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## MONITORING OF TRAINING QUALITY OF TEACHERS-RESEARCHERS IN THE SYSTEM OF POSTGRADUATES-DOCTORATE

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The article represents theoretical foundations (hypothesis, conceptions, the complex of diagnostics of educational training quality, important connections determined on the basis of correlation analyses) of creation of monitoring of training quality of teachers-researchers, post-graduates students, applicants, persons working for Ph. D, degree. The content and structure of monitoring, including 3 stages are developed. At the first stage with the help of specially selected tests, techniques, with a view to self-knowledge, self-development of teachers-researchers, the diagnostics of basic properties of the nervous system, functional symmetry-asymmetry of cerebral hemispheres, personal potential (gnosiological, intellectual, communicative, creative and so on) types of interpersonal relations, propensities to pedagogical, research activity is conducted. At the second stage development levels of pedagogues-researchers are diagnosed: abilities to self-development, self-education; professional-pedagogical abilities-didactic, gnostic, constructive, designing, organizational, communicative; and also styles of representations and decisions of problems, styles of training, competents, competencies. At the third stage the diagnostics of development levels of logical, pictorial, spatial thinking and general intellect of schoolchildren, students is conducted. It is necessary for evaluation of effectiveness of technologies, didactic, software and methodological tools of training that are developed and used by teachers-researchers in the educational systems that characterizes the quality of their theses investigations.

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**Keywords:** monitoring of training quality of teachers-researchers, diagnostics of development of personal potential, abilities, competencies of teachers-researchers, development of basic intelligence, pictorial, logical, spatial thinking of schoolchildren, students

Diagnostics and ensuring of quality of knowledge, education of students, quality of training of specialists was and is one of the main tasks of any educational system and the integral component of the learning process at school, college, university.

Adequate and continuous diagnostics of the quality of education is becoming an increasingly important stimulus of personal, intellectual, professional and creative development of schoolchildren, students of secondary and higher education institutions. This is testified by results of activity of Educational centers of monitoring of training quality established in different educational systems.

Side by side with this the necessity is ripe and the aim was set: for creation of monitoring of the quality of training of teachers-researchers in the system of postgraduates – Doctorate that required the determination of its theoretical and practical foundations.

Theoretical foundation for monitoring of the quality of professional and pedagogical qualifications of the teacher-researcher is following.

1. The conception of quality of pedagogical personnel training is developed by I.Y. Sokolova [7]. According to this concept, the quality of education, the training quality of pedagogical personnel is evaluated by the level of development of their scientific outlook, intelligence (different intellectual abilities) and formation of psychological activity system (PSA), including motives, goals, programming, information activity base, decision-making unit, profes-

sionally important qualities that are valued in the orientation on teacher professionalism, its components are offered by N.V. Kuzmina [2] and supplemented by I.Yu. Sokolova [9].

In accordance with the developed conception [9], the quality of specialists training at the university can be achieved when in educational process three groups of psycho-pedagogical technologies of training (research, design, and interaction – organization the educational process) are used. The effectiveness of these technologies can be achieved if the educational process takes into account the individual psychological characteristics, the propensity of students to different areas of the subject, professional activities and the principles of humanization of education, development and self-development, the basic psychological conceptions and didactic principles of education, the conceptions of PSA, principles of health preservation are implemented [9].

2. Conception of the personality professionalism and activity of the teacher by N.V. Kuzmina [2], according to which the professionalism of the teacher is characterized by its orientation, different abilities (perceptual-reflective, didactic, constructive, design, etc.) and competence (social – pedagogical, vocational-pedagogical, methodological, social – psychological, differential-psychological, etc.), and the professionalism of the teacher comes in possession of technology of research, design and interaction. Furthermore, in our opinion, the professionalism of the teacher is indicated when he creates training manuals, textbooks, including

computer version, a creative educational environment in domains of knowledge in educational systems as a whole [9].

3. Conception of professional development of the personality of E.I. Rogov [4. To his mind, the formation of the professionalism of the teacher occurs in three main directions:

- the change of the whole system of activity, its functions and hierarchical structure. In this there is a movement of the personality on the steps of professional skills, the personal style of activity forms;

- the change of the personality of the subject, outwardly manifested in motor skills, speech, emotionality in spheres of communication, that indicates the formation of professional world outlook;

- the change of relevant components of the attitude of the subject to the object of activity, manifested in cognitive, emotional, practical spheres. [4, pp.8].

In the making of the pedagogue- professional leading factors, as noted by E.I. Rogov are personal peculiarities of the specialist, functional structure of activity and its object, and all other factors – derived from the main [4, pp. 9].

4. The hypothesis that the main characteristics of endowments in teenager and adult ages in the sphere of pedagogical and research activities are functional symmetry of the cerebral hemispheres (equal manifestation of functions of the left and right hemispheres), high level of development of spatial, systems thinking and dominance of idealistic and analytical styles of presentation and problem solving, which is constantly confirmed by I.Yu. Sokolova in the practice of management of activities of students, postgraduates, competitors [6].

5. Established on the basis of correlation analysis, significant positive relations of synthetic, idealistic, analytical intellectual styles with functions of the right hemisphere of the brain, and significant positive relations of realistic and pragmatic of thinking styles with the functions of the left hemisphere of the brain (I.Yu. Sokolova, A.V. Andrienko [9]).

6. Complex of educational training quality diagnostic (KDKOP) established M.G. Minin [3]. In the structure of this diagnostic complex there are several routines that allow to evaluate the quality of mastering of the content of academic disciplines, and the type and the character of co-operative activity of the teacher and the student, the effectiveness of a teacher's work, the quality of curricula and programs, the level of training of students in a particular educational institution, the quality of main and additional educational services in the educational system.

M.G. Minin rightly considers that pedagogical diagnostics should be focused on the following objectives:

- 1) identification of gaps in mastering of knowledge,

- 2) internal and external correction in case of exposure of discrepancy between results of training and determined goals,

- 3) the planning of the next stages of the educational process;

- 4) the motivation through rewards for successful operation and the regulation of the complexity of the subsequent steps,

- 5) improving the learning environment.

Sharing this point of view, we note that a significant component of educational assessment is its psychological component, which includes the study of personal (intellectual, creative, etc.) potential, levels of development of its components among schoolchildren, students, post graduate students, and their inclinations to the subject, the professional activity; change of the levels of development of intellectual and other abilities under condition of application of appropriate technologies, methods and forms of education.

Diagnosis of these features can be used if monitoring of the quality of education and psycho-pedagogical research technologies is used in the educational process [1].

The basis for the practical implementation of monitoring of the training quality of the teacher-researchers are specially-selected and tested in long-term activity of educational psychologist tests, allowing with minimum time to identify the individual psychological peculiarities, its propensity to different fields, which are presented in teaching methodological manuals:

- Tool “Diagnostics of individual psychological peculiarities of students” developed by I.Yu. Sokolova [5], which includes a program of work of the school psychologist with teachers, parents, students of junior, middle and senior classes and appropriate tests;

- “From self-awareness to self-realization” – Collection of tests for students, post-graduate students, teachers contains diagnostic tests for functional symmetry and asymmetry of the cerebral hemispheres, temperament, character accentuation, personality types (structural drawing of a man – the test of Ann Mahoney, professional preferences questionnaire of D. Golland), types of interpersonal relationships of Leary, development tests of general intelligence, logical, spatial and imaginative thinking, the level of claims, the development of communication and organizational skills, the self, creativity. Tests of V.I. Andreev. Assessment of the ability to self-development, self-education, Evaluation of

the level of competitiveness of the personality, self-actualization test (CAT), etc. [11];

- The collection of tests for teachers “My style of activity” [8] contains the tests: assessing the professional orientation of the teacher, the formal diagnosis of dynamic properties of individuality (OFDSI) V.M. Rusalova, personal qualities of teachers “psychological personality profile”, the ability of the teacher to empathy, styles of teaching activity, types of interpersonal relationships, self-esteem of professional competence and abilities to professional activity, measuring of achievement motivation, communicative and organizational skills, self-test “willingness to self development”, etc.

Effectiveness of methods, techniques, didactic, software -methodological tools, etc developed by teacher- researches is measured at

the level of formation of knowledge and relevant skills and abilities of students.

Based on the above the monitoring of training quality of teacher-researchers in the system of postgraduate – doctorate which provides the continuous monitoring of the quality of postgraduate training of postgraduate students and doctorates is developed. The content and structure of the monitoring, having 4 levels, are presented in the table.

The purpose of monitoring: to identify the potential, creative possibilities of postgraduate students, doctorates, knowledge of which is necessary for them to develop themselves, to develop their personal potential – intellectual, creative, gnosiological and others, and qualities which are necessary for effective research and professional – pedagogical educational activity.

Monitoring of training quality of teacher – research in the system  
of post – graduate – doctorate

№ p/n	Stages of research of professional-pedagogical and research training of teachers-researchers	Indicators of training quality of teacher, psychologist-researcher	Measuring tools
1.	Diagnosis of levels of personal development (intellectual, creative, etc.) potential and individual psychological peculiarities, professional abilities of the teacher-researchers, psychologist-researcher	gnostic, acseological, creative, communicative, artistic potentials, the properties of the nervous system (NS), FCA, intellectual abilities, thinking styles, interpersonal relations	tests tests tests tests tests
		professional-pedagogical abilities, competence, competency, developed didactic tools forms, methods and techniques of learning, creative educational environment in the domains of knowledge, training aids, training-methodical aids, including computer manuals, complexes	tests tests tests, assessment of level of development of intellectual, creative subject and professional abilities of students, schoolchildren
2.	Research of the development of professional-pedagogical abilities, competence, competency, possession of didactic means, methods, technologies of training	articles in scientific journals, collections of papers, monograph, participation in grants, conferences, training of highly qualified scientific and pedagogical staff (for doctoral students)	amount and quality of articles, monographs, reports, conference papers, the number of defended PhD thesis
3.	Research of improving of scientific-research qualification	The theme of thesis, its contents, level of readiness to defend	The actuality of research, compliance with Higher Attestation Commission

#### **Periodicity of assessment of quality training of teacher-researchers in the system of postgraduate-doctorate**

1. The assessment of the level of development of potential and its components is taken place twice a year, at the beginning and at the end of the school year.

2. The assessment of the level of development of professional pedagogical abilities and

competence, its components is taken place twice, at the beginning and at the end of the school year.

3. The assessment of the level of professional-pedagogical activity, which manifests itself in development by the teacher of technologies and teacher training methods, in creation of textbooks, and teaching aids, including computer, in the creation of creative educational environment

in the domain of knowledge, etc. is held once a year, at the end of the calendar year.

4. The assessment of the level of research qualifications for certification is taken place annually at the end of the calendar year.

5. The assessment of content and the level of readiness of the dissertation research is taken place once or twice at the methodological seminar and at the predefence.

Results of practical application of monitoring are presented in the article [6].

The content of monitoring of the training quality of the teacher-researcher in postgraduate sc system – Doctorate [9] can be used to assess the quality of professional-pedagogical qualifications of teachers in systems of Qualification Improving Institutes.

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## FORMATION OF COGNITIVE INTEREST OF PUPILS OF RURAL SCHOOLS

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In this article the problem of development of cognitive interest as natural aspiration of pupils to knowledge is considered. Results of long-term tracking of level of formation of development of cognitive interest of pupils of initial classes of rural school are generalized and factors of development of interest in the doctrine are revealed. The created cognitive interest of pupils makes active not only informative processes, but also creative incentive efforts of pupils in various spheres of activity

**Keywords:** cognitive interest, activity, knowledge, condition, educational process, independence, activity, result

The thorough scientific base for research of development of cognitive interest as natural aspiration of pupils to knowledge is opened in Ya.A. Komensky's, K.D. Ushinsky's, D. Locke's, Russo's works, etc. P.Ya. Galperin, G.A. Zuckerman, L.A. Wenger, D.B. Elkonin, V.V. Davydov, etc. brought a certain contribution in studying of cognitive interest and its activity. Modern domestic teachers and psychologists Zankov L.V., Telnova Zh.N., Schukina G.I., Lozovaya V.I. emphasize relevance of studying of features of cognitive activity and ways of its activation at younger pupils.

Researches of I.G. Morozova, G.I. Schukina, T.A. Kulikova revealed that the cognitive interest isn't immanently inherent in the person from the birth, it develops in the course of activity of the person, is formed in social conditions of his existence. T.V. Kostayeva notes that "it is possible to call cognitive interest in the most general definition the selective activity of the person on knowledge of subjects, phenomena, events of world around intensifying mental processes, activity of the person, his informative opportunities" [2, p. 118].

Educational process is a set of teaching and educational process (activity of the teacher) in unity with educational and informative and self-educational process (activity trained). The purpose of educational process is creation of conditions for development of informative activity of trainees. Realization of the purposes provides development of cognitive interests, ways of activity, the emotional sphere, humane and strong-willed qualities of the personality [4].

We will stop on results of long-term tracking of level of formation of development of cognitive interest of pupils of initial classes of rural school. According to Yu.N. Kulyutkin and G.S. Sukhobskaya, the cognitive interest on the way of the development is characterized by informative activity, an obvious selective orientation of subjects, valuable motivation in which the major place is taken by informative motives which promotes penetration of the personality into essential communications, the relations, regularity of knowledge [3].

The main FSES of the second generation is the personal result of training, education of the child therefore important part of our research is development of cognitive interest of pupils. Development of informative activity of pupils demands recomprehension of the major elements of training as the contents, forms, methods and technologies. The strategic direction of development of cognitive interest of trainees is creation of psychological and pedagogical conditions which will allow to develop the different parties of activity at the pupil: intellectual, personal, social.

We together with teachers, directors of schools, students – probationers of rural schools of Ust-Yansky, Verkhoyansk, Momsky, Aldan and Tomponskyuluses of the Republic of Sakha (Yakutia) carried out questioning of pupils of initial classes for the purpose of an assessment of expressiveness of informative activity according to A.A. Gorchinskaya's test "Informative activity of the younger school student". The form of the standardized questionnaire consists of five questions, having possible versions of answers (table 1).

Table 1

Indicators of expressiveness of informative activity of pupils of initial classes

Groups	Only students	Strong expressiveness of informative activity	Moderate expressiveness of informative activity	Weak expressiveness of informative activity
Entrance diagnostics in the stating stage	189	69–37 %	111–58,5 %	9–4,6 %
Control	94	32–34,1 %	56–60 %	6–5,8 %
Experimental	94	38–40 %	53–56,6 %	3–3,3 %

These tables testify that at the stating experiment investigation phase in control group was revealed that strong expressiveness of informative activity is observed at 37% of pupils, moderate expressiveness of informative activity – 58,5%, weak expressiveness of informative activity – 4,6%.

Investigating a problem of formation of cognitive interest of pupils, we found out that novelty of the content of material, practical need, variety of forms of independent work, creative approach to the organization of activity of pupils and own activity of the teacher, encouragement of creativity, an initiative, independence of pupils, creation of an emotional tone of activity, and also, use of active forms of

education, methods and receptions which form motives of activity, resistant cognitive interests of need for self-education are one of factors of development of interest in the doctrine. Results indicate positive changes of expressiveness of cognitive interest of pupils: strong expressiveness of informative activity increased to 40%, moderate expressiveness of informative activity – 57%, weak expressiveness of informative activity decreased to 3%.

Main customers of quality of education and participants of educational process are parents of pupils. The summary table “Satisfaction of Participants of Educational Process by Various Parties” is made according to results of questioning” (table 2).

**Table 2**

Summary table of results of questioning “Satisfaction of participants of educational process by various parties”

Participants of educational process in experiment	Satisfaction with the activity party (%)	Satisfaction with organizational party (%)	Satisfaction with a social psychological aspect (%)	Satisfaction with the administrative party (%)	General satisfaction (%)
Pupils (241)	83,9	77,9	88	84,9	89
Teachers (78)	93,7	82	91,2	78,6	83,9
Parents (101)	85,6	85,2	94,6	87,9	90,1

According to results of the final table, it is possible to note the following:

- high level of satisfaction with four parties of teaching and educational process: pupils, teachers and parents (high level is equal 70% and above);
- high quality shows also small distinction between indicators of satisfaction with educational process of pupils and teachers;
- success of use of variable technologies of training, they provide needs of pupils and parents of quality education;
- purposeful work of pedagogical collective and administration on development and improvement of teaching and educational process.

Also the level and quality of performance of independent creative works was investigated. Writing of creative works promotes development of interests, intellectual growth of pupils, pride of overcoming of difficulties, and, above all, gives belief in the forces, promotes further self-improvement. A conclusion that for development of creative abilities it is necessary to improve both logical and figurative thinking received in psychology/Ribot, R. Meyli/represents the great interest.

It is known that all abilities are developed in activity. Tracking of results was carried out by means of different techniques: performance of examinations, an exhibition of independent creative works (pupils choose subjects, the

direction), drawings, a portfolio, pedagogical reception “an imagination binomial” of D. Rodari, tests for identification of level of skill to communicate, the general outlook; the specifying conversations with pupils, teachers and parents [1]. Results of research are given below (table 3).

