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OBJECT-ORIENTED SYSTEMS AS A FORMATION FACTOR OF INFORMATIVE LOGICAL COMPETENCE OF FUTURE SPECIALISTS

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Computerization of all industries, science and education requires the creation and implementation of new information technologies on the one hand, and on the other, a new approach in professional education of future specialists. The article considers one of the problematic solutions with the creation of the educational method of object-oriented systems based on statistical modeling. The information model is the study of natural and special languages, based on theoretical thinking. The computer moderator is considered as a result of generalization of professional knowledge about the subjects and phenomena presented in the information model. Methods for increasing the efficiency of using object-oriented systems in higher education institutions due to the fuller use of the achievements of modern pedagogical science.

Keywords: *future specialists, computerization, information technologies, development of creativity*

Development of science and new technologies, computerization of all industries, science and education demand creation and introduction of means of new information technologies on the one part, and with another, in connection with emergence of problems in activity of experts with their application, new approach in vocational education of future experts is necessary.

Consequence of existence of a contradiction between a level of development of information technology and level of their application in education to special disciplines is a search problem at this conjuncture more effective educational technologies. One of the problem solutions is connected with creation of a teaching method of object-oriented systems on the basis of datalogical modeling. Informational model is exact description of subject, study by natural and special languages, based on sensational and theoretical thinking. Computer moder considered as result of generalization of professional knowledge about subjects and phenomena presented in informational model [1].

One of the important factor perfection of system of professional staff preparation in high schools is active use of object-oriented systems in the educational process. Despite existence of serious researches in this area, still very sharp there is need for further development of its theory and methodology. At the present time planed progress in the creation of pedagogical technologies adequate to aims, content and methods of intensive education, therefore in higher education institutions a big variety of perspective technologies of education which allow to solve effectively many didactic problems existing today at the higher school in process of education of highly qualified specialists is developed [2].

Usually program environment, where the user works at the computer, is defined by set of program components available on it. As we know, software includes great number of program components with certification, good recommendation and extensive use. As a rule, every computer has the same software, which is necessary to the user for the professional interface creation. Components of general purpose are a part of the software – operating systems, the applied programs raising level and improving quality of the interface. However the main components of the software are problem-oriented systems, each of such systems intends for the tasks solution from this or that problem area. There are many problem areas, so accepted to pay great attention to some types of such system, most often used and possessing features and the features characterizing them.

The problem-oriented system, as a rule, is represented a set of the programs intended for the problems solution of a certain applied type and united by the general interface. Adaptation of one kind or another of problem-oriented systems to some applied area leads to receiving the applied program system having the users, concrete appointment and application [3].

Computer science as educational subject introduced in all types of primary schools of the Post Soviet Union from the first of September 1985. The new subject matter called "Basis of Informatics and Computer Facilities" (BICF). At comprehensive school the subject was taught in two senior classes.

At the same time, gradual penetration into the curriculum of comprehensive school of data from informatics area began much earlier and this process began with experiments on studying by school students of *programming and cybernetics elements*. In this notable period of history of state education some quite fixed stages characterizing important high-quality accumulation in system of school education and society as a whole are allocated. This accumulation (world outlook, educational and methodical, organizational and many others) also led in the mid-eighties to creation of the conditions which have provided formation and introduction in school of an independent subject. Below the short review of prerequisites of introduction of subject "Basis of Informatics and Computer Facilities" (BICF) in high school of the countries of the former USSR is given.

Emergence of the first electronic computers (EC) in our country belongs to the beginning of the 50th of the XX century. Together with it the new area of human activity gained rapid development — programming for the computer. It is necessary to tell, what even in the initial stage of the formation noted by imperfection of language means and methods, programming for the computer didn't contain any basic difficulties limiting possibilities of its understanding and perception with school students. There is a simple explanation: drawing up simple training programs for the computer leans on a limited circle of very simple and valid concepts which are quite available to the school student of middle age.

