Researchers raise a question: to use or not to use the computer at lessons? It is unambiguous that the computer opens before being trained and the teacher new opportunities, helps to find new ideas and to solve complex problems.

Use of information and computer technologies in studying of English very effectively as didactic functions of these technologies are broad. It is connected by that computer technologies allow to receive information mnogokanalno and consequently, considerably increases both the volume of received information, and quality of its assimilation.

In the course of introduction of information and computer technologies on educational Wednesday of occupation of English in the specialty 5B05110 — the physicist allowed to raise and stimulate interest being trained, stirred up their cogitative activity, efficiency of assimilation of a material, helped to individualize training, increased the speed of a statement and information assimilation, and also helped to carry out quickly correction of knowledge in case of need.

In training of competitive experts received practical use information and communication technologies on the basis of computer tutorials and global networks. Thus considerably quality of professional education due to use of various electronic educational means (according to many experts efficiency of occupations increased by 15—25%) considerably increased. Computer introduction in education became the beginning of transformation of traditional methods and tutorials.

Results of the analysis of statistical data confirm that fact that, joining in labor collectives as skilled workers, graduates of educational institutions surely solve problems of preparation and processing of design, technological and other information for providing engineering and administrative decisions.

In educational process of ICT are not only a tutorial, but, including, and the integral link of training of specialists of energy drinks, they carry out as a role of presentation or means of testing, and are the instrument of obtaining special skills (design in AutoCAD/COMPAS, control and software support, etc.)

Available in Natural sciences faculty of IKTU computers (the 5th computer. classes), multimedia devices (3 m / projector and screens, 5 inter. boards) allow to conduct training with optimum load of students on 1 computer.

Available information support allows to provide training of students in work bases at the computer at the initial stage of training, and then to become the advanced users of applied programs, to seize professional skills.

Computer use in the course of training Profile disciplines probably with various purposes:

- at an explanation of a new material for its maximum assimilation;
- for optimum fixing of the studied material;
- for improvement of control of knowledge being trained;
- for the organization of interesting fruitful work for a subject.

Information and computer technologies strengthen intelligence of the person, promote development of logical and operational thinking, specialize perception, thinking and memory.

In the conclusion there is a wish to tell that, looking at it, information and computer technologies creates conditions for an individualization and an intensification of process of training in a foreign language, providing performance of equal exercises on complexity with all being trained at the same time.

Use of information and computer technologies are a basis for training of competitive experts.

Proceeding from the aforesaid, it is possible to formulate priorities which follow from the requirement of training of competitive experts in higher education institution.

The first — increase of level of training of specialists due to improvement of technologies of the training applied today in higher education institution, and widespread introduction in educational process of information means.

The second — mastering the student of higher education institution a complex of knowledge, skills and abilities, development of qualities of the personality providing successful performance of problems of professional activity and comfortable functioning in the conditions of information society in which information becomes a decisive factor of high efficiency of work.

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## **ИСПОЛЬЗОВАНИЕ ИНФОРМАЦИОННЫХ И КОМПЬЮТЕРНЫХ МОДЕЛЕЙ В ПРОЦЕССЕ ОБУЧЕНИЯ БУДУЩИХ УЧИТЕЛЕЙ ФИЗИКИ**

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В статье анализируются методические аспекты использования информационных и компьютерных моделей в процессе обучения будущих учителей физики. Акцентируется внимание на целесообразности разработки новых средств информатизации обучения студентов вузов физике.

**Ключевые слова:** информатизация образования, компьютерные модели, обучение физике, студент.