Only 305 pupils of rural schools of the third – the fourth classes, from them 76 pupils of nomadic schools were captured by Inspection. Defining a level of quality of creative works, the commission was guided by the following criteria: creative level – independent application of the knowledge gained from different sources, planning, making the assumption, the relation of the pupil, independent implementation of a reflection is brightly expressed; the advanced level – finding of the necessary information, its analysis, application of the knowledge acquired independently from the textbook or other sources recommended by the teacher to make the assumption by means of the teacher or others, ability to carry out a reflection; the basic – a choice from versions of information, use of the ready purpose and planning of the activity offered by the teacher, performance of independent work on the offered plan of the teacher or others, ability to reflex by means of the teacher; the critical – poorly expressed psychological readiness for independent, creative work, a superficial

statement of material, activity of reproductive type is observed. Other indicators – literacy of oral and written language, its wealth and others at determination of quality aren't taken into account, they are considered where it is about quality of assimilation of the training program.

Independent creative works on Russian – the composition at the choice of the pupil are checked for subjects: “My family”, “Our native village”, “A deer – beauty and pride of the North”, “my Homeland”, “Occupations of parents”.

Table 3

## Performance of independent creative works

Levelsofquality	The composition on a free subject The control/experimental at rural schools 229	The composition on a free subject at nomadic schools76
The creative	38\57	12\18
The advanced	78\93	21\31
The basic	102\73	38\23
Low (critical)	11\6	6\4

Pupils of rural nomadic schools chose subjects: “A deer – beauty and pride of the North”, “My family”. In compositions of the pupils estimated by creative level of quality complete idea of a family, a total characteristic of parents, including character, commitment, the attitude towards other people, relatives, love to deer, the nature, their advantages, shortcomings, desire to be in something similar to them is noted. Pupils give an assessment to work of reindeer breeders, emphasizing that life of reindeer breeders and life of the nature are interconnected, opening a pride for the family and their values. A commission of experts, defining quality of the performed work, noted that at pupils of nomadic schools observation is well developed, especially in life of a plant and animal life and show the pronounced emotional and estimated attitude to the described phenomena.

Thus, research of features of cognitive activity (motivation of the doctrine, cognitive interest, informative activity) of pupils of initial classes showed that the level of development of intellectual abilities with processing of information, formation of actions of the pupil which was considered from the practical, conscious, purposeful side, ability to represent a substantial assessment of the actions and to prove the estimates raised.

The created cognitive interest of pupils:

- makes active not only informative processes, but also creative incentive efforts of pupils in various spheres of activity;

- promotes bigger concentration of the purposes and ways of activity, stimulates search of the new purposes and ways;

- promotes expansion and increasing knowledge of pupils in subject domain, and also in wide areas (about the world, about the person) which pushes to self-knowledge; bears the peculiar emotional satisfaction inducing to long occupation by the related activity.

Formation and development of cognitive interests by teachers focused on an activity component of education will provide continuity of the purposes at a step of the general education.

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*Materials of Conferences***“THE WORKBOOK” IN NORMAL PHYSIOLOGY, AS A MEANS OF THE STUDENTS’ INDEPENDENT WORK ORGANIZATION**

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The FGOS III generation realization is practically suggested the new qualitatively approach to the specialists’ and experts’ training, when the leading role is became not the total sum of the knowledge and the practical skills formation, but the ability to search independently for the answers to the raised questions and to be comprehended the course of the educational material. The development of the individual’s intellectual potential, the formation of the logical analysis methods, the comprehensive skills to be processed the necessary information, to be formed the productive thinking are becoming the higher education objectives. This approach has already found its reflection, in the ratio of the classroom and extracurricular load – up to 60% of the total time to be mastered the curriculum of the educational program is made up now the proportion of the students’ independent work. For all this, the use of the elaborated and carefully designed didactic tools provision of the independent work is acquired the particular significance.

“The Workbook” is practically contained the structured set of the materials for each of the sections of the normal physiology: the purpose of the section study; the list of the examination questions for the section, the questions for the self – control; the methods and the practical works description, having proposed for the mastering in the framework of this section; the computer simulations description of the “Virtual Physiology” computer program, that the student can be performed, as within the framework of the classroom work, well as independently (e.g. for links, to the related resources); the tasks for the self – study, the examples of the situational challenges with the standard solutions, the themes abstracts, the recommended references list, the preparation algorithm for the classes, the information on the rating system of the knowledge assessment and examination structure for the normal physiology.

At “The Workbook” creation, the Chair employees’ staff has been based on the approach, according to which the 4 levels of the student’s independent work are being singled out:

- 1) the reproducing independent works on the model;
- 2) the divergent – reconstructively works;
- 3) the heuristic works;
- 4) the creative (e.g. research) works.

The tasks for the self – study are practically included in themselves, as the quite simple tasks for the reproduction (e.g. the schemes, tables filling), well as the divergent – reconstructively works (e.g. the answer plan making out for the question). Such

tasks fulfillment is aimed at to draw the student’s attention to the main points and the principle moments in the material study, to restructure the information, to consolidate the terminological apparatus, and the basic concepts, the digital parameters.

The representative examples of the situational challenges are based on the knowledge clinical application on the physiology, and they are presented a higher level of the complexity. The analysis of each of the four possible answers offered with the detailed justification of the correct choice can not only to be fixed the theory, but to be formed the logical approach, the ability to be applied the knowledge in the particular clinical situation, which is especially significant in the physician preparation.

The abstracts topics have been made up in such a way, that the student is not just theoretical material presented by the well – known theme, and conducted the research work, for example, the comparative analysis of the physiological research techniques and methods or explored the potential impact possibilities on the regulation physiological mechanisms of the certain processes.

The proposed challenges gradation has the specific significance, which is the component multilevel approach to the learning. So, the transition from the simple challenges to the complex ones is practically given the student’s confidence in their abilities, it, moreover, is created the positive attitude on the subject study. On the other hand, the quite clear challenges division, in terms of the complexity, is allowed, as the student, well as the teacher to understand the level, at which the student is studying the discipline. This is practically allowed the possibility to the teacher consciously to be applied the methodological approaches, and also to be built the individual educational trajectory.

Thus, “The Workbook” in the normal physiology is the significant didactic tool to be insured the students’ independent work in their vocational training of the future physician.

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#### **USING THE THOUGHTS OF SCHOLARS ABOUT THE PERSONAL QUALITIES IN THE EDUCATIONAL PROCESS OF THE UNIVERSITY**

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Knowledge of great historical persons of our people a debt of everyone. From this point of view

on folds of centuries the key of personal qualities of the person disappeared. The Kazakh people – the successor of a rich spiritual condition. Manuals of the world-famous, great thinker of the Turkic people of Al-Farabi, scientists of the Middle Ages as Balasagun, Kashkari, Iugneki, Jassau, thinkers of an epoch of Golden Horde – Horezmi, Dulati, Saran, Zhalyiri, Abylgazy plays large role in education of modern generation. Asan Kajgy further manuals, Shal Kyiz, Zhiembet, Buhar, Shal, Dulat, Murat, Mahambet, Majlykozhy about the person and a society, a shower and a body, about life positively influence youth education [1].

Rather under the statement of thinkers to feel a part of one people, one nation needs to follow five different conditions. First, it is necessary to know language of this nation well. Secondly, you should own the information of belief of this nation. Thirdly, should impregnate traditions of these people. Fourthly, should know nation history backwards. Fifthly, should know this district to each corner. The person who could install in itself these five qualities, only it can name itself the present, sanguineous representative of the nation, – the Greek thinker has told. The person should begin knowledge of the world and life with itself. If the Kazakh doesn't know about the nation in detail, if doesn't feed feelings to understand lacks and advantage of other nation it is very doubtful. For knowledge of the nation it is necessary to know well five points which mentioned above [2, 13].

If so the higher school should impart to young generation such qualities as love to the native earth to appreciate national traditions, customs of the people, spirituality, consciousness, humanity, development of personal qualities. Works of great thinkers about methods and ways of development of personal qualities have great value.

The most important line of the person is its social importance, consciousness, responsibility, freedom, advantage and individuality. The more clearly the person shows the qualities and abilities and adds to the actions creative property, the there is its value more. From this point of view the concept of the person is supplemented with concept of individuality. Individuality of the person is characterized by lines peculiar only to it and distinguishing from others. For example: a version of characters (quiet, angry), creativity (actions, an orientation), tastes etc. Therefore, in creativity of the future experts-teachers should be shown personal qualities on a level with profound knowledge, pedagogical thinking, professional ability. Individual qualities supplement personal concepts.

The Kazakh thinkers attached great value to personal qualities of the person. Great thinkers appreciated humanity, spirituality, talent and mind, resource and heroism, patience, calmness, attentiveness in the person.

The great Abay which have learned thoughts of east and western classics expresses pedagogi-

cal thinking in the songs and words edification. Explaining that boasting, a thoughtlessness, a negligence, envy eclipses reason and thoughts, he agitates to remember heard, to follow an example with seen, to be far away from bad habits, to prefer passions reason, to be constrained. He said: "If you want to be the reasonable person, give the account to the acts of times in one day, time in a week, or at least once a month". It means that Abay paid much attention in self-education of the person. The person is born with two characters. The first character is born with thoughts – the main thing to eat, drink, have a sleep. These are requirements of essence. The second – I want all the nobility. It is requirement of soul. (7th word) proceeding from this Abay concludes the thought that "the person learns such things as knowledge, a science from requirement of soul, it can only the person who is talented and works assiduously".

Y. Altynsarin expresses the thoughts on education through the story "Zhemis agashtary" (Fruit trees) where the father explains to the son that in "education there is a great value. And if you will not study, you will be to curves, as this tree". At Ybyray has a lot of stories about ethics, behavior. Also Ybyray in the stories brightly expresses a love role in a family. These thoughts are and in its songs. His songs are directed to agitation the educational ideas, they are given in ethics-pedagogical thoughts.

Comparing culture incomparable riches Altynsarin writes such lines:

Mal daulettyn bailygi  
Bir zhutasan zhok bolar  
Okymystyn bailygy  
Kunnen kunge kop bolar

Yesh zhytamak zhok bolar [4, 13 p].

Meaning: "All your riches can end at once, but riches of mind and knowledge on the contrary will increase every day".

At schools which Ybyray under the requirement of that time without fail has opened should pass religious studies. The book purpose "Muslim support" Ybyray has told "... first that the concept of religions at the Kazakh youth isn't has left in an incorrect channel, and secondly that the Tatar language wasn't used I has started to read Muslim Sheriyat .... I have started to write this book" he has told. Not only Ybyray worried about prosperity of Kazakh poetry, but also many other writers – realists.

Thus the success and achievement of Altynsarin and its activity progresses now. Each of the Kazakh people has been brought up by poetry of Ybyray Altynsarin. And till now its activity has much important role in our life. Its essence of poetry is in particular pedagogical formations. It has helped to leave to the Kazakh people to the public: the Kazakh schools, grammar schools, and certainly, school and educational techniques for the first time have opened.

Training in the independent country is possible at all. Now, contrary to development the society

the pivotal purpose is to absorb in itself spirit and to keep people history. Life sources are connected with each other, allow to feel that degree which influences to youth development in culture. The main reason is not schooling of children to creativity from early age. How much there will be cultural a person so will relations are combined with people also it will be and is polite. And formation of character opinion and cultural values is connected by the people. Works of great thinker-philosopher S. Kudaiberdyuly such as: "Ush anyk", "Akyl degen olsheusyz bir zharyk nur", and "Jan men dene ham konil", "Anyk pen tanyk" etc. are full of philosophical reason on the person. Shakarym has been afflicted by that the person comes on this light "person", and can't keep this condition of cleanliness to the death and has told: "I was born as a person and to die as the person – my dream". The person perceives abstraction – thanks to pure reason can note useful from the harmful. A soul support – conscience. Conscience is an honesty, justice, mercy, and smothering it that never disappears, not destroyed, and to become all above and above" – told Shakarym in his thoughts. Thanks to works of great thinkers develops wisdom of the person, individuality, special fitness, special diligence, special ability, a special habit at restoration of the future experts. The known scientific Kant has told: the person should be the person to live life as the person at any situation it should remain the person who shows a way of these philosophies separately. It is philosophy – wisdom. We can find it at Socrat's, Ybyray's and at Abay's thoughts. On Socrat reasoning wisdom is the world. To understand itself and others to concern all with understanding.

For example, "good qualities and then all will be to you under a hand" (J. Balasagun) are necessary to the Live person, "Be cruel, let doesn't go on and if there will be a good education also the child will grow up brought up" (J. Balasagun), "Knowledge received in the childhood, which help desirable result with the future" (J. Balasagun), "Learn children to mind and reason, and let good character develops together with dexterity" (J. Balasagun), "Think that waits for you ahead, desirable it is possible achieve only holding a correct way" (Firdausi), "Be sincere both soul and a body" (Y. Altynsarin), "Humanity of the person depends on mind, a science, the good father, good mother, the good friend and from the good instructor" (A. Kunanbaev), "Think of a science, and thanks to a science night will appear in the light afternoon" (Firdausi), "the Person has realized that it the inhabitant of this planet, it has started to think and operate at planet level – and it should so to think and operate" (V.I. Vernadsky), "the Person can overtake the person only mind, character and honor. And all other is nonsense" (Abay).

We have noticed that it is a lot of advantage of the spent debates and circles. Because, if the future expert pays attention on enthusiasm of merits it shows its feature, wisdom, and eminence.

Today individual qualities of the person test for it: depth of outlook and life, responsibility, an estimation and perfection of the person, humanity, morals and nobleness, deep thoughts, perception of secrets. Kindness revival, kindness to a companion, honesty to the friend, knowledge of the place in a society and the value. Courtesy and fair intentions not to put a stain on authority, not to sell the honor for the sake of vital trifles, feeling of advantage. Eagerness to fight, restraint, and ability to be on the ball showing respect for everything, to grow the humanity. Resoluteness, innovation, ability to think, the activity which is not repeating individuality. Our ancestors eulogized such qualities and yours faithfully gave such titles as: wise, formed, brought up, the expert, skillful. In preparation of competitive experts works of great thinkers as a paradise source. In an English proverb it is told, "If you has mentality, it needs to be cleverer to operate available mentality". What qualified wasn't the expert if it is inquisitive, will aspire to individuality and self-development we would be quiet for our future generation.

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#### THE MULTILEVEL APPROACH TO STUDENTS' TEACHING AT THE "NORMAL PHYSIOLOGY AND REGENERATIVE MEDICINE" CHAIR OF THE NORTHERN STATE MEDICAL UNIVERSITY (ARKHANGELSK CITY)

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The competence – based approach introduction to the learning (e.g. FGOS of the third generation) is one of the key points, in the context of the Higher Medical education reform in the RF. In the new standards structure, the students' independent work role is being increased, which has already been reflected in the change in the ratio of the classroom and extracurricular hours to the first decrease and he second increase. It is quite a difficult challenge for

the junior students, who have not yet fully adapted to the Institute of Higher education, the College, and the University education system. Therefore, the students' preparation process optimization goal has already been set to the chair staff, by means of the teaching methodology changing.

So, the main components of the educational process structure have already been formed and filled with the substantial and content part: the lectures, practical training and seminars, independent work. "The Workbook", in which all the tasks are set out, has already been developed to facilitate the student's work. Thus, all the necessary materials are available on the Internet at the University site chair page.

Due to the sharp decrease in the number of the lecture hours, the lecture course structure, which now it is included only the review lecturers on the key sections and topics, has already been changed. For all this, the complete package of the lecture presentations is issued and is given to the students. The control of the lecture material mastering is being carried out, through the feedback directly during the lecture, by means of questions and answers, as well as, specially, composed tests around the whole lecture course.

At the practical training, the students perform the tasks on the physiological processes modeling, by means of the simulation computer software. The part of these tasks are practically performed by them at home, freeing up more additional time the obtained results discussion in the class. The situational challenges solution to the case of the clinical and physiological plan, having adapted for the pre-clinical courses students is another part of the classroom study. For all this, the method is practically used in small working groups. As the auditoriums are equipped by the computer equipment and have their access to the Internet, the students can practically use in their preparation of all the available materials: lectures, electronic textbooks, and manuals, publications in the scientific periodicals. When the assignments discussing, the teacher maximum his attention is paid to the professional competences formation – the ability to use the knowledge in the physiology for the clinical situations treatment. For all this, multiple repetitions of the basic concepts, at the same time, is practically contributed to the material consolidation. The psychological comfort conditions are being created for the students varying degrees of their readiness and qualification. So, the clinical material using in the tasks is significantly increased the students motivation to the physiological challenges study.

The test tasks fulfillment on the studied subject is the obligatory component of the students' training. The increased complexity tasks (e.g. so called, the advanced level), which are also discussed in the class, are usually being offered, especially, for the most successful students. The mastering of the minimum basic level is practically achieved,

thanks to the simple test tasks availability, having covered all the key aspects of the studied section. So, the similar tests have already been included into the boundary control program and the final semester testing.