In spite of the big differences of problem-oriented systems, it is possible to allocate a number of works often realized in them, the most characteristic basic functions. These basic functions: analysis of phrases of language of communication; generation, synthesis of programs; structuration, placement, storage, information search; configuration creation, support of versions, editing of communications; planning, design of calculations; management of execution; optimization of calculations; providing the suitable interface; editing, macro processing; expertise; maintaining history of changes; support of collective work; directory service.

Proceeding from the above it is possible to allocate some of the most popular types of the problem-oriented systems suitable these basic functions, namely: programming systems; database systems; information systems; packages of applied programs; word-processors; systems of computer graphics; training systems; systems of artificial intelligence.

However, as showed the studied research, introduction of modern technologies of education in process of higher educational institutions in many respects restrains a weak readiness of their didactic bases and absence of scientifically reasonable practical recommendations about application in education. Psychological aspects of their introduction are rather poorly studied. Now rates of improvement of education technologies advance processes of their psychology and pedagogical judgment and research. The successful solution of this problem in a certain degree is interfered by that the saved up experience of their application in higher education institutions scientifically isn't generalized and theoretically isn't comprehended. Approaches to interpretation of this phenomenon remain very various and do not bring full clarity in explanation of its essence and specifics. And it means that those potential possibilities of increase of efficiency of educational process which are put in use of object-oriented systems are used in student teaching far not completely.

It is important to note that degree of sensibleness of requirement to fill up the knowledge at different people is not identical. At students on the first plan often into the forefront the pragmatically motives connected with the solution of private, situational tasks. In these conditions, it is especially important to provide at object-oriented systems special measures for stimulation of educational activity, maintenance of positive motivation to the doctrine, creation of a favorable operating mode. It is necessary to involve trainees in independent activity of the doctrine, imitating practice, repeatedly strengthening possibilities of the analysis and synthesis of the phenomena and processes. Application within object-oriented systems of computer simulators, databases, electronic textbooks, solvers of tasks, graphic and text editors, etc. allows realizing it.

The studied researches in a number of higher education institutions show what exactly computer tutorials are those means which create necessary prerequisites for emergence of internal motivation of the personality activity in the conditions of information technologies of training (see. Table No. 1). In this case, students start deriving pleasure from the study process, irrespective of external motivators. In this case also

promoted education based on object-oriented systems separate functions of the teacher can be transferred to the computer. The electronic textbook can act as the teacher-tutor which is capable to show a mistake and to hint at the correct answer; to repeat a task again and again; "friendly" to treat the user and at some instant even to give him essential help.

Table 1 – levels indicators of development components of students professional readiness to use of object-oriented systems in educational process in higher education institution

Experimental group (EG) – 151, Screening group (SG) – 153									
Components	Period	High		Sufficient		Average		Low	
		ӘТ	БТ	ӘТ	БТ	ӘТ	БТ	ӘТ	БТ
Motivational	Beginning	-	-	19,16	19,42	32,28	36,45	48,56	44,13
	End	17,11	-	72,13	22,31	10,76	48,27	-	29,42
Informative	Beginning	-	-	17,26	17,49	34,38	39,25	48,36	43,26
	End	10,32	-	70,48	23,42	19,2	47,81	-	28,77
Active	Beginning	-	-	20,53	19,21	38,23	42,28	41,24	38,51
	End	10,12	-	70,18	22,32	19,7	40,52	-	37,16
Operational	Beginning	-	-	18,45	19,12	36,12	38,34	45,43	42,54
	End	9,63	-	71,22	21,41	19,15	36,52	-	42,07

As shows the analysis, the majority of trainees already on the occupations focused on future specialty in higher education institution perfectly realize necessity of computer use for the professional activity. Educational process in essence comes nearer to productive work more and more. Especially this effect amplifies if the educational tasks solved within object-oriented systems, are connected with practical activities of future expert or are of interest in his today's study.

Object-oriented systems provide trainees with accurate and adequate information on advancement in education, maintain their competence and self-confidence, stimulating with that internal motivation. Informative process is under control of the trainee: he feels responsibility for own behavior, explains the reasons of the success not with external factors (ease of a task, luck), and own diligence and diligence. In many training programs the principle of motivation of pupils to search when the computer in case of the wrong decision gives focusing instructions is realized, directing that actions of trainees. The effective training system, eventually, provides correction of mistake and allows finishing the solution of a task. Thanks to it, one of common causes of the negative relation to study, namely, failures in the solution of educational tasks is eliminated [4].