The abstract messages preparation, in the form of the multimedia presentations on the analysis results of the current scientific publications reviews (e.g. as domestic, well as foreign ones) in the studied sections at the "Physiology" Chair. This is practically allowed to be actively involved the most talented students and, moreover, to be created the necessary development perspective for the less prepared ones in the learning process at the Chair. So, the students' reports are being presented sequentially in the classrooms, and then at the meetings of the student scientific circle, the final scientific conferences, and they are taken into account in the score – rating knowledge assessment.

The examination in the "Normal Physiology" course is practically carried out in the three stages:

1) the credit for the practical skills, in accordance with the list, having recommended by the Ministry of Public Health of the Russian Federation (MPH RF) program and completely approved at the Chair (e.g. they have been presented in "The Workbook");

2) the test phase – the computer testing at the Chair (e.g. the similar final examination tests have already been presented at the NSMU site);

3) the oral interview – the situational challenges solutions (e.g. the examples and solution algorithm have already been presented in "The Workbook" and at the NSMU site).

According to the module – rating system, for the "satisfactory" assessment it is quite enough the FGOS basic part mastering (e.g. the current and final testing; the ability, knowledge and practical skills possession, the tasks fulfillment for the self-reliant work, the answer to the basic questions in the situational challenges solution), to access the "good" and "excellent" assessments it is necessary in addition to the basic level of the advanced level tests solution, as well as the ability to be given the detailed and deep answer in the situational challenges solution (e.g. all solutions algorithms are quite available for the students).

Thus, the multilevel approach to the learning and formation assessment of the general cultural and professional competences in the students is being introduced at the "Normal Physiology" Chair of the NSMU. So, the used system is practically promoted to the students' motivation enhancement to study physiology, as well as the students' skills development to the independent work.

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**THE PRACTICAL WORK  
IMPLEMENTATION, AS ONE MEANS  
OF COMPETENCES FORMATION ON  
“WORKSHOP ON NEUROPHYSIOLOGY”  
ACADEMIC DISCIPLINE**

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In recent years, the activities of the Higher School teacher and lecturer have already been changed, in connection with the tendencies and trends in the further development of education. The actual change challenges in the educational process are connected with the FGOS APA implementation, the new academic disciplines introduction [2]. Due to the methodological support lack on the part of the academic disciplines, there is the task of the methodological – educationally complexes creation, having taken into account the competence approach in the education. And this is also applied to the “Workshop on Neurophysiology” academic discipline on the “Clinical Psychology” specialty.

The “Workshop on Neurophysiology” academic discipline specificity is in the fact, that the students’ ability presence to be used the different sources of the information to be gained the knowledge: the textual, statistical, and the others, is the necessary condition for its mastering. The practical work, the implementation of which is ensured such skills formation, as the analysis, generalization, results presentation, conclusions formation are the integral part of the neurophysiology teaching process. As a result, the students are learnt to be applied the theoretical knowledge in practice, the individual thinking is being developed at them [1, 3].

The practical work is focused on the general cultural and vocational competences formation, having related with the ability to be used the terminology in the neurophysiology; to be described and characterized the neurophysiological functions, the relationships between the nervous system structures; to be predicted the possible directions of the activation, the development and correction of the various processes relationship in the nervous system, the sections functions of the central nervous system under the conditions change of the external and internal environments of the human organism.

At the beginning of the course, the introductory lesson is conducted, at which the special attention is practically paid to the students’ understanding such fundamental notions and concepts of the practical work, as “the purpose of the work”, “the work’s tasks”, “the progress of work”, “the results”, “the conclusions”. In addition, the recommendations are given for the registration of the

works. At the subsequent lessons, the students are proceeded to the practical work fulfillment, having related with the neurophysiological parameters study in the humans. For example, the practical work, in comparison with the bone and air conduction of the sound, the gustometriya carrying out. When working in pairs, one student is played the volunteer’s role, the other – in the role of the experimenter. At the end of the study, the students must present and describe the final results, to draw the conclusions. Exactly, the conclusions formulation, in accordance with the goals and objectives, is practically required the results generalization skill, their comparison, change tendencies and trends analysis. This ability is gradually being formed, on the basis of the knowledge on the neurophysiology, which is allowed the students to be learnt, how to draw the theoretical knowledge for the practical activities realization.

The general direction of the education change are associated with the learning process intensification, the introduction of the interactive forms of the teaching, and the information technologies using, for example, the certain computer programs, the software and hardware devices.

The “Virtual Physiology” is one of such simulation programs, which is allowed the experts and specialists to simulate the practical work with the laboratory animals. The students are used the virtual instruments and they are modeled the neurophysiological experiment. All the student’s actions are practically analyzed by the computer with the subsequent visualization of the virtual tissues and animal’s internal organs reactions in response to the manipulation. After the experiment realization, it is possible the actions analysis be carried out, to be drawn the conclusion and, if the errors are revealed, then to be repeated the practical part.

Thus, the different types using of the practical work is practically allowed experts and specialists to be formed the competences, having related with the students’ ability and preparedness to the analysis skills mastering of their activities, with the ability to be developed the study design, with the analysis techniques possession, the evaluation and interpretation of the research results.

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# REFLECTION IS THE MAIN SYSTEM-FORMING ELEMENT OF THE EDUCATION

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Activity is defined as algorithm of a person's purposeful actions on transforming and changing the environment (living, non-living parts of nature and people). It is basically one-way "subject-object" process, during which a person gains experience and develops himself. A specific field of human activity is education and upbringing, where a teacher deals with a student (with a personality), who has his own interests and needs, the abilities to change the world around him. Interpersonal "subject-subjective" relationship is being set between a student and a teacher. It is some process of interaction needs and abilities of both sides of pedagogical process. Supporters of the traditional education stand by the "subject-object" scheme and try unilaterally and authoritarian to transfer ready knowledge (information on the socio-cultural experience of mankind). This is a gross violation of the systemic character, the integrity of the organization of independent learning activity, and it means violation of the person's development. This is forcible imposition of professional purpose of education to a student, its content and single-channel monitoring and evaluation of learning results. System-activity approach in education implies methodological support and organization of all the elements of a student's educational activity by a teacher: motivational and valuable (why do I need it?), subjective and informative (what am I learning?), operational thinking (How to do it?), reflexive (What do I want? What have I got?). In the system of developing education the methodology and methods of the active learning has got sufficient development. For example, teachers can skillfully organize a mobilizing beginning of the lesson i.e. goal-setting (to form motivation and interest) through the creation of some educational problem situation and continue organizing specific types of self-learning activities (informational and communicatory activities, collective and individual thinking activity, research and creative activities, practical, productive and economic activities, etc.). Systemic character and integrity of the educational process of learning will be violated due to the lack of some algorithm and methodology all of its components. The paradox is that the reflective stage of the algorithm of the learning activity is absolutely absent. And it is precisely reflection is closing, system-forming, self-developing, element. Methodology and methods of reflective learning remains insufficiently developed. There are practically no control and measuring materials, algorithm and methodical tools of the reflexive thinking development of a student and a teacher.

In the traditional system of teaching and control the reflective element of learning activities of a student is entirely replaced by the external evaluation and monitoring activities of a teacher. In this case, a student is deliberately suspended from opportunities to engage in self-development and self-realization.

The methodological basis of constructing the algorithm of the innovative technology RESDT (Reflexive-Evaluated Self-developing Technology) is the idea of personality-oriented, developing (self-developing) teaching. In this case, system-activity, reflective-evaluative, diagnostic and correctional approaches of organizing the monitoring of the teaching quality are the basic principles of construction of tools and algorithms of RESDT.

As a basis of the criteria for assessing the quality of teaching, and the construction of diagnostic and monitoring we took the model of training activities and at the same time, as it was mentioned above, the organization of self-assessment actions is defined by its system-forming and main developing element.

Innovative approaches of construction of the author's technology is to achieve professional self-development of a teacher and a student as "subject-subjective" system and their interactions by organizing the management and self-management by the quality of teaching based on system-activity, reflexive, information and communication, and diagnostic and correctional teaching principles. Actually, a special lesson on technology RESDT (Reflexive-Evaluated Self-developing Technology) built on the basis of the organization of reflexive action (reflective thinking) is our innovation. The lesson REST is a system-forming element of the whole system of the teacher's educational activity.

REST has passed a solid scientific and experimental test. According to the results of studying its effectiveness scientific seminars and conferences were held at the various levels: the Republican scientific-practical conference "The effectiveness of the author diagnostic and correctional teaching" (Ufa, June 2003.), Interregional Scientific and Practical Conference "Educational diagnostics and monitoring is the basis of management by quality of subject teaching" (Sibay, January 2005), a number of reports, presentations, master-classes, presentation of innovative projects on Russian Education Forum in 2002, 2003, 2005, 2006, 2007, 2008, 2009 and 2011, reports on the international scientific forums, including the section "Tools e-learning" of the International Conference ONLINE EDUCA MOSCOW 2007. On this educational technology a monograph, over a hundred papers of scientists, educators and practitioners, over 20 printed and 15 electronic teaching aids were published (5 books were published in Moscow), 10 printed and all the electronic aids were issued with the stamp of ME of Republic

of Bashkortostan. The description of technology was published in "School Technology № 12", 2001 and its complete description was issued in the SSC magazine "Secondary Professional Education" № 2 and № 3, 2008.

A number of educational systems: DCTS (Diagnostic and Correctional Training System) and RECS (Reflexive-Estimate Certification System), MARS (Multilevel Automated Reflexive System) and others, built on the basis of RESDT are highly valued in the scientific world and won several awards in scientific forums: The Laureate of VI International Moscow educational forum "School 2002", the winner of the Moscow educational forum "School 2003", the winner and finalist of All-Russian contest of innovations in the Russian Education Forum in 2004 and 2006, 2007, 2008, 2009.

With the introduction of a new Federal State Educational Standard RESDT, MARS systems are a type of online public monitoring of teaching quality. In 2009–2010 about 2000 graduates of the country, in 2010–2011 more than 15000 students have been trained for exams online using RESDT. Accordingly, the students have passed 10000 and 50000 exams during 2009–2010 and 2010–2011 academic years. Today more than 80% of the municipal districts of the country are implementing

RESDT in the educational process of their educational institutions.

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## CHANGES IN BIOCHEMICAL INDICATORS OF BLOOD SERUM, CHARACTERIZED THE STATE OF THE LIVER, DYNAMICS OF EXPERIMENTAL EXTRAHEPATIC CHOLESTASIS IN RATS

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Biochemical blood indexes of 69 white male rats with experimental extrahepatic cholestasis were studied to reveal the involvement of liver in pathologic process. Substantial changes were revealed in biochemical parameters of experimental animals blood serum which showed hyperenzymemia, hyperbilirubinemia and hypercholesterolemia in dynamics of extrahepatic cholestasis development. If cytolytic process marked on the 3<sup>rd</sup>, and especially on the 7<sup>th</sup>-15<sup>th</sup> day then the increase of activity of alkaline phosphatase, the level of cholesterol and bilirubin on the 3<sup>rd</sup> day of experiment. The indicated changes prove the involvement of liver in pathologic processes that naturally make the course of the main pathology worse.

**Keywords:** experimental extrahepatic cholestasis, rats, biochemical blood indexes, liver

Diseases of the gall bladder and bile ducts, especially cholelithiasis, often (16–23 %) leads to a fatal course of study [2, 4, 6, 7]. Anatomical and physiological relationship of the gall bladder to the liver is likely to affect the function of the latter standing in diseases of the former. However, the publications on the morpho-functional state of the liver in pathology data are contradictory. Some authors do not find specific violations of liver function or believe their transient [8, 9], while others show a profound change in its activity [1, 3].

Based on the above, the **purpose** of the present study was to evaluate blood biochemical parameters characterizing the functional and metabolic condition of the liver, in the dynamics of experimental extrahepatic cholestasis in rats.

### Materials and methods of research

The experiments were performed on 69 white mongrel male rats mixed by populations with initial weight of 180–200 g, containing on a laboratory diet under vivarium conditions. In 37 rats under hexenal anesthesia (100 mg/kg, ip), extrahepatic cholestasis by ligation of the common bile duct was reproduced [9]. The mortality rate was 32,4%. Controls were 24 sham-operated animals who received only laparotomy under aseptic conditions. Intact group included 8 rats. The research was performed at 1, 3, 7 and 15 days after the play models. Selection of research period was related to the development there significant morphological changes in the liver on in the experimental cholestasis [9]. In these periods the animals under ether anesthesia were killed by decapitation and the blood serum assentsion transaminases, alkaline phosphatase (ALP), cholesterol and bilirubin on biochemical analyzer Aytomulyzer Human (Germany) was identified.

The obtained digital data was statistically processed by package of application program statistical analysis Excel – 2000.

### Results of research and their discussion

The results showed that in 1 day after reproducing extrahepatic cholestasis significant changes in the activity of alaninaminotranferazes (ALT) in serum of experimental rats were not observed (figure). However, after 3 days activity of the enzyme increased dramatically, exceeding the normal and indexes of previous research period by 2,7 times. Hyperenzymemia by the 7<sup>th</sup> day of the experiment has increased even more. Its significance statistically increased over the previous period in 2,4 and the value of intact rats by 6,9 times. However, by the end of the experiment (15 days after reproducing cholestasis) a decrease of ALT was observed as compared to the previous period (1,7 times). It should be noted that despite the decrease, the activity of serum ALT in experimental animals remained significantly higher than normal ratio for 4,0 times.

Unlike ALT, the activity of aspartateamino-transferase (AST) in all terms of research was significantly more than the rates of the control group (2,4, 2,4, 2,6, and 2,4 – times) (figure).

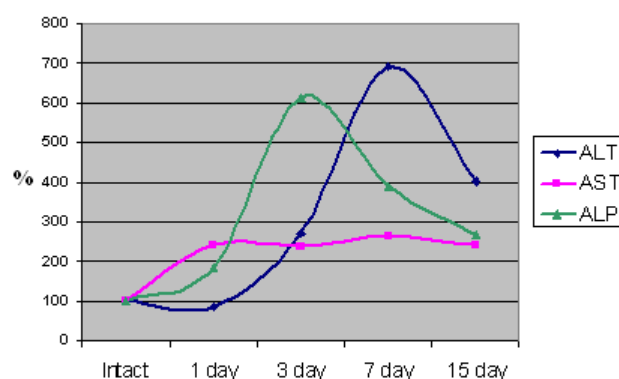
ALP activity increased sharply. For example, 1 day after reproducing of extrahepatic cholestasis ALP activity in serum was significantly exceeding control for 1,8 times (figure). In the future, this number has grown even more, exceeding the previous period and the control, 3,6 and 6,1 times respectively. On the 15<sup>th</sup> day pathology of ALP activity decreased approximately 2 times. However, despite this, the value of it remained high, exceeding indicator of intact rats by 4 times. In the future tendencies to lower serum ALP activity were maintained, and studied figure exceeded the normal value for only 2,7 times.

Increased ALT levels can be explained by the involvement in the pathological process of the liver, since usually in mechanical jaundice the activity of transaminases is normal or slightly increased [5] in our case, the increase of ALT registered already on the third day,

and on the 7<sup>th</sup> day of observation was given the maximum increase. These changes of ALT activity suggest secondary involvement of the liver in the pathological process.

It is more difficult to explain the increase in the activity of AST. We believe that the sharp increase of AST activity is a consequence of surgery in the modeling of this disease, as in muscle tissue the activity of AST was the high-

est. However, the high activity of AST is preserved in more long-term period of the research. One can only assume that the increase in of the enzyme activity is the result of haemolytic – for disturbances of the permeability of red blood cells, hepatocytes cells and of muscle cells due to increased pressure within the gall bladder and the biliary duct. Increased activity of ALP clearly shows the development of cholestasis.



The enzyme activity in the blood serum of rats with experimental hepatic cholestasis is in dynamics

Significant changes occurred in the content of cholesterol in the blood serum. Thus, after 1 day of reproducing extrahepatic cholestasis the level compared to the control increased significantly by 1,4 times (Table). In the future, the content increased even more, exceeding the previous term

of 1,5 and control animals by 2,1 times. In the following periods of total cholesterol content in the blood serum gradually decreased. However, despite of this its value after over 7 and 15 days after reproducing cholestasis was still above the control for 1,64 and 1,2 times, accordingly.

Cholesterol and bilirubin fractions in serum of experimental animals in mg/dl

Groups		Indexes			
		Cholesterol	Bilirubin		
			Total	Direct	Indirect
Intact		134,75 ± 6,26	0,57 ± 0,04	—	0,57 ± 0,03
Obturation:					
1 day	Experiment	205,83 ± 2,06 <sup>a, b</sup>	2,43 ± 0,06 <sup>a, b</sup>	1,36 ± 0,05 <sup>a, b</sup>	1,03 ± 0,07 <sup>a, b</sup>
	Control	147,3 ± 1,89	0,68 ± 0,06	—	0,67 ± 0,06
3 day	Experiment	313,83 ± 10,29 <sup>a, b</sup>	8,22 ± 0,10 <sup>a, b</sup>	5,56 ± 0,08 <sup>a, b</sup>	2,66 ± 0,16 <sup>a, b</sup>
	Control	151,50 ± 1,59 <sup>a</sup>	0,73 ± 0,05 <sup>a</sup>	—	0,62 ± 0,05
7 day	Experiment	232,50 ± 6,19 <sup>a, b</sup>	2,05 ± 0,05 <sup>a, b</sup>	1,35 ± 0,05 <sup>a, b</sup>	0,77 ± 0,03 <sup>a, b</sup>
	Control	141,77 ± 1,53	0,73 ± 0,05 <sup>a</sup>	—	0,62 ± 0,05
15 day	Experiment	166,67 ± 11,79 <sup>a, b</sup>	2,10 ± 0,06 <sup>a, b</sup>	1,75 ± 0,04 <sup>a, b</sup>	0,36 ± 0,01 <sup>a, b</sup>
	Control	138,33 ± 1,26	0,63 ± 0,04	—	0,61 ± 0,03

Notes: P < 0,05 a – compared to intact, b – compared with the control group.

One of the manifestations of extrahepatic cholestasis in experimental animals was the development of hyperbilirubinemia. It was

manifested by increase in both total, indirect and, especially, direct bilirubin in the blood serum, depending on the duration of the ex-

periment. For example, after 1 day in reproducing extrahepatic cholestasis indirect bilirubin levels rose to  $1,03 \pm 0,07$  mg/dl at its value in the control animals  $0,67 \pm 0,06$  mg/dl (Table). Absent in normal direct bilirubin was  $1,36 \pm 0,05$  mg/dl. This led to increased levels of total bilirubin up to  $2,43 \pm 0,06$  mg/dl at the value it in the control group and at the intact animals  $0,68 \pm 0,06$  and  $0,57 \pm 0,04$  mg/dl respectively. As lengthening the duration of cholestasis the content of bilirubin and its fractions increased sharply. If the content of total bilirubin increased till  $88,22 \pm 0,09$  mg/dl after 3 days, then indirect increased to  $2,66 \pm 0,16$  mg/dl and the direct to  $5,56 \pm 0,08$  mg/dl. However, within 7 days after the reproduction of model value of the general, the indirect and direct bilirubin significantly decreased relative to that of previous period, accordingly, 4,0, 3,5 and 4,1 times. Despite that, this rate remained high in comparison with the norm. Thus, the overall level of bilirubin was equal to  $2,05 \pm 0,05$  mg/dl, indirect to  $0,77 \pm 0,33$  mg/dl, and direct to  $1,35 \pm 0,05$  mg/dl. After 15 days of experiment, total bilirubin level maintained within the range of the previous term, and direct bilirubin tended to increase, accounting for  $1,75 \pm 0,04$  mg/dl.

For jaundice characterized by hypercholesterolemia. A significant increase of content of direct bilirubin in our case is connected to overruns bile tract caused by blockage, their bursting, and the subsequent transfer of bile in the blood stream. Elevated levels of indirect bilirubin is probably due to hemolysis, leading to enhanced formation of bilirubin.

## Conclusions

Thus, the dynamics of extrahepatic cholestasis in the blood of experimental animals, observed significant displacement on the biochemical parameters of the raw manifested hyperenzymemia, hyperbilirubinemia, hypercholesterolemia. If cytolytic processes manifested in the third and, especially, on the 7<sup>th</sup>–15<sup>th</sup> day, the increased activity of alkaline phosphatase, bilirubin and cholesterol levels was manifested on the third day of the experiment. These changes demonstrate the involvement in the pathological process of liver, which naturally exacerbates the main pathology.

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## FORMING SEMANTIC CONNECTIONS IN THEATRICAL PERFORMANCE

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In post-Soviet theatre, performances tend to shift their original (the playwright's) focus to that of the director. That necessarily brings about certain changes in the processes of establishing connotations in the play's semiotics. The paper will look at four types of correlations between the dramatic signifier and its signified, which are created visually and aurally. These correlations can be achieved by: creating parallels between the signifier's appearance and its acoustic manifestation; utilizing the physical characteristics of the signifier itself, which generate meaning-forming associations; using metaphoric associations while engaging the signifier in a physical act; mapping the signifier's intended use onto a separate theatrical action, which results in the transference of an outer action onto an inner one. As will be shown by several case studies of Russian and Moldovan dramatic performances these four types of correlations serve as a general basis for formulating more complex performative semantic structures.

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**Keywords:** theatre semiotics, semantic structure, meaningful action, theatrical sign, metaphoric type of connection

"The semiotics of art occupies an important place in a general theory of sign systems. The semiotics of theatre is an important and until now still underdeveloped part of this complicated problem" [4, p. 402].

The Prague linguistic circle was the first to employ a semiologic method of theatre analysis. It was mainly due to contribution of O. Zich, J. Mukarovsky, R. Jakobson and others that a notion of *sign* became an integral part of a theatre theory. Petr Bogatyrev, a Russian folklorist and member of Prague linguistic circle, explored the sign structure of stage language in his work "Signs of the theatrical art." Bogatyrev analyzed signs of different levels of perception, including mimics, speech, costume, hairdo, and movement. He pointed out that "stage props that function as theatrical signs during a performance acquire particular characteristics, qualities, and features than they have in a real life" [2, p. 10].

Sign is being understood as a result of inner connection between signifier and signified. The terms "signifier" and "signified" were used for the first time in F. de Saussure's *Course in General Linguistics* [6, p. 99–100]. These terms came into wide usage thanks to works of French structuralists R. Barts, A. Ubersfeld and P. Pavis. However, Ubersfeld defines theatre wider than "fixation of its sign nature" [7, p. 190] and Pavis confirms "the uninterrupted displacement of clear border between theatre and semiology" [5, p. 240]. This shows that sign problem is not fully explored.

Irina Gubanova, a Russian scholar of theatre theory, in her fundamental work *On theatre's sign nature* notes that "a capacity of notion *theatrical sign* is not explicit" [3, p. 15]. She concludes that "theater studies will have to return to the theoretical sources, theatrical practice will challenge theoretical modulations" [3, p. 24].

The purpose of this article is to analyze dynamics between signifier and signified on

particular theatrical examples. The aim is to study main elements involved into creation of meanings.

On the verge of the 21<sup>st</sup> century directors tend to create complex sign structures. As a theatrical sign is the smallest unit in meaning making chain it is necessary to study its constructing elements in detail. Connection between an object and its representation turns out to direct thinking from idea to object (director's idea) and back (spectator's idea).

Wide usage of meaning rerouting in contemporary theatrical performances allows to consider in detail relations between object (signifier) and object's representation (signified); to differentiate the sphere of an object and its representation, appearing as an image in one's mind and to discover principle of meaning making. Thus there were found out 4 basic ways of semantic connections making.

We see the content of the object sphere (as well as the object representation sphere) as item and action understanding item as a static representation of object (set, costume, make-up, scene, light, color, sound effects) and action as a dynamic one respectively (gestures, manner of movement, physical actions, intonation expressiveness). These very notions of item and action demonstrate 4 types of connection between signifier and signified:

- a parallel-subject type (item-item connection);
- an action-subject type (action-item connection);
- a metaphoric type (item-action-item connection);
- a parallel-action (action-action connection).

*Parallel-subject type of connection*

Speaking about associative connection between object and its representation, it should be mentioned that this is a connection between their exterior properties, so we speak about an audio-visual object related in man's mind to some associative image. In this case it is possible to say "it looks like..."

For example director tried to express the idea that gold as a symbol of power and wealth is a major aim of any ruler and can excuse any crime including bloodshed. In the scenic version of *Elizabeth I*<sup>1</sup> by P. Foster presented by Moldovan director P. Vutkarau there appear an object of golden brocade. It covers throne-pyramid of England after it has been covered with a red train of executed Mary Stuart perceived by the spectators as a shed blood. The golden brocade in this context is associated with gold, a symbol of power and wealth the way to which for Queen Elizabeth I was poured with blood. Object *golden brocade* is connected to its representation *gold (power and wealth)*.

To some extent perception of an object can be influenced by its exterior similarity. Black rough rubber floor together with paved path passing through the stage in *King Lear*<sup>2</sup> produced by Y. Butusov brings about associations with soil, dirt (object – *black rubber*, representation – *dirt*). Eloquent pose of Lear performed by K. Raykin in the same production is associated with a male gorilla ready to fight creating a link between an object – *actor's pose* and its representation – *gorilla Lear*.

Representation can be provoked by elementary plastic movements. In *The Government Inspector*<sup>3</sup> produced by P. Vutkarau shade of Khlestakov in the scene of bribe looks like both a spider and a multihanded dark god (dark side of Shiva Khali). It is interesting to mention that the two associations agree to the director's idea connecting the action to a voluntary and unconscious sacrifice made by the characters of the play to dark powers concentrated in Khlestakov. The link formed in this case is object – *shade of Khlestakov*, representation – *spider; bloodthirsty god*.

Associative link can be produced by changing some details of the object causing its identification with another thing. Cross with arch-like cross-beam over graves of murdered kings in *Richard III*<sup>4</sup> produced by Y. Butusov is transformed into three-legged throne of a crowned murder which Richard (K. Raykin) chooses among many other variants. This very grave cross – throne turns into an execution block for the next victim Buckingham (D. Sukhanov). Spectators get the following associative links: cross – *grave stone*, grave stone – *throne*, throne – *execution block*.

Associative *item-item* connection is widely used in modern theatre forming sphere of spectators' representation by means of visual forms, props, plastic scenes and sometimes acoustic effects. Sphere of spectators' representation in this case is connected with a speculative image evoked in their memory by an object offered by the director.

#### *Action-subject type of connection*

In this case connection appears between peculiarities of action carried out by signifier and associative image evoked by signified. Usually it is expressed by plastics, manner of movements, behavior, and intonation. The specific of this type of connection is that object (signifier) is a character performed by an actor

In a famous performance *Juno and Avos*<sup>5</sup> produced by M. Zakharov special musical-rhythmical intonation of actors in masques representing bureaucrats evokes associative link to a mechanism and projects its features to the bureaucratic state apparatus. Thus here object is *manner of speech*, representation – *principal of mechanism*. Such technique of intonation expressiveness can project this or that symbolic images in spectator's mind.

Peter Trofimov (S. Kiryushkin) in *The Cherry Orchard*<sup>6</sup> produced by I. Shats speaks about Christian values with some goat's bleating in his voice. It projects to the image of "eternal student" double aspect of a goat viewing it both as a scapegoat and a goat legged tempter. Object – *intonation of speech*, representation – *image of goat*.

In the mentioned above *King Lear* Earl of Gloucester (D. Sukhanov) appears over a piano making recognizable gestures and sounds of a parrot associated on the one hand with a bird and on the other hand with a soul of Gloucester. Spectators see objects – *gestures and sounds* and get representation – *a parrot*.

Representation in this case wholly depends on acting skills and gives actors a chance to take active part in creating semantic structure of a performance.

#### *Metaphoric type of connection*

This type presents combined associative connection reached through the actions of a mediator. Connection between object and its representation is built on the actions carried out over a signifier making it equal to signified and giving it some of signifier's attributes. Associative connection is evoked by the action and as a result representation is somehow put over the object.

<sup>1</sup> *Elizabeth I* by Paul Foster. Directed by Petru Vutkarau. Theatre "Eugen Ionesco", Chisinau, Moldova, premiere, 2004.

<sup>2</sup> *King Lear* by William Shakespeare. Directed by Yuri Butusov. Moscow Theatre "Satirikon", Moscow, 2007.

<sup>3</sup> *The Government Inspector* by Nicolay Gogol. Directed by Petru Vutkarau. Theatre "Eugen Ionesco", Chisinau, retro-premiere, 2007.

<sup>4</sup> *Richard III* by William Shakespeare. Directed by Yuri Butusov. Moscow Theatre "Satirikon", Moscow, 2006.

<sup>5</sup> *Juno and Avos (Junona I Avos')* Russian-language rock opera written by Alexey Rybnikov, poetry by Andrei Voznesensky. Directed by Mark Zakharov. The Lenkom Theatre, Moscow, premiere 1981, is one of the most popular performances until now.

<sup>6</sup> *The Cherry Orchard* by Anton Chekhov. Directed by Ilia Shats. State Russian Dramatic Theatre named by A. Chekhov, Chisinau, premiere, 2004.

For example wooden table in Y. Butusov's *King Lear* pulled away by actor during the performance due to this action is associated with Lear's kingdom. As a result there appears metaphoric connection between a table and a state. Thus object – *table*, action – *pulling away* and representation – *Lear's kingdom*.

In the same performance Edgar (A. Osipov) runs along red cloth on the floor as if burning his feet on hot coals, creating association between object (*red cloth*) and representation (*hot coals*). As the cloth first symbolizes land of Lear's kingdom torn by Regan and Goneril running of Edgar creates metaphoric link between red cloth and a kingdom turned into hell by constant fighting.

Calling this type *metaphoric* we mean only the principle of connecting two notions having no resemblance to a metaphor as it is. Images created in spectator's mind very often have more to do with a notion or a process than a certain thing. Character of actions carried over an object plays a very important role in creating associative link to a representation. Besides it is quite evident that the choice of an object is absolutely free and the object gets some additional meaning only in connection with actions carried over it.

#### *Parallel-action type of connection*

In this case action is viewed as an object itself. Exterior action of a signifier illustrates interior action of a signified. This type of connection can be viewed as a symbolic action.

Action can be an independent object and project inner actions onto the sphere of representation. When Khlestakov turns daughter of the Governor on a billiard table telling her about his love (aforementioned *The Government Inspector* produced by P. Vutkarau) spectators understand that he turns the girl's head and his real intentions are as serious as gambling. In I. Shats' production of *King Lear*<sup>7</sup> outer action of Edmond is burning his clothes while inner action is burning up passion, envy and thirst for power in his soul.

In production of *Elizabeth I* courtiers' hands are raised over the head of a bended knees Queen Elizabeth (A. Menshikova) and they move their fingers while she is making up her mind on prosecuting her sister. This action hints that the courtiers try to pull invisible strings and rule their Queen like a puppet thus revealing hidden mechanisms of power.

<sup>7</sup> *King Lear* by William Shakespeare. Directed by Ilia Shats. State Russian Dramatic Theatre named by A. Chekhov, Chisinau, premiere, 2007.

The mentioned above examples demonstrate that outer action refers to the inner one staying beyond the lines of characters and revealing its symbolic meaning. It is also possible to state that physical actions of actors form basis of the majority of associative links and meaning parallels on the sign forming level.

To sum up it should be pointed out that an effective connection between object (signifier) and object's representation (signified) can be reached by:

- a parallel-subject type of connection – an association is formed on the basis of similarity of object exterior or with a help of its acoustic analogue;
- an action-subject type of connection – an association appears on the basis of physical action of the object itself;
- a metaphoric type of connection – an association is reached by means of special physical action of actors with the object;
- a parallel-action type of connection – object is perceived as an independent action getting a new symbolic meaning by moving its original meaning from the external plan to internal.

These methods form a universal basis for creating complex semantic system, including sign and symbolic structure.

It should be noted that directors often demonstrate a preference for parallel-subject (50 per cent) and parallel-action (26 per cent) types of correlation on practice. The least used is an action-subject type of correlation (8 per cent). Visual action of actors perceived as an object (signifier) plays the main role in building object's representation (signified) by significant parallels, this confirms Yuri Lotman's idea in his *Semiotic of the stage* that "the thing never plays an independent role in the theatre, it is only attribute of actor's action <...> it has been interpreted" [4, p. 418].

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*Materials of Conferences***CONTRADICTIONS OF GLASNOST  
(ON TATARSTAN'S MATERIALS)**

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This article examines the state of cultural change management during the perestroika, the relationship between authority and the artistic intelligentsia, which is traditionally an instrument of party policy. The problem is investigated on the materials of the republic of Tatarstan.

The period of perestroika (1985–1991) is characterized by fundamental changes in government. Reform of M. Gorbachev led to the transformation of the Soviet system and society. Party Soviet leadership proclaimed a new policy development. One of the most important principles of the restructuring in the social and cultural sphere has been the policy of glasnost (publicity). Glasnost included freedom of speech, the ability of public and open discussion of pressing social problems. Artistic intelligentsia starts using these capabilities.

However, Gorbachev's policy of glasnost and democratization had many contradictions in the implementation. Party's policy in the field of culture had a number of features in a regional perspective. Freedom of creative expression for the regional artistic elite was significantly limited.

The "democratization" in the sphere of culture presented as a myth or illusion. That is, on the one hand – in science and art is addressed to the previously taboo topics to previously closed pages of Soviet history, etc. On the other hand – is retained tight control in the field of cultural communication, attention to the representatives of the authorities of the artistic intelligentsia continues unabated. In fact, the party leadership is not ready to speak openly about the problems of modernity.

A striking example of inconsistency and lack of glasnost implementation during the first step is to report events of the Chernobyl disaster, which occurred on April 26, 1986. In addition, the local press reported about authorities silencing of nuclear accident "Tri-Mail-Island" in 1979 [3]. Thus, through a critique of the foreign countries past the masses were distracted from their own problems of the present. The Chernobyl disaster has become both a symbol of technological policy of "acceleration" failure and the policy of glasnost.