In the higher educational institutions which are training future teachers, to students the most favorable conditions for use of technological capabilities of modern computers and means of communication, for search and obtaining information, developments of informative and communicative abilities, abilities quickly to make decisions in difficult situations, etc., must be created. The teachers exempted from transfer of formal knowledge, received freedom in a choice of forms of interaction with trainees, will be able to apply the forces to that, as has to make an essence of their work. This is about of elaboration of approaches to studying of this or that discipline taking into account individual opportunities and needs of students, training of the last during discussions, joint design and the critical analysis of the received results, a non-standard view of standing problems. For the educational institution training future teachers, what even traditional classroom forms of work will be filled in this case with the new contents as time saved thanks to application of information and communication technologies, can be given to personal contact of teachers and the trainees, the extremely necessary for their vocational training is very important.

In a context of education, we will be guided by the last definition.

In any sense, all pedagogical technologies (understood as ways) are information as teaching and educational process is always accompanied by exchange of information between the teacher and the trainee. But in modern understanding the information technology of training (ITE) is the pedagogical technology using special ways, program and technical means (cinema, audio-and video means, computers, telecommunication networks) for work with information.

Thereby, ITE should be understood as the appendix of information technologies for creation of new opportunities of knowledge transfer (activity of the teacher), perceptions of knowledge (activity of the trainee), estimates of quality of training and certainly, a full development of the identity of the trainee during teaching and educational process. And the main goal of informatization of education consists "in training of trainees for full and effective participation in household, public and professional areas of activity in the conditions of information society".

For incentive maintenance to education according object-oriented systems use, it is necessary to provide gradation of a training material taking with account a zone of the next development for groups of trainees with the different basic preparation, different skills of performance of intellectual operations and intellectual development. That is databank existence with problems of different degree of the complexity providing some methods and forms of giving of the same training material depending on level of basic knowledge, the purposes and developments of trainees is necessary [5]

There should to pay great attention to that the motivation of trainees to application throughout the entire period of stay them in higher education institution increases in educational process of object-oriented systems from a course to a course. Results of students questioning of the Kazakh National Pedagogical University which has been carried out within complex check of physical and mathematical faculty prove it. To point what problems to a request now have the greatest impact on your professional formation, respondents distinguished from twenty offered, as one of the most significant - a problem of creation of training programs and its use in the course of training.

Special meaning in creation of positive motivation to use of object-oriented systems plays possibility of process management of cognitive activity.

Object-oriented systems at the corresponding quality of the software, promotes providing real freedom to trainees in a choice of educational tasks and auxiliary information depending on their individual abilities and propensity. Such tendency to differentiation and individualization of training gives the chance to much bigger number of listeners to find confidence of educational work, to bring into accord of the requirement and complexity of tasks with level of their abilities and opportunities.

Use of object-oriented systems is one of factors of development and an individualization of strategy of subject activity, its motivational, personal regulation. Success of educational activity with their use is reached if there is the search activity born from the motivational sphere at which there are the objectives achieved through formation of the plan of action. As incentive motives of use of object-oriented systems at this stage of development of datalogical competence of future expert in higher education institutions act: higher intensity of work, its organization, activity, quality of assimilation, independence, objectivity of an assessment, discipline, novelty of a subject, and also singularity of occupations and others.

Use in educational process of higher education institution of object-oriented systems can become a basis for formation of essentially new form of the education leaning on a detailed self-assessment and motivated self-educational activity of the personality, supported by modern technical means.

Increase of datalogical competence of teachers in the conditions of education informatization, generally is based on the principles of modular training. Use of modular approach at design of the content of course preparation, allows to differentiate the content of training, by group of the modules providing development of a course in full, reduced and deepened options depending on needs of teachers. Criteria and indicators of a level of development of information culture of the teacher are defined according to modern treatments, reflect requirements imposed to information-logical competence of the modern teacher: complete idea of information space of a modern education system, information literacy: possession of technologies of preparation and registration of results of educational and methodical, skilled and experimental, research work; possession of the applied software; ability to mastering new software (educational) products and the organization of educational process with use of new information technologies: knowledge of opportunities of new information technologies; ability to use communication services in the course of training; ability to adapt and apply pedagogical software taking into account features of educational process.