Also contrary to the glasnost and declared at the XXVII Congress of the need to respect the right of every people to freely choose their own destiny and the like, culture and the media continued to develop the former trend of criticism of foreign countries. This is reflected in Kazan press. In "Evening Kazan" 1986 in the article "Straitjacket for dissent" reports on the use in Japan of psychiatry for political and social repres-

sion [4]. Similar news used to attenuate attention to their own identity issues. The practice of psychiatric hospitals in politically unreliable public and cultural figures kept and has application in 1986. Only reduced its scale.

Initially, many intellectuals positively evaluated the policy of glasnost. This is reflected in the letters, petitions addressed to the secretaries of the regional committee of Tatarstan. So in the name of R. Belyaev, the second secretary of the regional committee, G. Kaybitskaya, the former actress of Opera theatre, sent a request for awarding her the title of People's Artist of the USSR which was not awarded to her due to the vestiges of the personality cult. Herewith Kaybitskaya appealed to Mr. Gorbachev's report: "I heard repeatedly on television the words of our Party Secretary", Mikhail Gorbachev. His kind words inspired my heart. He said: "Write us, we will consider your request". [1]. This and similar petitions are the evidences of Party trust, intelligentsia hopes for reforming in the field of culture through the policy of glasnost.

The responses of the regional committee are baseless rebuttal of facts which are indicated in letters, complaints and petitions by intellectuals. For example, in the letter of anonymous writers "unhealthy atmosphere in the Writers' Union of Tatarstan", the authors' oppression, tyranny and incompetence of T. Minnulin, chairman of the Writers' Union of Tatarstan, are illuminated. The authors reveal the unfair treatment to many writers, including D. Valeev, A. Mushinskomu and others [2]. In its response, the regional committee denied Minnulin's prosecution of the authors mentioned in the letter. The response states: "The authors of the letter have misunderstood Valeev's behavior, limiting it only by unhealthy relationship with T. Minnulin" [2]. The regional committee representatives explain objective problems exclusively due to subjective reasons, i.e. abnormal personal relationship in the team.

The famous writer, playwright and social activist D. Valeev felt the pressure of the bureaucracy, expressed in relation to his works. D. Valeev's plays "1887", about the gathering at the Kazan University, which was attended by the student Vladimir Ulyanov; "Day X", about the Musa Jalil's feat (Tatar poet, who died in German prison), were fundamentally analyzed by the Marxism-Leninism experts, and finally corrected before going on stage. D. Valeev's fighting for his own ideas ended tragically for his creative life. Long confrontation with T. Minnulin, the chairman of the Union of Writers of Tatarstan and R. Belyaev, the secretary of regional committee party, led to the banning of staging in March 1987 by the first secretary of Party Committee of Tatarstan G. Usmanov [5]. Thus, proclaimed glasnost, freedom of speech and

expression of thoughts at the initial stage of perestroika were theoretical. Party's negative attitude to Valeev is largely due to his human rights work that he began in times before perestroika.

Thus, perestroika extended the possibilities of the artistic intelligentsia. Intensified international cultural relations, the public have been presented previously banned works of literature, movies, etc., in the discussions brought out critical problems of society. However, the study of archival documents, memoirs, periodicals and analytical literature, suggests the presence of contradictions between the proclaimed rate and the actual implementation of the ideological and cultural policies of perestroika. Unilateralism previous criticism of Brezhnev, Stalin courses; conceal of the authorities of the disaster at the Chernobyl nuclear power plant; use of psychiatric hospitals as prisons for dissidents; active counter-propaganda and criticism of foreign countries in the official media; harassment of the artistic intelligentsia engaged

in human rights activities, etc. –are indicators of trends conservation authorities ideological control that a period of perestroika through its further transformation fails.

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## RE-ENGINEERING BUSINESS-PROCESS OF MANAGING DEBIT LIABILITIES OF RESOURCE-SUPPLYING COMPANIES

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Analysis of business-process of managing debit liabilities of resource-supplying companies has been carried out. We have outlined special features of working with debit liabilities of private customers during the process of organizing marketing activity. Criteria of classifying debtors according to characteristics of the existing debt from the point of relation between volume, liquidity of debit liability and the consumed resources have been formulated. We have studied the basic content of methodical toolkit of managing debit liabilities of private customers according to the method of ABC-analysis that allows us to achieve optimization of resource costs, aimed to collect debts.

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**Keywords:** marketing activity, business-process, debit liability

One of the basic problems of managing finance of resource-supplying company is provision of financial stability that basically depends on volume of funds, drawn into debit liability [1]. Resource-supplying companies usually have organization-administrative documents (standards, regulations, states) that define work with debit liabilities [2] that include:

- Objectives and principles of managing liabilities, methods of accounting and reporting work with debtors;
- Organizing work of commission that manages a company's liabilities, organizing centers of financial responsibility;
- Classification and analysis of debts according to their liquidity;
- Basic rules, order of measures on prevention of debt growth;
- Business-process of working with actual and outdated debts, analytic account of debtors;
- Approaches towards organizing work on collecting debts in pre-court and court order, realization of control methods, etc.

The most numerous group of energy consumers and, therefore, problematic for collecting debit liabilities is population (private persons), that holds a significant part in total sum of debit liabilities and volume of outdated debts.

Analysis of the existing practice of developing and realizing methods of work with debit liabilities of resource-supplying organizations shows us an insufficient efficiency of this work that is proved by the structure and degree of liquidity of debit liabilities that are shown by companies in their accounting, managing, and corporate report.

For resource-supplying companies that operate with many various contractors, it is critical to define perspectives of working with certain consumers and select optimal financial conditions of work from the point of relation between volume, liquidity of debts, and resourced, drawn to their collection correctly and opportunely.

As analysis shows, basic defect of the existing system of managing debit liabilities of population in resource-supplying companies is lack of clear criteria of classifying debtors according to their significance, as a result, it forms surplus labour resource costs, leads to duplication of measures, implemented to the same debtors in different time periods with decrease of their efficiency.

The most wide-spread parameters of classifying groups of debtors according to significance are: 1) debt sum, 2) period of outdated payment.

In order to solve the problem we suggest implementation of ABC-analysis method that is referred to rationalization tools, as a method of classifying debtors. Facilitation of this method allows one to classify resources of a company according to their significance.

The essence of using ABC-analysis method by a resource-supplying company is in outlining groups of debtors according to statistic data. Groups are defined by their significance and each of them requires a certain approach towards it during further interaction. Algorithm of the suggested approach:

1. Characterize types of debit liabilities, ranged according to decrease in debt sum.

Category A – the largest debtors that require constant and detailed accounting and control.

Category B – less important debtors that are estimated and checked regularly, but not too often.

Category C – the widest nomenclature of debtors with small sums of debts.

2. Types of debit liabilities are defined and ranged according to decrease in period of payment delay.

Category A – debtors with long periods of liabilities, treated with reinforced measures of collection.

Category B – debtors with insignificant periods of payment delay, debts of which are usually collected via pre-court measures.

Category C – reliable debtors who follow payment schedule

Approbation of this method has been carried at processing database of accounting customers of resource-supplying company on a separate marketing department. Statistical processing of data included data on 54 thousand customers with a total sum of debit liabilities equal to 108 million rubles.

3. In case of combining gradation of debtors according to sums and periods, matrix of managing debit liabilities is formed (fig. 1).

4. Depending on type of debtor and his grade, measure of collecting debt is defined (fig. 2).

5. Analysis of the selection of billing system is carried out via additional toolkit for MS Excel "Inventor" – a set of utilities (macros and functions), aimed to carry out ABC-analysis that complements and widens abilities of standard Excel.

Ranging debtors according to total sum of debit liabilities:

Total sum of debit liability per one account	Average period of payment delay, days		
	0-30	30-90	>90
Small (C)	1	3	6
Average (B)	2	5	8
High (A)	4	7	9

Fig. 1. Matrix of managing debit liability according to ABC-analysis

Measure	Points								
	1	2	3	4	5	6	7	8	9
Telephone messaging									
Claim									
Notification on cutoff									
2 <sup>nd</sup> notification on cutoff									
Restructuring									
Civil complaint									
cutoff									
Executive list									
Joint visit with court officers / transferring case to collector organization									

Fig. 2. Measures of collecting debit liabilities

– Group A – 80% of debt, 14 thousand customers (26% of total amount) and total debt sum of 86 million rubles;

– Group B – 15% of debt, 20 thousand customers or 37% of total amount and total debt sum of 16 million rubles;

– Group C – 5% of debt, 20 customers or 37% of total amount and total debt sum of 6 million rubles.

6. Evaluating efficiency of measures [3], aimed to manage debit liabilities, was suggested to carry out via method of *EMV* (*Expected*

*Monetary Value*), that compares the following indexes:

– volume of debt within a group of debtors, weighed according to probability of its collection depending on level of measure, defined for a certain debtor.

– volume of costs, weighed according to probability of losses due to insufficient payment for a debt.

7. Results of approbating toolkit of managing debit liabilities have been evaluated according to EMV method.

For collection plan of this selection during the studied period of 30 % (traditional methods of collecting debts) actual (re-engineering of business-process) collection of debit liabilities equaled 58 %. The share of costs, aimed to collect debts equaled 3, % of this volume that is significantly lower than existing tariffs for services of collector organizations.

Possible practical implementation of the results:

1. Developing methodical toolkit of managing debit liabilities of population to a point of transferring it to resource-supplying companies.

2. Developing a module of automatic work place "Management of debit liabilities of population" for the existing billing systems.

Thus, re-engineering business-process of managing debit liabilities of population allows us to achieve optimization of costs for

resources, aimed to collect debts. Increase in probability of collecting a debt and, therefore, amount of the collected debts, will have a positive impact upon decrease in cash gaps, decrease in costs of paying percent for using borrowed funds.

Results of the initial approbation show us significant economic effects during the early periods of introducing the toolkit that allows us to state economical suitability of carrying out re-engineering of this business-process.

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*Materials of Conferences***INTEGRATION IN THE FORMATION  
OF THE PROFESSIONAL MANAGER'S  
COMPETENCIES**

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The article reveals the analysis of the integration in the formation of the professional manager's competencies. The process of professional development skills of future managers is under investigation within joint students and university teachers participation by means of research projects and work experience training. There are conclusions concerning importance of cooperation between university departments, region and city for the further professional manager's skill development.

At the present time the students' professional skills formation and development is constrained, it happens on the one hand, by means of the translational and reproductive student's position (while the position of professional experts is characterized by its active, transformative, creative character), students have individual way of academic training activity in contrast to the collective corporate nature of the professional specialists' activity (Anisimov O.S., Neverkovich S.D., Tyukov A.A. and others). The overcoming of these contradictions or "gaps" between the university and industry, means requirements for changes in educational process, its goals, objectives, content, technology and results.

The process of professional competence formation will be successful if the educational process is integrated with work experience training (real problem and demand solution of enterprises and companies) and research work.

In fact at the present time – up to 40% of graduate qualification works – are the projects related to enterprises' orders which are compared favourably with others, not only in respect of problem's originality, but also concerning approaches' development to efficiency estimation. As a rule, students involved in such kind of projects have all kinds of work experience practices in the same organization, and then, more likely these students continue to work in that company.

As a matter of fact, such type of work provides the independence and originality of thought, the ability to team work, responsibility, self-discipline, the ability to self-development and self-esteem, in such case we can state the whole student's involvement into educational and professional activities.

Both students and teachers become the participants of research and project educational activity, it makes the leading stream of educational modernization in university, including its objectives, content, technology and outcome.

Teachers, students as well as employers should be interested in this process, as the ultimate goal – is ensuring of compliance to the quality of student's training to business needs, and this goal can't be achieved out of more efficient interaction. Such kind of cooperation provides the basis for teacher's professional "feeding", it stimulates his research and innovative activity.

Work experience practice doesn't fully realize its resource in capacity of educational kind of professional students activity in higher education, the cooperation channel between the university department and employers is also not fully realized. The curriculum of work experience practice has to be annually agreed and corrected, in this way the supervisor of work experience practice can become the "conductor" of joint projects and initiatives.

On the other hand, the analyses of work experience practice reveals that students' involving into the top research work is restrained, their creative potential is restrained by dominating of particular research area, which weakly correspond to the region's demand, low degree of participating in the federal and regional programs, low continuity concerning school and university students, the 1<sup>st</sup> year and 2<sup>d</sup> year students; there is lack of learning and academic cult among universities; low students motivation in research work (1).

Evidently there are solutions of mentioned problems, other universities have got experience in this area. Davydenko T.M., Benyash M.V. suppose the technology of students' creative potential management in research work. According to this investigation, the students' creative potential management in research work means the controlled process which demands selective ways of work. Selectiveness supposes high sensitivity of management entity to changes. In this case the goal is to increase the result in specific growth points under the influence of management impact.

There are 3 steps in selective management process: organizational-selective, resource-motivated, selective support and stimulating. The content of students' creative development in research work changes from the first stage of "selection" of gifted school children and 1<sup>st</sup> year and 2<sup>d</sup> year students, they are involved into research conferences and competitions together with their supervisor, their motivation is supported by publications of research results, going to conferences, and finally these students take part in university department's projects together with university teachers. The growth point here means the students' participating in research projects which are implemented in strong partnership with company specialists. Success criteria means publication in top rating issues, taking part in scientific competitions.

The cluster types can differ in their ways of interaction (2). The cluster of the first type – is the interaction between university departments, teachers and students of different specialties. The second cluster involves the interaction between various projects specialties (for example it can be the graduation project of students of different specialties, multisubject projects of different university teachers and departments).

The third type of clusters are the university departments and external partners. The foundation of their cooperation is the agreement concerning working partnership for the purposes of specialist's training. This cooperation is based on the task setting up and project implementation in behalf of external partners interests, including their participation in this work.

Lately such kind of clusters are appearing in Cherepovets state university. Students take part in work experience practice involving into specific innovative projects and research tasks which include workplace management, business process development, work time study, functional and cost analysis of business processes, tourist project development, regional programs.

Those students who do practical training in "Severstal" JSC are tested at the point of "Entry", then the most skillful students are chosen, after that at the point of "Exit" each student receives the es-

timination card of their four basic competences. Annually the research work on efficiency estimation of specific company processes is realized according to some company's partnership agreements.

The fourth type of cluster is based on the interaction between region, city and the university department. It includes business plan development for small entrepot, regional social projects and programs.

The task of the university departments is to be taught forming the demand of external partners on such projects and programs. That's why it's necessary to look into ways to enable such interaction among all types of clusters.

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*Materials of Conferences*

**DYNAMICS OF HUMAN INFLUENZA  
VIRUS RESISTANCE  
TO CHEMOTHERAPEUTIC  
DRUGS FROM 2000 TO 2009**

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The proportion of resistant strains of human influenza viruses to rimantadine was increasing up to the 2005–2006 epidemic season, reached its maximum, and then gradually started to decline. The beginning of the 2007–2008 epidemic season has experienced an unprecedented increase in the oseltamivir resistance in A (H1N1) viruses circulating in some European countries. At that the specific number of this maximum ranged from 100 to 70 %, and its decrease in different regions took place with a different intensity. In 2009 the circulation of so-called "swine" A(H1N1) influenza broke out, the rimantadine resistance among isolates is kept at the level of 100 %. Influenza viruses of subtypes A(H1N2) and A(H3N2) are more susceptible to oseltamivir than to zanamivir. The situation with influenza viruses A(H1N1) and type B is reversed.

Currently, the main ways to combat the influenza infection are vaccinal prevention and chemotherapy. Both methods have their advantages and disadvantages, so the best result can be obtained in their combined application. This paper describes the latest advances in chemotherapy, demonstrates the dynamics of resistance and mechanisms of action of antiviral drugs against influenza viruses.

Vaccination covers the preventative methods to combat the influenza. Recently, the quality of vaccine agents was significantly improved, their range extended. With timely vaccination it is possible to prevent influenza infection in 80–90 % of children and adults, at that the disease in the vaccinated persons usually proceeds in a milder form [1].

Influenza chemotherapy has long been considered an unpromising sphere as compared to vaccinal prevention, but immunity against a particular strain does not protect the body from repeated illness caused by another strain. Therefore, the production and use of chemotherapeutic drugs is not only permissible but also necessary [2].

Currently, there are two groups of chemotherapeutic drugs:

- M protein-inhibiting
- neuraminidase-inhibiting

Historically, the very first anti-influenza chemotherapeutic drug was amantadine, discovered in 1933 by Czech researchers S. Landa and B. Mihachek when studying the oil properties.

The great disadvantage of amantadine is its high toxicity, and a large number of side effects, identified in a number of patients. This led to the creation of rimantadine, which is an alpha-methyl-1-adamantane.

**Dynamics of rimantadine resistance  
among circulating strains**

Rimantadine as well as amantadine is an inhibitor of influenza virus uncoating. It irreversibly inhibits the M2 protein, and thus stops the flow of protons through the virion membrane [3]. Rimantadine blocks the functions of ion channels and thereby disturbs the process of the virus "stripping".

However, the rimantadine action is directed only against influenza A virus, because influenza B virus does not have the M2 protein at which the drug-induced action is aimed. Analogue of the M2 protein in influenza B virus is the NB protein, encoded by the open reading frame in the neuraminidase gene and by its structure fundamentally differing from the M2 protein. There is no adamantane-binding site in the NB protein. However, despite the absence of the M2 protein, rimantadine can improve the condition of patients with influenza B, as it mitigates the toxic effects of influenza.

At present, the search for new chemical compounds among the adamantane derivatives is going on. For example, the antiviral activity against influenza virus for pyrrolidine and aminoethyl derivatives of aminoadamantane was shown, as well as for derivatives with metal ions [4].

Influenza A viruses, unsusceptible to the action of drugs of adamantane series, usually carry the following mutations in the amino acid sequence of the M2 protein: L26F, V27I, V28I, A30T, S31N, G34E. The greatest number of rimantadine-resistant strains carries the S31N mutation [5].

Mutations in the hemagglutinin gene are poorly investigated, however, for rimantadine-resistant strains it was shown that it has the following mutations: in HA2 – N49S, M58L, S70C, R75K, M58I, F109S, and in HA1 – L315P, S323P [6].

There are also mutations in the hemagglutinin gene associated with the S31N mutation in the M2 protein gene. According to Pontoriero et al. [7], those are the mutations S193F and D225N, which are present in rimantadine-resistant strains on the par with the S31N mutation in the M2 protein gene.

Initially, the number of resistant strains was low (less than 1 %). At the same time, in Greece the 2004–2005 epidemic season did not reveal any resistant strain. Later, in Europe, there was a slight increase in the proportion of resistant strains. In 2005–2006 their number increased to 12 %, and in 2006–2007 quite to 25 %. A similar situation was observed in the Asian region. For example, among the influenza virus strains circulating in Hong Kong from 2003 to 2005, a share of rimantadine-resistant isolates increased from 20 % to 83 %. Among the Asian strains of subtype A(H3N2), isolated in the

2005–2006 epidemic season, the resistance reached 100% [8]. By the 2005–2006 epidemic season the proportion of resistant strains of subtype A(H3N2) in Japan fluctuated, according to various authors, from 90% to 72.2% (25,9), while in the subtype A(H1N1) there was not found any resistant strain. In the 2006–2007 epidemic season in the Japanese population of subtype A(H3N2) the number of resistant strains came to 79,4%, and among A(H1N1) – only 48,2% (26–10). In the North America, despite the geographical distance from Eurasia, the overall tendencies were similar. For example, in the USA over the 2005–2006 epidemic season, 92,3% of isolates of subtype A(H3N2) were resistant to rimantadine according to the data of a genetic test, that is, by the existence of the S31N mutation. Of eight strains of subtype A(H1N1), isolated in the same epidemic period, this mutation was carried by two strains [9].

Neuraminidase breaks up the sialic acid component of hemagglutinin receptors of respiratory tract epithelial cells, helping to release newly formed virus particles from the cells and infect new cells with them.

Another function of neuraminidase is its ability to break down neuraminic acid in the nasal mucus, in that way making easier the virus penetration through the respiratory tract [10].

The drug Zanamivir was the first neuraminidase inhibitor. Due to the low bioavailability of zanamivir (Relenza) (less than 5%), it is effective and used in the form of aerosol inhalation or intranasal spray, which ensures its delivery to the place of direct viral replication in the cells of the respiratory tract. In addition, there is a danger of spasm development in patients with bronchial asthma [11].

Therefore, the pharmaceutical company F. Hoffmann – La Roche (Switzerland, Basel) has initiated a study to find another neuraminidase inhibitor, which would be effective for the systematic use. As a result of the synthesis and study of a large number of neuraminidase inhibitors in the pharmaceutical market oseltamivir (Tamiflu) has appeared. Unfortunately, it is impossible to use oseltamivir in serious cases when patients are unable to use the tablets. In 2009, the firm BioCryst Pharmaceuticals has registered the third neuraminidase inhibitor – an experimental drug peramivir. Peramivir was approved for use in critical situations to treat heavily ill patients infected with pandemic influenza A(H1N1) (“swine influenza”) [12].

Currently trials of a new neuraminidase inhibitor laninamivir are being carried out. This drug has revealed antiviral activity against influenza A and B viruses, including subtypes N1–N9, and against viruses resistant to oseltamivir. Also, it revealed efficiency against swine-origin influenza A(H1N1) and highly pathogenic avian influenza A(H5N1) [13]. Studies on the development of anti-influenza drugs in the group of neuraminidase inhibitors are in progress. In addition to the above, which are derived from cyclohexene, the cyclopentane and pyrrolidine derivatives have been developed, which also possess inhibitory activity

against influenza virus neuraminidase. 7-alkyl ether and bicyclic ether derivatives of zanamivir have also been synthesized, which revealed a higher, compared to the drug itself, level of activity *in vitro* and *in vivo* under oral administration in the model of influenza pneumonia in white mice [14].

Mutations resulting in the resistance to oseltamivir have been discovered mainly in the influenza A viruses, and they differ depending on the subtype: the most common mutations in the viruses carrying N2, were R292K and E119V, while the most frequent mutation for N1 was H275Y (often referred to as H274Y, which is consistent with the numbering in N2) [15].

Laboratory studies to detect the virus resistance have demonstrated that the stable mutations during treatment with oseltamivir occur rarely. However, they are specific to the subtype: in neuraminidase subtype N1 the H274Y mutation was revealed, and in N2 – R292K [16]. In addition, the E119V mutation was identified with a very low frequency (only in neuraminidase type N2) [17].

#### Dynamics of oseltamivir resistance

In the first three years of oseltamivir appearance in the market (1996–1999), there have been no registered cases of influenza viruses with reduced susceptibility to oseltamivir. Pooled data obtained from 2000 patients taking oseltamivir, demonstrate a low percentage of the drug-resistant strain appearance (0,33% for adults and 4,0% for children). Monitoring of influenza during the 2000–2001 and 2001–2002 epidemic seasons in 22 European countries revealed that less than 1% of the strains in every season possessed a reduced susceptibility to oseltamivir. The worldwide number of influenza viruses with reduced susceptibility in the period from 2004 to 2007 was also low (12/3261, 0,4%) [18].

However, the beginning of the 2007–2008 epidemic season has experienced an unprecedented increase in oseltamivir resistance of A(H1N1) viruses circulating in some European countries. Preliminary analysis data for isolates of the 2007–2008 epidemiological season showed an increase in the number of A(H1N1) strains carrying the H275Y mutation in comparison with the previous period (57/896 isolates, 6,4%), especially in the USA. Confirming this unexpected tendency, the European Centre for Influenza Surveillance (European Influenza Surveillance Scheme) reported that among strains of the influenza virus A (H1N1) the number of resistant to the drug increased to 23% (586/2533 tested samples), at that the ratio of resistant and susceptible strains was different for different countries, for example, 68% in Norway, 10% in England, and 1% in Italy. It is important that the majority of circulating influenza strains in Europe were susceptible to oseltamivir, as well as in the USA.

Further, in the winter 2008, a high level of resistant A(H1N1) strains was recorded in South Africa (100% of 225 isolates) and Australia (93% of 76 isolates), the lesser amount was observed in South

America (36% of 275 isolates) (WHO data, 2008). In the epidemic season 2008–2009 in most of Europe oseltamivir-susceptible A(H3N2) viruses were predominant [19], despite the presence of resistant A(H1N1) viruses. It should be noted that during this period oseltamivir-resistant influenza A(H3N2) and type B viruses were not registered, as well as that these viruses were susceptible to zanamivir. In the USA, however, A(H1N1) strains were the most numerous, and majority of them were resistant (~60%). In the course of the 2008–2009 epidemic the reports on the isolation of oseltamivir-resistant A(H1N1) strains came from 30 countries. 1291 of 1362 isolates (95%) proved to be resistant. At that, in Canada, Japan, Hong Kong, USA, Korea, and many European countries, the proportion of resistant strains was nearing or came to 100%. However, it should be noted that the appeared since 2009 in most countries, pandemic “swine” influenza A(H1N1) predominated over the seasonal and was more susceptible to oseltamivir (WHO data, 2009).

The next drug, Arbidol, is one of the most widely used anti-influenza drugs in Russia. As ribavirin, arbidol attacks the propagative influenza virus.

Mutations resulting in the development of resistance to arbidol have been mapped in hemagglutinin gene on the border between HA1 and HA2 subunits.

Ingavirin (2-(imidazol-4-yl)-ethanamide pentandioic-1,5 acid) is a new antiviral drug, a low-molecular peptidamine, being an analog of natural peptidamine.

A new drug is favipiravir (T-705) (6-fluoro-3-hydroxy-2-pyrazinecarboxamide), which revealed high activity *in vitro* against a number of RNA-viruses: seasonal influenza, highly pathogenic avian influenza. Presumably, favipiravir targets the RNA-dependent RNA polymerase [20]. Currently, there are no studies in which mutations, causing resistance to favipiravir, have been reported, but one may assume that they could be revealed in the viral polymerase gene, as it is the target of this drug.

### Conclusions

In general, we can say that the proportion of resistant strains was increasing up to the 2005–2006 epidemic season, when it reached its maximum, and then gradually started to decline. At that the specific number of this maximum ranged from 100 to 70%, and its decrease in different regions took place with a different intensity. In 2009 the circulation of so-called “swine” influenza A(H1N1) broke out, the rimantadine resistance among isolates is kept at the level of 100%. Influenza viruses of A(H1N2) and A(H3N2) subtypes are more susceptible to oseltamivir than to zanamivir. The situation with influenza viruses A(H1N1) and type B is reversed. Findings of one investigation suggest that zanamivir is more effective than oseltamivir, against neuraminidases of subtypes N2, N3, N6, N7 and N9, while N1, N4, N5 and N8 are more susceptible to oseltamivir. Combined use of chemotherapy and vaccinal prevention is essential method for a successful combating viral infections.

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*Materials of Conferences***ABOUT THE ROLE OF LANGUAGE AND COMMUNICATIVE COMPETENCE IN TRAINING EXPERTS**

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In the system of professional training future specialists the forming of the student's language and communicative personality is considered one of the priority trends of higher school activity.

The fundamental purpose of higher vocational education in present day conditions is focused on training the appropriate level and profile qualified expert, competitive, competent, able to work effectively at the level of international standards, ready to the continuous professional growth, social and professional mobility. Present day expert's competitiveness is defined not only by his high qualification in the professional sphere but also by the readiness to solve independently professional problems in the conditions of business communication, systemacity of thinking, ability to be reconstructed in the present day promptly changing society.

The present day social and economic conditions require from educational institutions the development of the accurate mechanism of social order accounting which level of implementation defines the experts training quality. In the tendency of the society civilized development and strategic demand of the society, a graduate is to be not only a highly skilled professional in a certain area but also a widely erudite personality having thorough humanitarian training, capable to express adequately himself – socially, intellectually and emotionally – by means of the language, i.e. to be competent communicatively and professionally.

Competent language skills, the existence of skills of cross-cultural communication in concrete professional, business, scientific spheres and situations are considered the integral component of students' vocational training in any specialty. Therefore the development of the language and communicative competence gained a prior relevance nowadays.

The formation and improvement of the language competence is the most important aspect of teaching languages, as the language competence is the knowledge of the language phenomena and the ability to use them in the productive speech.

“Communication between experts on professional subjects irrespective of its proceeding in the written or oral form, in the official or informal situation, i.e. communication as a special, auxiliary kind of activity providing implementation of the primary professional activity is the professional speech” [1].

In training the specialty language much attention is paid to the formation of oral professional and scientific communication. This term in modern

linguistics and methodology is understood as a special functional kind of language: the speech on subjects of science and specialty which is carried out in situations of public and informal communication of specialists-professionals in this or that branch of science and production [2].

The problem of training a competent expert is multidimensional. In order that language and communicative training had a profession-focused character and corresponded to informative needs of the technical profile experts, from the wide complex of universal and professional competences we will allocate the basic one, i.e. readiness:

- to business communication in the professional sphere (ability to organize and to conduct competently business negotiations and conversations),
- to language skills use for the solution of professional tasks;
- to search, systematization, assessment and interpretation of professionally significant information;
- to business correspondence, registration of the report theses, making abstracts and summarizing articles;
- to oral contacts in various conditions and situations of production and other work.

Besides, a present day expert is to know personal features and typical problems of people with whom it is necessary to communicate, to be able to analyze external signals (gestures, facial expressions, intonations), to possess the ability of resolving conflicts, to own skills of active hearing, to possess oratory, to be able to like interests of other person.

The increase of the level of technical specialties students' language competence is promoted, in our opinion, by the correct introduction in classes of the forms of business communication as it is impossible to manage without it in the sphere of economic, legal, diplomatic, commercial, administrative relations. The ability to conduct successfully business negotiations, to make competently and correctly the official paper and many other things, became an integral part of the person's professional culture nowadays. For achieving high productivity in practically any kind of activity it is necessary to own a certain set of data, knowledge, ideas of the business communication rules.

The culture of business communication promotes the establishment and development of the relations of cooperation and partnership between people, in many respects defining the efficiency of the relations: whether these relations will be successfully implemented in the interests of partners or will become empty, inefficient, and even will absolutely stop if partners don't find mutual understanding.

For the purpose of achieving a high level of the language competence development it is necessary:

- to form the conditions for the development of students' informative activity through the use of

new educational technologies, active forms of education (slides on the set subjects, video topics, etc.);

- to promote the development of students' oral and written language by means of active forms of education (selection of monological texts in technical specialties);

- to promote the disclosure and realization of each student's creative potential.

- to develop the linguistic, communicative, culture studying (linguistic county studying, ethnic culture studying, socio-cultural competence.

It is necessary to introduce actively in practice of teaching languages communicative technologies, as much as possible using the authentic training materials, new information technologies and methodological approaches (the method of projects, educational role-playing games, testing, discussions, oral and written presentations, etc.) that promotes the development of skills of critical judgment, the formation of abilities to act publicly, to conduct polemics, to estimate critically and to master the material creatively. And this, in turn, is the most important factor of successful professional activity of a future expert.

So, for example, at the chair of the Russian language and speech culture of Karaganda State Technical University it is developed and constantly improved the educational and methodological complex including the program, the working plan, as well as manuals containing texts with tasks aimed at the stage-by-stage formation of abilities of professional communication needed for the effective activity in the sphere of professional foreign-language interaction.

The selection of the language and speech material in the presented manuals is carried out taking into account the difficulties of this material assimilation and its importance for communication.

The proposed profession-focused texts are topical, informative and induce students to vigorous communicative activity in the specialty sphere. Alongside with the informative and general education value, the text material is to act not only as an information source, but also to contain statements on a problem with elements of comparison, reasoning, justification of a certain point of view. Each text has the *pretext tasks* representing lexical and grammatical exercises, explaining and fixing the most difficult grammatical phenomena, tasks for revising the taught language material; *text tasks*, setup questions premised to the authentic text; *posttext tasks* in the form of the questions checking understanding of the main information of the text and tasks for drawing up different types of the text plans, etc.

Thus, teaching to extract and understand information assumes the enrichment of students with special knowledge and specialty perspective, understanding of its advantage and need for further professional communication. All this finally allows forming the language base of students training.

Training specialists at technical colleges consists in the formation of communicative abilities which would allow carrying out professional contacts in various spheres and situations, to form the future expert's aspiration and ability to function as a strong language personality of the democratic type possessing a high linguistic competence in the sphere of languages, in professionally significant speech events of different types, in various modes, registers, forms, styles, types and genres of profession-focused speaking-and-thinking activity.

This finally expands the competence of a specialist-graduate of the present day higher school, makes him competitive at the modern labor market.

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#### BELIEFS AND CUSTOMS ASSOCIATED WITH THE TOTEM OF ANIMALS IN TURKIC LANGUAGE

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In our country, strengthening the independence and the entry of our country in a number of civilized countries, comprehension of the principles of national, moral and material values, and problems of their realization are vital nowadays. And this in turn requires the culture development; people pass their experiences, achievements in the development to future generations, as well as the progressive traditions of culture. Now consider the language picture of the world in general human cognition in the unity of the world model, and with the same conceptual view of the world is a philosophical and philological concept. The study "Language world" and "Conceptual picture of the world" in the trinity "Language-thought-world" is one of the urgent problems of modern linguistics. Language world – a specific method for the language of reflection and representation of reality in language forms and structures in its relation with the person who is the central figure of the language. From this point of view, we will consider the totem animal of Turkic peoples, including the ideological character of phraseology associated with the totem 'Kok bori' (Wolf) and 'Ayu' (Bear).

An Animal Totem is an important symbol and energy that a person uses to get in touch with specific qualities found within the animal which the person needs. Animals come to us because they have a lesson we need to learn or a power they are willing to share. An Animal Totem that comes to you brings power and wisdom if you will learn to communicate with it, give it respect, trust, and understanding. Animal totems tell us of lessons that we need to learn. They are powerful spiritual friends. Each animal has its own unique power and message. They help to empower and protect us. They can assist us with spiritual growth, inspiration, creativity and healing. They help us learn about ourselves.