At the present time the most perspective means information technologies, from the point of view of realization called above conditions, are object-oriented training systems. We will consider their modular structure, we will define structure and didactic functions which are used when forming a datalogical competence of future expert.

The structure of object-oriented training systems consists of group of modules of didactic ensuring process of training and the module of control and correction of a functional condition of the system user.

Briefly we will stop on the first group of modules which part the following from them has to be: the module of the trainee, the module of educational activity, the module of training activity, the solution of an educational task, knowledge of the user's mistakes.

The module of the trainee represents a set of competences which carry out: choice of the indicators characterizing initial level of an education in relation to a concrete subject (to a course, discipline); data collection about initial level of an education and reference of the user to a certain category; specification for it the educational purposes; choice of training influences according to the specified educational purposes and control of their achievement.

The module of educational activity includes the following: the description of levels of development of the actions ways provided by the purposes of training; choice of the main maintenance of the subject matter necessary for achievement of the educational purpose; choice of the maintenance of an additional material which needs to be known to acquire the main content of studied discipline; definition of sequence of the actions providing assimilation of a material and leaders to achievement of the educational purpose; definition of indicators on which assimilation of a training material and achievement of the educational purpose are estimated; choice of diagnostic means for definition of indicators of achievement of the purpose; total and current control.

The module of training activity includes the following: choice of training influences for each step of assimilation of the actions way (presentation of a theoretical material or an educational task); the appeal to model of the solution of an educational task for obtaining the standard decision; definition of deviation opportunities from the standard decision and the forecast of the deviations reasons; choice of diagnostic means for clarification of the reasons difficulties of the trainee at the solution of educational tasks; choice of auxiliary influences (subtasks, questions, instructions) for elimination of the difficulties reasons; implementation of training influences and use of diagnostic means; analysis of information on educational activity and modification of the trainee's model.

The module of the solution of an educational task contains algorithm by means of which the objective with attraction of methods which have to be known to the trainee to this timepoint can be solved. In the most general case the structure of this algorithm making a being of a way of actions, joins the following operators: identification of a subject situation (the analysis of statements of the problem and search of the similar solved tasks); development of the plan of the solution of a task and creation of algorithm of the decision; selection of the ready program and the task decision with its help; control of correctness of the solution of a task.

The module of knowledge of the trainee mistakes contains the catalog of its possible mistakes, rules of promotion and check of hypotheses of the wrong representations of the trainee which have led to this mistake. For this purpose, distinctions between the solutions proposed by the trainee and method of the tasks solution in this subject domain form the basis.

The considered set of modules allows at various grade levels analyzing and control advance trained to achievement of specific goals of training.

One of the main stages of object-oriented design is the choice stage or special development, according to a solved didactic task, object-oriented or other information tutorials. Their big variety doesn't allow covering completely in the real work all features this process. However, in needs to allocate the general requirements imposed to object-oriented systems as the didactic system which these means are used. The support on these requirements allows the teacher to orient and, according to the set didactic purposes, to choose the most optimum option of the design, allowing to increase efficiency of educational process.

The methodical aspects of development considered in work and applications in higher education institution of object-oriented systems have to help teachers to solve successfully problems of an intensification of educational process at the present stage of development information training technologies, and implementation of practical recommendations and offers will promote more effective use of object-oriented systems in their professional activity [6].

Deficiency of the developed educational system is one of main objectives here quite often is only training of the qualified participant of production necessary for society.

All other potential possibilities of the personality including creative practically remain unclaimed. As result, the person with insufficiently developed creative thinking experiences further difficulties in perception of constantly becoming complicated world, in decision-making in non-standard situations, is not

capable to catch communication between concepts and the phenomena, though a little differing from the habitual.