You can have several animal guides through out your life. Sometimes an animal guide will come into your life for a short period of time, and then be replaced by another depending on your life path. Your guide will instruct and protect you as you learn how to navigate through your spiritual and physical life.

In our country, strengthening the independence and the entry of our country in a number of civilized countries, comprehension of the principles of national, moral and material values, and problems of their realization are vital nowadays. And this in turn requires the culture development; people pass their experiences, achievements in the development to future generations, as well as the progressive traditions of culture. Now consider the language picture of the world in general human cognition in the unity of the world model, and with the same conceptual view of the world is a philosophical and philological concept. The study "Language world" and "Conceptual picture of the world" in the trinity "Language-thought-world" is one of the urgent problems of modern linguistics. Language world – a specific method for the language of reflection and representation of reality in language forms and structures in its relation with the person who is the central figure of the language. From this point of view, we will consider the totem animal of Turkic peoples, including the ideological character of phraseology associated with the totem 'Kok bori' (Wolf) and 'Ayu' (Bear). Animal totems of Turkic-speaking peoples are: kook bori (wolf), bear, deer, argali (mountain sheep), a dog, worshiped all kinds of cattle, swan, crow, hawk, vulture, eagle, owl, and many other birds, totems and revered serpent, a dragon, and other inanimate objects to tote. Frequent totem among the Yakuts – an eagle, swan and vulture; Teluts – eagle in Altai – a bear, the Khakass – eagle, Tuvinian – the swan and the eagle, Tuba's – fish, vulture, eagle, swan, gull. Raven was considered sacred to the Turkic-Khakas, Tuvan, Yakut Sakha peoples. In Yakuts Sakha Crow was not only a totem, they have existed the Wolf Totem. In the sentence "Bizdin tanbamyz Bereke bolsyn, uranymyz kok bori bolsyn!" (Let Our sign will be unity, but will appeal kok bori (wolf)), through a combina-

tion of "tanbamyz Bereke bolsyn" (let the sign of our unity be prosperity). Turkic-speaking peoples from the beginning showed their desire to solidarity, unity and friendship. Through a combination of "Uranymyz kok bori bolsyn!" (let kok bori (wolf) be our motto) they called the nation to become strong and brave as wolf. Wolf had been deemed a sacred animal among many Turkic peoples since ancient times. The image of kok bori is being used as Kazakh flag. This is a direct continuation of the the Turks "wolf flag". This can be seen in poems of akyn Suyunbay: to be as brave, persistent and bold as a wolf.

"Bori uranym bass,  
Borili Menin bayragym.  
Borili bayrak koterse,  
Kozyp Keter Kaydagim

Oguz Kagan was led from victory to victory by blue roan, blue wolf. Oguz Kagan before leaving the field against other countries distributed their subordinate feudal lords and the people of this decree: Men senderge kagan Boldym, Alyndar zhak pen kalkan, Tanba bizge bolsyn Bereke, "Kok bori bolsyn uran". I became your Hagan, take your bows and shields. Let our sign be solidarity, let a wolf be our motto [1]. Here you can see that the line "Kok bori bolsyn uran" has a deep philosophical meaning.

Because kok bori elevated to the level of the slogan in this line has long been revered and sacred animal in many Turkic-speaking people. And if the story "Yer Targyn" the protagonist is portrayed as the "Ay betinen kirip, Kun betinen shygatyn kok bori" (a wolf what have moon setting, and sun rising from his face), and the courage of Kambar batyr described as "zhalaktagan ash bori" (hungry wolf). This feature is also peculiar of the Kyrgyz tales. Even the famous Kyrgyz "Manas" Manas batyr is described as "kara shagyr kabylyny myeon koseu kuyryk kok arys-tannan tys, arkasynda kara kok zhaly bar zholyna Nur togilgen bala":

Arkasynda balanyn,  
Kara kok zhaly korindi.  
Kara shagyr kabylyny,  
Kaptalynda shabyndy.  
Koseu kuyryk kok Arystan  
On zhagynda kabyndy.  
Nur togilip zholyna  
Bari oylagan balanyn  
Manas dep aty tabyldy [2].

Therefore, the image of "Bori" widely shows the world of Turkic-speaking people. In the knowledge of our ancestors kok bori – light of Tengri is a symbol of victory and heroism.

Among the Turkic peoples are found proverbs, beliefs associated with kok bori, wolf. The proverb "Koidyn iyesi Bolsa, borinin taniri bar" or "Ittin iyesi Bolsa, borinin taniri bar" at the Kyrgyz people sounds like: "Maldyn iesi Bolsa, borinin taniri bar" and the Russian people, "The dog has

the owner, and the wolf has god". Bori is Tengri's dog, so people have a belief that if the sheep pad-dock was attacked by wolf people interpreted this as a good sign, "Kok borinin auzy tidi, kok taniri koldaydy, mal osip, jaman bolady". Kazakh people defines the relationship of wolf with steppe wilderness and mountain, "Eldi zherde ury bar Taully zherde bori bar" (there is thief in the place where people live, and there is wolf where the mountain), "Bori kyr askansha", "Dalada bori ulya, uydegi ittin ishi ashidy". (when a wolf howls in outside the dog envies at home) Arab proverb says, "It urse kalma, elge aparar, bori ulya Barma, sholge aparar". (don't stay when the dog barks, it leads to country, don't go when wolf howls, he leads to the desert) This proverb says that a wolf's howl was considered as a bad omen. The Kazakhs of Mongolia believed that shooting wolves and taking away their puppies leads to bad luck and forbidden to do so. They were afraid that the wolf will return and take revenge, "Kaskyr kaytse bir sokpay ketpeydi" (anyway the wolf makes visit) [3]. The proverb "Kaskyrdyn zhese de auzy kan, Zhemeshe de auzy kan" (in the sense that you need to beware of shamelessness when you get dirty, it will be difficult to purify) shows the similarity of bases of two languages: in Uzbek, "Ena Burining ham ogzi kon, Emas ham ogzi kon" / "Бурунинг еса ҳам оғзи қон, Емаса ҳам оғзи қон".

The totem wolf had two names, the first – kok bori, according to the historical tradition of honor, that is, seen as a totem, the second – the enemy of livestock, regarded as a predatory animal. The ancestors of the Kazakhs Huns in ancient times considered a wolf as totem. And one more special image that was made by Hunnish masters was wolf's head sculpture made of gold. When they remembered their ancestors, they looked into the sky and worshipped this sculpture. The name of one of the Turkic tribes – Ashina-Achino, comes from the word meaning "noble wolf" [4]. The legend of Ashina says at the time of the enemies' invasion, a wolf (shin – is translated as a wolf in Mongol), adopted a boy who was left at the old habitation of the nomads. The descendants of Turkic Ashina are descended from the descendants of this boy. Not only the Turks believe that their ancestors came from the wolf, the Romans also call themselves descendants of the wolf. At the time of Turk Kaganats originated the belief that the ancestor of the Turks is kok bori.

Not only Kazakhs, but also Kyrgyz, Uzbeks, Turkmens, Tatars saw the wolf as a sacred animal, and never called him directly, for example, Kazakhs called him "uzyn kulak" "tik kulak", "ulyma", "kokzhal", "it-kus" Uzbeks used the transition to the meaning of "itkush" (um-kys), Turkmens used euphemism "ady zhitin" (untitled), mesdan it (the dog of the steppes). The Kazakhs, even at the present time do not call his name. Pastoralists believed that if you call him a "wolf",

then he will attack livestock. When people meet on the village they had a tradition of asking, "Malyn It-kustan aman ba?" (are your animals safe from itkus?). It is the imprint of ancient totemism. The people have a belief that if a wolf runs ahead of the traveler, he is lucky.

Turkic-Altai people, too, thought the wolf was a sacred animal, and never called his name, for example, Soyots called him "uzyn kuyrykty", "ulyma", "kok koz", Kaczynski Tartars called "uzyn kuyryk" and Yakuts "kuyrykty". Altai Turks did not use a direct name "Poru", instead of this was used the term "aga", and Chuvashs instead of calling "kashkyr" used such euphemistically names as "uzyn kuyryk", "tokpak kuyryk" or "tanir iti" [5].

In The image of kok bori the sign of totemism, fetishism, animalism are visible. There were beliefs about the tendons, bones and meat of the wolf. For example, in the old village residents to find a person committed a theft, said "Kaskyrdyn taramysyn ortegegi zhatyrmyn" (going to burn the tendon of a wolf). It came from the belief that, burnt leg tendon will hurt the thief's leg. A thief who was scared to have leg cringe: "Ayagym tartylyp kalady" nemese "Taramys, sinirim tartylyp kalady", brought the stolen item.

There was a belief of carrying the wolf's bone as a mascot. Fat and meat of the wolf used to treat tuberculosis. There is a belief that if the Kazakh women during pregnancy were craving wolf's meat, the boy born by them will be brave, courageous. For instance: mother of one of the famous XVI century warriors Orak Mamai Karaulek azhe sings thus:

... Mamayzhan boyga bitkende,  
Arystan, bori etin zhep,  
Kanyp edi zherigim"  
(23 zhoktau, Moscow, 1926).

One of these wild animals was a bear. The bear's tabooed name was "aba". Ancient hunters saw a bear as a protector of all animals, the saint patron of hunters, the ancestor of all mankind; he was seen as a creator. Referring to the researchers' views: "During the Paleolithic age bear turned to totemic cult of fire-Mother" [6]. Therefore, hunters were afraid to eat meat of bear. Buryats, even if they never considered a bear as totem, they never gouged out his eyes when murdered an animal, assuming his eyes as star, and told: "We didn't kill you, the hamnigany and Urynkhay murdered you, black crows whispered that". At the same time shouting at the Raven – conveys M.N. Hangalov [7]. Kazakhs slaughtering the stock said "You have no guilt, and we have no food", and this meant that they ask for forgiveness. Adoration of the bear is common in the Altai, Tuvan, Saha, Khakas and Buryat people. Turkic-speaking peoples are not called him directly by name, and used the euphemistic names. For example, the Yakut called "ehe" (grandfather), "tyataagy", "kyrdagas" Altai

“abaay” (her father), “karyndash”, “taay” Teleuts “Eph kulakty”, “Cheer hulahtyg” Tuva “kayirahan” (king of the creatures) [5].

Kazakhs also honored the bear. The Kazakhs have devoted bears kyui (music) “Zhorga ayu”, “Ayu bii”. Also, there are names of people like Ayub, Ayuhan, Ayukhanov, etc.

In the ancient records there are names as Arslan (Lion), Aşina (Wolf), Bars (Leopard), *Buqa* (raindeer), *Küçük* (puppy), *Qaban* (wild boar), *Qulan* (kulan), *Teka* (goat), and etc. The Tatars were called wolf “*bype*” Leopard “Leopard” lion “Arslan”, as there are people they are: Baiburin, Burke, Buriev, Burikaev, leopard, snow leopards, Aybaris/ Aybarys, Ilbars, Ilbaris, Bibarsov, Akbars, Arslan, Baybyre, Bug, Baybuga, Kөchek,

Kybək, etc. And, among the ancient names of turk people Arslan/ Arslan called the rulers of Turfan, and Karahan: Arslan balban, Arslan tegin, Arslan Bilge Tengri ilig [8].

### Conclusion

In the language of Turk-speaking People the wolf and the bear were considered as bold, fierce, brisk, courageous animals. Perhaps because of this brave young men were taught to be strong, took heart, accustomed to the courage and bravery.

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*Materials of Conferences***SCKOPENHAUER'S WORKS  
UNPOPULARITY REASONS  
AT HIS CONTEMPORARIES**

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Why Arthur Schopenhauer's irrational philosophy has not been acquired the popularity among Schopenhauer's contemporaries? Why his fame has come to him just before his death, at the end of his life's way? First, in that society, the Hegel's ideas have been prevailed, and, that is why, many people have adhered, precisely, to his views. It, moreover, has been necessary to be proved to people, that the Hegel's philosophy is quite nothing, in comparison with the Schopenhauer's philosophy. Second, the major reasons have been and in the Schopenhauer's philosophy itself. So, the main drawback, inherent in all the critical methods of the Schopenhauer's views, is the almost complete absence of the historical knowledge, and the facts assessment. In the method, by which Schopenhauer reviews and discusses the religion and philosophy phenomena, we have not seen the historical factor, that is complemented itself the critical, and is formed, together with it, the historical – critical point of view, the historical – critical or the historical evolutionary approach, having distinguished the scientific character of the XIX-th century from

the XVIII-th one. Thus, Schopenhauer – is the Weltschmerz philosopher, but it is not the dull grief. So, it is rather a kind of the heroic pessimism, which is closed to the stoicism. Schopenhauer bases his pessimistic views, as some definite understanding of the time, well as the space. The time is hostile the person. That is why, the space is separated the closest to each other people, that it is confronted their interests. The causality is being brought its troubles. It, like the pendulum, is practically thrown people from one states to the quite another ones, which are quite opposite them. Thus, the causality – is the most destructive human sorrows basis. So, A. Schopenhauer does not call to the suicide, and this, he is quite differed of Edward Hartmann's philosophy, which is closed to the Schopenhauer's doctrine, the reasonability challenge of the settling accounts with the life is completely resolved in the affirmative one. Schopenhauer also will be given the quite negative answer, and he is justified it, as follows. The Schopenhauer's philosophy has not been received its necessary popularity in the society, mainly, because of the fact, that the historical knowledge and the facts evaluation are almost completely absent in his works.

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## Materials of Conferences

**ABOUT THE NEW STATEMENT  
OF CLASSICAL PROBLEM OF RIGID  
BODY DYNAMICS IN THE CASE OF EULER**

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The nontraditional conjugate vectors (tangent and cotangent) of the finite Euler rotation are proposed to be used in the problem of Euler rigid body (RB) dynamics. Moduli of these vectors are proportional to tangent and cotangent of a quarter angle of rotation. Contrary to the classical Rodrigues' vector, they do not become infinite within the complete RB rotation. Kinematic differential equations for these vectors have common solution (in the Cauchy's form). New dynamic polar differential equations are obtained from the classical dynamic Euler-Poisson equations as a result of replacement of angular velocity vector by the vector kinetic moment, as well as replacement of three directional Poisson cosines by the conjugate vectors coordinates. In the case of Euler, three obtained scalar dynamic differential equations have two classical first integrals (of energy and areas). Three new dynamic equations are considered as integrable ones. These equations explicitly determine the whole RB orientation, not just its vertical, like three Poisson equations do.

1. In classical Euler's problem of rigid body (RB) dynamics with a fixed point [1], the differential Euler-Poisson equations are commonly used. Three Poisson equations determine only the earth vertical reference in relation to RB, not the whole RB orientation. Moreover, it is presumed possible to determine RB orientation through the Euler angles with additional integration of expression for time derivative of RB precession angle [1, page 16]. But the direct integration of only three Poisson equations basically does not solve the problem of determining RB orientation in three-dimensional space. In order to explicitly determine RB orientation, it is necessary to have at least six directional cosines. However, in this case, one must integrate nine differential equations instead of six Euler-Poisson equations. In this regard, the possibility of using well-known three-dimensional rotation vectors in RB dynamics is appealing, because they have three independent coordinates.

The classical Rodrigues' vector [1] has modulus with tangent ( $\operatorname{tg}(\varphi/2)$ ) of half-angle  $\varphi$  of RB finite rotation. This vector cannot be used in the problem of RB dynamics for  $\varphi \geq \pi$ . Unconventional *conjugate* rotation vectors considered in papers [2–4]:  $\vec{\tau} = \tau \vec{k}$ ,  $\vec{\rho} = \rho \vec{k}$ , where  $\tau = k_\tau \operatorname{tg}(\varphi/4)$ ,  $\rho = k_\rho \operatorname{ctg}(\varphi/4)$  ( $k_\tau$ ,  $k_\rho$  – the arbitrary constant coefficients,  $\vec{k}$  – unit vector of Euler axis of RB finite rotation) are of

particular interest (for  $0 < \varphi < 2\pi$ ) by virtue of their conjugation properties [4].

New statement of Euler problem of RB dynamics is proposed in the report on the basis of differential equations for the RB conjugate rotation vectors.

2. The *conjugate polar* non-linear vector kinematic differential equations of RB rotation are considered in the form of linear transformations of angular velocity vector  $\vec{\omega}(t)$  of RB rotation (as an independent vector variable of time function) [4, 5]:

$$\vec{\tau}' = \tau' \theta_{(\tau)} \vec{\omega}, \quad \vec{\rho}' = \rho' \theta_{(\rho)}^T \vec{\omega}, \quad (1)$$

where  $\vec{\tau}' = d\vec{\tau}/dt$ ,  $\vec{\rho}' = d\vec{\rho}/dt$  are the local (relative) derived vectors with respect to time  $t$  (the derivatives with respect to some coordinate basis  $\mathbf{J}$ , associated with RB);

$\tau' = \partial\tau/\partial\varphi$ ,  $\rho' = \partial\rho/\partial\varphi$  are the partial derivatives of the  $\tau$ ,  $\rho$  vectors moduli with respect to angle  $\varphi$ , which are defined as the following functions:  $\tau' = (k_\tau + \tau^2/k_\tau)/4$ ,  $\rho' = -(k_\rho + \rho^2/k_\rho)/4$ ;  $\theta_{(\tau)}$ ,  $\theta_{(\rho)}^T$  are the orthogonal operators [4]:  $\theta_{(\tau)} = E + 2(k_\tau T + T^2)/(k_\tau^2 + \tau^2)$ ,

$\theta_{(\rho)}^T = E + 2(-k_\rho R + R^2)/(k_\rho^2 + \rho^2)$ ,  $T$  is the transposition.

Here,  $T$  and  $R$  are the skew-symmetric operators of vector multiplication [3–5], which satisfy the identities:  $T\vec{\tau} = \vec{\tau} \times \vec{\tau} = \vec{0}$ ,  $R\vec{\rho} = \vec{\rho} \times \vec{\rho} = \vec{0}$ ,  $\vec{0}$  is zero vector,  $E$  is unity operator. The operators  $\theta_{(\tau)}$ ,  $\theta_{(\rho)}$  satisfy the identity  $(\theta_{(\tau)} \theta_{(\rho)})^2 = E$ , which determines conjugacy of the vectors  $\vec{\tau}$ ,  $\vec{\rho}$  and the equations (1) [5] as the properties of duality and isomorphic correspondence.

3. The equations (1) have the first (trigonometrical) integral in the form of scalar product  $(\vec{\tau} \cdot \vec{\rho}) = \tau\rho = k_\tau k_\rho = C$  (arbitrary constant) and allow simple and intuitive kinematic interpretation, polar precession-nutation model [5] at arbitrary vector  $\vec{\omega}(t)$  and for any RB. In the first equation, vector  $\vec{\omega}$  is being transformed (at every instant of RB motion) into the vector  $\vec{\omega}_\tau$  by the operator  $\theta_{(\tau)}$  as a result of precession  $\vec{\omega}$  by angle  $\psi_{\theta_\tau} = \varphi/2$  (rotation of vector  $\vec{\omega}$  with modulus  $\omega(t)$  over the surface of some circular precession cone with cone angle  $2\psi_\omega$ ) around the Euler axis with unit vector  $\vec{k}$ . Angle  $\psi_\omega$  – the nutation angle (deviation of vector  $\vec{\omega}$  from unit vector  $\vec{k}$ ). Then, the vector  $\vec{\omega}_\tau$  is multiplied by the scalar operator  $\tau'E$ . In the second equation, the vector  $\vec{\omega}$  is being precessed (rotated over the same cone surface) by angle  $\psi_{\theta_\rho} = (\pi + \varphi/2)$  and is multiplied by the scalar operator  $\rho'E$ . The nutation angle  $\psi_\omega$  is determined from the scalar products:  $(\vec{\omega} \cdot \vec{\tau})$ ,  $(\vec{\tau}^* \cdot \vec{\tau})$  or  $(\vec{\omega} \cdot \vec{\rho})$ ,  $(\vec{\rho}^* \cdot \vec{\rho})$ .

On the basis of such interpretation, the equations models (1), for example, the kinematic non-holonomic equality is obtained:

$$\frac{(\vec{a} \cdot \vec{b})^2 + ((\vec{a} \times \vec{b}) \cdot (\vec{a} \times \vec{b}))}{(\vec{a} \cdot \vec{a})(\vec{b} \cdot \vec{b})} = 1 \quad (2)$$

where  $\vec{a} = \vec{\omega} \times \vec{r} = (\theta_{(\tau)} \vec{\omega}) \times \vec{r}$ . From the equality (2), follows the equality with the arbitrary constant  $C_\tau = k_\tau$ , for example:

$$\left( \frac{C_\tau^2 + \tau^2}{C_\tau \tau (\vec{a} \cdot \vec{b})} \right)^2 ((\vec{a} \times \vec{b}) \cdot (\vec{a} \times \vec{b})) = 4 \quad (3)$$

The equalities similar to the equalities (2) and (3) are obtained at replacing the vector  $\vec{r}$  by the vector  $\vec{\rho}$ . The equations (1) have common solutions in the Cauchy form [5, 6]. So, the general solution of the first equation (1) determines the type of group multiplication and division operations of vectors  $\vec{r}$  in the associative Lie group [6]. In this group, the inverse element  $\vec{r}^{-1}$  is equal to the opposite vector, i.e.  $\vec{r}^{-1} = -\vec{r}$ , while the unity element is equal to zero vector  $\vec{0}$ .

4. On the basis of kinematic equations (1), the various new (polar) dynamic differential equations of RB rotation are obtained.

In the classical case of Euler, the problem of solving the system of six dynamic differential Euler-Poisson equations [1] comes to integration of system of only three dynamic equations with two independent classical first integrals (of energy and areas [1]). These two integrals are enough in order to consider the system of three equations as integrated [1].

Moreover, the change  $\vec{\omega} = S^{-1} \vec{g}$  is introduced in the equations (1), where  $\vec{g}$  is the constant vector of kinetic moment (constant in magnitude and direction in the reference basis I [1]);  $S^{-1}$  is the inverse operator S of RB inertia [4, 5] (constant in the basis J bound with RB).

Obtained from (1), for example, the polar matrix differential equation with coordinates of the vector  $\vec{r}$  has the following form (see also [4]):

$$\vec{\tau}_J^* = \tau' (\theta_{(\tau)J} S_J^{-1} \theta_{(\tau)J}^T) \theta_{(\tau)J}^T \vec{g}_I \quad (4)$$

where  $\vec{\tau}_J^* = [\dot{\tau}_{j1} \dot{\tau}_{j2} \dot{\tau}_{j3}]^T$  is the column matrix with coordinates of the derivative  $\vec{\tau}^*$  in the basis J;  $\theta_{(\tau)}^J$  is the matrix (3×3) of operator  $\theta_{(\tau)}$  in the basis J;  $S_J$  is the diagonal matrix (3×3) with three constant principal moments of RB inertia;  $S_J^{-1}$  is the inverse matrix,  $g_I = [g_{i1} g_{i2} g_{i3}]^T$  is the constant column matrix with the vector  $\vec{g}$  coordinates in the basis I.

Three vector  $\vec{r}$  coordinates explicitly define RB orientation. In the problem of RB dynamics, in general case (at variable vector of kinetic moment), the equation (4) is used in combination with the dynamic Euler equations for the vector of kinetic moment [1].

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*Materials of Conferences***IDENTIFICATION AND STRUCTURAL ANALYSIS OF SIGNALS**

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The tendency of modern development is to solve complex problems that require multiple resources, the close relationship of various aspects of social life and lead to the need to consider the complex difficult to describe objects, phenomena and processes.

Technology, economics, sociology, education is increasingly turning in operating complex ergatic systems, i.e. systems of one of the elements which is man himself, (space projects, innovative economic and social programs, the problem of building effective models and transformation of the professional activities, etc.). Separate development of the individual components of this systems, such as engineering, technology or management does not solve complex problems, in particular the quality of life of sustainable growth, and is not provided, in turn, change the individual influencing factors: new technology, improving the organization of work, professional development and performers etc.

So today was becoming increasingly pronounced decrease from existing and need to formulate new methodological approaches to solving these problems. Changing the type of scientific and practical problems, their transformation into actual management tasks the organization and operation of complex systems is accompanied by the need to develop new scientific and special-scientific concepts, ideas using a systematic approach.

It is increasingly clear that a systematic approach is a generalized methodological concept that allows building new means of studying complex systems. This fact is becoming increasingly important due to the control problems of complex objects, complete an adequate description of which is either unavailable or can not be obtained, for economic or technological reasons.

Complex systems are characterized by a large number of different elements, the presence of various types ( heterogeneous ) the links between elements , a high level of integrity , integration, robustness , as well as a new , non-traditional in the sense of the formalization of properties , which include unique , no clearly formalized purpose of existence , the lack of optimality . Such systems is difficult to assign a large number of different kinds of parameters which set does not fully unambiguous description of their integrity and parametric description of complex systems , in most cases they do not provide an unambiguous assessment.

Development of methods for classification and identification of signals in a wide semantic meaning of the word "signal" is identified with concepts such as communication and information, it is urgent to solve various scientific and practical problems and, in particular, the problems of managing complex geographically distributed objects.

Under such objects are generally understood semantic objects of any nature (both physical and abstract) having a distributed structure, i.e. objects to control which requires monitoring geographically or functionally segregated totality of their elements.

The essence of the problem is the identification information (signals) obtained in particular from the distributed object and a decision about the state of the object on the basis of identification results. Existing methods for the solution of this problem, a common approach to signal analysis that consists in allocating them in so-called informative signs used subsequently to classify signals.

However, in the process of solving the problem of classification, as a rule, there is a problem multicriteriality, the characteristic feature of which is the consideration of the two spaces – the space of variables (signal parameters) used in the construction of its mathematical model, and space criteria. The problem of multi-criteria evaluation signal, regardless of its nature, is actually reduced to the problem of estimating the importance (significance) of the evaluation criteria of private properties and characteristics of the signal when evaluating the integral measure of the difference (distance) within classes and between classes. This problem, in our opinion, is generated by the fact that the aggregate partial criteria (properties and characteristics of signals) are special systems that have their own structure and properties different from the properties of the integral evaluated signal, as a system. In addition, the existing classification methods in constructing measures of difference, as a rule, involve the use of analytical expressions relating the parameters of the signals with independent arguments and differences of scales, which makes their implementation.

In such a situation suitable research towards finding new solutions to the problems under consideration until a drastic change very concept mapping (representation) of the signal, in particular, through the use of the ideas and methods of the structural approach in the orientation system and then solving problems identification and structural analysis.

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*Short Reports***SYNERGETICS IN ARCHITECTURE  
AND TOWN PLANNING.  
INNOVATIVE ASPECTS**<sup>1</sup>Kremlev A.G., <sup>2</sup>Babich V.N.<sup>1</sup>*Ural Federal University, e-mail: kremlev001@mail.ru;*<sup>2</sup>*Ural State Academy of Architecture and Arts*

Innovative development of the economics in the conditions of information saturation (of knowledge, know-how, applied methods and technologies, used materials) and in the conditions of globality of communication opportunities (multiplicity and availability of information sources, an international innovations transfer and usage, hi-tech productions, intellectual products) cause radical (fundamental) changes in the architectural and town-planning sphere (new concepts and styles, purposes and tasks, ways and realization methods).

The continuous stream of innovations changes consumer inquiries, forms qualitatively different social inquiry, defines the basic directions of architectural creativity and urban policy. The perception of the modern city (megalopolis) in its spatial development as an elaborate socially-technical system irreversibly occurs from a position “a form – a movement” (change of a form, structural transformations, modernization of the intersystem providing processes) and is estimated as a result of an architectural and social co-evolution. The principles of the organization of co-evolution development of an urban environment of the megalopolis (as an elaborate system) are defined by systemacity, dynamism and self-organization [1].

Systemacity of an complex organized object is characterized by coherence, interdependence, interaction of its elements and components and appears through such system concepts as composition (elements, communications), structure (morphology, order), subsystem (components, units of system hierarchy), environment (a dichotomy “system – a system environment”), procedural invariants (life period, transition unit, a temporary condition), determination of system properties and processes (functional properties and relations, development and functioning processes) etc. [2].

Thus a system approach to the research of co-evolution development of an urban environment of the megalopolis (as a socially-technical system) means identification of mechanisms of establishment of coherent relation and mutual coordination of parameters of evolution of all components of the subsystems representing the population, production, economy and finance, transport, trade, culture and education and other spheres, in the conditions of an external environment (interchange with social and natural environment) which influence is also multi-vectorial, diversified (noncoplanar), has non-linear character, non-commutative and as a whole isn't associative. The multiple layers of an urban

environment are defined by polyfunctionality of the urbanized territory and are perceived systemically, being reflected in an image shape of the city.

The development of the city as a socially-technical system (dynamics, an orientation, an attractor – is a limit in time and steady phase condition) is caused by the balance of external environmental influences and internal inquiries (and opportunities). The potential (as the real ability) of the city development has to be purposefully used (realized) that assumes a search and development of the complex town-planning decision (modeling of the city space as a whole and in parts, in various layers of city infrastructure). The local centers of the urban environment development (individual building, trade and entertaining points, the services enterprises, etc.) supplement the city infrastructure, locally fill up an urban area, forming zones of compromise space [3]. They also form an urban environment (as the self-organization elements), influence the social and economic climate of an urban area. Their appearance is predictable in some measure, but an architectural and art representation is original (often nonprofessional, not expressive, not esthetical), and has to be regulated administratively (that is again lay in the context of the scheme of complex modeling). It indicates again the need of system approach to the research of the urban environment development problems.

The complex system has various stages in its development. Its structure, organization model (communications and relations), hierarchy are directly connected with the system evolution, with movement degree to the aggravation moment (a crisis point of the development trajectory – a bifurcation point). Besides the coherence (coherence in time) of interconnected (in complete, elaborate system) components (separate parts and elements, different hierarchical levels) takes place, besides a transformation of parameters of functioning system happens, the role of some parameters is intensified (they accept the dominating value), of others – is weakened. It causes the changes of the system properties and macroscopic behavior of the system. Reorganization of the internal organization of the system (structure, communications, functions, hierarchy) or self-organization take place, as well as reorganization of external (functional) qualities and above-system relations (structural communications with the environment). The process of the system self-organization is defined by transition to new, rather steady dynamic state in the conditions of nonstationarity of the environment and openness of the system itself which provide a continuous resources exchange (of energy, substance, information) with the environment.

Synergetic approach to the consideration of the modern city defines it as a dissipative system, as a complex, open and non-equilibrium structure which is affected by multidirectional streams (of various

nature) of the environment and internal processes of structural transformations. Non-equilibrium systems are characterized by special conditions – points (zones) of bifurcation where the natural (determined) process is broken, and a possibility of fundamental uncertainty of further system behavior appears [4].

Dynamics of the city depends on arriving resources, their volumes, frequency, target orientation, and also possibility of their rational consumption. A city structure formation can happen irregularly (selectivity of its separate objects), depending on stimulating factors and administrative decisions. Not only economic (material, financial) levers can stimulate, but also natural, social, historical and other essential circumstances.

As a result of changes of existence conditions of a system (new factors and/or transition of some former factors influencing its functioning and development in the status of defining ones) the values of any local system parameters (structural and quantitative) deviate the average values (on concrete time interval) – there are appeared new fluctuations which interact with the existing ones. Domination of any fluctuation leads to transformation of the general (system) structure. Besides it is possible to operate an appearance and development of necessary fluctuations by regulating an intensity (direction) of resource streams. However there are exist (uncontrollably arisen) the natural (spontaneous) fluctuations, which are capable to weaken (to limit) the actions of operated fluctuations that leads to non-predictable situations. The trajectory of the city development has bifurcation zones, which help the system to change an extreme condition – an attractor defining the new direction in development.

The architectural system considered from an object and process position, uniting an architectural activity result and realization process (from the project development to its introduction, implementation), is the object of management, i.e. of the impact directed on artificial transformation of this object. Thus, architectural and town-planning activity concerning a concrete object of an urban environment is carried out within administratively accepted development plan and/or reconstruction of city space. Besides the control object is developed as well by natural laws (independent of administrative activity): the changes of external form, of the infrastructure elements, landscape take place, and not only of local character, but also of regional one (in larger territories). Therefore it is necessary first of all to consider the object as a natural system, to define tendencies of its natural development, to make the forecast of such development. After that to consider the object as artificial system – as a result of purposeful activity that will demand to make its project (model), to estimate a degree of deviations from a predicted condition (in case of natural development), to develop the management program, choosing operating parameters (significant from the point of view of the project) with an estimation of

their influence on transformation process, to define methods and program implementers.

Architectural and town-planning management has to be carried out in a resonance with immanent tendencies of the city system development.

Synergetic approach to the idea of city system (megapolis) as actively developing dissipative system, self-organizing and evolving (coexisting and interacting to environment – social and natural) takes place in the field of the innovations defining the appearance of the various probable alternatives of development (with irreversibility of changes, acceleration of reorganization processes, diversification).

It is possible to characterize innovative aspects of architectural activity through innovation of means (methods, technologies) of the architectural and town-planning design, innovation of means (methods, technologies) implementation of such project, through innovation of the architectural activity object, urban environment, town planning process.

Specification of the presented innovative groups reflects the current scientific and technical level of society development, the degree of distribution of innovative activity in the architectural and construction sphere in its various manifestations, covering all stages of architectural and construction process. Besides the theoretical researches and developmental works directed on the solution of the arising conceptual or current tasks (during practical realization) can be also performed: choice and usage of innovative materials, designs, equipment, construction technologies; technical and economic foundations of the project (including carrying out various expertise); IT-based mathematical modeling, including geometrization of architectural forms (architectural space), parametrization of a designed project, optimization of a model choice on the basis of a multicriteria assessment; and also the actions directed on the solution of organizational, administrative, financial, labor, legal and other problems of social and economic character.

Innovation of the architectural activity object, urban environment, town-planning process includes not only new forms, new architectural concepts, new purpose, but also arising opportunities transformed depending on today's (also tomorrow's) tasks allowing to satisfy arising society requirements in time and effectively.

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