L.S.Vygotsky formulated the main objective of pedagogics of the future in which life "reveals as system of creativity, the constant tension and overcoming, a constant combination and creation of new forms of behavior. Thus, each our thought, each our movement and experience is aspiration to creation of new reality, break forward to something new... "references". Education of the creative person – a problem of all education system from preschool to the highest. And the role of system of the higher education here is very responsible as at this stage there is an opportunity, often the last to fill those omissions which were allowed earlier.

Creative abilities. Types of creativity are very various by the nature is an art, scientific, technical, pedagogical creativity. Following L.S. Vygotsky defining "creativity of the social relations", i.e. "creative abilities to fast and skillful social orientation", it is possible to allocate communicative and adaptive creativity.

If to stop on the sphere informative, cognitive, activity, here the modern psychology defines creative abilities, or creativity, in a context of the general mental abilities.

From the activity point of view creativity can be shown differently: as at the level of the complete personality (scientific, art, pedagogical creativity), and separate components of cognitive activity – during the solution of creative tasks, participation in projects, etc. But always it is possible to find manifestation of ability to establish unexpected at first sight connection and ratios when the creative person independently builds system of the relations with a subject and social environment.

And exactly it needs to be considered as the most important in creative process, without denying, nevertheless, the importance of total result. Thus, in the pedagogical plan the main thing in creativity is that the trainee during cognitive creative activity realizes the importance in quality of "the world converter", an opener new, realizing himself as the personality. And where the teacher managed to achieve it, and this is possible to speak about formation of reflect on installation on creativity which also means existence of own point of view, known courage and independence in decision-making.

So, where creativity essence in context of cognitive activity? There is different interpretation of this conception. Gilford defines creativity as divergent thinking (lat. *divergentia* – a divergence, type of the thinking going diversely) which is characterized by ability to put forward a set equally correct ideas at the solution of some problem, not stereotype of the thinking. Torrance notes ability to realize gaps and contradictions, and also to formulate hypotheses of rather missing basic data. Accordingly, as creativity criteria sets of the properties characterizing features of creative cognitive activity are used. Divergent thinking characterizes:

Speed – ability to state the maximum quantity of ideas, ways of the solution of this or that problem, and their quantity more important than quality;

Flexibility – ability to put forward various ideas, for example, connected with use of objects, methods, etc. (in the most widespread dough for check of flexibility of thinking it is offered to think up different methods of application of any subject of daily use);

Singularity – ability to generate the new non-standard ideas, the remote associations, to find the unusual answers differing from the standard;

Exactness – ability to improve a creativity product, adding details, to strive for completeness. Respectively, and development of creativity connect with improvement at the trainee of above-mentioned qualities.

If to share that point of view that creativity is to some extent inherent in each person, and its manifestation is interfered by environment influences, inhibition, social templates, we can treat a role of open education elements, strengthening of emphasis on independent work of trainees as very positive moment. And on this basis development of creativity of seniors, a student is a way of creative potential release from those "suppression" which they got earlier. At the same time, external influence, and of the environment can play positive role also. By researches it is established that development of creativity requires absolutely reinforcement of initial abilities influence of the environment which possesses "*high degree of uncertainty and potential diversity, and also contains models of creative activity and its results*".

We should concentrate at the moment connected with imitation. Following to samples – very important factor defining dynamics of creative abilities development. Features of imitation in creative cognitive activity are characterized by consecutive transition from imitation of reproductive character

through creative imitation the chosen sample to the independent creativity which base is formed by two previous stages. However, this process has to be regulated by the teacher as the choice of a sample for imitation (as generally, and the principle of implementation of cognitive activity) can cause certain difficulties in trainees. Experiments show that trainees with initially high level of creativity choose high samples for imitation while not creative trainees such, probably, unattainable, a sample for imitation can't and don't try to find. The last remain at a stage of reproductive activity.

As V.V.Davydov noted, "it is impossible to reveal original depths of creative potential of the person, remaining only within the settled forms of his activity and already accepted systems of training and education as in other living conditions and in other systems of training and education this potential can significantly change".

Professionalizing as process of mastering by trainees by specialty advances to best results provides realization of their strategy to self-realization in educational work. Vision by students of strategy of achievement of tops of professional skill and following to logic of advance to them assumes passing of a number of stages by them. Each of them marks achievement of new levels of professional competence, such as professional formation (ability independently to carry out official duties); ensuring stability in work (the guaranteed, timely and high-quality performance of office tasks); ascension to professional skill (the creative, effective activity assuming realization of individual activity strategy) and others.

Naturally, that new problems have to adapt for a context checked time and practice and pedagogical ideas functioning today. In this sense, various aspects of the content of education and the effective organization of educational process are especially important for research objectives. First of all: problems of the content of education, methodical requirements to the maintenance of separate subjects, continuity problems, etc. Further - problems of effective management of didactic processes and their increases, the concept of increase of efficiency of educational process, psychological mechanisms of assimilation of knowledge [7].

So, the carried out analysis showed that it is possible to increase efficiency of use of object-oriented systems in higher education institution due to fuller use of achievements of modern pedagogical science, optimization of educational process, activation of cognitive activity of trainees, improvement of the content of training, the comprehensive accounting of individual psychophysiological characteristics and a psychological state of trainees. Object-oriented design on this basis is an indispensable condition of creation of pedagogical systems of qualitatively new level having the purposes, theoretical base and technique of the organization, functioning and the assessment, capable to provide modern requirements of the social order of training of modern experts.

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ОБЪЕКТНО-ОРИЕНТИРОВАННЫЕ СИСТЕМЫ КАК ФАКТОР ФОРМИРОВАНИЯ ИНФОРМАТИВНОЙ ЛОГИЧЕСКОЙ КОМПЕТЕНТНОСТИ БУДУЩИХ СПЕЦИАЛИСТОВ

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Компьютеризация всех отраслей промышленности, науки и образования требует создания и внедрения средств новых информационных технологий с одной стороны, а с другой, новый подход к профессиональному образованию будущих специалистов. В статье рассматривается одно из проблемных решений с созданием учебного метода объектно-ориентированных систем на основе статистического моделирования. Информационная модель - это изучение естественных и специальных языков, основанное на теоретическом мышлении. Компьютерный модератор рассматривается как результат обобщения профессиональных знаний о предметах и явлениях, представленных в информационной модели. Авторы описывают методы повышения эффективности использования объектно-ориентированных систем в высшем учебном заведении за счет более полного использования достижений современной педагогической науки.

Ключевые слова: будущие специалисты, компьютеризация, информационные технологии, развитие творчества

БОЛАШАҚ МАМАНДАРЫНЫҢ АҚПАРАТТЫҚ-ЛОГИКАЛЫҚ ҚҰЗЫРЕТТІЛІГІН ҚАЛЫПТАСТЫРУДЫҢ НЕГІЗГІ ФАКТОРЫ РЕТІНДЕ ОБЪЕКТИГЕ БАҒЫТТАЛҒАН ЖҮЙЕЛЕР

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Барлық салаларды, ғылым мен білімді компьютерлендіру, бір жағынан, жаңа ақпараттық технологияларды құруды және енгізуді, ал екінші жағынан - болашақ мамандардың кәсіби біліміне жаңа көзқарасты талап етеді. Мақалада статистикалық модельдеуге негізделген объектілі-бағдарланған жүйелердің оқу әдісін құру арқылы проблемалық шешімдердің бірі қарастырылады. Ақпараттық модель теориялық ойлауға негізделген табиғи және арнайы тілдерді зерттеу болып табылады. Компьютер модераторы ақпараттық модельде ұсынылған тақырыптар мен құбылыстар туралы кәсіби білімді жалпылаудың нәтижесі ретінде қарастырылады. Қазіргі заманғы педагогикалық ғылым жетістіктерін толыққанды пайдалану есебінен жоғары оқу орындарында объектілі-бағытталған жүйелерді пайдаланудың тиімділігін арттыру әдістері келтірілген.

Түйін сөздер: болашақ мамандар, компьютерлендіру, ақпараттық технологиялар, шығармашылықты дамыту

ФИЛОЛОГИЯ

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